

96th Congress }
2d Session }

JOINT COMMITTEE PRINT

SPECIAL STUDY ON ECONOMIC CHANGE

VOLUME 4

**STAGFLATION: THE CAUSES, EFFECTS,
AND SOLUTIONS**

STUDIES

**PREPARED FOR THE USE OF THE
SPECIAL STUDY ON ECONOMIC CHANGE
OF THE
JOINT ECONOMIC COMMITTEE
CONGRESS OF THE UNITED STATES**



DECEMBER 17, 1980

Printed for the use of the Joint Economic Committee

U.S. GOVERNMENT PRINTING OFFICE

65-018 O

WASHINGTON : 1980

prises an analysis of stagflation, separating the issue into several parts before charting a realistic course of action toward a more healthy economy.

It should be understood that the views expressed in the technical papers are exclusively those of the authors and do not necessarily represent the views of the Joint Economic Committee or of individual members. The staff study was approved by the Chairman's Special Study Review Committee formed by the Chairman, Representative Bolling, Ranking Minority Member Representative Clarence J. Brown, and Senator Javits.

Sincerely,

JOHN M. ALBERTINE,
Executive Director, Joint Economic Committee.

CONTENTS

	Page
Letters of transmittal.....	III
STAGFLATION: THE CAUSES, EFFECTS, AND SOLUTIONS	
Stagflation: Causes and Cures—Thomas F. Dernburg.....	1
The Post-Keynesian Interpretation of Stagflation: Changing Theory To Fit the Reality—Alfred S. Eichner.....	38
Toward a Theory of Institutional Inflation—Janos Horvath.....	67
Regaining Control Over an Open-Ended Money Supply—Albert Gailord Hart.....	85
Monetary Disequilibrium Theory in the First Half of the Twentieth Century—With Remarks on Disequilibrium in the 1970's—Clark Warburton.....	143
Inflation and Labor Force Participation—N. J. Simler and Alfred Tella...	155
Demographic Aspects of the Stagflation Problem—Jeffrey M. Perloff and Michael L. Wachter.....	168
Accelerating Inflation and the Distribution of Household Savings Incentives— Edward J. Kane.....	193
The Distributional Effects of Inflation and Their Implications—Joseph J. Minarik.....	225
Is There a Shortage of Saving in the United States? The Role of Financial Institutions, Monetary and Fiscal Policy in Capital Accumulation During Periods of Stagflation—Paul Davidson.....	278
The Economic Effects of Tax Changes: A Neoclassical Analysis—Norman B. Ture.....	316

STAGFLATION: CAUSES AND CURES

By Thomas F. Dernburg*

CONTENTS

	Page
Summary.....	1
I. Introduction.....	2
II. The origins and propagation of stagflation.....	5
A. Aggregate supply restriction.....	5
B. High marginal tax rates, the policy mix, and stagflation.....	13
C. Excessive demand as a source of stagflation.....	23
D. Inflation as a cause of stagflation.....	26
III. Policies to combat stagflation and suggestions for research.....	27
A. Perverse behavior of automatic stabilizers during stagflation.....	27
B. The pairing of targets and instruments.....	32
C. What can be done immediately.....	33

SUMMARY

The term stagflation is generally applied to the unhappy economic condition under which the rate of inflation and the rate of unemployment are both uncomfortably high, or as in 1970 and again in 1975, when both rates rose simultaneously. Stagflation has characterized much of the industrial world throughout the 1970's and it is the most serious economic problem that now confronts advanced economies.

Several sources of stagflation are identified in this paper and are related to historical experience in the United States. The most important sources of stagflation undoubtedly are supply restrictions. World food shortages and increases in the cost of energy such as beset the economy in 1973-1974 are the most spectacular examples. But labor supply restrictions that follow in the wake of increases in the minimum wage, increased union membership and power, and wage retaliation in response to higher taxation are also important sources of supply restriction. Such restrictions reduce output and employment as they push up the price level. Faulty monetary fiscal policy mix is identified as another potential source of stagflation. An easy-money tight-fiscal mix can create problems if higher taxes lead to wage retaliation. In that event, both aggregate demand and supply are reduced with the result that output and employment drop sharply, while the net effect on the price level is unpredictable. This particular diagnosis is quite helpful in explaining the success of policy in 1964 and its abject failure in 1968.

The deterioration of 1970 is attributable to the generation of stagflation from the demand side. This happens when excessive demand pushes the unemployment rate below the so-called "natural" rate.¹

*Senior economist, Joint Economic Committee. Mr. Dernburg is now staff director of the Subcommittee on Economic Stabilization of the Senate Committee on Banking, Housing, and Urban Affairs.

¹ Unfortunately the natural rate of unemployment is not a well defined concept. Current estimates place its value in the neighborhood of 5.5 percent although a great deal of uncertainty surrounds this estimate.

Rates below the natural rate of unemployment are unsustainable and lead to accelerating inflation.

Finally, inflation tends to beget stagflation. This is partly because inflation imparts a restrictive bias to monetary and fiscal policy and partly because inflation brings with it automatic restrictive effects that lower output and employment. When the price level rises, the real quantity of money declines. This raises real interest rates and reduces investment. The rise in the price level also reduces the real value of public debt, and the resulting real balance effect reduces consumer wealth and consumption spending. Consumption is also reduced if the inflation pushes taxpayers into higher tax brackets, since this lowers their real disposable income. Also, inflation causes the Nation's international competitive position to deteriorate. This transfers economic activity abroad. Finally, a phenomenon such as the energy shock of 1974 reduces consumer real income as it raises prices. Such purchasing power transfers cannot help but produce acute stagflation.

Stagflation creates a serious dilemma for traditional monetary and fiscal policies because these instruments generally cannot act to alleviate one component of the disease without exacerbating the other. The last part of the present study therefore sets out in quest of solutions to the stagflation dilemma that are separate from the old-time religion of tight budgets and tight money. A start in the right direction would be reduction of payroll taxes, the institution of a wage subsidy program, and adoption of a differential minimum wage that would ease the youth unemployment problem. Since supply shocks are largely responsible for stagflation, it is suggested that these shocks be cushioned by the establishment of buffer stocks of primary agricultural products as well as stocks of coal and oil. It is further recommended that the tax system be indexed for inflation.

Stagflation will linger for years. But that does not mean we cannot begin to deal with the disease with the adoption of the proposals presented in this paper.

I. INTRODUCTION

The persistence of inflation in combination with high unemployment is the central phenomenon of the late 1970's.²

Stagflation, as the simultaneous presence of excessive³ unemployment and excessively high rates of inflation as conventionally termed, is not the exclusive stepchild of the 1970's. The novelties of the 1970's are the persistence of the disease and the fact that nearly all competent forecasters have come to take for granted that stagflation will remain with us throughout the future.

Is there no end in sight? This is a frightening and depressing question, and it represents the motivating force behind this paper. In it an attempt is made to summarize, in simple and nontechnical terms, what

² Otto Eckstein, *The Great Recession*, North Holland (Amsterdam, New York, and Oxford), 1978, p. 152.

³ Stagflation exists when unemployment and the inflation rate are both excessive. The term excessive is, of course, far too vague to be of use. Are unemployment and inflation excessive by some historical standard such as the performance of the 1960's, or are they excessive according to some normative standard as prescribed by the Humphrey-Hawkins bill? Economists tend to look for technical criteria. For example, contemporary theorists visualize a "natural" rate of unemployment. If policy attempts to achieve a lower target rate of unemployment, this will lead to an acceleration in the rate of inflation, and the target employment objective would therefore be regarded as excessive. Picking the appropriate criteria for satisfactory unemployment-inflation performance is essential if appropriate policy decisions are to be made. This topic will be detailed at a later stage.

is known about the nature of stagflation and what is known about possible remedies for the problem. The introductory section discusses the measurement and meaning of stagflation and attempts to put the 1970's experience into historical perspective.

Part II considers the general principles that underlie the stagflation phenomenon. What are its root causes, and why does it tend to be a self-sustaining process that generates its own continuation? An attempt is made throughout to apply analytical principles to the history of stagflation in the United States.

Part III tackles the policy problem of how to combat stagflation and separates proposed cures that are more debilitating than the disease from those that are less inhumane. This section also includes suggestions of avenues for further research and inquiry.

The simplest and most common indicator of stagflation is the so-called "discomfort index." It is not an index at all but rather the sum of the global unemployment rate and the rate of inflation. The index and its components are shown for the period 1947-48 in table 1 where the measure of the rate of inflation is the percentage increase in the implicit price deflator for gross national product (GNP deflator).

TABLE 1.—UNEMPLOYMENT, INFLATION, AND THE DISCOMFORT INDEX

	Unemploy- ment rate (percent)	Percent change in implicit price deflator for GNP	Discomfort index	Change in discomfort index
1947.....	3.9	13.1	17.0	-----
1948.....	3.8	6.9	10.7	-6.3
1949.....	5.9	1.0	4.9	-5.8
1950.....	5.3	2.0	7.3	-2.4
1951.....	3.3	6.8	10.0	2.8
1952.....	3.0	1.3	4.3	-5.8
1953.....	2.9	1.5	4.4	.1
1954.....	5.5	1.4	6.9	2.5
1955.....	4.4	2.2	6.6	-.3
1956.....	4.1	3.2	7.3	.7
1957.....	4.3	3.4	7.7	.4
1958.....	6.8	1.6	8.4	.7
1959.....	5.5	2.2	7.7	-.7
1960.....	5.5	1.7	7.2	-.5
1961.....	6.7	.9	7.6	.1
1962.....	5.5	1.8	7.3	-.4
1963.....	5.7	1.5	7.2	-.4
1964.....	5.2	1.6	6.8	-.3
1965.....	4.5	2.2	6.7	-.1
1966.....	3.8	3.3	7.1	.4
1967.....	3.8	2.9	6.7	-.4
1968.....	3.6	4.5	8.1	+1.4
1969.....	3.5	5.0	8.5	.4
1970.....	4.9	5.4	10.3	1.8
1971.....	5.9	5.1	11.0	.7
1972.....	5.6	4.1	9.7	-1.3
1973.....	4.9	5.8	10.7	1.0
1974.....	5.6	5.6	11.2	.5
1975.....	8.5	9.6	18.1	6.9
1976.....	7.7	5.3	13.0	-5.1
1977.....	7.0	5.6	12.6	-.4
1978.....	6.0	7.5	13.5	.9

Sources: Bureau of Labor Statistics and Department of Commerce.

The necessary condition for the presence of stagflation is that the discomfort index be high and that each of its two individual components also be high. There was considerable discomfort in 1948 and 1951 but this was because of high inflation rates. Since the employment situation was satisfactory, these years could not be regarded as examples

of earlier stagflation. Similarly, 1958 was a year of serious discomfort. But in 1958 high unemployment was almost exclusively responsible. Although there have been exceptional individual stagflation years in the past—the record was set in 1934 when unemployment exceeded 22 and inflation was 7 percent—stagflation as a persistent phenomenon is uniquely a product of the 1970's. This is clear from Table I which shows that in each year of the 1970's both the unemployment rate and the inflation rate were excessive relative to levels that are generally regarded as consistent with satisfactory employment and reasonable price stability.

The 1970's have also been unique and surprising in the frequency with which the unemployment rate and the inflation rate have moved in the same direction. Both increased in 1970 and 1975, both decreased in 1972, and both increased in 1979. Such coincident movement occurred only once (in 1952) during the preceding 20 years. Thus two decades (1930–1950) followed the standard expectation that rising unemployment would be accompanied by a declining rate of inflation. The fact that this pattern can no longer be counted upon is at the core of the current crisis in macroeconomic thought and its practical by-product, the paralysis of policymaking. It suggests that higher unemployment is not a cure for inflation, and conversely it suggests that the acceptance of a higher rate of inflation will not necessarily yield a benefit in the form of lower unemployment. In fact, there is now considerable reason to suppose, as explained later in this paper, that an increase in the rate of inflation may be a factor in raising unemployment.

Changes in Discomfort

In addition to the level of discomfort, considerable concern should also be attached to year to year *changes* in discomfort. Indeed, in some discussions, stagflation appears as a situation in which unemployment is *rising* (as opposed to high) and in which the inflation rate is *accelerating* (again as opposed to high). This distinction is crucial for purposes of diagnosing the nature of the disease in specific instances and therefore for designing appropriate policy responses. Rapidly rising defense expenditures pushed the unemployment rate to well below 4 percent from 1966 to 1968. The consequent overheating of the economy produced a delayed price level acceleration so that by 1970 unemployment and inflation were both rising. However, the unemployment rate in 1970 was 4.9 percent and the inflation rate was 5.4 percent, producing a discomfort index of 10.3. This was moderate compared with the statistics of 1976 at which time unemployment averaged 7.7 percent and prices rose 5.3 percent, for a discomfort total of 13.0. From the standpoint of the level of discomfort, 1976 was clearly the poorer year; but from the standpoint of *improvement*, 1976 would have to be viewed as a spectacular year since the discomfort index dropped 5.1 points as opposed to 1970 when it increased 1.8 points. Both years are normally thought of as years of stagflation. But in 1970 stagflation was interpreted in terms of the deterioration that took place relative to the preceding year. In 1976, on the other hand, stagflation was interpreted as the continuation of an excessive level of discomfort despite enormous improvement over the preceding year.

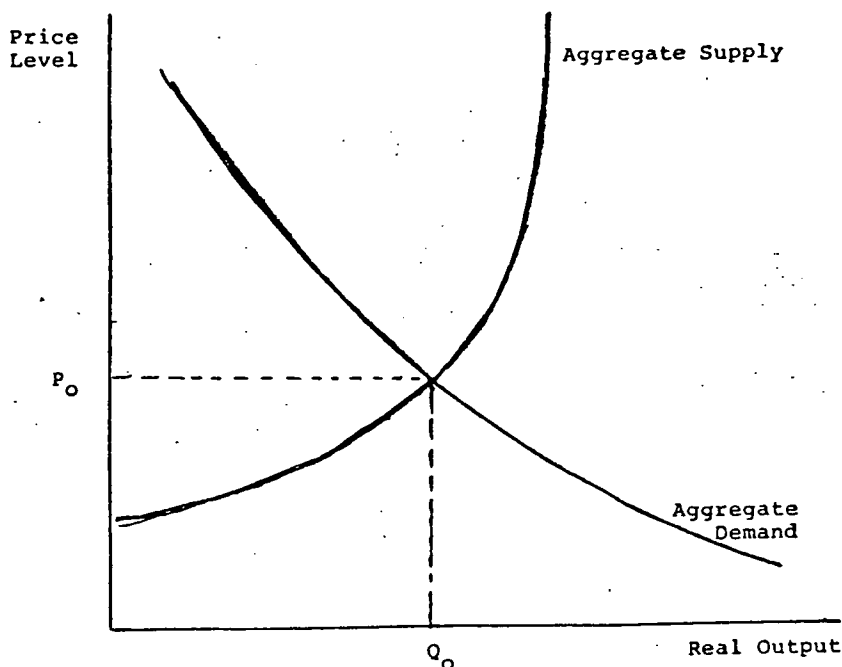
II. THE ORIGINS AND PROPAGATION OF STAGFLATION

A. Aggregate Supply Restriction

THE CONCEPTS OF AGGREGATE DEMAND AND SUPPLY

Among the simplest and most useful ideas of standard macroeconomic analysis are the concepts of aggregate demand and supply. These concepts are especially helpful in the analysis of stagflation. The ideas are illustrated graphically in figure 1 where the downward

FIGURE 1.—Illustrative aggregate demand and supply curves.



sloping aggregate demand function shows the quantity of real output demanded to be declining as the price level rises, while the upward sloping aggregate supply curve shows the quantity of real output supplied to be rising as the price level rises.

Aggregate demand depends on the responses of consumer spending and business investment responds to changes in the price level. The aggregate demand curve shown in figure 1 is negatively sloped because a rise in the price level lowers the real quantity of money, raises interest rates, and reduces interest-sensitive consumer and investment spending. Similarly—because the real value of people's holdings of cash balances and government debt falls—a rise in the price level makes

them poorer. This "real balance" effect causes real consumption spending to decline. For these reasons, as well as others noted later, a rise in the price level reduces the amount of real final output that consumers and business will wish to purchase.

The aggregate supply curve is positively sloped but becomes steeper as high employment is approached. If the money wage rate can momentarily be imagined as fixed, a rise in the price level reduces the real wage rate, defined as the ratio of nominal wages to prices. This increases the level of output and employment that profit-maximizing business firms will be willing to produce. The increased steepness of the curve at higher output levels is caused by the fact that the fixed money wage assumption cannot be sustained in a tight labor market so that once prices and money wages rise at the same pace, further reductions in real wages are not possible and output and employment will no longer respond to a rise in the price level.⁴

⁴ One of the principal differences between Keynesian economics and the traditional (or classical) view is that the earlier economists generally assumed competitive labor markets in which a price level change would evoke a wage response. This line of thinking implied that there was only one real wage rate that cleared the labor market and this, in turn, implied a unique equilibrium level of employment and output. Labor market competition would ensure that changes in the price level would be matched by "equal-proportionate" changes in money wages so that real wages would remain unchanged. Equilibrium aggregate supply was therefore independent of the price level and the aggregate supply curve was therefore a vertical line as depicted in fig. N4a, and labeled S.

FIGURE N4a.—Classical case.

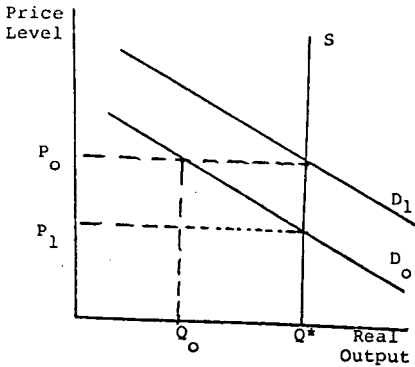
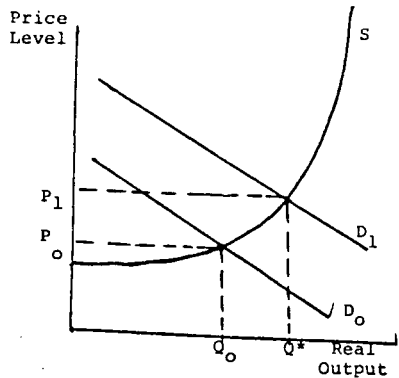


FIGURE N4b.—Keynesian case.



The second major difference between Keynesian and pre-Keynesian economics involves the aggregate demand curve. Although it is normally thought to be negatively sloped, Keynes conceived of deep depression circumstances in which an increase in the quantity of money could not lower interest rates and a situation in which there was so much excess capacity that a fall in interest rates would not raise the level of investment spending. In either case, the rise in the real quantity of money implied by a fall in the price level would have no effect on investment spending, so that in the absence of other price-level induced spending effects, aggregate demand would be the same regardless of the price level.

The classical and Keynesian extremes are depicted in figs. N4a and N4b respectively. In the classical case an initial disequilibrium such as might occur at price level P_0 and output level Q_0 would be eliminated by a fall in the price level to reach equilibrium at P_1 and Q^* .

Expansionary fiscal policies shift the aggregate demand curve to the right. For example, a reduction in taxes raises consumer spending and increases the demand for goods and services at the existing price level. As fig. N4a makes clear, this has no effect on real output in the pre-Keynesian scheme of things. Starting at P_1 and Q^* , a fiscal policy that shifts the aggregate demand curve from D_0 to D_1 merely raises the price level to P_0 without affecting equilibrium output.

By providing a rationale for a positively sloped aggregate supply curve, Keynesian economics shifted the focus of importance from the supply to the demand side. In fig. N4b, a shift to the right of the aggregate demand curve from D_0 to D_1 by means of expansionary monetary or fiscal policy can raise the level of real national product from a starting point at P_0 and Q_0 to a higher output level such as Q^* .

The intersection of the aggregate demand and aggregate supply curves in the illustration is at price level P_0 and real output level Q_0 . These levels can be described as the equilibrium levels in the sense that markets for goods, financial assets, and factors of production are all cleared. Once P_0 and Q_0 are reached, there is no tendency for anything to change and the economy remains at rest until some external (sometimes called "exogenous") shock causes a shift in either of the two curves.

FIGURE 2

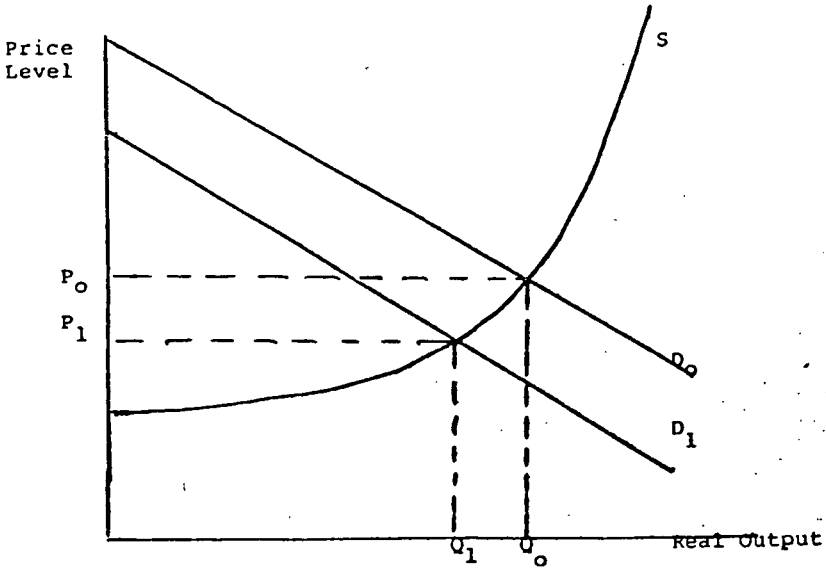
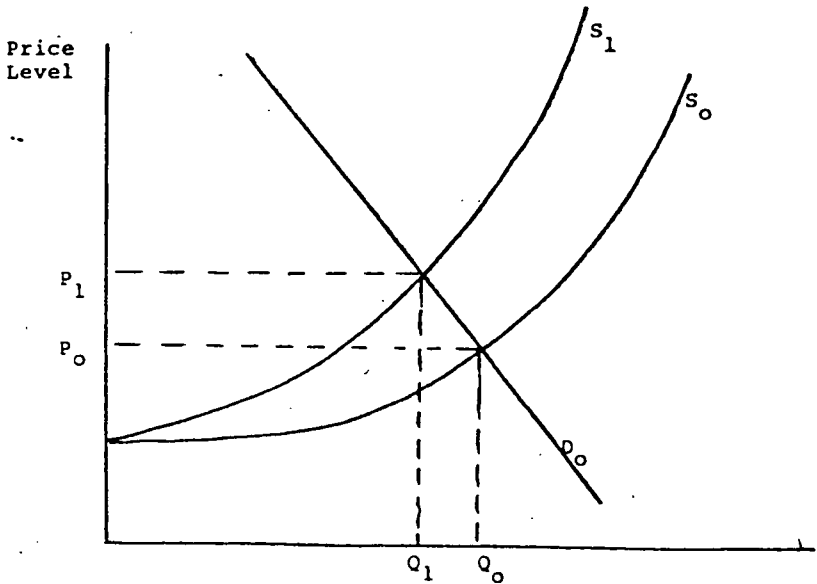


FIGURE 3



THE KEYNESIAN ORIENTATION

The world of Keynesian economics is the world in which disturbances originate on the demand side and are therefore correctable by suitable demand offsets. Keynes was especially concerned about the instability of investment demand. Figure 2 illustrates the problem of the 1930's. Imagine a collapse of investment spending that causes the aggregate demand function to shift to the left and therefore results in a reduction in real output from Q_0 to Q_1 . The solution to this problem is for policy to compensate for the decline in investment by raising aggregate demand through expansionary tax and expenditure policies, plus easy money policies designed to lower interest rates and boost investment.

THE EFFECT OF SUPPLY RESTRICTION

The decline in aggregate demand which lowers output also puts downward pressure on the level of prices. This is not the case when the source of the disturbance comes from the supply side. In that event, illustrated in figure 3, a restriction in supply which shifts the aggregate supply curve to the left (such as a shift from S_0 to S_1) lowers output and employment as it raises the price level. Thus, one basic ingredient conducive to stagflation is a restriction in aggregate supply.

It was during the 1958 recession, when the price level surprisingly failed to fall, that economists first became aware of the possibility that inflation could be generated from the supply side. At that time it was widely thought that price increases were attributable to the monopoly power of unions and powerful concentrated industries. It was also at

that time that the concepts "cost push" and "administered" inflation entered the popular vocabulary.

RESTRICTION OF LABOR SUPPLY

Money wages could rise without increased demand for labor because of an increase in the bargaining power of unions, because of an increase in the fraction of the labor force that is unionized, because of a rise in the legal minimum wage rate, or because increased tax rates (especially at the margin) lead to a reduction in labor effort.

All these wage-push sources have in common the circumstances that their effects are equivalent to a restriction in aggregate labor supply. The mechanism by which the consequent rise in money wages causes output to fall and prices to rise is as follows: The rise in wages initially causes profit-maximizing firms to curtail production and employment. As a result, real income declines and consumer spending therefore also declines. However, it is known that the decline in consumption will be less than the decline in real income. Since consumption demand declines by less than the fall in real income, excess demand appears in commodity markets and this pulls up the price level.

AUTOMATIC SOURCES OF DEMAND RESTRICTION

The rise in the price level then has the following consequences for production and employment. First, it sets the interest-investment mechanism in motion. It reduces the real quantity of money, raises interest rates and slows investment spending. Second, it sets the real balance effect into motion. It reduces the real value of government obligations including cash balances, and this reduction in the wealth of the private sector reduces consumption. Third, there will be a trade balance effect inasmuch as the rise in prices causes the Nation's competitive position to deteriorate internationally. This makes foreign goods relatively more attractive to U.S. consumers while increasing the cost of exports to foreigners. Therefore, economic activity is transferred from the domestic to foreign economies.

For all these reasons, a restriction in labor supply will tend to produce the symptoms of stagflation. The restriction in labor supply in turn restricts aggregate supply and this then raises the price level as it reduces production and employment.

THE DILEMMA FOR STABILIZATION POLICY

Unlike the Keynesian world of demand fluctuation, there is no obvious directive for the manner in which monetary and fiscal policies should behave in response to supply restriction. If demand management policy attempts to reverse the rise in the price level, it must pursue restrictive measures that will lower aggregate demand. But, as can be seen by imagining a new aggregate demand curve S_1 at the old price level (P_0) in figure 3, such policy would cause output and employment to fall even more. Conversely, if policy is geared to the restoration of the original level of output (Q_0) and employment, it must resort to expansionary measures that would cause another imaginary new aggregate demand curve to cut S_1 at Q_0 , which, would

accentuate the rise in prices. Thus, the unpleasant choice for stabilization policy appears to be to do nothing, or to generate more inflation combined with an even greater fall in output.

The quandary for policy noted in the preceding paragraph prompted economists concerned with cost-push inflation to speak of a "dilemma model." The dilemma is that if policy resists inflation caused by an upward wage push, it must tolerate unemployment. On the other hand, if policy accommodates the higher price level, the unions which forced up wages initially will learn that they have not accomplished anything since the real wage gain will have been wiped out by the rise in the price level. The temptation, then, is to try again, and if that happens the upward wage-price treadmill will be set in motion with the result being a steady inflation rather than a one-time adjustment of wages and prices.

OTHER SOURCES OF SUPPLY RESTRICTION

Restrictions in labor supply are not the only source of aggregate supply reduction. When State and local governments raise sales and excise taxes, these indirect tax increases directly raise costs and prices. The price level increases take hold, as do all the adverse effects on output and employment caused by a higher price level. In addition, the tax increase causes real purchasing power to be transferred from the private to the government sector so that the fall in aggregate demand, and the consequent reduction in production and employment, will be accentuated. This purchasing-power transfer effect on output and employment would be averted if the tax increase were accompanied by a commensurate rise in government expenditure. But in that event the price level would rise still further because of an additional demand-pull effect.

A very similar effect occurs when governments raise the payroll taxes that finance social insurance. Social security is financed in equal parts by Federal payroll taxes on employers and employees, and unemployment insurance is financed almost exclusively by State and Federal taxes charged to employers.

These taxes have risen enormously in recent years. While the employee portions are the counterpart of regressive personal income taxes, the employee portion is an important source of stagflation.

An increase in payroll taxes has the same effect on an employer's costs as an increase in any other component of employee compensation. It could happen that the higher payroll taxes are offset by lower wages than usual, and in that event the payroll tax increase would have the effect of a regressive tax increase on labor income. Since this would imply an aggregate demand decline, it would put downward pressure on the price level. However, as shown in a recent study by the Congressional Budget Office,⁵ the evidence suggests that increases in employer payroll taxes are largely shifted forward into higher prices rather than backward into lower wages. The result is stagflation and it is generated through exactly the same processes as described above—the interest-investment mechanism, the real balance effect, the trade balance effect, and the purchasing-power transfer effect. The latter is likely to be important since the higher prices imply a reduction in consumer real income and purchasing power.

⁵ Congressional Budget Office, "Aggregate Economic Effects of Changes in Social Security Taxes," August 1978.

EXTERNAL SOURCES OF SUPPLY RESTRICTION

A special form of purchasing-power transfer occurs when the supply restriction is not purely domestic in origin. The food price explosion which began in early 1973, the energy price increases that came in 1973-74 and again in 1979, and the devaluations of the dollar in 1971 and 1973 are examples. In all cases the domestic price level was pushed up by forces that were largely independent of domestic demand. Prices of basic agricultural staples are determined in world markets and the world price of oil is, in the short run, dictated by the decisions of the Organization of Petroleum Exporting Countries (OPEC) rather than by market forces. The poor world food harvests that characterized the early 1970's shot food prices up and therefore drained purchasing power from domestic consumers. But some of the transfer went to domestic producers of agricultural products (who are also consumers) and a considerable part of it went to poor countries that used increased earnings from the sale of primary agricultural products to increase imports from industrial countries such as the United States. The United States was a beneficiary of the world food shortage in an important sense because this helped to account for the extraordinary increase in the value of exports that we enjoyed in 1973 and 1974. The 1974 increase was particularly welcome inasmuch as it was the only source of expanding demand in an economy that otherwise appeared to be falling apart.

It seems likely that the purchasing-power transfer effects of the food price explosion were either minor or worked to bolster aggregate demand in the United States. Certainly the food shortages contributed greatly to inflation, and insofar as the resulting interest-investment and real balance effects served to restrict output and employment, they contributed to stagflation as well.

THE OIL SHOCK OF 1974

The rise in crude oil prices produced a different situation. The higher cost of imported oil added roughly \$50 billion to the energy bills of American consumers in 1974.⁶ Since the demand for energy is unresponsive to changes in price in the short run, the effect of the energy price increase was to drain purchasing power from other potential consumer outlays and this contributed to the advent and severity of the great recession of 1974-75.

Here again the importance of the purchasing-power transfer effect depends upon what the recipients of the transfer do with their gains. Some of the income transfer went to domestic oil companies which, potentially, could have spent the proceeds on new investment or on higher dividends. In both cases this would have largely offset the expenditure transfer effects of the higher prices on consumers. The bulk of the gain however, went to the OPEC cartel. Some of its members are underpopulated and underdeveloped countries that were unable to spend in an efficient way the proceeds of their vastly greater export earnings on imports. The result, therefore, was an enormous accumulation of unspent "petrodollars" by the OPEC countries and a consequent purchasing power drain that caused a sharp increase in the world economy's price level to be accompanied by an equally

⁶ See Lawrence Kumins, "Energy Shock: Oil and the Economy," *Current History*, November 1975, pp. 189-201.

sharp reduction in the world's aggregate demand for real output. The outcome for the domestic economy could not have been anything other than acute stagflation.

PRICE CONTROL AND SUPPLY RESTRICTION

The removal of price control acts on the economy much as any other supply shock. When controls are removed, all sectors of the economy in a position to do so raise the price of what they sell so that wages and prices quickly jump. The real quantity of money then declines and the interest-investment mechanisms—along with the real balance and trade balance mechanisms—then ensure that a reduction of aggregate real spending takes place.

Direct controls are generally viewed as a means of combating inflation that averts recession. This is because the imposition of controls holds out hope that inflation can be squelched without resort to restrictive monetary and fiscal policies. However, the supply shock effect of the removal of controls suggests that the controls only delay the recession and that their removal helps to bring about the recession.

MONETARY POLICY AND PRICE CONTROL

It is true that a recession could be averted if the monetary authority "accommodated" the price level increases that accompany decontrol by raising the nominal quantity of money by enough to prevent the real value of the money stock from declining. But this is asking the Federal Reserve to raise the rate of nominal monetary growth at a time of accelerating inflation, and the Federal Reserve has not, thus far, been willing to undertake such a radical departure from traditional monetary management. It is clear that the Fed was not willing to provide such accommodation in 1973 when controls were phased out and inflation accelerated. Hence, there is considerable support for the proposition that the elimination of price controls contributed to the severity of the subsequent inflationary-recession, as the acute stagflation of 1974-1975 has come to be called. Professor Robert J. Gordon summarizes the point as follows:

The termination of price controls is like a crop failure, an increase in the price of imported oil, or any other supply shock in that inflation is made temporarily worse than it would have been. More of existing nominal income growth is used up to pay for the inflation, and as a result real output may fall.⁷

TEMPORARY V. PERMANENT SUPPLY SHOCKS

As already noted, supply shocks create an exceedingly difficult problem for stabilization policy. This is because, with prices and unemployment rising simultaneously, it is difficult to decide which disease to combat. If it is decided to combat one, this risks exacerbating the other. Another problem for stabilization policy is to distinguish between shocks that are temporary and those that are permanent.

A permanent supply restriction such as the increase in energy prices of 1974 will produce a one-time, and unavoidable, permanent rise in the price level. This higher priced GNP needs to be financed and it is therefore appropriate and necessary for the monetary authority to accommodate this shock with a proportionate increase in the monetary

⁷ Robert J. Gordon, *Macroeconomics*, Little, Brown and Company, Inc. 1978, p. 318.

aggregates. This does not mean a permanent increase in the rate of monetary growth, but it does mean a one-time adjustment. The failure to provide such an accommodation will force real output to drop and precipitate the kind of disastrous conditions that prevailed in 1975.

It seems clear that policymakers could safely have viewed the oil shock as a one-time permanent supply restriction. But this was not clear in the case of the food price explosion. Basic agricultural staples are traded in competitive markets so that the return of favorable world producing conditions could be expected to bring a subsequent increase in food supplies with a corresponding reduction in prices. In this case the monetary authority should accommodate the initial price level increase, and then draw back once it becomes clear that food prices are receding. The difficulty is that an increase in food prices, even if temporary, enters the cost of living and therefore into wage adjustments that are likely to be permanent. Therefore, even a temporary supply shock may give rise to second-round effects that may lead to a permanently higher price level or even a permanently higher rate of inflation. The dilemma for monetary policy is acute. First, the authorities must be able to determine whether a shock is permanent or temporary, and second they must face the hard decision of whether to accommodate the inflation that stems from the shocks.

B. High Marginal Tax Rates, the Policy Mix, and Stagflation

One of the earliest attempts to analyze the genesis of stagflation was provided by the author in a 1974 paper which appraised a common European stagflation-causing syndrome and concluded that the monetary-fiscal mix could be a principal source of the disease.⁸ The policy mix in many countries was characterized by monetary conditions that were consciously and deliberately expansionary in an effort to hold down interest rates, raise investment spending, and thereby raise the rate of economic growth. Meanwhile, fiscal policy attempted to divert resources to the public sector. There was, therefore, a drift in the direction of higher public expenditures financed by higher taxes, and at the same time an attempt to force-feed the growth rate by easier monetary conditions.

The problem caused by the attempt to divert resources both to investment and to the public sector is that it can be achieved only by increasingly heavy taxation of consumers. Consumers, however, rebelled by demanding higher wages in response to the higher taxes and this created a situation conducive to the generation of stagflation.⁹

POLICY MIX IN THE UNITED STATES

In the last few years, the policy mix in the United States has not been descriptive of the situation outlined above. Rather, it has been

⁸ Thomas F. Dernberg, "Personal Taxation, Wage Retaliation and the Control of Inflation," International Monetary Fund, Staff Papers, Volume 21, November 1974, pp. 758-788. A simplified version of this analysis may be found in Dernberg and McDougall, *Macroeconomics*, McGraw Hill Book Company, 5th edition, 1976, pp. 323-343.

⁹ The tax-wage interaction in various countries is discussed in a wide variety of sources, many of them government documents. The Swedish experience is discussed in Assar Lindbeck, "Theories and Problems in Swedish Economic Policy in the Post War Period," *American Economic Review*, Supplement, Vol. 58, pp. 1-87. The impact of heavy wage taxation on wage behavior in the United Kingdom has been analyzed by D. Jackson, H. A. Turner, and F. Wilkinson, "Do Trade Unions Cause Inflation"? Cambridge University Press, New York, 1972, Chapter 3. Some econometric evidence for the United States is provided by Robert J. Gordon, "Inflation in Recession and Recovery," *Brookings Papers on Economic Activity*, Vol. 1, 1971, pp. 105-166.

the opposite, tending to promote consumption while holding back investment. Nevertheless, in an analysis of stagflation it is important to pursue the line of thinking that was developed to interpret the European case of the 1960's. First, the "wage adjustment model," as the author described the tax-wage retaliation syndrome, focused attention on faulty monetary-fiscal policy mix as a force that could generate stagflation. Second, it suggested how stagflation could be moderated by changing the mix of monetary-fiscal policy in a way that makes one instrument more restrictive as it makes the other instrument less restrictive. Third, the model helped in the interpretation of American economic history because it proved to be an effective explanation for why changes in the mix of fiscal and monetary policy were so highly successful in promoting noninflationary expansion in 1964-65, and why policy mix changes were such horrendous failures in 1968 when growth was slowed while inflation accelerated.

Contemporary analysis views inflation as the product of a permanent disequilibrium process. This is the view expressed in the next section. The model to be discussed here helps to bridge that gap by viewing stagflation as generated by the simultaneous existence of excess supply in the labor market (thereby causing high unemployment) and excess demand in markets for goods and services (thereby generating rising commodity prices). Finally, it is clear that taxpayers in the United States are becoming angry and rebellious over high levels and rates of taxation, so that the European experience may have important lessons for U.S. policy decisions of the future.

To move to the specific problem of heavy direct taxation of labor income, workers realize that what is important to them is their net wage after taxes rather than their gross wage before taxes. A rise in direct taxes may therefore cause workers to demand higher money wages to maintain their real income after taxes. In the aggregate, this means that workers attempt to bargain for wages in a manner that maintains real disposable income in the face of a rise in taxes. The evidence that wages behave in this manner, though far from conclusive, is nevertheless considerable. Econometric wage equations developed for individual countries often show positive correlation between money wages and taxes on labor income, and various governments have shown considerable concern over what they perceive as a threat of wage retaliation against higher personal taxes. In some European countries, wage bargaining is less a negotiation between unions and employers than a negotiation between unions and government. So-called "stabilization agreements" and "social contracts" amount to a promise on the part of government to hold down taxes and public expenditures in return for which labor promises to exercise wage restraint. There is evidence that positive upward wage adjustment occurs in response to tax increases even in such countries as the United States where unions are comparatively weak and where only a small fraction of the labor force is organized.¹⁰

Consider the consequence of this environment within the context of the aggregate demand and aggregate supply curves of the preceding section. A rise in personal taxes shifts the aggregate demand curve to the left because it lowers consumer disposable income. This reduces

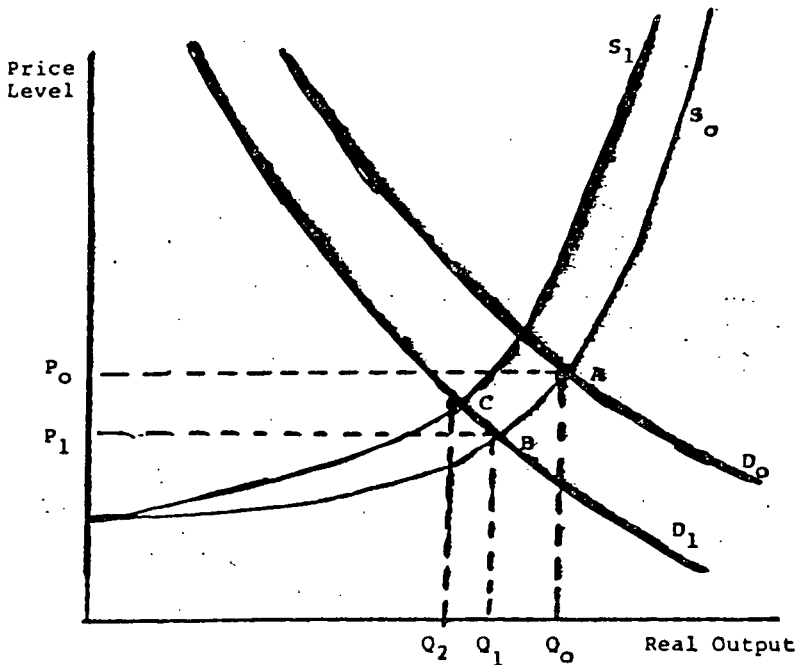
¹⁰ Gordon, "Inflation in Recession and Recovery," *op. cit.*, provides some empirical evidence for the United States.

consumption and therefore lowers output and employment while pushing the price level downwards. On the other hand, and as has already been shown, a rise in money wages shifts the aggregate supply curve to the left. This causes the price level to rise as it reduces output and employment.

A tax increase combined with an upward wage push can be viewed as the combination of both the foregoing shifts—i.e., a simultaneous restriction (shift to the left) in both the aggregate demand and aggregate supply functions. In this event, the combined effect is to accentuate the reduction in output and employment because both the higher taxes and higher wages move the economy in this direction. But at the same time, the net effect on the price level is ambiguous. The reason is the fall in aggregate demand caused by the tax increase tends to lower the price level, whereas the restriction in aggregate supply caused by the higher wages tends to raise the price level. The direction of change of the price level is not clear, and it is, in fact, entirely possible for a personal income tax increase to raise the price level.¹¹

¹¹ Consider fig. N11. Let aggregate demand D_0 and aggregate supply S_0 intersect at point A to yield output Q_0 and price level P_0 . Next let a tax increase shift aggregate demand to D_1 . The intersection at point B implies a lower level of output (Q_1) and price level (P_1). However, if this is then accompanied or followed by an upward push of wages, aggregate supply shifts to the left so that the new intersection is at point C where D_1 and S_1 intersect. Real output now falls still further (to Q_2) but the price level is pushed back up and may or may not end up below P_0 .

FIGURE N11.—Simultaneous aggregate demand and aggregate supply restriction.



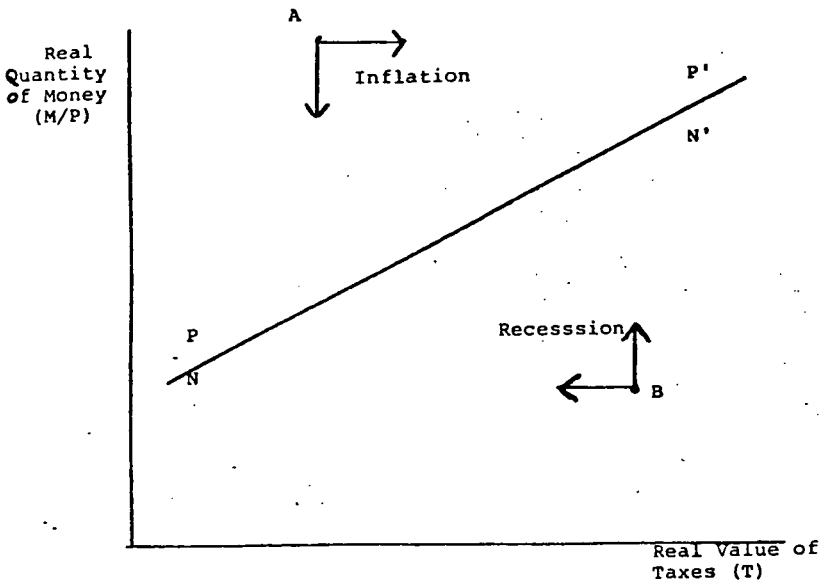
THE DYNAMICS OF FAULTY POLICY MIX

The picture painted above is gloomy because it suggests that a rise in taxes may merely reduce output and employment without reducing the price level. However, this fact is not enough to determine what will happen to the rate of inflation. A steady upward movement of prices implies a permanent disequilibrium situation, and it suggests that the dynamics of perpetual disequilibrium need to be examined. Figures 4 and 5 are of considerable assistance within the context of this new orientation. Each figure measures the real quantity of money (M/P) on the vertical axis and the real value of personal taxes (T) on the horizontal axis. To isolate the effect of these two policy instruments, other policy variables such as the level of real government purchases are assumed to be held fixed.

Figure 4 shows an iso-employment (NN') curve that specifies the combination of real money supply and real taxes that keeps the demand for labor equal to its supply so that there will be neither involuntary unemployment nor excess demand for labor. The NN' curve is upward sloping because a rise in taxes reduces aggregate demand, tending to lower employment, so that the real money supply must be raised to lower the interest rates and raise investment expenditure to offset the employment-reducing effects of the tax increase. Focusing on disequilibrium, it is clear that combinations of M/P and T that lie below the NN' curve imply excess supply of labor and unemployment, whereas points above it imply excess demand for labor and a tendency toward wage inflation.

A similar combination of money supply and taxes can be visualized that maintains equilibrium in markets for goods and services and that, therefore, prevents the price level from changing. A rise in taxes will reduce consumption and this tends to lower the price level; but this can be offset by an increase in the real money supply because this stimulates investment spending. This iso-price level curve, too, will be positively sloped with points above it implying combinations of money supply and taxes that are too expansionary and, therefore, cause price inflation, whereas points below it imply a restrictive policy combination that creates excess supply in markets for goods and services and that tends, therefore, to cause the price level to fall.

FIGURE 4

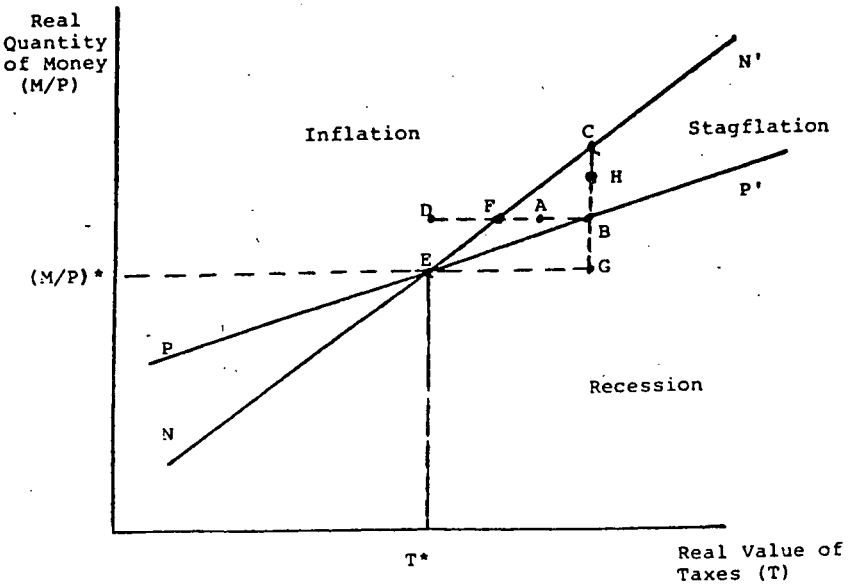


An important property of the simple Keynesian world is that the iso-employment NN' and iso-price level PP' curves are the same and are therefore superimposed, as shown in figure 4. This comes about because money wages are assumed to be unchanged when other things vary. It means that if the goods market and the labor market are both initially in equilibrium, and if a change in the money supply disrupts that equilibrium, the change in taxes that restores equilibrium in one of the markets automatically does so also in the other market.

Under these conditions, changes in the money supply and changes in the level of taxes may be thought of as perfect substitutes for each other. Either policy, or any one of an infinite number of combinations, can be used to eliminate recession or inflation. At a point such as A in the inflation zone in figure 4, either a reduction in the money supply or a rise in taxes can move the economy out of inflation and onto the

joint NN' - PP' curve, and the opposite change in either policy instrument from a point such as B in the recession zone can restore full employment and secure simultaneous product and labor market equilibrium. Evidently, one policy may even be used to compensate for a movement in the wrong direction by the other policy. Upward pressure on prices, finally, combined with downward pressure on wages cannot coexist in the standard model, so that simultaneous inflation or deflation in both the product and the labor markets is the only possibility allowed in standard theory. This is the Keynesian demand world in its most clear cut terms. It is no wonder that the phenomenon of inflationary-recession, or stagflation, has posed such a dilemma for policy.

FIGURE 5



WAGE RETALIATION IN RESPONSE TO HIGHER TAXES

To analyze the effect of a rise in money wages in response to increases in taxes on labor income, consider figure 5 which again shows the iso-employment and iso-price level curves and measures the real value of the money supply (M/P) on the vertical axis, and the real value of personal taxes on the horizontal axis. The difference between figures 4 and 5 is that the iso-employment and iso-price level curves are no longer superimposed if a rise in taxes causes wage retaliation. As shown below, such wage retaliation leaves the NN' curve in its initial position, but it causes the PP' curve to rotate in a clockwise manner.

The explanation is as follows: Beginning with the NN' curve, upward money wage push in combination with a tax increase would accentuate the loss in employment and produce a price level higher than without the wage push. But since the real value of the money stock is measured on the vertical axis, action by the monetary authority to prevent the real quantity of money from changing is implicitly present at any level of M/P in the diagram. This means that the interest-investment and real balance mechanisms are neutralized so that the wage push does not affect employment. Stated differently, the employment effects of a tax increase can be offset if the monetary authority is willing to adjust the real quantity of money including an added adjustment that accommodates the higher price level that may have been induced by the labor supply restriction. It is assumed, therefore, that the nominal money stock is adjusted to produce the required change in the real stock, and this causes the NN' curve to remain put when taxes and wages increase.

In the case of the PP' curve, the outcome is different. If a tax increase is accompanied by upward wage adjustment, the resultant fall in the equilibrium price level will be less than without the wage adjustment. It will, therefore, require a smaller increase in the money supply to maintain the equilibrium price level at its original level. This means that the PP' curve flattens because of a tendency for taxes and money wages to move systematically together in the same direction.

The flattening of the PP' curve produces the situation depicted in figure 5. There are now four possible zones instead of the two of the standard analysis shown in figure 4. A point above both NN' and PP' is in the standard excess demand inflation zone. A point below both NN' and PP' is in the standard recession zone characterized by general demand deficiency. However, at a point that lies above one of the curves but below the other, one of the two markets exhibits excess demand whereas the other is characterized by excess supply. The zone to the right of the intersection of the two curves described stagflation, or inflationary recession. At a point such as A there is excess supply in labor markets since point A lies below the NN' curve, and excess demand in product markets since point A lies above PP' . The wage-adjustment model therefore provides one possible explanation of how unemployment and inflation may exist simultaneously.

POLICY MIX AND STAGFLATION

It is important to understand the nature of the stagflation zone. Consider figure 5 and begin at point E with goods and labor markets in equilibrium. Now let taxes be raised by an amount EG. If the tax increase is accompanied by upward wage adjustment, the increase in the money supply needed to prevent the price level from falling may be only BG, whereas the amount needed to prevent employment from falling must be a larger amount, such as CG. Some intermediate response such as GH implies that since the monetary response exceeds BG it must produce excess demand in goods markets. However, since it is less than CG it is not sufficient to prevent the tax increase from

causing excess supply in labor markets. The result, then, is stagflation. Goods market are in a state of excess demand causing prices to rise, while labor markets are in a state of excess supply causing unemployment.

It is clear from inspection of the stagflation zone in figure 5 that a situation of stagflation such as is represented by point H implies that taxes and the money supply are both too high. To eliminate stagflation and to achieve equilibrium at point E, it would be appropriate to lower taxes. This would secure a pause in wage demands since lower taxes substitute for higher wages; and since this provides a favorable cost-price relationship, it causes output and employment to be expanded. The inflationary pressures may then be relieved by a modest reduction in the money supply. Therefore, if the source of stagflation is labor supply restriction in response to increasingly heavy taxation, relief may be secured by changing the policy mix in the direction of an easier tax and more restrictive monetary policy combination. The policy prescription follows from the fact that the wage adjustment causes a tax change to have a relatively more powerful effect on the level of employment than it does on the price level, whereas the opposite is the case for a change in the money supply. This can be seen in figure 5. Suppose that taxes are raised by EG. The increase in the money supply needed to stop the price level from falling is BG, but the increase in the money supply needed to restore full employment is CG. Monetary policy clearly has an easier time getting the price level under control after a given tax change than it does in attempting to restore full employment. The opposite is the case for tax policy.

This analysis suggests that although a tax reduction does have an inflationary effect, this can be neutralized by a reduction in the real quantity of money with the net additional benefit that the level of output and employment will be higher after the implementation of both policy changes. Conversely, a reversal in this policy mix would be inappropriate. Consider point A in figure 5 and imagine raising taxes to eliminate inflation (moving from A to B). This would eliminate inflation but it would also provoke upward wage adjustment and produce a drop in employment (point B is farther from NN' than point A). Monetary expansion could then restore full employment (reach NN' at point C), but the inflation would be worse than ever.

CORRECT ASSIGNMENT AND STABILITY

The preceding illustrates an important principle of policy economics known as the principle of effective market classification, or more commonly as the correct assignment, or appropriate pairing, of policy instruments with targets.¹²

In an ideal world, the monetary and fiscal authorities would collaborate to reach equilibrium at point E with taxes at T* and the real quantity of money at (M/P*). However, since the authorities probably do not know where E is, and for various reasons may not be fully in

¹² See Robert A. Mundell, "The Appropriate Use of Monetary and Fiscal Policy for Internal and External Stability," International Monetary Fund Staff Papers, September 1962, pp. 70-79.

accord on the need for or desirability of coordination, there is a second-best solution that can achieve the desired result. That solution is to assign to each policy instrument responsibility for achieving that target over which it has the greatest relative effect. In the present example, stagflation will be eliminated if monetary policy concentrates on getting inflation under control while tax policy is directed at the elimination of unemployment. However, if the policy instruments reverse their roles, the result will be a steady worsening of the stagflation. The reason is that when instruments are incorrectly assigned to targets, their attempt to achieve a target over which they have little influence produces massive adverse side effects on other objectives.

The interpretation of stagflation provided by the present analysis is that the disease may be the product of a situation in which both the real value of the money supply and the level of personal taxes are too high. Such a situation may arise—as it did in 1968—as the result of an attempt to combat inflation by raising taxes, combined with a well-intentioned effort by the monetary authority to avert fiscal “overkill” by expanding the money supply. Or it may arise as the consequence of an attempt to raise the economy’s growth rate by changing the policy mix in favor of easier money and higher personal taxes, in an effort to shift resources from consumption to investment. The trouble with such a change in the policy mix is that if the tax increase provokes upward wage adjustment, it will cause employment to drop sharply. Meanwhile, the easier monetary policy produces excess product demand with stagflation being the net result of the change in the policy mix.

PROGRESSIVE INCOME TAXATION AND STAGFLATION

It is important to note that stagflation may be brought about through the purely automatic response of the progressive personal income tax. When the economy is in the classical inflation zone, as at point D in figure 5, real income will be fixed since the economy is producing at the limit of its resources, but the price level will be rising and money GNP will therefore be increasing. The progressive income tax will be pulling taxpayers into higher brackets and the real value of the aggregate tax burden will therefore be rising automatically. Consequently, imagine that the economy is at point D in figure 5 and assume that the monetary authority holds the real value of taxes so the policy mix is automatically pulled to the right from point D toward point F. As the real value of taxes rises, the wage-adjustment process comes into play, so that excess demand in the labor market is eliminated more rapidly than excess product demand. Consequently, when point F is reached, the inflation continues, the real value of taxes keeps rising, and the economy is dragged into the stagflation zone where unemployment emerges, while inflation continues.

These considerations lend support to a program of reform that would eliminate the taxation of nominal income and replace this with the taxation of real income. If this were done, the economy would remain at point D because an indexed tax would keep the average tax rate of taxpayers constant unless their real income changes, or until a discretionary tax change is introduced. Such indexing, of course, would

perpetuate inflation since the economy would tend to remain at point D, but it would also avert stagflation. Indexing of the tax system would prevent the rightward drift into the stagflation zone, and restrictive monetary policy could eliminate the inflation. That is the correct policy combination. More on the subject of indexing will be addressed in Part III of this study.

INTERPRETATION OF THE 1960'S

The wage-adjustment model is of considerable assistance in interpreting the economic history of the 1960's. For example, the tax reductions of 1964-1965 were generally credited with being successful in raising output and employment without increasing inflationary pressure. On the other hand, the tax increase of 1968 failed to slow inflation. It seems merely to have contributed to a costly recession and to the advent of the era of permanent stagflation. **An important factor in each case was the behavior of monetary policy.** Although the economic expansion of the early 1960's was accommodated by monetary growth, this was not excessive, as indicated by the fact that real interest rates drifted upward during the period. On the other hand, the 1968 tax increase which took effect at midyear was accompanied by a rapid rate of monetary growth that continued until the end of the year.

The wage-adjustment model and the principle of correct assignment provide the following interpretation of these episodes. In 1964, policies were properly assigned, with taxes being lowered to raise output and employment, and with monetary restraint helping to hold down the price level. The tax cut provided disposable income relief. Upward wage pressure was therefore moderated, unit labor costs fell and the result was a large gain in employment and output combined with excellent price performance.

The interpretation of the 1968 experience is as follows: The rise in taxes was followed by upward wage pressure. Unit labor costs rose and caused output and employment to fall, while price inflation continued unabated due to the impact of continuing rapid monetary expansion throughout the year. **Had monetary restriction been employed in the first instance, the result might have been considerably less costly and traumatic.** The exceedingly poor performance of unit labor costs could have been avoided and the rate of inflation would have been slowed with far less loss in output and employment.

The wage-adjustment model would appear to have little applicability to the problems of the last five years. Nevertheless, the potential wage pressure that can come from higher rates of taxation of labor income should be borne firmly in mind whenever higher taxation is contemplated. The wage adjustment model calls attention to one of the most serious difficulties that has beset the economy in recent years. Stagflation invites an inflation-conscious monetary authority to slow the rate of monetary growth. This not only threatens the short-run prosperity of the economy; it also stifles productivity growth because it puts a burden on the financing of capital spending. The low rate of productivity growth suffered in the economy the last five years has implied stagnation of real wages. This has meant that increase in nominal wages have gone directly into raising unit labor costs and prices.

It is no accident that poor productivity performance coincided with a disappointing revival of capital spending from the 1974–1975 recession. This, in turn, coincided with stringent monetary policies. Although nominal M^1 (currency plus deposits) grew at an annual rate of 5.6 percent from the end of 1972 to the end of 1977, real M^1 declined a full 7 percent during this period, or at an annual rate of 1.4 percent.

This point is emphasized here because there is a danger that while the pairing of monetary policy with the control of inflation may be appropriate in the short run, in the long run monetary stringency may actually contribute to stagflation if it slows capital formation and productivity growth. This conflict between short and long run objectives is one of the most serious dilemmas which confronts monetary policy.

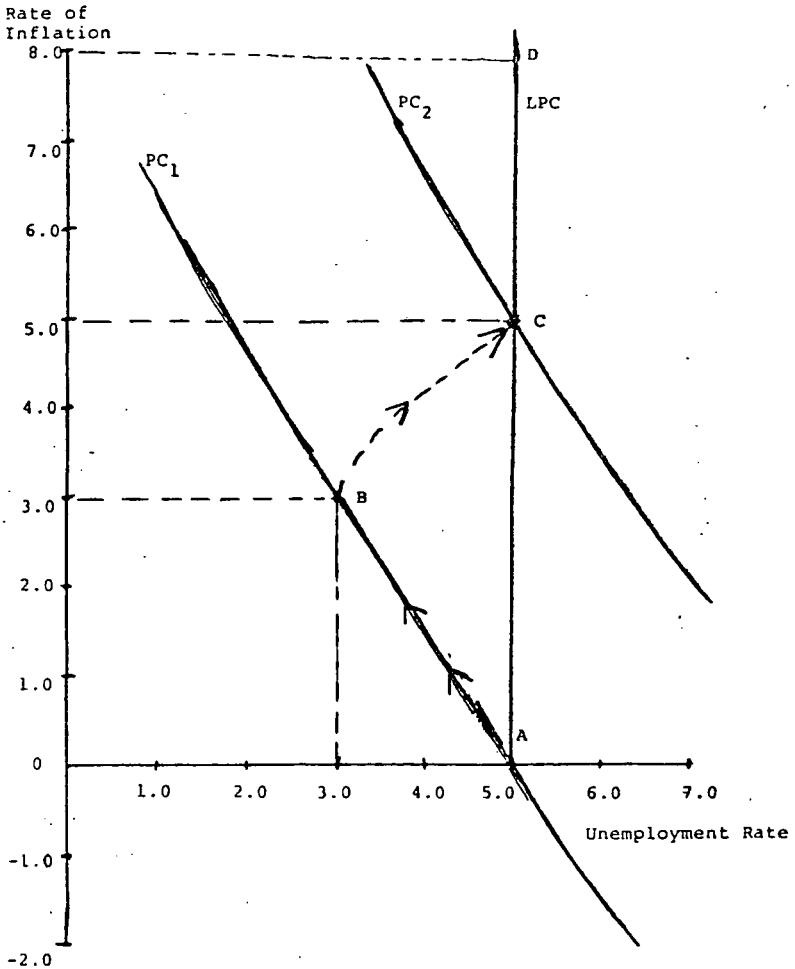
C. Excessive Demand as a Source of Stagflation

In preceding sections, emphasis was placed on restrictions in aggregate supply and faulty monetary-fiscal policy mix as principal sources of stagflation. Note was also taken of the circumstance that there is an important distinction between factors that provide a one-time upward shove to the price level and those that cause a steady inflation. In this section, focus shifts to the mechanisms that can generate a steady inflationary process and an attempt is made to show that stagflation—in the sense of an increase in discomfort as defined earlier—can be generated by overly ambitious efforts to raise employment by means of expansionary fiscal and monetary policies.

One of the conspicuous differences between the economies of the 1960's and 1970's and earlier analyses of inflation is that the rate of inflation replaces the price level on the vertical axis of pictures of the sort used to illustrate aggregate demand and supply in earlier parts of this paper. The transformation of one into the other can be accomplished in a simple and straightforward way. It is merely necessary to imagine the level of excess demand at different price levels in a picture such as figure 1, and add the reasonable dynamic assumption that the inflation rate will be higher the greater the level of excess demand. Excess demand is measured as the horizontal distance between the aggregate demand and supply curves at the prevailing price level.

In keeping with the procedures established by A. W. Phillips for whom the famous "Phillips curve" was named, the variable generally measured on the horizontal axis is the unemployment rate rather than the level of real output. But this creates few problems of comparability because, as Arthur Okun's "law" states, there generally is a close inverse correlation between the level of real output and the rate of unemployment. The initial Phillips curve then looks like the example shown in figure 6 and labeled PC_1 . It is a negatively sloped curve which suggests that a low rate of unemployment implies tight labor markets and excess demand and therefore produces a high rate of inflation. Conversely, a high rate of unemployment (in excess of 5 percent in the hypothetical example shown in figure 6) implies excess supply in labor markets, and therefore a negative rate of inflation.

FIGURE 6.—The Phillips curve.



THE TRADE OFF

Belief in the validity of the Phillips curve caused economists of the 1960's to speak of a "trade off" between unemployment and inflation. Lower unemployment could be achieved by raising aggregate demand, but the price that would have to be paid would be a higher rate of inflation. Or there could be a lower rate of inflation, but the cost to the economy of this would be higher unemployment and lower output. The facts followed that expectation throughout most of the 1950's and 1960's, but the relationship broke down during the 1970's when it often appeared as if the Phillips curve was positively sloped, with high or increasing inflation accompanied by high or increasing unemployment.

THE NATURAL RATE OF UNEMPLOYMENT

In recent years economists developed the concept of a natural rate of unemployment. More recently, and for reasons that will become evident shortly, this acquired the appellation "non-accelerating inflation rate of unemployment," or NAIRU. Basically, the natural rate of unemployment is the rate of unemployment that would be associated with a situation in which the quantity of labor demanded by employers equals the amount that workers are willing to supply. That is, it is the rate of unemployment that is associated with a cleared labor market and a situation that therefore is free from overall upward or downward pressure on wage rates.

To induce employers to hire more workers, it is necessary to lower the real wage rate. But to get more workers to seek work and to work more hours, it is necessary to pay a higher real wage rate. Therefore, it is reasonable to ask how employment can be raised if the economy is at the natural rate of unemployment. The answer that a large body of economists subscribes to is that the price level expected by workers lags behind the actual price level. Therefore, if there is an increase in aggregate demand that raises both prices and wages but raises prices more than wages adjusted for productivity growth, employers will perceive this as a reduction in the real wage and will wish to increase hiring. Meanwhile, if workers notice the rise in wages, but not the rise in prices, they will think the real wage has risen and more labor effort will be offered. The result could then be a reduction in the unemployment rate along the Phillips curve from a point of price stability such as A in figure 6 to a point such as B where inflation proceeds at a rate of 3 percent.

But a position such as point B cannot be sustained. Workers will catch on to the fact that real wages have declined, so that employment will fall and the measured unemployment rate will once again rise. At the same time, the higher rate of inflation brings forth increased wage demands and that tends to raise the inflation rate to a still higher level.

In sum, then, an effort to drive unemployment below the natural rate may produce a path that goes from A to B along the short-run Phillips curve and then curves up and to the right to a point such as C. The B to C movement is descriptive of 1970 when both inflation and unemployment increased as the result of the adjustments produced by the excessive demand caused by the Vietnam War.

THE LONG-RUN PHILLIPS CURVE

Note that this type of analysis implies that the short-run Phillips curve shifts up to PC_2 when point C is reached. Policy could try once again to lower unemployment by raising aggregate demand, but this would ultimately result in another south-to-north clockwise loop that would put the economy at a point such as D. Hence there would be no permanent gain in employment and the inflation rate would be still higher.

To summarize: There is a tendency always to return to the vertical line labeled LPC—which stands for Long-Run Phillips Curve. The discouraging fact about this is that points to the left of LPC imply

accelerating inflation. This means that efforts to lower unemployment by demand stimulus may simply accelerate inflation without permanently lowering unemployment. And it means that such efforts may produce dreary years such as 1970 when both the rate of inflation and the rate of unemployment increased.

As if these were not enough dilemmas for policy, an additional one is caused by the fact that the value of the natural rate of unemployment is unknown. What is known is that it tends to shift. During the early 1960's, President Kennedy's Council of Economic Advisers believed that a 4 percent unemployment rate could be achieved without setting off inflationary pressure. Subsequently, demographic changes—the increase in the relative number of women and teenagers in the labor force—caused this figure to be increased so that by 1978 the Council was setting 4.9 percent as a feasible target which, however, was raised to 5.1 percent in its annual report January 1979. Meanwhile, economists who have studied this issued seem to average the current natural rate at 5.5 percent, albeit which a high variance, which is a fancy way of saying that consensus with respect to this figure is not overwhelming.

D. Inflation as a Cause of Stagflation

In the preceding section, stagflation was interpreted as a deterioration from the preceding year, as in 1970. However, this paper earlier focused on the level of discomfort such as existed in 1976 when unemployment and inflation were far too high. The kind of situation that prevailed in 1976 can come about merely as the result of a pre-existing inflation. In its "1977 Midyear Review of the Economy," the Joint Economic Committee stated:

The most important restrictive effect caused by inflation is the conservative bias that it imparts to budgetary and monetary policy. Stagflation, as the simultaneous existence of excessive unemployment and an excessively high rate of inflation is sometimes called, creates a genuine dilemma for stabilization policy. Excessive unemployment calls for expansionary policy, but this risks renewed inflation, while a high rate of inflation calls for restrictive policy, thereby risking higher unemployment. The said truth is that since 1974 inflation has provided, and continues to provide, powerful motivation to suspend the Employment Act in favor of restrictive economic policies that slow economic growth and increase unemployment.¹²

As the Committee pointed out, inflation itself generates higher unemployment. And this can happen automatically without any conscious policy decisions because inflation reduces the real quantity of money, and lowers the real value of public debt, and it thereby brings the interest investment mechanism and the real balance effect into operation in a restrictive manner. It also tends automatically to impede consumer spending because it shoves taxpayers into high tax brackets and reduces their real disposable income in a manner that might be described as the inflation tax effect.

MONETARY POLICY AND STAGFLATION

Economic activity must be financed. Irving Fischer's famous quantity equation states that money (M) multiplied by its frequency of

¹² "The 1977 Midyear Review of the Economy," p. 29.

turnover (velocity, V) must, by definition, equal the nominal GNP (PQ). Therefore the equation states the truism that

$$MV = PQ$$

It follows from this that the rate of monetary growth plus the rate of velocity growth must equal the sum of the rate of growth of the price level and the rate of growth of real output.

During a period of rapid or rising inflation, the Federal Reserve will tend to slow the rate of monetary growth. If the inflation proves to be intractable, either velocity must rise or real output must fall. Generally, both will happen. As money grows tight, interest rates rise, and the resulting inducement to economize on the holding of cash balances steps up monetary velocity. At the same time, however, the higher interest rates impede capital spending and home construction and this then slows the growth of real output and raises unemployment.

Therefore inflation, combined with the traditional behavior of an inflation-conscious monetary authority, tends to produce a condition of stagflation. This is perhaps why Milton Friedman has remarked that the Phillips curve is now positively sloped, and it also explains why inflation is a serious enemy to rapid growth and high employment.

The dilemma for the monetary authority is once again acute. To prevent the growth of real output from declining the Federal Reserve must gear its policies to maintaining a constant rate of growth in the real quantity of money. But that implies tolerance of any rate of inflation. On the other hand, if the Fed is determined to contain inflation it must reduce the rate of growth of the real quantity of money; but as a consequence of such policy, the growth of real output and employment will be slowed.

III. POLICIES TO COMBAT STAGFLATION AND SUGGESTIONS FOR RESEARCH

It may seem somewhat odd that policies to combat stagflation and proposals for research into the area are being married into a single part of this study, but the reasons for this will become clear in the next section on shockproofing and income taxation.

A. Perverse Behavior of Automatic Stabilizers During Stagflation

As noted earlier, the automatic response of the progressive personal income tax to inflation can cause the economy to be dragged into the stagflation zone. An even more serious situation may arise when real and nominal GNP move in the opposite direction, as may happen under the impact of supply shocks. Developments during 1974 illustrate this problem far better than any diagram.

In 1974, real output (real GNP) fell by 1.4 percent; but because prices rose 9.7 percent, nominal GNP increased and by a substantial 8.1 percent. Movements in opposing directions of real and nominal GNP have occurred before, but never—except during the post World War II reconversion period—by anything approaching the magnitude of the sharp divergence of 1974.

When real and nominal GNP move in the opposite direction, this can be harmful for the economy. For example, the income tax which normally acts as an automatic stabilizer that cushions fluctuations in real GNP may react perversely, for a time, accentuating rather than moderating the decline in real GNP. This is because the income tax is geared to the movement of nominal GNP rather than real GNP and taxes can therefore rise rapidly even as real output and real income are contracting. The Joint Economic Committee, in its "Review of the Economy, October 1978," explained the problem in the following way:

Between the fourth quarter of 1973 and the third quarter of 1974 . . . real GNP fell at an annual rate of 3.2 percent. However, because of the inflation rate of 11.1 percent . . . money GNP increased 7.6 percent and personal income rose 9.4 percent. Personal income . . . is the base for the individual income tax. Its rapid increase, combined with the progressivity of the income tax, caused revenue from the Federal income tax to rise 15.8 percent. The result was that the ratio of Federal income tax receipts to personal income rose from 11.0 percent to 11.5 percent during a time when real output and real wages were falling.

This did enormous damage to the economy. It meant that our income tax acted as a source of instability rather than as the automatic stabilizer that we have come to expect. An automatic stabilizer should cause the ratio of the tax to its base—the aggregate tax rate—to fall when real income falls. But in 1974, the opposite happened.¹⁴

The report went on to observe that it would have been far better in 1974 for income taxes to have been indexed for inflation. In that event,

. . . the aggregate tax rate, instead of rising to 11.5 percent . . . would have fallen to about 10.9 percent. This experience shows that indexing is the difference between an income tax that is an automatic stabilizer all of the time, and one that is an automatic stabilizer only some of the time.

If taxes had not been permitted to run up so sharply in 1978, consumer income and expenditure would not have been so seriously demoralized, and some tax relief would have occurred automatically instead of having to wait until March 1975 when relief finally came, but only after the economy had already skidded to its recession trough.

Indexing the income tax is a controversial issue. Those who favor it point to the 1974 episode as a prime example of why indexing the tax system would contribute to the stability of the economy. Those who oppose indexing concede that the economy would have benefited from it in 1974 but they would argue that 1974 is a special case, unique in history, and unlikely to be repeated again in the future. Those who argue in this manner cannot conceive of another quadrupling of oil prices combined with all the other supply shocks that were inflicted on the economy prior to and during that period.

ELASTICITY OF AGGREGATE DEMAND

The view here is that the issue depends less upon the likelihood that new supply shocks will again pelt the economy—which they surely

¹⁴ Joint Economic Committee, "Review of the Economy," October 1978, p. 155.

will—but upon the shape of the aggregate demand curve. Consider figures 7 and 8 which basically replicate figure 3 and show the effect of a restriction in aggregate supply as indicated by a shift in the aggregate supply curve from S_0 to S_1 .

FIGURE 7.—Supply shock with elastic aggregate demand.

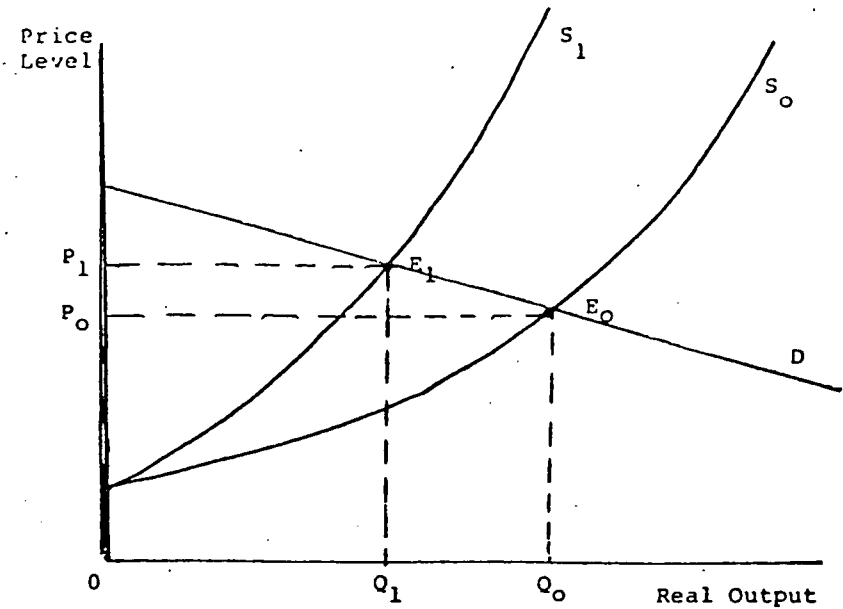
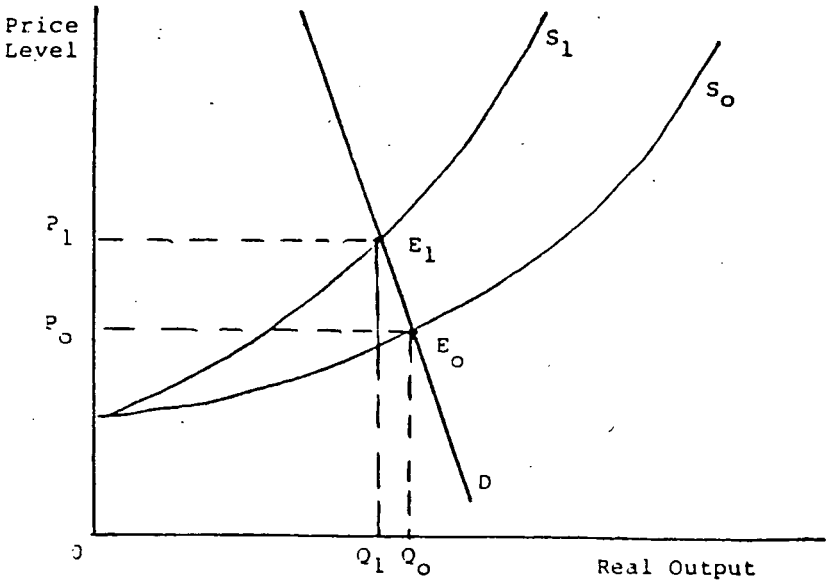


Figure 7 illustrates the case in which aggregate demand is highly sensitive (“elastic” in the economist’s lexicon) to changes in the price level. In the elastic case, the percentage fall in real output exceeds the percentage rise in the price level, and this means that nominal and real GNP both decline when aggregate supply is restricted. Initially, real GNP equals Q_0 , and since prices initially equal P_0 , nominal GNP is the product of the two and can be seen to be the rectangle described by the points $OP_0E_0Q_0$. In the price elastic case, the supply restriction causes nominal GNP to fall as can be seen by comparing the new smaller rectangle $OP_1E_1Q_1$ with the original one.

FIGURE 8.—Supply shock with inelastic aggregate demand.



But what if aggregate demand is price “inelastic,” i.e., fairly unresponsive to changes in the price level? This case is illustrated in figure 8. Here the percentage fall in output is less than the percentage rise in the price level so that nominal GNP rises when real GNP falls from Q_0 to Q_1 , and this can be seen by noting that the new nominal GNP rectangle is clearly larger than the initial one.

The case shown in figure 8 is descriptive of the economy in 1974 when the percentage increase in the price level vastly exceeded the percentage drop in real GNP. However, since movements in the opposite direction of real and nominal GNP have been rare in the past, and have been substantial only under extraordinary circumstances such as the post World War II reconversion period, the question of whether aggregate demand has become less responsive to the price level in recent years than it was in earlier times is important. If it has become less responsive, there will be the same kind of trouble experienced in 1974–75 the next time a substantial set of supply shocks hits the economy. And if that is the case, the time will be past due when such fundamental reforms as gearing taxation to real income and profits, rather than to nominal income and profits, should be instituted.

In the Keynesian world there is no place for inflation indexing of taxes. Inflation is viewed as being caused by excessive demand and a time of excessive demand is an inappropriate time to collect fewer taxes. That view, however, fails to take account of the supply side forces that generate stagflation and that necessitate a rethinking of conventional macroeconomic policy economics.

FACTORS AFFECTING THE ELASTICITY OF AGGREGATE DEMAND

Having suggested the importance of measuring the elasticity of aggregate demand with respect to prices and how that elasticity may have changed over the years, the issue may be left and recommended as a fitting subject for empirical investigation. Such an investigation is apt to be a formidable task. For example, the 1974 episode is not as clear-cut as it has been made to seem because the aggregate demand curve could not have been stationary as depicted in figure 8. Yet, any useful empirical investigation would have to isolate those changes in real and nominal GNP that came about from the supply side from those that came about from shifts in aggregate demand. This empirical research project cannot be undertaken for the purposes of this paper. The factors that influence the responsiveness of aggregate demand with respect to changes in the price level can, however, be noted.

Underlying the responsiveness of aggregate demand to changes in the price level are such parameters as the increase in real consumption per dollar increase in real disposable income (the "marginal propensity to consume"), the increase in real tax yield per dollar increase in real income (the marginal aggregate tax rate), the increase in real consumption per dollar of real wealth increase, the reduction in investment spending for each point by which the real rate of interest increases, the increase in real investment outlays induced per dollar increase in real output (the "marginal propensity to invest"), the frequency of turnover of money relative to income (velocity), and the degree to which increases in interest rates cause wealth holders to economize on the holding of cash balances (the "interest elasticity of the demand for money").

Specifically, if investment becomes more responsive to changes in the rate of interest, aggregate demand will become more responsive to changes in the price level because of the greater effect that any change in the real quantity of money will have on investment.

As the marginal propensity to consume and the marginal propensity to invest increase, aggregate demand becomes more responsive to changes in the price level because any increase in spending caused by a rise in the real quantity of money will have higher responding (multiplier) effects. For the same reason, a rise in the marginal tax rate will lower the responsiveness of aggregate demand to changes in the price level since high marginal tax rates dampen multiplier effects.

On the monetary side, if the demand for real cash balance becomes more sensitive to changes in the real rate of interest, aggregate demand will become less sensitive to changes in the price level. The reason is if cash balance holdings increase substantially when interest rates fall, less of any increase in the real quantity of money caused by a fall in the price level will be available to finance a higher level of real output. Similarly, an increase in the transactions velocity of money causes aggregate demand to become more responsive to changes in the price level because any increase in the real quantity of money will finance a larger level of additional real aggregate expenditures.

Casual empiricism discloses only a few distinct trends. Because of the steady increase in the ratio of taxes to GNP at the State and local

level—especially the introduction of State income taxes—the trend in taxation has been to raise the marginal rate of taxation with respect to GNP. As noted above, this tends to give a more vertical tilt to the aggregate demand function. Similarly, investment appears not to have been nearly as buoyant or responsive to output and interest rate changes as it was in the past, and this too adds to the upward tilt of aggregate demand. Working in the opposite direction is the fact that the velocity of money, hardly defined to include currency and demand deposits, M_1 , has shown a trend rate of increase of about 3% per year. But this reflects financial innovations that permit wealthy holders to increase the proportion of their liquid assets held in time as opposed to demand deposits. Thus, the velocity of M_2 —which includes time deposits at commercial banks—has shown no trend at all.

Evidence is meager that there has been a sharp break such as distinguishes the shape of aggregate demand in the 1960's from the 1970's, and the evident lessened responsiveness of aggregate demand to changes in the price level therefore remains something of a mystery. It is important that this mystery be solved. As noted earlier, however, this cannot be done in this paper.

B. The Pairing of Targets and Instruments

Note was taken earlier of the importance of the appropriate pairing between the various instruments and targets of economic policy. Each instrument should be "assigned" to the target over which it has the greatest relative effectiveness. The crucial point was that if a particular instrument chases after a target over which it has relatively little influence, the result could be such massive adverse side effects that the effort could well prove to be destabilizing for the entire economy.

Note was also taken of the circumstance that what might be appropriate pairing in the short run might be inappropriate pairing from a longer range perspective. For example, tight money combined with lower taxes might calm stagflation in the short run; but this policy combination might be lethal in the longer run because of the bias it would produce against capital spending. Therefore, one of the first principles of appropriate pairing is to maintain a clear distinction between the short run and the long run and to attempt to find efficient pairings that do not produce inconsistencies between short and long-run targets.

CONFLICT BETWEEN APPROPRIATE PAIRING IN THE SHORT AND LONG-RUN

A clear example of conflict between short and long-run needs has been the behavior of fiscal and monetary policy in the United States. In the short run it is appropriate for monetary policy to concern itself with inflation, as was indicated earlier, and that has generally been the practice followed. However, often the consequence is a recession and this has prompted efforts to restore prosperity by resorting to tax cuts and other forms of fiscal stimulus. As a result of the repetition of this sequence, the policy mix has tended to cause the economy to drift ever more heavily into a consumption bias that neglects the capital spending which provides the productivity growth which is essential for price stability and the growth of real income.

MULTIPLICITY OF TARGETS

A second dimension of the pairing problem is that there are many objectives and that there may not be enough policy instruments available to simultaneously achieve all the objectives. It is a well known principle of economic policy that there must be at least as many independent¹⁵ policy instruments as there are objectives if all the objectives are to be attained. For example, resources can be returned to the private sector by reducing government spending. But this is deflationary and therefore will violate the full employment objective. To ensure that both objectives are met, a second instrument is needed. An expansionary monetary policy could lower interest rates and raise capital spending. In that way the resource transfer can be effected and full employment can be maintained.

Finally, it is easy enough to figure out how to pair two instruments against two objectives; but it is quite another thing to do this in an economy in which there is a multiplicity of goals that is being sought.

The issues raised here are crying for research attention. In particular, what are the appropriate pairings in the short run and are they consistent with long run goals? Second, can analysis get beyond the two-by-two model and can an entire "matrix" be developed with instruments shown in a column paired against the appropriate target in the corresponding row of the matrix? Finally, can the matrix be made to have at least as many columns as it has rows, so that there will be enough policy instruments available to deal with all the objectives.

These are complex issues that will have to be dealt with by careful and elaborate econometric research. No one has undertaken such research, as far as the author knows. But it would be a project well worth undertaking and as soon as possible.

Such work is likely to be exceedingly complex. Existing econometric models have not been constructed for the purpose of distinguishing the relative effectiveness of instruments vis-a-vis targets, or with an eye to consistency between short and long-run pairing. The project proposed here will probably have to start from scratch; it will be time consuming and it will require substantial financial support.

C. What Can Be Done Immediately?

"FREEBIES"

The first thing that must be borne in mind is that monetary and fiscal policies are essentially powerless and inefficient methods of attempting to deal with the problem of stagflation. If these policies are used to reduce the discomfort of unemployment they will accentuate the discomfort of inflation. If they are used to alleviate the discomfort of inflation they will exacerbate the discomfort of unemployment. Additional tools are needed. Freebies may be defined as policy changes that would simultaneously lower inflation and reduce unemployment.

¹⁵ The word independent is used here in a technical sense to mean that the instruments must have differential effects on the various targets. If two policies have identical relative effects on all targets they are not independent since the economy is no better off by having them both than it would be if there were any one instrument. Independence in this sense has nothing to do with political independence or administrative separation and the like.

There are plenty of them around. The trouble is that they have been used to worsen stagflation rather than to ease the disease. Writing in *Challenge Magazine*, Arthur Okun lamented:

We now face a major escalation of payroll taxes to shore up the financing of social security. We returned to a farm program that highlights cutbacks in farm acreage, automatically reducing supplies and productivity in our agricultural sector. The minimum wage was raised by 15 percent at the beginning of this year, with substantial further increases locked into law for the years ahead.¹⁰

AVERTING SUPPLY RESTRICTIONS

Okun's lament brings the issue of supply restriction squarely back. OPEC price increases cannot be helped nor is there much that can be done if there is a poor world food crop. Of course, stockpiling programs would serve as beneficial shock absorbers, and such programs should be instituted and augmented. In the meantime, however, policy should refrain from inflicting supply restrictions on the economy.

Consider the minimum wage. This was raised to \$2.65 an hour on January 1, 1978; it went up automatically to \$2.85 the next January; and it will again rise automatically to \$3.05 in 1980. Although minimum wage legislation is a political sacred cow, it is appropriate for economists to point out that it raises labor costs, shoves up prices, and then raises unemployment via the several mechanisms explained in this paper. Former Chairman G. William Miller of the Federal Reserve suggested a postponement of the 1980 increase and he also suggested the establishment of a differential minimum wage that would establish a lower minimum wage for young workers. These proposals deserve to be taken seriously.

The raising of minimum wages should be discontinued entirely and a system of employment tax credits should be substituted. The basic idea behind the tax credit plan is to lower the labor costs of employers without lowering the take-home pay of employees. Such a program would hold down labor costs and prices and it would expand employment. Outcome: less stagflation.

Employment tax credits can be implemented in numerous ways. One of the most constructive would permit employers to reduce their business income taxes by a fraction of their payroll contributions for the social security and unemployment insurance taxes they pay on behalf of their employees. This would lower labor costs, lower prices, expand employment, and it would not reduce the revenues that flow into the trust funds that finance social insurance programs.

The difficulty, thus far, with employment tax credits is that they have been applied only at the margin. An employer receives a tax credit only for the *additional* workers he hires, not for those he already has on his payroll. The reason for framing the legislation in this manner is budgetary and it also involves practicality. The budget costs of an across-the-board employment tax credit are substantial, and few legislators can be convinced of the benefit of providing employment tax credits for those who already have jobs.

But there is an economic danger in the marginal approach because a period of slack will cause layoffs and therefore denial of tax credits, whereas a period of rapid expansion will produce the opposite. That is

¹⁰ Arthur M. Okun, "Stop the Self-Inflicted Wounds," *Challenge*, March-April 1978.

not good fiscal policy because it amounts to raising and lowering taxes at precisely the wrong times.

PAYROLL TAX REDUCTION

Rising payroll taxes are a primary cause of stagflation. Such taxes finance unemployment insurance (UI) as well as social security (OASI), and also programs such as hospital insurance under Medicare (HI) and disability insurance (DI).

UI is financed by State and Federal taxes that are levied almost exclusively on employers. These taxes have increased enormously in response to the extraordinarily deep recession of 1974-1975. The Federal law of 1976, H.R. 10210, "The Unemployment Compensation Amendments of 1976" doubled the Federal tax per covered employee from \$21 and \$42 per annum. And in the meantime the ratio of state UI tax receipts to taxable wages rose 32 percent between 1974 and 1976, a period during which the economy was struggling its way out of the worst recession since the Great Depression of the 1930's.

The payroll taxes that finance social security have also been rising at astronomical rates. These taxes are split evenly between employer and employee. In January 1979 the maximum taxable base rose from \$17,700 to \$22,900. Combined with an increase in the tax rate from 6.05 percent to 6.13 percent, this implied an increase in payroll taxes of \$333 for each employer and employee who earned \$23,000 or more.

These are disastrous developments not only with respect to stagflation but also with respect to the equity and balance of the tax system. In 1970, employers contributed about \$430 to social insurance on behalf of employees whose compensation equaled or exceeded the maximum taxable base. By 1976, this figure had more than doubled to roughly \$1,000, and by 1980, it will reach \$2,000, thereby amounting to a more than four-fold increase in a decade. Containment of inflation and the maintenance of high employment are incompatible with that kind of government-imposed increase in labor cost.

In the aggregate, contributions for social insurance came to 18.3 percent of total Federal revenue in 1960. By 1965 they had risen to 20 percent, by 1970 to 26 percent, and in 1979 they are expected to come to 33 percent. Whereas social insurance taxes were less than one-fifth of Federal revenue in 1960, they amount to one-third or more 20 years later. Meanwhile, the share of personal income taxes has remained roughly constant at about 45 percent, while the share of corporate income taxes has dropped sharply from 22 percent in 1960 to 17 percent in 1976.

PAYROLL TAXES AS LABOR COSTS

Tax increases that raise labor costs add both to inflation and to unemployment. It follows that one of the first orders of business is to reduce payroll taxes and to substitute alternative means of financing. In the case of unemployment insurance, the Federal tax increases embodied in H.R. 10210 should be rescinded as soon as possible. In addition, the deep and protracted recession of 1974-1975 greatly strained the State unemployment insurance trust funds and threw many of them into serious deficit. As discussed in an earlier paper by the au-

thor,¹⁷ the appropriate response to this crisis would have been a Federal grant program that would have encouraged States not to raise the payroll taxes charged to employers. That paper also developed a formula that would base "cost equalization" grants on the amount of abnormal unemployment suffered by a State rather than on the financial condition of its trust fund account. In that way States that have raised taxes to reduce deficits would not be penalized relative to States that have not, so the program could not be viewed as a bailout of the States that chose not to raise their payroll taxes.

FINANCING SOCIAL SECURITY

There are many reasonable solutions to the problem of social security financing that have been given serious consideration. But thus far none has been adopted. Former Congressman Burke of Massachusetts advocated a tri-partite financing program that would claim one-third from the employer, one-third from the employee, and one-third from the general revenues of the Treasury. The proposal would eliminate exclusive reliance on payroll taxes and help moderate stagflation. The tax credit proposal discussed earlier would have similar effects.

Congress has been reluctant to dip into general revenues to finance social insurance because it wants to maintain the link between contributions and benefits. To counter this argument it has been suggested that HI be removed from payroll tax financing since hospitalization benefits are a function of accident and misfortune and have no relation to contributions. Some would also remove disability insurance from payroll tax financing. It may not be advisable, however, to do this until the administration of the program is brought under control. As of now DI benefits rise when the unemployment rate rises, so it appears that the definition of disability is somewhat more protean than desirable. Once the benefit side of the program is rationalized and freed from abuse it would be come appropriate to reorganize the financing of the program. Although it is true that the magnitude of the benefits are linked to past earnings, this linking is so loose that it amounts to a poor excuse for earmarking a fraction of payroll taxes to finance disability insurance.

OTHER POLICIES TO MODERATE STAGFLATION

Other direct attacks on stagflation are available. Arthur Okun has proposed the extension of additional grants in aid to State and local governments in return for a reduction in State and local sales and excise taxes. Okun and Governor Henry Wallich of the Federal Reserve have also proposed the adoption of a tax-based incomes policy (TIP). The JEC's October 1978 Review of the Economy presented a detailed analysis of the requirements for a successful TIP. The idea is to reward non-inflationary wage behavior by granting tax rebates to employers and employees who live within the guidelines and to penalize the high flyers who violate the guidelines by imposing penalty taxes.

¹⁷ Thomas F. Dernburg, "Economic Recovery and the Financing of Social Insurance," Committee on the Budget, U.S. Senate, May 19, 1977.

SUMMARY OF POLICY RECOMMENDATIONS

The first requirement for reducing stagflation is to stop the "self-inflicted wounds" that Arthur Okun bemoans. The second step is to tread lightly when it comes to the use of fiscal and monetary policies because these instruments are in conflict. Their efforts to combat one element of discomfort will exacerbate the other component of the discomfort index. Finally, it is necessary to be on the lookout for additional instruments of policy that will help to slow the inflation without slowing the economy.

Suspension of further increases in minimum wages, adoption of employment tax credits, payroll tax reduction, implementation of a well-designed TIP, and the provision of incentives to reduce sales and excise taxes appear to be the first order of business in combating stagflation. Simultaneously, steps should be taken to insulate the economy from the effects of supply restrictions. High on the list of priorities is the inflation indexing of personal and corporate taxes, the establishment of buffer stocks of vital commodities including oil and agricultural staples, and the extraction of a commitment from the Federal Reserve that it will provide one-time accommodation to finance the higher price levels imposed by supply shocks.

THE POST-KEYNESIAN INTERPRETATION OF STAGFLATION: CHANGING THEORY TO FIT THE REALITY

By Alfred S. Eichner*

CONTENTS

	Page
Introduction.....	38
I. The nature of post-Keynesian theory.....	40
A. The shift to dynamic analysis.....	41
B. Long period and short period analysis.....	42
C. The distributional issues.....	44
D. The role of money.....	46
E. Business savings and profit margins.....	47
F. The Microfoundations.....	48
II. The interpretation of stagflation.....	49
A. Distribution of the benefits from technical progress.....	49
B. The role of trade unions.....	50
C. A shift in the growth rate.....	51
D. Consumption out of nonwage income.....	53
E. A shift in the international terms of trade.....	55
F. The influence of aggregate demand.....	56
III. The policy thrust of post-Keynesian theory.....	57
A. Incomes policy.....	58
B. A social and economic council.....	59
C. The role of the secretariat.....	61
D. Winning the support of trade unions.....	62
E. Getting the process going.....	63
F. The intellectual obstacle.....	64
References.....	65

INTRODUCTION

While most economists remain puzzled by the simultaneous occurrence of unemployment and inflation, the phenomenon is readily explained, and an appropriate policy response suggested, by a body of economic theory which has only recently emerged to challenge the orthodox Keynesian and monetarists' models. The new analytical framework is termed "post-Keynesian," both to differentiate it from the "neo-classical synthesis" which dominates the teaching of economics in the United States and to indicate that it represents a logical extension of Keynes' own break with orthodox thinking. The new approach has its origins in works published two decades ago, but it is only now coming to the attention of American economists, as evidenced by the current series of articles in *Challenge* magazine and the appearance of a *Journal of Post Keynesian Economics*.

This paper consists of three parts. The first section describes the salient features of a post-Keynesian approach, contrasting that ap-

* Professor of economics, Rutgers University, and director, Center for Economic and Anthropogenic Research.

proach with the orthodox neo-classical type of analysis. These salient features are the following:

1. Post-Keynesian theory is formulated with the most important economic fact of the past several centuries clearly in mind. This is the continuous, though uneven, expansion of various national economies over time. In contrast, orthodox theory views the economy as coming to rest at a particular "equilibrium" point.

2. Post-Keynesian theory views investment as the key determinant of economic expansion, both secularly and cyclically, and it regards investment as being inextricably linked to pricing and income distribution. In contrast, orthodox theory emphasizes only the role of prices, and those only as a determinant of resource allocation.

3. Post-Keynesian theory is meant to describe an economic system with advanced credit and other monetary institutions—all of which play a key role in dynamic processes. In contrast, orthodox theory, including the monetarist variant, focuses largely on the stock of money, ignoring the effect which the broader range of credit arrangements has on real economic activity.

4. Post-Keynesian theory acknowledges the critical role played by large corporations and trade unions in the economy. In contrast, orthodox theory recognizes only the atomistic competitive firm, regarding all manifestations of monopoly power as exceptional cases.

The second section of the paper explains how the basic propositions of post-Keynesian theory lead to a quite different understanding of stagflation and suggest a quite different policy response from those to which orthodox theory gives rise. Among the propositions to be highlighted are the following:

1. That the growth of *real* wages over time depends on a series of economic and technological factors, including the: (a) rate of growth of output per worker; (b) the rate of investment; and (c) the proportion of non-wage income devoted to purposes other than investment.

2. That the growth of *nominal* wages over time depends on a series of socio-political factors, including the relative strength of the trade union movement, the size of the key bargain negotiated in a bell weather industry and the stance taken by the government as to what increase in normal wages is fair and reasonable.

3. That a rise in the price level, i.e. inflation, occurs when the growth of nominal wages, as determined by socio-political factors, exceeds the growth of real wages, as dictated by economic and technological factors. This is because business firms will pass higher costs on to purchasers in the form of higher prices, thereby producing a rise in the price level that brings the nominal and real wages into line with one another.

4. That the set of factors determining the rise in prices is not entirely the same as those determining the growth of real output so that it is possible to have economic growth without inflation and inflation without economic growth. The corollary to this last proposition is that a policy which seeks to limit inflation by curtailing economic growth is likely to prove ineffective. Indeed, to the extent that the policy leads to a lower rate of investment, and therefore to a slower growth in productive capacity, it is likely to prove self-defeating. Thus the so-called Keynesian policies in the past of short-term demand management

to curtail inflation, since they have had an adverse effect on the long-term rise in supply potential, may actually have contributed significantly to the current stagflation problem.

The third section of the paper discusses both the policy and intellectual implications of a post-Keynesian approach. While the principal policy implication is that some form of incomes policy needs to be added to the existing fiscal and monetary instruments for regulating the pace of aggregate economic activity, it will be pointed out that such a policy cannot be implemented in an institutional vacuum but must instead follow from other changes to be made in the way economic policy is determined. Among those changes are the following:

1. Better integration of the private interest groups that will be affected by any incomes policy into the process of economic decision-making.

2. Better coordination of policy within government itself.

3. Better linking of policymaking bodies to technical secretariats with data collection and analytical capabilities.

The intellectual implication of the foregoing is that the post-Keynesian approach needs to be taken more seriously than it has to date by American economists, both within government and without. In this way, perhaps the country can recover from the present intellectual bankruptcy of economic policy.

I. THE NATURE OF POST-KEYNESIAN THEORY

Post-Keynesian theory has emerged as a synthesis of three unorthodox visions, each the contribution of a different individual. There is, first, John Maynard Keynes' view of the economy as a system with an integrity of its own, the behavior at the macro level being more than just an extrapolation of the behavior observed at the micro level.¹ There is, in addition, Roy Harrod's perception of the economy as a system in continuous motion, proceeding along an expansion path like a train hurtling between cities, and not simply coming to rest at some equilibrium stop.² Finally, there is Michal Kalecki's insight that the capital accumulation, or expansion, process is inextricably linked to how income is distributed and prices set.³

It was Joan Robinson in "The Accumulation of Capital" (1956) who first synthesized these three disparate visions in a single work of originality which marks the beginning of a distinctly separate post-Keynesian theory⁴—one that could effectively challenge the neoclas-

¹ Although this vision is perhaps more fully developed in "The General Theory" (Keynes, 1936), it is already discernible in the earlier "Treatise" (Keynes, 1930).

² The vision is first found in Harrod's 1939 article but is better developed in his 1948 book. See Kregel, 1971, chapter 8.

³ For the most important of Kalecki's essays in English, see his 1971 volume. See also Kalecki, 1939, 1954; Feiwel, 1975.

⁴ Although "The Accumulation of Capital," together with its companion volume, the "Essays in the Theory of Economic Growth" (1962), is the most important of the early major works in post-Keynesian theory, the contribution of Robinson's contemporaries at Cambridge University, England, should not be overlooked. Piero Sraffa's "The Production of Commodities by Means of Commodities" (1960) is in a class by itself, providing as it does the broadest possible foundation for revitalizing economic theory, but the work of Nicholas Kaldor as presented in a series of journal articles (Kaldor, 1955-56, 1960a and 1960b) needs to be acknowledged as well. Moreover, there is the contribution of the American institutionalist economists, particularly Gardiner C. Means and John M. Clark (Means, 1962; Clark, 1961), in developing the micro foundations of post-Keynesian theory, along with the similar contribution of the Oxford pricing study group in England (Wilson and Andrews, 1951).

sical synthesis being developed contemporaneously in Cambridge, Mass.⁵ If the neoclassical synthesis can be said to treat Keynes' arguments as a minor gloss on Walras and other neoclassical theorists, then post-Keynesian theory must be described as marrying Keynes with Harrod and Kalecki. The neoclassical synthesis and post-Keynesian theory represent the only comprehensive conceptual framework (aside from the Marxian one) for understanding how the American economy works. It is the neoclassical synthesis which has come to dominate in the post World War II period not only the teaching of economics in the United States but also the formulation of public policy. To bring out the critical differences between these alternative paradigms, it is useful to explain why Keynes has been married to Harrod and Kalecki in the post-Keynesian approach rather than his arguments being treated as simply a minor gloss on Walras.

An understanding of the role played by effective demand, especially as influenced by any excess of public spending over tax revenues, has been the main intellectual factor in the ability of Western governments, including that of the United States, to avoid the massive and prolonged economic slumps that punctuated the pre-World War II period. This understanding derives primarily from Keynes' 1936 classic, "The General Theory of Employment, Interest and Money." To the extent that large-scale unemployment has been prevented, Keynes' purpose in writing "The General Theory" has been largely achieved and the short-term but large-scale unemployment which exercised the 1930's generation of economists and public officials has been put to rest. Nonetheless, as the basis for formulating policy once the specter of large-scale unemployment was banished, the model developed by Keynes has a number of shortcomings. It was Harrod who first pointed out the most serious of these.

A. The Shift to Dynamic Analysis

In "The General Theory" it is business investment that plays the critical role in determining the level of effective aggregate demand. (Ironically, in the work which has been used largely to argue the need for increased public spending, government expenditures figure hardly at all in the formal analysis.) What Harrod pointed out—along with American economist Evsey Domar—is that the influence of business is not limited just to increasing aggregate demand in the immediate run. Once the investment projects currently being funded have been carried through to completion, aggregate supply in the form of plant capacity will also be increased.⁶ This latter effect is overlooked in the sort of static model on which Keynes based his arguments and which, even today, underlies most macroeconomic analysis.

Harrod's point was to show that increasing aggregate demand by stimulating business investment would not necessarily solve the problem of persistent unemployment. Although the problem might be temporarily ameliorated by the increase in aggregate demand, once the new capacity which the investment made possible were to come on line,

⁵ Although the neoclassical synthesis first appeared in Samuelson's dissertation (1947) as well as in the first edition of his well-known introductory textbook, the extension of that framework to a growing economy did not come until Solow's (and Swan's) separate 1956 articles.

⁶ Harrod, 1939, 1948; Domar, 1946, 1947, 1957.

it might well lead to a situation in which aggregate supply capacity exceeded aggregate demand, thereby discouraging further investment and producing a slump in business activity which would, in turn, cause unemployment to rise. Harrod, along with Domar, was able to indicate the conditions that would have to be met if the increase in aggregate supply from business investment was not either to overtake or, alternatively, fall short of the increase in aggregate demand produced by the same investment. These conditions for assuring that aggregate demand and aggregate supply grow apace are given by the well-known Harrod-Domar formula,⁷ and they include, among others, that the propensity to save, the marginal social return on investment and, most important of all, the rate of growth of investment all remain constant over time. For Harrod, the significance of the formula was in suggesting how unlikely it was that those conditions could actually be satisfied, and thus how unlikely it was that cycles in business activity could be avoided.

More important than the specific point Harrod tried to make, however, was the new mode of dynamic analysis which he introduced. To take into account the more enduring impact of business investment on supply capacity, and not just the immediate effect on aggregate demand, it was necessary to show how the economy's expansion path *over time* was likely to be affected. This way of setting up the model was in sharp contrast not only to the traditional approach in economics but also to that followed by Keynes in "The General Theory," where the focus is on the new equilibrium position at which the economy will come to rest. The difference between the two modes of analysis can best be brought out by indicating what happens when the respective models to which they give rise are left undisturbed. Whereas in the usual static model the economy settles down to a fixed level of activity, in the type of dynamic model upon which post-Keynesian theory is based the economy continues to expand indefinitely at a constant rate. This is the steady-state expansion rate given by the Harrod-Domar formula and which Harrod labeled the "warranted growth rate."

B. Long Period and Short Period Analysis

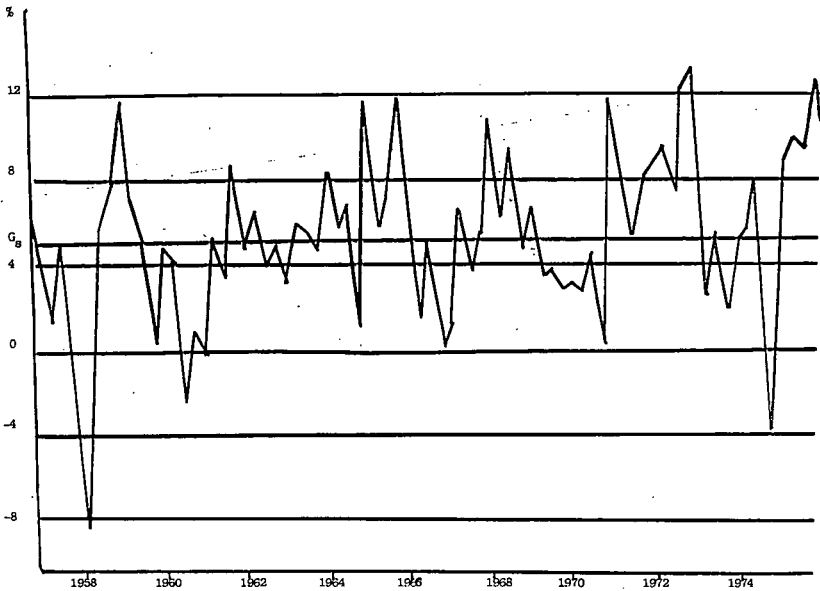
Robinson, in her writings, has made this dynamic mode of analysis more applicable to actual historical phenomena by distinguishing the short period from the long period.⁸ It is only from the latter perspective, when all the factors which cause cyclical movements in the economy can be ignored through one device or another, that the Harrod-Domar formula applies. The warranted growth rate given by the Harrod-Domar formula is a theoretical construct useful only for interpreting long-term trends in the economy. To understand the actual historical course the economy takes, a course marked by pronounced cyclical movements, it is necessary to complement the long-period analysis with a short-period analysis. The two need to be carried out conjointly—the short-period analysis because it allows for deviations from the warranted growth rate and the long-period analysis because

⁷ $G = s/v$, or, in the version put forward by Harrod, $G = s/C$, where G is the growth of output, s is the marginal propensity to save and v or C are the incremental capital/output ratio.

⁸ Robinson, 1956, Books II and III; 1962, pp. 44–47.

those deviations can be explained only in reference to what they are deviations from.

EXHIBIT 1.—Annual growth rates for GMP, quarterly, 1955–76.



NOTE.—GMP is the Gross Marketed Product. It is the GNP less the compensation of government employees and it is roughly equal to GPD, gross private product. G_s is the secular growth rate or trend line and for 1952–76 is roughly equal to 5.13%.

Take the most recent performance of the American economy, as shown in exhibit 1. Both the secular trend (the secular growth rate, $G_s = 5.11$ percent) and the fluctuations around that trend line can be clearly discerned. (The average deviation from the trend for the period covered by the chart was 3.03 percent, or three-fifths as great as the secular trend.) The same general pattern holds, whether one examines some earlier period in American history or the historical data from another advanced market economy. This record of continuous, though uneven, expansion is the most important economic fact of the past several centuries, and it is but one of the several “stylized” facts which post-Keynesian theory, with its combined long- and short-period analysis, is capable of explaining.⁹ In contrast, this fact runs counter to the underlying assumptions of a static neoclassical model.

The short-period analysis of post-Keynesian theory is linked to the long-period analysis in a number of ways. The most important is that both the secular trend which the long-period analysis is meant to explain and the fluctuations around that trend line which the short-period analysis is meant to explain depend on the same key determinant. This is the rate of investment. Indeed, investment plays the same critical role in post-Keynesian theory that relative prices play in neoclassical theory. An increase in business investment, provided it is accompanied by certain other adjustments, will lead to a higher secular growth rate. It has been found that, aside from some measure of a

⁹ Kaldor, 1961.

country's relative technological backwardness, the rate of investment is the single most important factor in explaining why the secular growth rate differs among the major Organization for Economic Cooperation Development (OECD) nations.¹⁰ At the same time, the increase in investment, unless it can be maintained at a constant rate—along with the growth in the other components of “discretionary spending”—will set in motion the factors that produce cyclical movements in the economy. From a post-Keynesian perspective, then, both the secular trend and the fluctuations around the trend can be explained within the context of the same accumulation process. As long as the accumulation process proceeds at a steady pace, the expansion will be free of fluctuations—with the rate of expansion depending on the rate of investment. But once the growth rates start to vary, the economy can be expected to move off its steady-state expansion path, as given by the Harrod-Domar formula, and trace out the cyclical pattern which the historical data like those charted in exhibit 1 reveal.

In simple models, the emphasis is usually on business investment as the key factor in explaining any cyclical movements; the implicit question is how can a constant growth in investment be maintained. The changes which have occurred in advanced market economies like that of the United States during the 20th century, however, require that other types of discretionary spending also be taken into account, with an understanding of the mixed role they play. On the one hand, consumer spending on durable goods, including housing, and the government's purchase of goods and services have the same multiplier effect as business investment, thereby serving to stimulate aggregate demand. On the other hand, they have no capacity augmenting effect, thereby leaving aggregate supply unchanged. This suggests that maintaining the delicate balance whereby aggregate demand and aggregate supply grow apace is even more difficult than Harrod initially pointed out, and that an economic policy which is focused exclusively on manipulating aggregate demand through fiscal and monetary policies may itself exacerbate the problem of keeping the economy on a steady growth path.

C. The Distributional Issues

If it is necessary to combine Harrod's vision with Keynes' to develop a clear conception of an economic system expanding over time, it is necessary to add Kalecki's vision as well to see the interrelationship between the investment, or accumulation, which makes the expansion possible and the associated phenomena of distribution and pricing. Kalecki's point was that one needs to keep an eye on the division of the national income between wage and non-wage shares even as one carries through a Keynesian-type analysis with its division of the national product between consumption and investment goods. What can be shown, relying on the simplest of models, is that the higher the rate of investment, and thus the more rapid the rate of economic expansion, the lower will be the share of the national product, in the form of consumption goods, going to workers. This is because resources need to be diverted from the consumption stream and, with their purchase financed from the non-wage, or profits, share, used instead

¹⁰ Cornwall, 1977, chapter 8.

to expand productive capacity. The economy can be placed on a higher growth path only if the real wage is lowered; and there is thus an inverse relationship between the rate of expansion and the laboring force's share of the national income.¹¹

The Polish emigre reached this conclusion on the simplifying assumptions that: (a) there are no savings out of the wages paid to workers; and (b) all the profits received by other groups in society are used to purchase investment, and not consumption, goods. Other writers have shown that, although it needs to be elaborated on somewhat, Kalecki's basic point still holds even after his simplifying assumptions are relaxed.¹² Any use of non-wage income for purposes other than expanding productive capacity will, other things being equal, depress the real wage still further. As for any savings by workers, while these will certainly increase the workers' share of the national income—the profits, or interest, earned being added to their wage income—it will not alter the division of the national income between wage and non-wage shares. These further results have led post-Keynesian economists to identify the following variables (aside from the rate of technical progress) as the key factors determining the distribution of income: (1) The rate of investment; and (2) the marginal propensity to consume out of profits or, more precisely, the portion of non-wage income used for purposes other than to finance the expansion of productive capacity. The argument, it turns out, applies both to the long-period and to the short.

The argument can also be further expanded to take into account, not only the government's use of resources but also any shifts in the international trading relationships among countries, such as those produced by *the hike* in 1973 of Organization of Petroleum Exporting Countries (OPEC) oil prices. The government's purchase of goods and services for national defense and other non-economic purposes is analogous to consumption out of non-wage income. These purchases lower the real wage without adding to the economy's productive capacity (and thereby without offering the hope of a higher real wage in the future). The same is true when, because of an increase in the price of oil and other natural resources imported from other countries, the physical quantity of goods exported, and thus the portion of the national product unavailable for domestic consumption, has to be increased. Government expenditures on infrastructure, e.g. transportation, and even on human resource development fall in a somewhat different category, and their effect, as forms of social investment, on the real wage over time cannot be determined simply on the basis of an aggregate analysis.¹³

¹¹ Kalecki, 1939; Feiwel, 1975, chapter 3.

¹² Robinson, 1956; Pasinetti, 1962, 1974, chapters 5–6. The basic formula for understanding the distribution of income is

$$P/Y = [1/(s_p - s_w) \cdot I/Y] - [s_w/(s_p - s_w)]$$

where P are profits, Y is the national income, s_p is the marginal propensity to save out of profits, s_w is the marginal propensity to save out of wages and I is investment (Eichner and Kregel, 1975, pp. 1296–1300).

¹³ The issue here is whether the social rate of return on these types of expenditure is not just positive but indeed at least equal to the social rate of return on plant and equipment and other types of private investment. The issue needs to be approached, at the micro level, on a program-by-program basis. It is at this point that the recent literature on program budgeting, program evaluation and similar types of analyses of the public sector spending become relevant. See Dorfman, 1965; Schultze, 1968; Rivlin, 1971; Eichner and Brecher, 1979.

D. The Role of Money

What has been said so far about post-Keynesian theory would still hold even if, as is often argued, money were simply a veil behind which the allocation of real resources takes place. It is, of course, necessary to peer behind the veil and focus instead on the real resources which have been given a monetary value. And this is certainly what post-Keynesian theory attempts to do—though with an emphasis on how those real resources are expanded over time and not simply allocated. From a post-Keynesian perspective, however, money is more than just a veil. It is an important institutional feature of an advanced market economy like that of the United States, and it gives rise, not only to the important distinction between real and monetary flows but also to the possible divergence of investment and savings based on that distinction. Here, again, the original Keynesian vision needs an addendum.

Keynes, in his short-period analysis, was concerned only with the new equilibrium position that would be reached when investment and savings were again in balance. It was an equilibrium position determined by the multiplier effect of the new level of business investment and whatever other changes in discretionary spending had occurred. But in the short periods of actual historical experience, investment and savings never actually come into balance. This can be seen by examining the Federal Reserve Board's Flow of Funds Accounts and comparing the change over time in each non-financial sector's net cash inflow with its outlays on durable goods.¹⁴ This relative balance between investment and savings—or between discretionary expenditures and discretionary funds—pushes the economy in two quite different directions.

On the one hand, to the extent that the outlays on durable goods in any one sector of the economy exceed that sector's cash inflow, additional purchasing power is injected into the income stream and the pace of economic activity will, as a result of that increase in purchasing power, be quickened. This can be termed the "cash-flow feedback effect," and it is the equivalent of what happens when, in a simple Keynesian model, investment is greater than savings. The cash-flow feedback effect also works in reverse so that when outlays on durable goods fall short of a sector's cash inflow, that is, when investment is less than savings, the rate of economic expansion is dampened.¹⁵

But any imbalance between a sector's outlays and its cash inflow will also have a second financial impact. This is the other side of the story. While it is usually assumed that any cash deficit in one sector will necessarily have to be offset by a surplus in other sectors so that, overall, the deficit is equal to zero, this need not be the case when an economy with a well-developed financial sector is in disequilibrium. With outlays exceeding cash inflow, the resulting deficit can be financed by loans of one sort or another.

Normally, the banking system steps in and, once assured as to the borrower's credit worthiness, provides the required additional liquidity—with the result that, however defined, the stock of "money" in

¹⁴ The Flow of Funds Accounts typically refers to the net cash inflow as "Gross Savings," to the outlays on durable goods as "Tangible Investment," and to the difference between the two as the "Net Financial Investment."

¹⁵ This insight into the workings of a market economy derives not from Keynes (1936) and his short-period equilibrium model but rather from Myrdal (1939) and Metzler (1947) and their short-period disequilibrium models.

circulation shows an increase. Thus one finds a strong correlation between the size of the deficit in the various sectors of the economy—in the business and household sectors as well as in the government sector—and the money supply. The usual accommodation role of the banking system, however, can be reversed. Sometimes it is because of a combined weakness in the economy and in the banking system. Lending institutions may lack the reserves to provide additional loans when a general decline in sales and other revenues has forced business firms to seek credit, and the cutbacks in spending which must then be made, together with the failure to make payments on the existing debt, may well bring the entire financial structure tumbling down, as in the money panics of the past.¹⁶ More typically, however, and this is especially the case after 1951, the accommodation policies of the banking system are likely to be reversed by the actions of the Federal Reserve Board. In that event, business firms, households and even State and local governments may be forced to cut back on their spending, either because interest rates are deemed to be too high or those spending units simply cannot arrange the necessary financing. This serves to dampen the rate of economic expansion, just as a “looser” monetary policy, by encouraging greater reliance on credit, serves to stimulate the economy.

The likely divergence between “investment” and “savings” whenever the economy is in disequilibrium, together with the normal response of the financial sector, is not the only distinguishing feature of a monetized economy. The existence of money prices, indicating the amount of purchasing power which must be surrendered in exchange for real resources, is another distinguishing feature. These “money” prices are different from the “shadow” prices of neoclassical theory which serve only as a measure of relative scarcity. Integral to Kalecki’s vision is the recognition that money prices are linked to the process by which accumulation takes place and the resulting growth of real income is distributed between wage and non-wage recipients.

E. Business Savings and Profit Margins

One of the underlying premises of neoclassical theory which Keynes chose not to jettison is that household savings are the primary source of the funds used to finance business investment. His argument did not hinge on that point, and in the case of the British economy in Keynes’ time—with the family-controlled type of enterprise still dominant—it was not so easy to see how critical the distinction was between household savings and business savings. Kalecki, developing the same model from a different philosophical tradition and from a different national background (Polish) perceived the matter in a different light. He realized that business profits are the major source of the funds used to finance investment (an observation now confirmed by empirical evidence¹⁷) and, except for the costs of producing the goods being sold, nothing is more important in determining the level of those business profits than the prices business firms are able to charge. It is through changes in the price level that real wages can be held down and the amount of resources devoted to current consumption limited so that capital accumulation can take place according to business investment

¹⁶ Minsky, 1978.

¹⁷ Anderson, 1964, p. 25; Bosworth, 1971; Elchner, 1976, p. 289.

plans. Thus the prices established by business firms pay a key role in the growth and distribution process. In particular, they are the means by which the nominal claims against total output, as represented by money income, are deflated to make them compatible with the available real resources.¹⁸

Firms need not be monopolistic for the prices they set to play this key role. They need not even be price setters—although Kalecki, like post-Keynesian economists after him, recognized that firms in the economy's industrial sector are more likely to be price setters than the price takers postulated in neoclassical theory. All that is necessary is that, through some combination of market power and current levels of demand, firms be able to establish the margins above cost that will bring them sufficient net cash inflow, or savings, to finance their planned investment while at the same time pushing down real wages to the level needed to free the necessary real resources. Even if all the required funds cannot be generated internally, as long as the banking system is willing to extend credit, the results will be the same: Business firms will be able to obtain the real resources they need to carry out their investment plans. And if, by some chance, there should be an insufficient amount of those resources to satisfy both consumption and investment demands, then the ability of business firms to raise their prices to keep pace with the rise in costs, including that of labor, will assure that it is not the investment demands that go unmet.¹⁹

The margins which firms are able to establish are what determine the *rate* at which business savings will be generated relative to the growth of sales. How much net cash inflow will actually be realized once a particular margin has been established depends on the state of the economy—in particular, on the level of aggregate demand, which itself depends on the rate of business investment and other forms of discretionary spending. It is for this reason that post-Keynesian economists argue that it is not savings which limit or determine investment, as neoclassical theory suggests, but rather the reverse.²⁰ The margins above cost will, of course, vary from industry to industry, depending on what barriers to entry and other limitations on competition exist.²¹ But the relative size of the margins is less important than the fact that all firms depend on margins of some sort—to survive if not to flourish and expand. It is these margins which, if they can be maintained, provide the funds needed to finance capital expansion internally at the same time they establish the set of prices that will deflate the nominal claims against real output to bring them into line with the available real resources.

F. The Microfoundations

Thus the microfoundations of post-Keynesian theory derive from Kalecki's vision. These microfoundations, unlike the core of neoclassical theory, do not have to exclude from the analysis by assumption the most important economic institution to emerge over the past century. This is the large corporation, or megacorp, which has grown to become the multi-product, transnational conglomerate that, along

¹⁸ Kalecki, 1954; Feiwel, 1975, pp. 93–111.

¹⁹ Steindl, 1952; Eichner, 1976; Kenyon, 1978.

²⁰ Kregel, 1971, p. 197.

²¹ Bain, 1956; Sylos-Labini, 1962; Eichner, 1976, pp. 71–77, 103–7.

with the other giants in its class, dominates the world economy. It is the megacorp which, because of its strong market position, has been able to maintain the margins needed to assure high rates of business savings and thereby to generate the funds needed to finance high rates of investment. Indeed, over the past century, the megacorp has been the economy's primary instrument of capital accumulation.²²

Nor does post-Keynesian theory need to exclude by assumption, or treat as an aberration, the industrial trade union which emerged in the megacorp's wake and which now serves as the laboring force's countervailing weight in the bargaining over relative income shares. Both the industrial trade union and the megacorp are easily encompassed within a post-Keynesian framework. If this is not apparent from what has already been said, it will become clear when, in the section which follows, the problem of stagflation is examined from a post-Keynesian perspective.

II. THE INTERPRETATION OF STAGFLATION

To understand the forces which led to the current problem of stagflation, it is necessary to begin with the technical progress which underlies the dramatic improvement in the standard of living over the past several centuries. This technical progress manifests itself economically in the secular or long-term rise in output per worker. Without this rise in output per worker, there would be no way to improve the standard of living for any group in society except at the expense of some other group. Economists still lack a firm grasp of the factors which lie behind this phenomenon. While it is clear that the technical progress depends, ultimately, on the growth of technical knowledge, the process whereby the one is transformed into the other is only imperfectly understood. The one thing that can be said with some confidence is that, with an adequate stock of knowledge available to be exploited, the rate of technical progress, as measured by rising output per worker, depends on the rate of capital accumulation. With whatever new plant and equipment is being added to the existing stock embodying the latest technological advances, output per worker can be expected to increase as investment proceeds apace—provided the demand for the increased output exists.²³

A. Distribution of the Benefits From Technical Progress

While an essential part of the economic problem facing any society is how to organize production to maximize technical progress, a no less essential part of the problem is how to arrange the distribution of the benefits from that technical progress. The conventional solution has been to rely on market mechanisms, with falling prices the key to assuring the widest possible dissemination of any benefits from technical progress. The emergence of the megacorp, however, has effectively closed that option. Businessmen learned from their experiences during the depression decade of the 1870's that falling prices were likely to reduce their profit margins to the point where, because of the inability to replace worn out plant and equipment, whatever capital had been

²² Eichner, 1976, pp. 112, 272.

²³ Robinson, 1956, chapters 9-18; 1962, part III; Eichner, 1976, pp. 181-2.

invested in their firms would eventually be expropriated. Rather than allow this to happen, businessmen took the series of steps that marked the merger and consolidation movement at the turn of the century. The result was to create the type of oligopolistic enterprise, the megacorp, which today dominates the industrial sector of the American economy and which, acting in concert with its major rivals, is able to maintain a significant margin above costs, even in the face of sharp contractions in demand.²⁴

The shift to an oligopolistic industrial structure, already apparent in the United States by the end of World War I, has largely achieved the purpose of protecting profit margins from falling prices. But, as the experience over the next decade demonstrated, merely preventing prices from falling was not sufficient to assure continuous economic expansion. With technical progress leading to a rapid increase in output per worker but with no mechanism available for assuring that real wages would rise to keep pace—through higher money wages if not through falling prices—the economy found itself on an unsustainable growth path. Without a secular rise in real wages, consumer purchasing power could not be expanded across a broad front. And without a rise in consumer spending generally, the rapid rate of economic growth could not be maintained. The investment boom of the early 1920's ended, choked off by the failure of consumer purchasing power to expand broadly, while the high rates of cash inflow from the margins which megacorps were nonetheless able to maintain simply fueled the speculative excesses of the decade's second half.²⁵

This defect in the operative distributional mechanism of the American economy has now been partially remedied by the collective bargaining power of industrial trade unions. First nurtured during the 1930's but achieving social acceptability, only in the crucible of war, like the megacorp itself, industrial trade unions today serve as the principal mechanism whereby real wages are able to keep pace, through higher money wages, with the growth in output per worker which technical progress makes possible. The trade union movement is able to play this role because of a negotiating stance which demands that the groups it represents receive their "historical share" of the benefits from technical progress. This negotiating stance, backed by their collective bargaining power, enables industrial trade unions to insure that one of the essential conditions for steady-state expansion in the long period is realized. The condition is that the growth of real wages over time be roughly equal to the growth of output per worker. With the market power of the megacorp preventing real wages from rising as a result of falling prices, the industrial trade union sees to it that real wages rise through higher money wages.

B. The Role of Trade Unions

Still—and this is the important lesson to be learned from the post World War II experience—the power of the trade union movement is an imperfect mechanism for pushing up real wages to keep them in line with the growth of output per worker. Not surprisingly, in exercising their collective bargaining power, industrial trade unions tend

²⁴ Eichner, 1969. For a somewhat different interpretation, see Chandler, 1977.

²⁵ Soule 1947; Galbraith, 1955.

to err in favor of the groups they represent, with the result that money wages are apt to rise more rapidly than output per worker. This, in turn, leads to an increase in the unit cost of production and, with megacorporations acting to maintain their profit margins, to an increase in industrial prices. Just as money wages need to keep pace with the growth of output per worker, not falling short of that mark if the steady-state rate of expansion is to be maintained, so money wages must keep pace with the growth of output per worker, not exceeding that mark if the expansion path is to be an inflation-free one. Indeed, from the dynamic perspective of post-Keynesian theory, the growth of money wages in excess of the secular rise in output per worker provides the starting point for understanding the causes of inflation. It is because industrial trade unions have a tendency to push up money wages beyond that non-inflationary limit that they provide only a partial remedy for the defect in the economy's operational distribution mechanisms which the market power of megacorporations has created.²⁶

The above argument should not be taken to suggest that the collective bargaining power of the trade union movement is the fundamental cause of the secular inflation which the U.S. has experienced since the end of World War II. This would be an unfair inference to draw for several reasons. The most important, of course, is that if it were not the collective bargaining power of the trade union movement that was being counted upon to make sure that money wages rose at the same rate as the secular growth in output per worker, some other mechanism would have to be found to bring about the same result. Industrial trade unions have not sought this role. They have simply come to fill it by default. Moreover, this role which industrial trade unions play has received the implicit endorsement of the government at the highest level. The endorsement takes the form of Presidential intervention in the contract settlement, or key bargain, reached in the bellwether industry that will set the pattern for the rest of the unionized work force, and this intervention is likely to be buttressed by guideposts, Pay Board rulings, or whatever other means the government uses to exert influence over the collective bargaining process. Indeed, it is by intervening in one or more of these ways that the government indicates what it believes to be a fair and reasonable increase in workers' wages. The role played by industrial trade unions is thus only the most conspicuous feature of a far more subtle socio-political process actually determining the growth of money wages. Finally it should be pointed out that if, and when, some other mechanism is substituted for the pattern bargaining, buttressed by Presidential intervention in one form or another, which presently determines the growth of money wages, that mechanism will have to be able to cope with the same complicating factors which now make it so difficult for the trade union movement, in seeking to preserve labor's "historical share" of the benefits from technical progress, to hold the growth of money wages to a non-inflationary rate.

C. A Shift in the Growth Rate

The factors which invalidate the simple rule that money wages should rise in line with output per worker are two-fold, each reflect-

²⁶ Eichner, 1976, chapters 5, 7-8.

ing a different determinant of relative income identified earlier. The first of these complicating factors is the growth path which society, through its political system, has chosen. As pointed out above, the more rapid the rate of economic expansion, the lower the proportion of the economy's real output that will be available to workers and other household members for current consumption. This does not mean that the real wage must necessarily decline. With the economy continuing to expand, but with the rate of investment now boosted to put the economy on a more rapid sustainable growth path, the real wage might even increase, at least in *absolute* terms, even if it is not able to grow quite at the same rate as before. The point is that the relative share going to workers will necessarily have to decline so that a proportionately greater part of the increase in real output can be used to expand productive capacity.

Thus the simple rule, that real wages should rise in line with the secular growth of output per worker, no longer holds when the economy shifts from one sustainable growth path to another. The rule needs to be modified to take into account the change in the rate of investment, and thus the change in the share of income going to business enterprises in the form of profits that must occur if the shift to a different growth path is to be accomplished. If industrial trade unions or any other group with the power to make its views felt try to apply the simple rule, insisting that the relative distribution of income between workers and other groups remains unchanged, then one of two results will follow: Either the attempt to shift to a different growth path will be frustrated or, alternatively, the shift to a new growth path will be accompanied by an inflationary wage-price spiral as first the money costs of production are increased, threatening the margins needed to finance investment, and then business enterprises respond by increasing their prices, thereby preserving the margins.

One of the difficulties in avoiding the latter result is that it is by no means clear when a shift to a new growth path is occurring. The shift initially coincides with, and is indistinguishable from, the economy's more conspicuous cyclical movements.²⁷ Typically, it is only when a period of economic recovery and expansion continues for longer than anticipated without a cyclical downturn that a more rapid rate of secular expansion can be discerned. Similarly, it is only when the recovery from the downturn is delayed or less rigorous than expected that a less rapid rate of secular expansion becomes evident. Moreover, the same redistribution effects which occur with a change in the secular growth path are likely to be mimicked when there are cyclical movements of the economy. As pointed out above, a higher secular growth rate is likely to be accompanied by a decline, in relative terms, of the wage share of national income, and the same is true during the expansionary phase of the cycle. One can expect to observe a disproportionate increase in profits and other non-wage income. Conversely, one can expect to observe a disproportionate decline in profits when the economy slips into a recession.²⁸

If the disproportionate increase in profits which occurs when aggregate demand is high is interpreted differently by trade unions and megacorporations—with trade unions regarding the higher profits as secular

²⁷ Eichner, 1976, pp. 241-44.

²⁸ Eichner and Kregel, 1975, pp. 1305-06; Eichner, 1976, 201-3.

in nature and megacorps regarding the higher profits as only cyclical—then the likelihood of a shift to a more rapid growth path being accompanied by a wage-price inflationary spiral is considerably enhanced. Trade unions, acting to preserve their historical share of the benefits from technical progress, will insist that the rate at which money wages increase be raised. Megacorps, on the other hand, regarding the higher profits as being only cyclical, will react to any boost in the rate at which money wages increase as though it were a threat to the margins they need to finance investment. They will raise their prices. The tragedy in this oft-repeated scenario occurs when the government, alarmed by the rise in industrial prices, acts to constrain the growth of the economy, thereby confirming the megacorp's pessimistic view that the disproportionate increase in profits previously enjoyed was merely a cyclical phenomenon.²⁹

D. Consumption Out of Nonwage Income

The other factor, besides any shift to a different growth path, that makes the simple rule for apportioning the benefits from technical progress no longer applicable is a change in the portion of non-wage income devoted to non-investment purposes. If the economy consisted only of business firms which supplied goods and services along with households which consumed those goods and services, then the non-wage income would be identical to the profits being earned by business firms and any use of those profits other than to finance investment would involve the purchase of consumption goods. Even without introducing any further complications, it is possible to envision a situation in which the proportion of profits devoted to consumption might increase. The megacorps could decide to boost the rate at which they increase their dividend payments, thereby enabling their stockholders to command a larger share of the consumption goods presently being produced. Or, rather than favoring their stockholders, the megacorps could increase the salaries and perquisites of their top executives while providing them with more sumptuous quarters in which to work. Still, what are likely to be far more important in determining the overall distribution of income are the other ways, in an economy which consists of more than just domestic producers and households, that the proportion of non-wage income devoted to non-investment purposes can be increased.

One of these ways is through the instrument of government. The resources which government is able to command through taxes are analogous to business investment in that they reduce the amount of resources available for direct consumption by households. (Whether those resources are indirectly consumed by households through the public goods which government provides is another matter.) At the same time, the resources commanded by government are similar to consumption goods in that they do not serve to augment the economy's productive capacity. (The exception would be investment by the government in the economic infrastructure, e.g., transportation, energy.) Thus, any increase in the share of aggregate output going to government has the same effect as an increase in consumption out of profits. It will lower the real wage, at least relative both to profits and to

²⁹ Eichner, 1976, pp. 244–70.

government revenues. For this reason, a major shift of resources into the public sector—such as occurred in the mid-1960's with the creation of the antipoverty programs and, more recently, with the dramatic rise in publicly subsidized health care—can itself initiate a wage-price inflationary spiral. This will be the result if, despite the greater proportion of the benefits from technical progress which are now to accrue to the groups served by government programs, trade unions insist on the same growth of money wages—and the megacorps, to protect their profit margins, respond by raising prices.

A secular shift of resources into the public sector, of the sort just pointed out, should not be confused with deficit spending by the government. The latter is essentially a short-period device for enabling the political authorities to place the economy on a different growth path, much as the firing of inboard rockets enables space engineers to place a satellite in a different orbit.³⁰ While the shift of resources into the public sector may initially be brought about through deficit spending and while both are likely to be accompanied by a decline in labor's relative share of national income, still the two are different. Any decline in labor's relative share which occurs as a result of the higher level of aggregate demand temporarily produced by deficit spending is simply a cyclical phenomenon, and its effect is not likely to be felt beyond the current oscillation around the trend line. For all practical purposes it can, and should be, ignored. The decline in labor's relative share produced by a secular shift of resources into the public sector, however, will be as long lasting as the shift itself and needs to be fully taken into account.

What has just been said is not necessarily an argument against resources being shifted into the public sector. That issue hinges on the indirect benefits from the increased public goods the government is able to provide relative to the direct benefits households can expect to derive from a more rapidly growing real wage.³¹ The point needs to be made simply as a warning that if a secular shift of resources into the public sector is decided upon, it is almost certain to be accompanied by a slower growth in real wages. And if, despite this fact, trade unions insist on maintaining the same growth of money wages, the basis for a wage-price inflationary spiral will have been laid.

What has just been said about the shift of real resources into the public sector applies with no less cogency to the use of transfer payments to increase disproportionately the income of non-workers. Any increase in the rate at which the income of non-workers is growing, either because transfer payments themselves are growing disproportionately or because the eligible population is expanding more rapidly than the work force, will lower the growth of workers' real wages. If technical progress—and thus the rate at which real income can be increased—is measured by the secular growth of output per worker, it then follows that, if others besides members of the work force are to share in the benefits of technical progress, the share available to workers will perforce be reduced. As long as the division of income between workers and non-workers remains unchanged, the income of each group can increase at a rate equal to the secular growth of output per

³⁰ Eichner, 1977a; Eichner, 1976, pp. 234–38.

³¹ Eichner and Brecher, 1979.

worker without creating a problem. But once the division of income, for one reason or another, becomes more favorable to non-workers—as it has in recent years, in part because of the way the social security program is structured—the basis for a wage-price inflationary spiral will have been laid, just as it will be if there is a shift of real resources into the public sector. This argument can be extended to cover other non-workers besides those who receive transfer payments. Indeed, it applies to the income received by the megacorps' stockholders and other rentiers. Any disproportionate increase in their income will also be at the expense of workers' real wages.

E. A Shift in the International Terms of Trade

The other way in which the proportion of non-wage income devoted to non-investment purposes can be increased, thereby lowering the growth of real wages, is through a shift in the international terms of trade so that the prices of imported raw materials rise. Eventually the higher prices for raw materials will have to be offset by an increase in the share of aggregate output that flows to other countries in the form of exports. The resources thereby diverted to the rest of the world are similar to the resources commanded by government. Since they add neither to the consumption of households nor to the productive capacity of business firms, they lower the real wage in the immediate run without creating the prerequisite conditions for real wages to grow more rapidly over the longer run. While attention has been largely drawn to the rise in oil prices by the OPEC nations following the Arab boycott in 1973, this is but one example of the higher prices for imported raw materials which have followed in the wake of the American government's decision two years earlier to scuttle the Bretton Woods agreement and allow the dollar to float downward. Indeed, a currency devaluation's primary effect on an industrialized country dependent on imported raw materials is to increase the cost of those raw materials.³²

A shift in the international terms of trade, like a shift to a more rapid growth path or a shift of resources into the public sector, need not be inflationary. It becomes inflationary only if, despite the relative decline in real wages which must necessarily follow, money wages continue to grow at the same rate as before. With the rate at which money wages are growing threatening their profit margins, the megacorps and other business firms can be expected to raise their prices, thereby triggering a wage-price inflationary spiral.

There are thus a number of ways in which a wage-price inflationary spiral can be initiated—by a shift to a more rapid growth rate, by a shift of resources into the public sector, by a shift in the international terms of trade or indeed by a shift of any sort that necessarily implies a decline in the growth of real wages. Whatever the means by which it is triggered, however, the wage-price inflationary spiral reflects essentially the same underlying imbalance—a growth of money wages that exceeds the growth of real wages as determined both by the rate of accumulation and by the proportion of non-wage income devoted to non-investment purposes. If the rise in money wages exceeds this

³² The devaluation will also have the effect of loosening the constraint on the price of domestically produced industrial goods that imported substitutes provide. This is because the devaluation raises the price of imported industrial goods as well as the price of imported raw materials. Eichner, 1976, p. 67; Eichner, 1977b.

maximum rate of increase in real wages, thereby placing the economy on an inflationary growth path, the fault no more lies with the trade union movement for pushing up money wages as best it can to protect the group it represents than with the megacorps for pushing up prices to protect their profit margins. The fault lies instead with the absence of any overriding social mechanism for seeing to it that the growth of money wages is limited to the non-inflationary maximum.

F. The Influence of Aggregate Demand

So far no mention has been made of demand factors. This omission is deliberate. It is possible to provide a fairly complete explanation for the recent inflationary experience of the United States, based on post-Keynesian theory, without any particular emphasis on demand factors. This, in turn, hints at why the government's anti-inflationary policies over the past several decades, designed primarily to act as a brake on aggregate demand, have been largely ineffective. Still, this does not mean that demand factors can or should be ignored. Indeed, they are important in two ways—though only as further qualifications to the main explanation already given as to the underlying causes of inflation.

First, the higher prices that need to be paid for raw materials may reflect more than just a shift in the international terms of trade. In the case of the United States and other countries with a significant primary products sector, there is also the possibility of a shift in the domestic terms of trade. That possibility is enhanced if, as in the case of American agriculture, the primary products sector consists of a large number of relatively small producers, with prices governed for the most part by impersonal market forces, much as the neoclassical theory assumes. In that event, the domestic terms of trade between the predominately competitive agricultural sector and the predominantly oligopolistic industrial sector will shift, depending on demand factors. When the level of aggregate demand is unusually high, with the rate of economic growth above the secular average, prices in the agricultural sector are likely to rise more rapidly than those in the industrial sector because the prices in the agricultural sector are governed largely by demand factors—unlike the prices in the industrial sector, which depend primarily on long-term supply considerations. But when the level of aggregate demand falls off, as it usually does at some point during the cycle, prices in the agricultural sector will not just rise less rapidly than those in the industrial sector, they may actually decline. Whichever the case, however, the terms of trade will shift against the agricultural sector.

That sector occupies a strategic place within the American economy. Since the United States is a major supplier of foodstuffs to other nations, agricultural prices depend on demand conditions in the world economy as well as in the domestic economy. The sector therefore serves as a link between the two spheres of economic activity, with any change in the international terms of trade affecting the domestic economy through its impact on food prices. This international connection is in addition to the influence exerted on food prices by domestic demand factors. Food prices are, in turn, a major determinant of real wages (along with the cost of shelter). When food prices rise, the real wages

of workers are thereby reduced. This leads to the sort of discontent among rank-and-file trade union members which forces their leaders to respond by pushing for higher money wages. It represents yet another way in which a wage-price inflationary spiral can be triggered, in this case through the shifting terms of trade between an agricultural sector that is competitively structured and the household sector, as a result of changes in aggregate demand.

The second way in which the influence of demand factors needs to be taken into account as part of a comprehensive explanation for the recent inflationary experience of the United States is by looking at the role played by government itself. What the historical record shows is that the government, when confronted by a wage-price inflationary spiral triggered in one or more of the ways just described but with no other explanation available for the phenomenon except the "excess demand" thesis derived from neoclassical theory, has usually reacted by seeking to curtail the growth rate. The means employed, either fiscal or monetary policy, have been less important than the result achieved—one of the government-engineered recessions which has marked the post World War II period. Only gradually has it come to be recognized that this policy response, successful as it may be in reducing the growth rate, along with employment and real income, has little or no effect on price levels. Indeed, it simply produces "stagflation."

Government contracyclical policy has therefore become a major destabilizing factor in the American economy, confirming Kalecki's prophecy of a political trade cycle to replace the regular trade cycle of the pre-Keynesian era.³³ However, it is not just that the government's contracyclical policy is likely to prove ineffective, at least in dealing with inflation. Even more a source for concern is the fact that a policy which seeks to control inflation by curtailing the growth rate only exacerbates the conflict over the distribution of income which lies at the core of the inflation problem. With the emphasis on limiting aggregate demand, business investment is likely to be discouraged as the megacorps and other firms adjust their capital expenditures to the new secular growth path which government policy has dictated. And with the rate of accumulation thereby lowered, technical progress—which is the source of the higher output per worker, and thus the source of any increased real income over time for all members of society—will be lowered as well. The conflict over how that income should be distributed can only be heightened by its decline.

III. THE POLICY THRUST OF POST-KEYNESIAN THEORY

Post-Keynesian theory would be of little value to public officials if it were able to provide an explanation for stagflation but could suggest no cure. Indeed, the explanation would be questionable. That is why the discussion must now turn to the matter of public policy.

From what has already been said, it should be clear that "stagflation"—the simultaneous occurrence of rising prices and depressed business conditions—can easily be prevented. The government need

³³ Kalecki, 1943 ; Feiwel, 1975, chapter 9.

only abandon its policy of trying to control inflation by reducing aggregate demand. While this remedy would leave the problem of inflation unattended to—a serious flaw, in view of how easily a wage-price spiral can be triggered and how unfair the resulting redistribution of purchasing power can be—it would at least not compound the problem by adding the woes of rising unemployment to the woes of rising prices. A theory, such as the post-Keynesian one, can be useful if it does no more than indicate how to avoid making a bad situation worse. Still, the problem of inflation would remain. The real question, then, is whether post-Keynesian theory can suggest an alternative public policy, one that will keep the economy on a non-inflationary growth path without the country being forced to settle for too low a rate of economic expansion.

A. Incomes Policy

In fact, such a policy is implicit in post-Keynesian theory—just as a policy for combating widespread unemployment could be deduced from *The General Theory*. The policy required to keep the economy on a non-inflationary growth path is often referred to as an “incomes policy”—though it is not necessarily what some people have in mind when they use the term.³⁴ It does not, for example, simply mean a policy for holding down money wages. As already indicated, the rise in money wages is only one of the ways in which the claims against the growing social surplus that technical progress brings can exceed the increased real resources that are actually becoming available. No, an incomes policy must be seen as applying to all forms of household compensation—to dividends and rents as well as to money wages.³⁵ Unfortunately, this is not how economists have always viewed an incomes policy.

Moreover, an incomes policy cannot, in a democratic society, simply be imposed. It must instead gain acceptance among the different economic interest groups within the society as the fairest and most equitable basis for distributing the benefits of technical progress. This requires that a consensus first be reached, through the appropriate representative bodies, about the principles that will govern the apportionment of any increase in the social surplus. It also means facing up honestly to the distributional issues. Thus an incomes policy needs to be preceded, at the political level, by some minimal societal agreement as to how the benefits from technical progress are to be distributed. The fact that the market alone is incapable of rendering this judgment, in the face of the pricing power which the megacorps, trade unions and foreign cartels are capable of exercising, is what makes an incomes policy an essential addition to fiscal and monetary policy.

³⁴ Eichner, 1979.

³⁵ While some would argue that all of the profits earned, and not just the portion paid out in dividends, should be limited, this differential treatment follows from the post-Keynesian distinction between consumption out of profits and any reinvestment of profits. The latter, it can be assumed, is governed by the rate of economic expansion and therefore does not need to be controlled directly. Of course, this argument ignores the possibility of capital asset appreciation, financed out of an expansionary monetary policy, and the resulting ability of capital asset-holding households to finance additional consumption out of capital gains. Eichner, 1976, pp. 280–3. It also ignores the possibility that the retained profits will be invested in ways that provide social returns far below the private returns. *Ibid.*, pp. 283–6.

It was because neither of these points was sufficiently appreciated that previous efforts to establish an incomes policy in the United States—and this includes both the guideposts under Presidents Kennedy and Johnson and the Pay Board rulings under President Nixon—eventually met defeat. In both cases, the restrictions on the growth of money income applied primarily to wages.³⁶ Moreover, the policy itself was simply promulgated by the executive branch, with little or no discussion beforehand with the groups that would be affected by it. One should not be surprised if the current effort to establish an incomes policy, since it has followed essentially the same script leads to the same denouement.

The point is that an incomes policy cannot be successfully implemented in an institutional vacuum—no more than a monetary policy can be successfully implemented without a central bank and fiscal policy without a legislative committee to review the Government's budget as a whole. The new institution that needs to be created if there is to be a more effective incomes policy will be especially difficult to establish since the government, acting alone, cannot make it work successfully. The various economic interest groups that will be affected—and here one needs to mention not just the trade union movement but also consumer, farm and other groups as well—cannot be expected to give the new institution their necessary support unless they are assured a role in shaping its policies. This means that some way will have to be found to involve these various interest groups in the functioning of the new institution.

B. A Social and Economic Council

What is being recommended here is the creation of a quasi-governmental body—a social and economic council is perhaps the best way to describe it—on which would sit representatives of the various economic interest groups that must give their support to an incomes policy, together with representatives of the governmental units that play a key role in setting the Nation's economic policies. The council would serve as a forum for both the private and public interests represented on it, and its function would be to work toward a consensus on the fundamental question of economic policy that must be resolved before the outlines of a non-inflationary incomes policy can even be discerned. For what will become clear, as the exercise of formulating an incomes policy is carried through to completion, is that an incomes policy is largely derivative from other, more fundamental social choices. The post-Keynesian theory described above, especially the explanation for inflation that has been offered, indicates what those fundamental choices are.

There is, first, the choice among alternative growth paths. The Government, through its fiscal and monetary policies, can readily place the economy on any one of numerous growth paths—even if it cannot always insure that the growth path will be held to for long. Whatever the choice, it implies a certain rate of investment, or capital formation. And whatever the rate of investment, this will, in turn, limit the growth of the household sector's real income. The choice, therefore,

³⁶ An effort was made, as part of the wage and price controls established during the Nixon administration, to place a limit on dividends, and this limit was even lower than on wages.

is between a higher level of real consumption in the immediate run and a higher rate of growth of real consumption over time.

Then there is the choice among alternative consumption patterns. As pointed out above, any use of non-wage income for non-investment purposes will have the effect of reducing real wages and other types of household income. The resources commanded by government, whether to provide additional public goods or simply to redistribute income among households, fall in this category. And thus the second fundamental choice is between the growth of private consumption financed out of private income and the growth of a public sector that involves a certain mix of programmatic activities and transfer payments.

These two choices will go a long way toward determining what the actual figures for a non-inflationary incomes policy are likely to be. There are, however, other factors that need to be taken into account.

There are the disturbances which can occur in international commodity and other types of competitive markets, causing the price of raw materials to rise beyond the control of any national government. (There are also the planned currency devaluations and the actions by international cartels which lead to the same result. Indeed, the latter two types of deliberate acts are often the underlying cause of the disturbances which occur in international commodity markets.)

Then there are the supply bottlenecks which exist within certain sectors of the domestic economy, causing the prices of essential consumption items to rise disproportionately. (Housing and health care appear to be two most important items of household consumption the price of which has been affected by bottlenecks and other supply constraints.)

This is not to suggest that the loss of real income from these factors should simply be acquiesced to by government. In most cases, an appropriate policy response can be devised which, with sufficient time allowed for its effect to be felt, will at least ameliorate the underlying condition. For example, reform of the international monetary system could probably avoid the type of currency devaluation which arises from speculation and which then leads to a rise in the cost of raw materials. At the same time, long-term agreements between producing and consuming nations could probably stabilize the price of key commodities. Similarly, the Nation's housing and health programs could be reformed to incorporate better cost-containment features. The common feature in each of these policy responses, if it is effectively to counteract rising costs, will have to be an emphasis on long-term supply capacity. Still, these policies cannot be expected to have much effect in the immediate run, and thus the disturbing factors they are intended to ameliorate must be taken into account by the social and economic council when considering what is likely to be a non-inflationary rate of growth of wages and other forms of household income.

Not only in giving weight to these disturbing factors but also in making the more fundamental choices which underlie an incomes policy, the social and economic council will need the assistance of a technical staff trained in economics, statistics and related disciplines. An intelligent choice among alternative growth paths, for example, cannot be made either by the private groups represented on the council or by any of the public members until the full implications of any option have been spelled out. The same is true of the choice among

the alternative consumption patterns which are possible, through public policy, once a growth path has been chosen. What will be the implications, not just in terms of broad aggregates such as investment, real wages and employment, but also in terms of the impact on particular sectors of the economy and even on particular industries and household groups? It would be the responsibility of the technical staff, or secretariat, attached to the social and economic council to provide the answers to these and any other questions which might arise in the course of the discussions within the council.

C. The Role of the Secretariat

What is envisioned is a process whereby the council would first be presented by the secretariat with the broad options that exist insofar as the fundamental choices which need to be made. As the council, through its deliberations, narrows these choices, the secretariat would then provide more detailed analyses, tracing in full the implications of the choices toward which the council was moving. In preparing background papers for the consideration of the council's members, the secretariat would work closely with the technical staffs of all the different groups, private and public, represented on the council. Indeed, a primary objective of the secretariat would be to reconcile, as much as possible, any discrepancies or conflicts in the position papers prepared by others. In thus building on the concurrent analytical efforts of the groups represented on the council, the secretariat would seek to develop as broad a consensus as possible as to the implications of the policies being recommended—this as a necessary basis for developing as broad a consensus as possible on the policies themselves.

Success in achieving such a consensus would be important since, to avoid overstepping constitutional boundaries, the social and economic council would necessarily be without the power to implement policies on its own. Its influence would instead depend on the actions taken by the private and public groups represented on it. Even if one or more of these groups was unwilling to act in accord with the consensus developed within the council, this fact would become known during the council's deliberations, and the policies to be recommended would be formulated with that likelihood in mind. At the same time, the consequences of any group, private or public, not acting in accord with the consensus developed within the council would be fully spelled out, and the other groups represented on the council could bring pressure to bear on the recalcitrant group. The inability of the council to take any action on its own would not preclude public officials, both within the executive branch and within Congress, from doing what they think necessary to support the consensus developed within the council.

Thus the logic of a post-Keynesian analysis, when applied to the problem of inflation, points to more than just the need for an incomes policy. It also points to the need for a new set of quasi-governmental institutions so that the non-inflationary growth of household income can first be determined, this as the culmination to a series of more fundamental social choices, and then that figure used as the basis for an incomes policy. The required new institutions are: (1) A social and economic council, on which would sit representatives of private

interest groups as well as key public officials; and (2) a secretariat to provide the council with technical back-up support. The council, because of its broadly representative nature yet limited powers, might well be able to remove two of the major obstacles presently blocking the successful implementation of an incomes policy. These two obstacles are: (1) The lack of support for an incomes policy among the private groups that are affected by it, particularly trade unions; and (2) the lack of coordination among government bodies in setting overall economic policy.

D. Winning the Support of Trade Unions

If inflation is due in part to money wages rising more rapidly than output per worker, then the support of the groups that negotiate money wages on behalf of workers—and this means primarily, though not exclusively, the trade union movement—is critical to the success of any incomes policy. Yet trade unions can hardly be expected to support a policy which offers little except the promise of holding down money wages and thereby forcing workers to surrender the one protection they have against inflation. The way an incomes policy would work, as outlined above, might have a better chance of winning the support of trade unions and other groups precisely because holding down money wages would be only part of a much larger agreement or “social contract” that would be worked out even before the social and economic council came into being.

In the first place, it would have to be agreed that whatever ceiling was suggested for the growth of money wages would apply to other types of household income as well, in particular, to dividends. In this way, the trade union movement could be reassured that its members would end up no worse from an incomes policy than households in general. More important, however, the trade unions in return for surrendering some of their control over money wages, would be given a greater voice in the decisions that determine the growth of real wages. As already pointed out, the key to the growth of real wages is the rate of investment, or capital formation, and this depends to a large extent on the rate of economic expansion which the government’s fiscal and monetary policies have dictated. The trade union movement, together with the other private interest groups whose support is essential to the success of an incomes policy, must therefore be assured of having a larger role in the formulation of overall government policy. This prior understanding, if there is to be a non-inflationary incomes policy, is related to the need for greater coordination of policy within government itself.

A number of important steps have been taken in recent years to improve the coordination of economic policy within government, the most important being the new congressional budgeting procedures. Still, it continues to be the case that different parts of the government often find themselves working at cross purposes with one another in trying to influence economic events, and this occurs as much within the separate branches of government as among them. Moreover, given the different mandates which the different parts of government have and the determination with which they can be expected to protect their independence of action, the problem has no permanent solution. It can only be mitigated. In this respect, a social and

economic council, on which would sit key officials from throughout the government, could be expected to have a salutary effect. In the course of going through the exercise required to produce an effective incomes policy—in particular, making the series of fundamental social choices that will determine what is the non-inflationary growth of household income—the public officials on the council will have to indicate what actions the government can be expected to take. And if it becomes clear that those actions are somewhat in conflict with one another, especially after the secretariat has completed its task of reconciling the various projections, then the public officials on the council will come under the same pressure to shift their stances in support of the consensus being developed within the council as would any of the private interest groups that might be tempted to strike out on their own. Through the give-and-take that would characterize the social and economic council's deliberations, greater coordination of policy within the government would be likely to follow.

It is not enough, however, that the Government act with greater unity. It is also important that the Government, in deciding what actions to take, give weight to the policies that will assure support and cooperation from the private parties—particularly trade unions but also the megacorps and other business enterprises as well—whose support and cooperation are essential to the success of any incomes policy. For trade unions, and even the megacorps, these policies are preeminently the ones which will enable the economy to expand, at whatever rate is chosen, with the least possible deviation from the trend line. They are policies that will minimize any cyclical fluctuations. Indeed, it will no doubt be found that policies which minimize cyclical fluctuations are policies that go far toward maximizing the rate of expansion itself. These, of course, are the very same policies which lead to a rapid growth of real wages and profits while sparing workers and others the ill effects of unemployment and depressed business conditions.

If, in the past, the government was unwilling to pursue these types of policies, it was primarily because of the fear that by doing so it would add to the rate of inflation. However, with both industrial trade unions and the megacorps lending their support to a non-inflationary incomes policy, this fear no longer need dictate government policy. A bargain could in effect be struck: non-restrictive growth policies in return for trade unions agreeing to hold down the growth of money wages and the megacorps agreeing to limit profit margins. It is this bargain, or "social contract," that would provide the essential starting point for the social and economic council's deliberations so that, aided by its secretariat, the council could develop a consensus around the set of policies, private as well as public, that would place the economy on a steady, non-inflationary growth path.

E. Getting the Process Going

Only two further problems need to be addressed. The first is how to get the whole process going—in particular, how to initiate the dialogue among the various parties, private and public, so that a "social contract" can be worked out and the institutions necessary for developing a non-inflationary incomes policy put in place. Actually, this is the easier of the two problems. It requires only that some neutral

body, say a private foundation or a public interest group not identified with either organized labor or industry or even with the government, act to convene the various parties so that the dialogue can begin. The body sponsoring this initial get-together must be one in which the various parties that are to participate can have trust, and indeed the success of the endeavor is likely to depend heavily on the individual chosen to preside over the plenary gathering. It should be someone with long experience in working with the leaders of organized labor, industry, government and the other groups whose support is essential to the success of any incomes policy.

If the plenary gathering were to succeed in hammering out the necessary social contract, it could then be given quasi-official status, transforming itself into the social and economic council described above. Since the council, even after it received official recognition, would have no power of its own, there should be no objection to its coming into being in this manner. Indeed, the lack of statutory authorization at the outset would be a clear advantage since, if the conference were unable to accomplish its task of achieving agreement on a social contract, the effort could be abandoned and the parties participating in the endeavor would not find themselves trapped on a legally constituted body whose usefulness had already ended.

The success of the plenary gathering in working out the details of a social contract and transforming itself into a social and economic council would depend not only on the individual chosen to preside over the conference but also on the quality of the staff work carried out in preparation for the conference. This leads to the other problem that needs to be addressed before one can have confidence in the course of action being outlined.

F. The Intellectual Obstacle

This second problem concerns not the political implications of post-Keynesian theory but rather the intellectual implications. The plenary gathering to discuss a social contract like any subsequent meetings of the social and economic council emerging from that group cannot be expected to reach agreement unless there is confidence among the various parties participating that the options being presented to them have been correctly analyzed. Here the continued dominance of the neoclassical orthodoxy among American economists is likely to do great mischief. As long as economists continue to hold onto the false hope that inflation can be brought under control through fiscal or even more simplistic monetary instruments, there will be reluctance to take the much more difficult step of putting into place a whole new set of institutions so that an incomes policy can be added to the stock of policy tools. And even if this reluctance can somehow be overcome because policymakers in their desperation are willing to turn to unorthodox solutions, economists operating from a neoclassical perspective are likely to continue to muddy the waters.

In truth, the options cannot even be clearly perceived, let alone correctly analyzed, from a neoclassical perspective. Thus the staff work that must be carried out in preparation for any plenary gathering must somehow transcend the current orthodoxy in economics. And this must continue to be the case even after agreement has been reached

on the nature of the social contract and the technical staff has been transformed into a permanent secretariat attached to the social and economic council.

Fortunately, even here there are some grounds for optimism. The majority of economists have little faith in or commitment to neo-classical theory. They use it in their teaching and research only because they know of no better alternative. They might, in time, be persuaded that a post-Keynesian approach opens up the possibility of far more productive work. They would certainly find that any empirical research, which now simply leads to anomalous findings, would be given a boost rather than being held back by what the theory leads one to expect.

Still, as Keynes warned on an earlier occasion, one should not underestimate the power of vested ideas to lead men of practical affairs down false paths—at least in the short run. And this, in turn, suggests that perhaps the greater problem in trying to follow the course of action outlined above will be the intellectual deadweight of the neoclassical orthodoxy in economics. As the earlier sections of this paper indicated, economic theory can be changed to fit the reality through the adoption of a post-Keynesian perspective. But it is not clear how quickly economists can be won over to that more realistic, and therefore more useful, perspective. It is therefore not clear how quickly policymakers can be expected to choose with confidence a more effective strategy for dealing with stagflation.

REFERENCES

- W. Locke Anderson, *Corporate Finance and Fixed Investment: An Econometric Study*, Boston: Harvard Business School, 1964.
- Joe S. Bain, *Barriers to New Competition*, Cambridge, Mass.: Harvard University Press, 1956.
- Barry Bosworth, "Patterns of Corporate External Financing," *Brookings Papers on Economic Activity*, 1971.
- Alfred D. Chandler, Jr., *The Visible Hand, The Managerial Revolution in American Business*, Cambridge, Mass.: Harvard University Press, 1977.
- John M. Clark, *Competition as a Dynamic Process*, Washington: Brookings Institution, 1961.
- John Cornwall, *Modern Capitalism, Its Growth and Transformation*, New York: St. Martin's Press, 1977.
- Evsey D. Domar, "Capital Expansion, Rate of Growth and Employment," *Econometrica*, April 1946.
- "Expansion and Employment," *American Economic Review*, March 1947.
- *Essays in the Theory of Growth*, London: Oxford University Press, 1957.
- Robert Dorfman, ed., *Measuring the Benefits of Government Investments*, Washington, D.C.: Brookings Institution, 1965.
- Alfred S. Eichner, *The Emergence of Oligopoly, Sugar Refining as a Case Study*, Baltimore: Johns Hopkins Press, 1969 [Westport, Conn., Greenwood Press, 1978].
- *The Megacorp and Oligopoly: Micro Foundations of Macro Dynamics*, New York: Cambridge University Press, 1976.
- "The Geometry of Macrodynamical Balance," *Australian Economic Papers*, June 1977 (a).
- "Inflation: The International Dimensions," paper presented at Conference on Post-Keynesian Theory, Rutgers University, April 1977 (b).
- "Post-Keynesian Theory: An Introduction," *Challenge*, May 1978.
- "Post-Keynesian Theory: A Look Ahead," *Challenge*, May 1979.
- Alfred E. Eichner and J. A. Kregel, "An Essay on Post-Keynesian Theory: A New Paradigm in Economics," *Journal of Economic Literature*, December 1975.
- Alfred S. Eichner and Charles Brecher, *Controlling Social Expenditures: The Search for Output Measures*, Montclair, N.J.: Allanheld, Osmun, 1979.

- George Feiwel, *The Intellectual Capital of Michael Kalecki*, Knoxville: University of Tennessee Press, 1975.
- John Kenneth Galbraith, *The Great Crash*, Boston: Houghton Mifflin, 1955.
- Roy Harrod, "An Essay in Dynamic Theory," *Economic Journal*, March 1939.
- *Towards a Dynamic Economics*, London: Macmillan, 1948. Nicholas Kaldor, "Alternative Theories of Distribution," *Review of Economic Studies*, no. 2, 1955-56, reprinted in Kaldor, 1960a.
- *Essays on Value and Distribution*, Glencoe, Ill.: Free Press, 1960(a).
- *Essays on Economic Stability and Growth*, Glencoe, Ill., 1960(b).
- "Capital Accumulation and Economic Growth," in *The Theory of Capital*, F. A. Lutz and D. C. Hague, eds., London: Macmillan, 1961.
- Michal Kalecki, *Essays in the Theory of Economic Fluctuations*, London: Allen and Unwin, 1939.
- "Political Aspects of Full Employment," *Political Quarterly*, no. 4, 1943, reprinted in Kalecki, 1971.
- *Theory of Economic Dynamics*, New York: Rinehart, 1954.
- *Selected Essays on the Dynamics of the Capitalist Economy, 1933-1970*, London: Cambridge University Press, 1971.
- Peter Kenyon, "Post-Keynesian Theory: Pricing," *Challenge*, July 1978.
- John Maynard Keynes, *A Treatise on Money*, London: Macmillan, 1930, 2 vols.
- *The General Theory of Employment, Interest and Money*, London: Macmillan, 1936.
- J. A. Kregel, *Rate of Profit, Distribution and Growth: Two Views*, Chicago: Aldine, 1971.
- Gardiner C. Means, *The Corporate Revolution in America*, New York: Crowell-Collier, 1962.
- Lloyd Metzler, "Factors Governing the Length of Inventory Cycles," *Review of Economics and Statistics*, February, 1947.
- Hyman P. Minsky, "The Financial Instability Hypothesis: A Restatement," unpublished, 1978.
- Gunnar Myrdal, *Monetary Equilibrium*, London: William Hodge, 1939.
- Luigi L. Pasinetti, "Rate of Profit and Income Distribution in Relation to the Rate of Economic Growth," *Review of Economic Studies*, October, 1962.
- *Growth and Income Distribution: Essays in Economic Theory*, London: Cambridge University Press, 1974.
- Alice Rivlin, *Systematic Thinking for Social Action*, Washington: Brookings Institution, 1971.
- Joan Robinson, *The Accumulation of Capital*, London: Macmillan, 1956.
- *Essays in the Theory of Economic Growth*, London: Macmillan, 1962.
- Paul Samuelson, *Foundations of Economic Analysis*, Cambridge, Mass.: Harvard University Press, 1947.
- Charles L. Schultze, *The Politics and Economics of Public Spending*, Washington: Brookings Institution, 1968.
- Robert M. Solow, "A Contribution to the Theory of Economic Growth," *Quarterly Journal of Economics*, February 1956.
- George H. Soule, *Prosperity Decade, From War to Depression: 1919-1929*, New York: Harper & Row, 1947.
- Piero Sraffa, *Production of Commodities by Means of Commodities*, London, Cambridge University Press, 1960.
- J. Steindl, *Maturity and Stagnation in American Capitalism*, Oxford: Basil Blackwell, 1952.
- T. W. Swan, "Economic Growth and Capital Accumulation," *Economic Record*, November 1956.
- Paolo Sylos-Labini, *Oligopoly and Technical Progress*, Cambridge, Mass.: Harvard University Press, 1962.
- T. Wilson and P. W. S. Andrews, *Oxford Studies in the Price Mechanism*, Oxford: Clarendon Press, 1951.

TOWARD A THEORY OF INSTITUTIONAL INFLATION

By Janos Horvath*

CONTENTS

	Page
1. Institutional Inflation Rooted in Misapplied Grants: A Sketch.....	67
2. On Partially Dependable Theories.....	69
3. Supply Drag Emanates From Capacity Restraint and Administered Pricing	72
4. On the Road of Rigidities.....	74
5. On the Dynamics of Regulations: A Grants Economics View.....	77
6. Implicit Grants as Policy Instruments Against Inflation.....	79
7. Summary and Recommendations.....	81
References	81

1. INSTITUTIONAL INFLATION ROOTED IN MISAPPLIED GRANTS: A SKETCH

That prices rise when demand exceeds supply is a phenomenon observed through the ages. Now the time has come to restate the interaction between the two actors. It is also accurate to say that when supply lags behind demand, prices rise. This restatement sheds light on the current seemingly paradoxical inflation-unemployment dilemma.

The reason for supply lag could be elemental calamity, lack of adequate capacity, or capacity underutilization. Understandably, unmet demand sets off price inflation. Supply lag caused by capacity underutilization leaves some of the factors of production idle; hence underemployment of labor, machines, and land. The very supply drag that causes involuntary unemployment of labor also simultaneously causes the price level to rise. So this train of thought suggests that in the contemporary American economy there is inflation because there is unemployment.

The thickening institutional entanglements of the contemporary American economy are now accompanied by aggravating restraints of performance and production. Paradoxical systemic rearrangements evolved wherein *implicit grants* (i.e., subsidies, bounties, tributes, monopoly profits) accrue to strategically situated groups *for the restraint of supply*. The process amounts to reward for *non-achievement* and reinforcement of *negative-achievement*. In more and more sectors of the economy, government intervention and business and labor decisions lead to rigid, sometimes even rising, income shares despite disservice rendered. This anomaly creeps in and is perpetuated by laws and conventions which stifle dynamic market adjustments, such as cost-cutting technologies and managerial innovations. To make matters worse, the costs of institutionalized inefficiencies are enhanced by the costs of compliance with new vintages of regulations.

*Janos Horvath holds the John W. Arbuckle Chair in Economics at Butler University, Indianapolis. During spring 1980, he is visiting professor of economics at the University of Colorado, Boulder.

The sequence, which runs from restraint of trade to capacity under-employment to product shortages and to higher prices, has a sophisticated microeconomic underpinning and has evolved into a folklore of antitrust. Yet it is crucial to remember that the fashionable scapegoat of antitrust occupies only one place among several protagonists. There are others whose privileged status became institutionalized through laws, regulations, and conventions. They include the beneficiaries of trade protection who retard industrial progress and hold prices above the competitive level; the recipients of subsidies in agriculture who pledge to limit land cultivation; the labor union and professional association who possess power to hold down the supply of skill and service through exclusion of applicants; the slum clearance legislation which reduces the supply of inexpensive housing units; and so on.

Government regulation of business and income distribution.— Usually, government regulations of business originate from the premise that unfettered production and exchange bring about consequences that conflict with certain societal targets. The visible hand of the regulator is assigned to supersede the invisible hand of the market. One important characteristic of all business regulation is that it also alters the distribution of income and wealth. Therein lies a forceful motivation for favoring or for opposing a particular regulation, or regulatory reform, by special interest groups.

Benefits accruing to gainers and burdens inflicted on losers can be effectively traced and illuminated within the framework of *implicit grants*. Implicit grants result whenever governmental regulations intervene into economic transactions in such a way that prices, or the terms of trade of the contracting parties, are affected.

To advance a particular objective, the lawmaker may bestow privileges or impose constraints by enacting a regulation. The illusion that regulation is virtuous because it is well intended routinely beclouds the costs of eroded efficiency. To compound the irony, benefits and burdens are not readily detectable and they frequently accrue to unintended parties. Instead of remedying market failures, the regulation induced grants economy is habitually imbued with *perverse effects*.

The extra income secured over what it would be under conditions of market competition amounts to that implicit grant which prompts lobbying against market oriented legislation. Implicit grant flows tend to decline if the competitive market mechanism solves the task of allocation and distribution. The domain of implicit grants expands if market solutions are replaced by legal-judicial decisions. Redistributive consequences notwithstanding, the granting of exemptions from the competitive market's discipline tends to reduce the supply of products and to foster administered pricing based on cost-plus markups; both departures from the competitive market performance fuel price inflation.

The weakening of competitive market forces gives clues to explain how, in market capitalism, the thickening entanglements with regulation generates a powerful constituency of its own. By principle, the capitalist businessman resents governmental intervention initially, but as time passes accommodations are found so that regulations are

clutched as protective umbrellas. This alliance of government bureaucracy and business management is joined by labor unions. The inflationary impact of the large mass of small regulations is underrated as if forgetting that little streams make great rivers [21, 37, 50].

The idea of *institutional inflation*¹ *via misapplied grants* sheds new light on the inflation-unemployment paradox. Misguided economic regulations distort the market and give rise to implicit grants which, in turn, reinforce inflationary dynamics. The elimination of such pathological grant flows could remove the motivation for supply drag. The ensuing effective capacity utilization, encouragement to new investments, and subsequent cost reduction—all tempered by the fresh breeze of market-competition—could pave the way to inhibiting price increases and occasionally even reverse them.

2. ON PARTIALLY DEPENDABLE THEORIES

The notion of supply drag helps to put into perspective the conventional inflation theories. Demand pull generates stress mainly because supply lags. Cost push that shifts supply backward stems from rigidities in markets and prices. Yesteryear's experiences generate expectations which stimulate the inflationary cycle. Compliance with certain environmental and safety regulations imposes wastefulness on business. Government deficits grow as public programs complement and replace private activities. Money supplies increase to accommodate transactions in inflated face values.

The inflationary recessions of the 1970's have damaged the image of the American economy as well as the reputation of economic science. Comparisons of actual output and potential output during the decade estimate a GNP gap of \$650-950 billion while sizeable proportions of labor, equipment, and land remained idle. Even a fraction of the foregone income could have eased the pressure of such national priority needs as technological progress, energy development, and environmental protection. The chronic slack in resource utilization of this magnitude that has accompanied persistent inflation is a puzzle and prompts soul-searching among economists. Apparently, the dominant theories of our time do not adequately reflect contemporary realities. Nonetheless these theories remain at the foundation of national economic policy—a bleak outlook indeed.

The irony is that all the prevalent inflation theories have some validity, yet, alas, each remains inadequate in itself because each provides only a partial explanation. Governmental budgetary deficits have become chronic and do exceed the rationale of counter-cyclical fiscal measures. Instead of countering genuine business cycles, monetary policy also accommodates election cycles. So both policy tools convey demand-pull impulses. Inflationary expectations reinforce cost-push

¹The notion of institutional inflation has been anticipated by several authors. Brunner and Meltzer published the papers of the 1974 Carnegie-Rochester Conference under the title "Institutional Arrangements and the Inflation Problem" [10]. William Feilner underscores that "institutional rigidities" and their consequences are misunderstood [18, 138]. Wachter and Williams recommend the examination of the "institutional infrastructure" [71]. Eckstein and Giroia deplore the "structural changes" that have made the economy inflation-prone [15, 332]. William Bryan conjectures that "the world has passed yet another watershed and it may be that a return to reasonable price stability is not attainable within the existing institutions" [11]. The author of this paper discussed "Institutional Inflation Via Misapplied Grants" at the 1971 meetings of the American Economic Association [32, 33].

impulses which stem from efforts to catch up and gain advances in setting wages and prices. Demand-shift caused by new products creates bottlenecks which lead to wage increases. Wage increases in turn, spill over into other economic sectors, including declining industries. When labor productivity grows slower than wage increases, the result is rising prices. The expectation of continuing price hikes into the future triggers a compensatory wage increase in advance. Similarly present consumer expenditures tend to become excessive if future price hikes are expected, particularly for housing and durable goods [39].

It appears that the several agents of inflation form a seamless web of interacting forces. The major unsettled questions concern the details of the transmission mechanism from the creation of demand and supply through to inflation. If there is any element of consensus among the contending schools, it is that much more theoretical exploration as well as empirical research is needed before macroeconomic policies become more effective.²

While acknowledging each of the prevalent inflation theories, a generalized thesis of this writer is that *the inflationary recession of the 1970's is a phenomenon of institutionally perpetuated disequilibrium between aggregate demand and aggregate supply*. On one hand, aggregate demand increases steadily because of a blend of such primary forces as persistent government deficits, environmental and safety requirements, natural resource depletion, built-in obsolescence, and aggressive marketing. On the other hand, aggregate supply increases only unevenly and usually remains restrained below potential, due to governmental regulations and oligopolistic practices in the product as well as factor markets. It is conceivable that from time to time a leading role will be assumed by one or another of the inflationary actors, such as excessive money, excessive demand, cost push, and expectational dynamics. These transitory protagonists do not negate that in the longer run the most potent source of inflationary unemployment is capacity underutilization rooted in institutional restraints. Under the umbrella of the institutional inflation hypothesis it will become feasible to trace the synergistic collaboration of all actors.

The institutionalized underemployment, that reached onerous proportions by the 1970's, can be traced to three general causes which evolved over many years. They are: (1) Monopolistic practices; (2) old economic regulations; and (3) new societal regulations.

First, that restraint of trade causes higher prices is a phenomenon long known. This was the rationale for the Sherman Act back in 1890. In the same vein, attention turned to labor unions and professional associations who have acquired degrees of legalized power to hold down the supply of skill and service through the exclusion of applicants.

² Observing pensively that "the economy has inadequate capacity to generate the 'right' prices," Robert Solow underscores that "the basic question is *why* are wages and prices sticky? The persistence of disequilibrium prices and interest rates means that there are Pareto-improvements available that are not being exhausted. Somewhere there are simple or complicated bargains that could be struck from which all participants would gain. Why do those transactions fail to occur?" Labeling the phenomenon a serious intellectual problem [65, 11] Solow recommends the diversion of some research resources in this direction [65, 16].

Second, the older economic regulations—i.e., Interstate Commerce Commission (ICC), Civil Aeronautics Board (CAB), acreage control, and scores of others—have conveyed major impact by, inter alia, setting rates, licensing routes, adjusting investments, fixing profit, and determining quotas. Widely diffused, their role in stagflation is very significant—even when hardly detectable.

Third, the societal regulations of the immediate past ten years—mainly environmental protection and occupational safety—have accentuated inflationary pressures in their redirecting sizable resources.

To complicate the situation, the major protagonists are accompanied by auxiliary actors on the scene: The beneficiaries of trade protection retard industrial progress and hold prices above competitive levels. Slum clearance legislation reduces the supply of low-priced housing units. The governmentally fostered merchant-marine industry raises costs of shipping above world levels. Business compliance with regulatory paperwork imposes waste. Conflicting and inept regulations discourage technological advance and entrepreneurial innovation. And so on.

The leitmotif of my thesis is that institutionalized obstacles obstruct performance. The institutions of the society have become increasingly geared to the idea of *protecting* privileges which entitle organized groups to secure their particular slice in the national pie. (Fading are the voices which advocate that the rules of the game, excluding secured privileges, are worthy of protection.) For almost half a century, the list lengthened to include all those to whom society had granted a privilege of one sort or another. The *visible hands* of special interests hold down the *invisible hands* of free enterprise competition, with the resultant underperformance of the national economy. The competitor preempts competition and, ironically, the regulated capitalist businessman advocates continued regulation.³

Critics of the institutional inflation hypothesis may argue that the rigidities described above have been present in the American economy for longer than the last decade, and therefore could not have made the difference between the high inflation during the 1970's vis-a-vis the mild inflation during the earlier decades. The criticism only helps to put into focus the dynamics of institutional inflation.

In fact, the many seemingly minute changes evolving inside the American economy during the past half century have by now reached a threshold where they alter systemic relationships. The cumulative institutionalization has been evolving somewhat similarly to the accumulation of toxics in the human body, a process which goes unnoticed or causes little concern, until the toxics begin to act as carcinogenic agents. The inflation-unemployment phenomena of recent years baffles conventional analysis because their underlying causes have been creeping up gradually. Little wonder that the conventional concepts of economic theory do not fully suffice, even though they could diagnose the earlier past satisfactorily. Today, those who cavalierly dismiss institutional rigidities neglect what are really *self-inflicted* wounds,⁴ each of which causes distress [54, 33-34].

³ In the words of Alfred Kahn: "Inflation has become a chronic problem . . . because we have experienced a decreasing willingness to rely upon and expose ourselves to the functioning of an uncontrolled market. The fact is that most people in this country don't like the way a truly competitive economy operates, and have found ways of protecting themselves from it" [37].

⁴ An expression coined by Arthur Okun [54].

3. SUPPLY DRAG EMANATES FROM CAPACITY RESTRAINT AND ADMINISTERED PRICING

Upon recognizing the crucial role of institutional restraints, the conventional tools of both microeconomics and macroeconomics lend themselves to reconcile the inflation-unemployment contrariness. In the sphere of microeconomics the trend has been toward increasingly inelastic supply functions. Such supply rigidities result either from old-fashioned monopolistic practices, or from labor union power, or more manifestly from proliferating governmental regulations. Clearly, all institutional rearrangements and public policies that lead to some unbending of inelastic supply functions—in product market as well as factor market—could reduce inflation.

In the sphere of macroeconomics there are more complexities. A great deal of the discourse is conducted around the Phillips Curve concept. The earlier Phillips Curve notions dominant during the 1960's—negatively sloped and offering trade-off options between inflation and unemployment—have been impaired during the 1970's when trade-offs became either blurred or outright nonexistent. By now a revised view gains acceptance; accordingly, the Phillips Curve has a negative slope only in the short run, but in the long run is vertical at the natural rate of unemployment. Countercyclical monetary and fiscal policies can reduce unemployment below the natural rate only temporarily and even then, at the cost of acquiescence to accelerating inflation rates [64].

That economics is a *dismal* science has become manifest anew, as policy makers find themselves no longer free to choose between two evils (or some mixture of them). Rather, both inflation and unemployment must be endured with aggravating discomfort. Countercyclical monetary and fiscal policy measures do not work as they used to. Expansionary monetary and fiscal policies tend to fuel inflation with or without stimulating output. Conversely, contractionary monetary and fiscal policies tend to restrain output while boosting price levels. This challenge too, or disproof of, the neoclassical paradigm is a controversial issue in contemporary political economy.

Shifting the analysis from comparing inflation and unemployment rates to comparing inflation and capacity utilization rates could help resolve this issue. Table 1 brings together data from 1968 to 1977 that trace rates of capacity utilization (as reported in the Federal Reserve Board Series for total manufacturing) and inflation (as measured by the Consumer Price Index). Economic performance in this decade is particularly illuminating, because the thickening institutional rigidities have begun to undermine systemic behavioral and structural relationships within the national economy that had helped in the past to combat inflationary impulses.

It is noteworthy that the data do not show high rates of inflation associated with high capacity utilization rates. Indeed coincident association is almost the reverse. For example, the lowest rate of capacity utilization occurred in 1975 at 73.6 percent, while the inflation rate was nearly the highest during that decade at 9.1 percent. Moreover, the lowest rates of inflation did not coincide with the lowest rates of capacity utilization: One of the lowest inflation rates, 4.2 percent in

1968, coincided with the second highest capacity utilization rate, 87.0 percent.

TABLE 1.—RATES OF CAPACITY UTILIZATION AND INFLATION, 1968-77

Year	Capacity utilization		Inflation		Direction
	FRB ¹	Difference	CPI	Difference	
1968.....	87.0		4.2	1.2	Opposite
1969.....	86.2	-0.8	5.4		Opposite
1970.....	79.2	-7.0	5.9	.5	Parallel
1971.....	78.0	-1.2	4.3	-1.6	Opposite
1972.....	83.1	5.1	3.3	-1.0	Parallel
1973.....	87.5	4.4	6.2	2.9	Opposite
1974.....	84.2	-3.3	11.0	4.8	Parallel
1975.....	73.6	-10.6	9.1	-1.9	Opposite
1976.....	80.2	6.6	5.8	-3.3	Parallel
1977.....	82.4	2.2	6.5	.7	

¹ Total manufacturing in Federal Reserve Board series.

Source: Economic Report of the President, 1977.

If the focus of analysis were shifted from annual figures and changes to the observation of time lags, the data on capacity utilization and price inflation seem to give some support to the Phillips Curve conception at least in the very short run. The lagged relationship, showing changes in capacity utilization rates preceding changes in price indices, reflect fixed price contracts, union wage settlements, and the impact of inflationary expectations. In any case, there exist in the literature by now firm theoretical foundations as well as empirical evidence that the Phillips Curve becomes invalid as a basis for longrun analysis and policy formulation.

Without further scrutinizing the capacity utilization versus inflation relationship, there appears immediate and ample apprehension that the conventional wisdom is due for some rethinking. The Phillips Curve might have—beyond negative slope on the short run and vertical slope on the long run—periods of positive slope. Indeed, the positively-sloped Phillips Curve is deftly damatized by the *discomfort index*, which is the arithmetic sum of unemployment rate plus inflation rate.⁵ This could be regarded as another signaling mechanism that offers corroborative evidence that supply drag deserves attention.

The problem is greater than a limping policy tool; the whole Keynesian-cum-neoclassical paradigm has become blunted. Repeatedly, increasing rates of unemployment failed to bring about price deflation. When recessionary aggregate demand—which in the neoclassical framework predicates a deflationary gap—continued to coexist with inflation, there emerged a melancholic pronouncement that *the rules of economics do not work as they used to*.

It was not the rules of economics that failed but, somehow, half of them have temporarily slipped under the embellishment of a

⁵ Okun's "discomfort index" is used by Thomas Dernburg in a chapter of this JEC compendium on stagflation [13].

Keynesian-cum-neoclassical paradigm. If the neglected half of macro-economic activities, namely aggregate supply, is considered in conjunction with aggregate demand, then some of the disjointed members of body-economics falls into place. It is a pivotal Keynesian idea that aggregate demand shifts determine the level of national economic activities. The shifting aggregate demand is contrasted against a potential full employment output which serves as the benchmark for aggregate supply. So at the full employment level an overheated or underemployed state of affairs could be revealed through *inflationary gap* or *deflationary gap* respectively. But the model breaks down under the weight of stagflation. The failure results from the unbalanced attention given in the Keynesian framework to aggregate supply, which is assumed to follow aggregate demand.

While Keynes described the 1930's adequately, his paradigm is inadequate for the 1970's. Unlike during the great depression, nowadays aggregate supply chronically lags behind aggregate demand. By now, the impact of regulations coupled with the special interest of operators increasingly does result in capacity restraint. In aggravating the situation, not only capacity utilization lags, but investment (the building of new capacity) also lags behind what it could be under the fresher breeze of a more competitive environment. What really matters is that purchasers are trying to obtain more than is actually being produced and they thereby are inflating the price level. Conceptually—whether the underlying reason is elemental calamity, lack of adequate capacity, or simply restraint of production—in all cases, the hub of the matter is that supply lags behind demand.

4. ON THE ROAD OF RIGIDITIES

In the 1930's Keynes showed governments how they could promote full employment by manipulating the level of demand. Yet the relative success with which the policy tools have been used has created conditions for another problem, rising prices, against which the tools are less effective. Even a most circumspect control of demand does not by itself do the trick. A reduced demand can still be excessive and will force prices upward if supply declines by greater proportions.

The specter of Ricardo's conquest over Malthus may haunt us in a reverse fashion. For a century Say's Law that "supply creates its own demand" was upheld as an article of faith in spite of recurrent business cycles. Eventually, Keynes forcefully challenged the doctrine's tenableness. Attention turned to demand. But somehow the pendulum has swung with such momentum that by now a generation of Keynesians seems to think that—to paraphrase an inverted Say's Law—demand creates its own supply. The current failure of demand management to conduct simultaneous compliance on the supply side makes one wonder how long will it take before that Keynesian orthodoxy loosens.⁶

⁶ Although countercyclical monetary and fiscal policies geared at aggregate demand continue as the official major policy tools, recently suggestions for alternative measures have begun to surface. For example, Irwin L. Kellner writes in the Summer 1979 Business Report of the Manufacturer Hannover Trust Company: "The time has come to pay greater attention to expanding supplies, and less to increasing demand. For only by enlarging supplies can we make some immediate headway against inflation without the need to resort to controls." Earlier a cognate view was intimated in the 1977 mid-year economic outlook report of the Organization for Economic Cooperation and Development. In essence, the OECD said that so much slack in manpower and factory capacity exists that extra growth could itself prove an anti-inflationary help. "Somewhat stronger recovery should be beneficial" to employers by holding down unit labor costs [75].

Whether from the vantage point of analytical reformulation or the perplexities of the state of arts, the issue at hand is an "underemployment inflation." Aggregate supply lags behind aggregate demand. There exists a strong element of causation that runs from underemployment to product shortages and to higher prices.

The rigidities of the market system are often magnified by ill-advised governmental regulations. After two to three decades of recognition gap, the phenomenon has by now begun to capture attention. Pondering achievable employment policy goals, William Fellner points out that "institutional rigidities exist largely because the bulk of the public misunderstands their consequences and has not been made aware of the harm they do" [118, 138]. Eckstein and Girola observe: "Structural changes in the economy's markets have made the economy somewhat more inflation-prone. . . . An exceptionally unfavorable combination of unemployment and inflation can be seen to originate in these independent elements, which are then amplified by the endogenous wage-price-unemployment mechanisms." [15, 332-333]. Wachter and Williamson conclude that "additional efforts to examine institutional infrastructure . . . will serve further to illustrate the mechanism of inflation" [71, 569].

Empirical evidence abounds. A deft eye-opener is John R. Meyer's assessment of transportation regulation, which reads:

Whatever its early historical justification, or even possible successes, government regulation of transportation in the United States is today undeniably a failure. It does not serve anyone's interests well. For consumers and shippers, regulation creates important inefficiencies in transportation services. For many carriers, particularly railroads and airlines, regulation results in return on equity that is lower than that of almost any other major private sector of the U.S. economy. . . . Low returns on capital have driven investment out of the industry, even where it is seemingly still justified by identifiable demand [49-44]. Transportation regulations represents a large departure from the standard American norm of using the marketplace to indicate when, where, and how economic activity should occur. In lieu of the marketplace, a legal-judicial process is used instead, a process that looks backward to precedent rather than forward to evolving technology and demand patterns [49, 44]. Technological progress tends to undermine the status quo and to provide alternative means of meeting various transport needs, thus complicating the life of the regulator. It is not uncommon, therefore, to see regulators adopt a very skeptical attitude toward new technology regardless of whether the change could potentially produce lower rates and costs. The classic recent example of regulatory obstruction of technological innovation was the ICC's refusal for many years to allow the Southern Railway to use larger hopper cars, so-called "Big Johns," for moving grain [49, 45-46].

Casual browsing of public policies toward business provides numerous odd cases. Here are two stories elaborated on in *The Wall Street Journal*. One headline reads: "In Pennsylvania a Man Can Be a Law-breaker for Selling Milk Cheap." [72]. From the story one learns that the United Dairy Farmer Cooperative Association in Pittsburgh has been declared illegal by State authorities and a Federal court. Unless the U.S. Supreme Court agrees to rule on the case, the manager is bound for jail because in defiance of price-fixing regulations, he sells a gallon of milk 18 cents cheaper and pays slightly more to farmers than other dairies do. The other ill-advised regulation illustrates the complexities of a situation when benefit to some enterprising producers and mass of consumers, which would result from lower costs and prices, can be prevented by a much smaller group's already established

narrow vested interests. "Several railroads want to cut rates for soybean meal sold by Midwestern processors to Southeastern chicken farmers. But their case has been mired by regulatory and other rate-setting proceedings for three years. Southeastern soybean and cottonseed processors are blocking the rate cut by *protesting the potential competition*" [73] (Italic added). Amazingly enough, time and again the regulatory bureaucracy condones the encroachment of narrow special interests over broad public interests, while ignoring the competitive free enterprise philosophy of the country.

Examples from the market of goods and services can be complemented by cases from the market of productive factors. At least one illustration from the labor market seems to be in order, as abstracted by Nicholas Kaldor. In an economy dominated by large corporations, price competition is not so prompt or effective as to compel firms which experience exceptional reductions in new processes (or a fast increase in selling volume, or both) to pass on the full benefit to the consumer in the form of lower prices *pari passu* with the reduction of costs. The very existence of this situation leads to wage increases that are, in a sense, unnecessarily large—i.e., they are governed by what the employer can afford to pay (without compromising his competitive position) and not by what he needs to pay, in order to obtain the necessary work force [38, 708].

The ill-health of the national economy, as it appears to a seasoned diagnostician, is underscored by Arthur M. Okun:

The year of 1977 was marked by a host of self-inflicted wounds in the form of government policies that directly raised costs and prices. . . . Any inflationary force feeds into wages and back into prices in our economy, and hence there is no such animal as one-shot inflation. . . . The problem can be seen in perspective only if the spotlight is focused on the totality of these actions. We need a systematic public monitoring and scoring of all the microeconomic measures taken by government that raise or lower the levels of costs and prices . . . [to design] measures that reduce costs through lower indirect taxes, less costly regulatory procedures, and pro-competitive institutional changes. If the public, and the policymakers themselves, are adequately informed, perhaps we can stop the self-inflicted wounds [54, 33-34].

Yet governmental regulations have been difficult to reform or abandon, even when recognized as counterproductive, because elements of regulation frequently tend to satisfy certain special interests; real or imaginary.⁷ Historically, some business enterprises have sought to avoid competition and have sometimes been aided in doing so by regulation. Some rules and procedures create vested interests and capital values which reform would endanger [6, 146 (1977)]. While it is not at all simple to measure the burden of governmental regulations, some estimates exist. According to Murray L. Weidenbaum, the annual cost to the consumer of excessive Federal Government regulation came to over \$60 billion during the early 1970's, [79, 41]. For a more recent year, the cost rose to \$102 billion, as estimated by Secretary of Commerce Juanita M. Kreps [43]. Studying truck transportation, John R. Felton concluded that entry control, rate regulation, and

⁷ The Airline Reregulation Act of 1978 offers a vivid example of misconstrued rigidities. Airline corporate management, in unison with labor unions, campaigned and lobbied against deregulation, predicting dire consequences. One year after deregulation, Frank Borman, chairman and president of Eastern Airlines, comments, "I was totally wrong." The experience with wide-open route and price competition has been "vibrant and exciting" [77, 16]. In fact, instead of chaos and bankruptcies, the consequences have been more travels, more revenues, more profits—while price declined in spite of an inflationary milieu.

limitations on the operation have reduced efficiency and added to social costs at least \$5.3 billion [20, 12]. No doubt there are beneficiaries of the system who act rationally when advocating the perpetuation of the status quo, yet unquestionably, the gainers gain less than the losers lose.

5. ON THE DYNAMICS OF REGULATIONS: A GRANTS ECONOMICS VIEW

Whenever in the name of certain societal targets and priorities the invisible hand of the market is superseded by the visible hand of the regulator, the distribution of income and wealth is altered. The actual size and the normative impact of such redistributions can be well analyzed within the framework of grants economics.

Grants economics proposes to update the prevailing neoclassical paradigm on the recognition that some of the existing images and views about the nature of our capitalist market economy are outdated at best, and quite misleading at worst. As Martin and Anita B. Pfaff have observed in a systemic study:

These images reflect what we have learned about our society as being a capitalist market society: economic relationships between households, firms, non-profit institutions, and the government supposedly are based largely on exchange, whereby party A gives something to party B only in exchange for a corresponding return flow of equal value. An examination of the real world will reveal, however, a vast network on nonmarket flows of exchangeables which has become so significant that it tends, by design or accident, to distort the prevailing exchange flows. This system of unilateral or one-way flow is termed the grants economy [56, 120].

A transaction, if it is not an exchange of equal values, contains a grant element. The usefulness of this framework may be grasped by applying it to familiar policy issues. The grant elements embodied in trade protection, for example, can be sorted out by contrasting the world market price with the domestic price after the imposition of a tariff. The incidence of implicit grants can be traced, as they accrue to the domestic producer and government, at the expense of the domestic consumer and foreign producer. Likewise, grant impact statements could be calculated about government policies aimed at agricultural marketing, regulation Q in banking, environmental protection, the stipulation of routes cum fares for trucks, railroads and shipping. Other cases abound.⁸

The label *grant* is a generic term for the unmatched transaction of exchangeables when, in an accounting sense, the net worth of the grantor diminishes while the net worth of the grantee increases. This simple definition provides a compass to rectify some deeply ingrained delusions about the functioning of contemporary economic organizations [7]. The conventionally held view is that goods, services, and factors of production move from one party to another at a price that generally reflects the values involved. Even though it is recognized that there exists a broad assortment of bounties (donations, subsidies) in

⁸ In this vein an interesting case is intuited and traced by Thomas F. Wilson, who writes: "Explicit recognition of the grants economy elevates the vantage point from which one may observe economic phenomena: this is especially true when one assesses the significance of money in the economy. Money serves as a 'medium for transactions' involving grants as well as exchange, and money today is essentially a product of the grants economy, providing an economic return in the form of 'seigniorage.' Seigniorage is a grant, giving the producer (or 'creator') of money, or those to whom the grant has been transferred, command over resources in the economy" [9, 38]. "The profit from money creation is, therefore, a grant from society to those who issue money . . ." [9, 42].

one direction and a broad assortment of tributes (extortions, dispossessions) in the other direction, the conventional view is that these transactions occur on the fringes only. So these transactions are routinely kept outside the domain of economic inquiries. In other words, the conventional wisdom holds that *quid pro quo* (i.e., the exchange of equal values) is the rule while departure from it remains the exception only. Unfortunately, this conventional attitude unnecessarily narrows the scope and relevance of economic policy analysis [55].

Indeed, an implicit grant structure emerges whenever any regulation, concession, stipulation, or restraint does *de facto* alter the system of relative prices. More specifically, implicit grants result whenever governmental regulations intervene into economic transactions in such a way that prices, or the terms of trade of the contracting parties, are affected. There might be some measurement problems when the beneficiary of certain unearned pains would prefer to erase the grantee label by branding it an earning. An illustration is agricultural price support rationalized under the rubric of parity. [33] Nevertheless, *as a network of policy instruments, the grants economy represents the heart of the political economy, because routinely it is by pulling the levers of positive and negative subventions (i.e., unmatched transfers) that the political system intervenes into the economic system.*

Grants economics, as it complements exchange economics, provides a framework for analyzing all aspects of transactions.⁹ Conventional exchange economics deliberately ignores or downgrades many important production and distribution processes which do not fit the Procrustean bed of neo-classical paradigm. Consequently, a case that does not fit the neat abstraction of prevalent theories is relegated to *grey areas* and the analysis continues *ceteris paribus*. But now grants economics cum exchange economics can overcome those inhibiting barriers that had confined analysis to rigidly defined production and distribution patterns. Such an integrative economic science—while sharpening the images of production and exchange—is capable of dealing with a largely enhanced sphere of human, social, and political interactions [63, 320–345, 55].

To pursue a policy, the lawmaker may choose to extend benefits or to impose burdens through a regulatory structure. However, it is a political irony that benefits or burdens may accrue to unintended parties,¹⁰ thereby causing harm to the society at large [7, 53], [33, 744]. It is a fact of life that, far from acting as an unconditioned remedy

⁹ That inflation is, *de facto*, an implicit coerced grant (i.e., tribute) to the government might motivate policy makers to cause, or acquiesce in, rising prices. As described by G. L. Bach: "Inflation is, in effect, also a tax that transfers income and wealth to the government. When the government spends without correspondingly increasing taxes and thereby induces inflation, it obtains resources through its expenditures. Those who can buy less because of the higher prices give up the resources, just as if new taxes had been levied on them. Furthermore, the government's gain as a net debtor is also in effect a tax on creditors who hold money and other government debts." [3, 31]. The motives behind inflationary monetary expansion are elaborated by Charlotte Ruebling [9, 59–69].

¹⁰ It is common knowledge that agricultural subsidies, initially intended for small family farmers, have, as time passed, accrued mostly to large farmers and to tax shelter schemes [33, 744]. A more recent irony is the story about governmental regulations designed to protect consumers but hurting them. Certain electric utility companies use their captive-coal operations to reap profits otherwise denied in the rate-making process, sometimes earning three times more on investment than commercial (unregulated) coal operators. For instance, the Pittsburgh-based Duquesne Light Company was able to save 2.4%, or an average of 51 cents a ton, on coal it got from its wholly-owned Warwick mine. But in 1977 the company began charging itself 31.8% above the going market price for coal and passing most of the increase on to customers. Had Duquesne Light bought all its coal on the open market that year the savings to customers would have totalled about \$5 million [76].

for market failures, the grants economy often is characterized by *perverse effects* [7, 55]. An inventory of grant elements stemming from economic regulations tends to find more pathological grants than curative grants. Ultimately, it may become a unique contribution of grants economics to regulatory reform to diagnose and remove pathological, implicit grants. Undoubtedly, such measures could reduce the absolute size yet enhance the effectiveness of the regulatory bureaucracy.¹¹

6. IMPLICIT GRANTS AS POLICY INSTRUMENTS AGAINST INFLATION

The main theme of this essay is that institutionalized fetters sap the vitality of the national economy and throttle full capacity production. The implicit grants result from protecting privileges, from accommodating with the regulator, and from perpetuating market power. The grants provide feedback and reinforce obstacles to reform.¹² The disheartening trend continues with the growing list of individuals to whom society has "granted" privileges to derive gain from the restraint of economic performance. The paradox of misguided grants reveals itself most painfully in the inherent dynamics of a situation in which high-principled individuals (who would refuse benefits) are penalized insofar as others are without scruples.

Powerful economic and political forces which make for constancy in relative earnings in different occupations and groups often prevent reform toward optimum solutions. As Kenneth Boulding explains:

It is one of the great contentions of economics that the relative price structure is important. It profoundly affects the allocation of resources, the distribution of income, and the direction of technology. There is a great deal of wisdom lying around in economics as to what an optimum price structure might be, especially when modified by a grant economy, that is, a system of one-way transfers. . . . Indeed, we have run into an impasse on macroeconomic policy precisely because we have so completely neglected the structure of relative prices and wages (by interfering with its processes and solutions) [6, 12-13].

Ultimately we are saddled with the predicament that an institutional structure shapes the market forces which in response to technological change and organizational evolution would press for continuous redistribution of factor earnings. Institutional rigidities are the prime explanatory variable why more historical downward shifts of supply functions do not materialize in spite of huge social investment into infrastructure, such as interstate highways, R&D programs, and mass education.

Those who succeed in capturing disproportionate shares of the society's progress will have motivation to indurate the arrangements. The extra income share secured over and above what it would be under

¹¹ Henry Ford II of the Ford Motor Company, commenting on the regulatory role of the government, said: "It is not just liberal dogooders, Democrats, unions, consumerists, and environmentalists who are responsible for [it] . . . It's businessmen who want government contracts. It's bankers and transporters and retailers and manufacturers who want protection from competitors. It's insurance companies that lobby for bumper and air bag regulations that might lower their claim costs. It's catalyst suppliers who lobby for tough emission standards . . ." [21, 12].

¹² Richard Posner argues that beyond the conventional rationale, namely "to approximate the results of competition or to protect the regulated firm from competition [there is] another important purpose to regulation: we can call it 'taxation by regulation' . . . Foremost among them is the prevalence of 'internal subsidies,' whereby unremunerative services are provided, sometimes indefinitely, out of the profits from other services" [60, 22]. George Stigler anticipated grant impact statements, writing: "With its power to prohibit or compel, to take or give money, the state can and does selectively help or hurt a vast number of industries . . . The central tasks of the theory of economic regulation are to explain who will receive the benefits or burdens of regulation" [66, 3].

conditions of market competition amounts to that implicit grant which will motivate campaigns and lobbies against market-oriented reform legislation. Notwithstanding redistributive consequences, the granting of such privileges reduces the supply of products and thereby inevitably stimulates price inflation. Of course, no one of these actions can be easily excoriated as making a critical difference in the battle against stagflation. By a national standard, each of the sums is small; yet to people striving for benefits to particular interest groups, the returns are very high [54, 34].

The idea of institutional inflation, as reinforced by misplaced grants, provides an understanding of the problems at hand, bringing into sharper focus policy proposals which originate from a variety of sources. Effective reforms, which would reduce privileges as well as burdens by rearranging (mostly eliminating) grant flows, do require prudent assessment. The inevitable necessity of such an overhaul has been foreseen by many. James Tobin wrote years ago: "Someday we must start on the difficult structural reforms needed to dissolve the cruel unemployment-inflation dilemma" [67, 107].

Gottfried Haberler observed ". . . to the extent to which it is possible by anti-trust policy or otherwise to introduce more competition, such policy would have anti-inflationary effect" [28, 75]. In 1977, Lawrence Klein in his presidential address to the American Economic Association concluded ". . . the Keynesian policy carried the situation only so far, and undoubtedly under-estimated inflation potentials, leaving us now at the point where new systems of thought, drawing more on the supply side, are needed . . ." [41, 4-6].

Explicitly or implicitly, all these institutional reform ideas allow for, or rather insist on, less restrictions in both the product and the factor markets. By pursuing the ideas outlined in this study, there will evolve ways and means out of the maladjustments where one-fifth of manufacturing capacity, one-fourth of land, and around 6 percent of the labor force remains perennially idle. Under a rearranged system of national priorities, grants—implicit and explicit—would flow to those operators who, instead of practicing restraint, excel in capacity utilization and capacity building.¹³ The main thrust is toward the enhancement of supply. Alternatively, sole reliance on counter-cyclical policy measures, even reinforced by curbs on wages and prices, would mean settlement for unnecessarily grave pains and still could make only limited contributions. Without impetus to supply-enhancement, the price level will continue to rise and unemployment is prone to stay high.

¹³ Several years before it became a real life issue, the phenomenon was described hypothetically by William Vickrey, who wrote: "There is indeed no fundamental reason why inflation cannot be accompanied by generalized unemployment, confronting the framer of economic policy with the dilemma that stimulative measures are called for by the presence of excessive unemployment, while at the same time sedative and restrictive measures are called for to halt the inflation. . . . The sources of the difficulty presumably lie in some form of rigidity or resistance in the real economy to the forces that are supposed to be at work in the model economy to prevent such an occurrence. . . . The difficulty may perhaps be traced to the lack of effective competitive forces acting on large industrial employers on the one hand and strongly entrenched labor unions on the other in major sectors of the economy. In neither case is the remedy easy. The theoretically indicated solution in the latter case, of breaking up the large industrial and labor units sufficiently to restore competitive pressures on prices and wages may not be feasible either for technological or for political reasons; public ownership or public-utility-type regulation of such industries may be equally unattractive solutions" [69, 279]. Now the identification, tracing, and redirection of implicit grant flows may provide a solution to the Vickrey predicament.

If there is need for some kind of breakthrough, it is not to undo evil spells, but rather to remove the roadblocks brought about by institutional ironies and intellectual inertia.

7. SUMMARY AND RECOMMENDATIONS

Misguided economic regulations and excessive market power give rise to pathological, implicit grants which in turn reinforce inflationary dynamics in consort with supply restraint. The elimination of such pathological grant flows would remove the motivation for supply restraint. The resulting effective capacity utilization, cost reduction, and the breeze of market competition would work toward inhibiting price increases and occasionally even reverse them.

To prepare the stage for curing the American economy from the ailments of institutional inflation, the Congress could set certain targets and specify pertinent procedures. A feasible beginning could be to require the Joint Economic Committee, in an Annual Report on Stagflation—in addition to other relevant data and analysis—to do the following:

- (1) To include an inventory of implicit grant elements that stem from institutional rigidities;
- (2) To monitor all governmental regulations that raise or lower specific costs and prices, then calculate the pertaining *grant impact statement*;
- (3) To estimate the cost-increasing versus cost-reducing effects of environmental, health, and safety regulations so that their net effect on price levels could be gaged;
- (4) To monitor supply restraint by business organizations and calculate a *grant impact statement* which reveals the subsidy bounty-tribute content of each measure;
- (5) To trace the incidence of implicit grant elements by identifying gainers, losers, and deadweight loss;
- (6) To estimate the leverage of these grant elements on supply functions;
- (7) To describe ongoing efforts and potential actions toward noncompetitive institutional changes for removing pathological grants that curb supply;
- (8) To recommend alternative measures toward unbending, rigidly inelastic supply functions by redirecting pathological grants toward curative roles;
- (9) To estimate savings to the taxpayer and consumer by pruning the implicit grants economy; and
- (10) To estimate the impact and specific tax increases as well as reductions on costs and prices.

REFERENCES

1. Ackley, Gardner, "The Costs of Inflation," *American Economic Review*, Vol. 68, No. 2, May 1978, 149-154.
2. Association for the Study of the Grants Economy, *Tenth Anniversary Brochure*, Augsburg-Leitershofen, International Institute for Empirical Social Economics, 1978.
3. Bach, G. L., "The Economic Effects of Inflation," *Proceedings of the Academy of Political Science*, Vol. 31, No. 4, 1975, 20-33.

4. Ball, R. J. and T. Burns, "The Inflationary Mechanism in the U.K. Economy," *American Economic Review*, Vol. 66, No. 4, September 1976, 467-484.
5. Bosworth, Barry P., "Testimony Before the Subcommittee on Economic Stabilization of the House Committee on Banking, Finance, and Urban Affairs," Washington, D.C., Council on Wage and Price Stability, 21 June 1978.
6. Boulding, Kenneth E., "Successes and Failures," *Challenge*, Vol. 21, No. 1, March-April 1978, 11-13.
7. Boulding, Kenneth E., *The Economy of Love and Fear: A Preface to Grants Economics*, Belmont, California, Wadsworth, 1973.
8. Boulding, Kenneth E., Martin Pfaff, Janos Horvarth, "Grants Economics: A Simple Introduction," *American Economist*, Vol. XVI, No. 1, Spring 1972, 19-28.
9. Boulding, Kenneth E. and Thomas F. Wilson, ed., *Redistribution through the Financial System: The Grants Economics of Money and Credit*, New York, Praeger, 1978.
10. Brunner, Karl and Allan H. Meltzer, ed., *Institutional Arrangement and the Inflation Problem*, Amsterdam, North-Holland Publishing Co., 1976.
11. Bryan, William R., "Economic Performance and Policy: Stagflation Issues," in U.S. Congress Joint Economic Committee, *Stagflation: A Compendium*, 1980. Forthcoming.
12. Chow Gregory C. and Sharon Bernstein Medgal, "An Econometric Definition of the Inflation-Unemployment Tradeoff," *American Economic Review*, Vol. 68, No. 3, June 1978, 446-453.
13. Dernburg, Thomas F., "Stagflation: Causes and Cures," in U.S. Congress Joint Economic Committee, *Stagflation: A Compendium*, 1980. Forthcoming.
14. Dorfman, Nancy S. and Arthur Snow, "Who Will Pay for Pollution Control?" *National Tax Journal*, Vol. 28, No. 1, March 1975, 101-116.
15. Eckstein, Otto and James A. Girola, "Long-term Properties of the Price-Wage Mechanism in the United States, 1891 to 1977," *Review of Economics and Statistics*, Vol. LX, No. 3, August 1978, 323-333.
16. *Economic Report of the President, 1977*, and 1978, Washington, D.C., U.S. Government Printing Office.
17. Eichner, Alfred S., "Post-Keynesian Theory: An Introduction," *Challenge*, Vol. 21, No. 2, May-June 1978, 4-10.
18. Fellner, William, *Towards a Reconstruction of Macroeconomics*, Washington, D.C., American Enterprise Institute, 1976.
19. Fellner, William, et al., *Economic Policy and Inflation in the Sixties*, Washington, D.C., American Enterprise Institute, 1972.
20. Felton, John Richard, "The Costs and Benefits of Motor Truck Regulation," *Quarterly Review of Economics and Business*, Vol. 18, No. 2, Summer 1978, 7-20.
21. Ford, Henry II, "Notable and Quotable," *Wall Street Journal*, 8 April 1977, 12.
22. Friedman, Milton, "Nobel Lecture: Inflation and Unemployment," *Journal of Political Economy*, Vol. 85, No. 3, June 1977, 451-572.
23. Frisch, Helmut, "Inflation Theory 1963-1975: A 'Second Generation' Survey," *Journal of Economic Literature*, Vol. XV, No. 2, December 1977, 1289-1377.
24. Gordon, Robert J., "Can Inflation of the 1970s be Explained?" *Brookings Papers on Economic Activity*, No. 1, 1977, 253-79.
25. Gordon, Robert J., *Macroeconomics*, Boston, Little, Brown & Co., 1978.
26. Gordon, Robert J., "The Demand for and Supply of Inflation," *Journal of Law and Economics*, Vol. 18, No. 3, December 1975, 807-836.
27. Göran-Måler, Karl, "Macroeconomic Aspects of Environmental Policy," in *Economic Analysis of Environmental Problems*, 27-56.
28. Haberler, Gottfried, *Inflation: Its Causes and Cures*, Washington, D.C., American Enterprise Institute, 1966.
29. Hendershott, Patric H. and Kevin E. Villani, "Grant Elements in the Operation of Federally Sponsored Credit Agencies in the Home Mortgage Market," in *Redistribution through the Financial System* (Boulding-Wilton, ed.), 227-243.
30. Hirsch, Fred and John H. Goldthorpe, *The Political Economy of Inflation*, Cambridge, Harvard University Press, 1978.

31. Holt, Charles C., et al., *The Unemployment-Inflation Dilemma: A Manpower Solution*, Washington, D.C., The Urban Institute, 1971.
32. Horvath, Janos, "Institutional Inflation via Misapplied Grants," American Economic Association Annual Convention, New Orleans, 1971.
33. Horvath, Janos, "Rural America and the Grants Economy," *American Journal of Agricultural Economics*, Vol. 53, No. 5, December 1971, 740-747.
34. Horvath, Janos, "Some Measurement Problems in the Interaction of Grants and Exchange Transactions," in ASGE Tenth Anniversary Brochure, 2/9.
35. Hotson, John H., *Stagflation and the Bastard Keynesians*, Waterloo, Ontario, University of Waterloo Press, 1976.
36. Kahn, Alfred E., "Market Power Inflation: A Conceptual Overview," in Gardiner C. Means, *The Roots of Inflation*, 239-272.
37. Kahn, Alfred E., "Notable & Quotable," *Wall Street Journal*, 20 July 1979, 12.
38. Kaldor, Nicholas, "Inflation and Recession in the World Economy," *Economic Journal*, Vol. 86, No. 334, December 1976, 703-714.
39. Katona, George, "Behavioral Economics," *Challenge*, Vol. 21, No. 4, September-October 1978, 14-18.
40. Kenyon, Peter, "Pricing in Post-Keynesian Economics," *Challenge*, Vol. 21, No. 3, July-August 1978, 43-48.
41. Klein, Lawrence R., "The Supply Side," *American Economic Review*, Vol. 68, No. 1, March 1978, 1-7.
42. Klein, Lawrence R., "Keynes and Leontief: Merging the Models," *Challenge*, Vol. 21, No. 1, March-April 1978, 64-65.
43. Krepes, Juanita M., "Tax Policy and the Supply Side," *Challenge*, Vol. 21, No. 5, November-December 1978, 54-55.
44. Lerner, Abba P., "Stagflation—Its Cause and Cure," *Challenge*, Vol. 20, No. 4, September-October 1977, 14-19.
45. Lundberg, Erik, ed., *Inflation Theory and Anti-Inflation Policy*, Boulder, Colorado, Westview Press, 1977.
46. McCracken, Paul W., "The Cosmetic War on Inflation," *Wall Street Journal*, 18 August 1978.
47. Means, Gardiner C., et al., *The Roots of Inflation*, New York, Burt Franklin & Co., 1975.
48. Meiselman, David I. and Arthur B. Laffer, ed., *The Phenomenon of World-wide Inflation*, Washington, D.C., American Enterprise Institute, 1975.
49. Meyer, John R., "Transportation Regulation," *Challenge*, Vol. 19, No. 5, November-December 1976, 44-46.
50. Miller, James C., III, "The Pros and Cons of Trucking Regulation," *American Enterprise Institute Reprint No. 95*, March 1979.
51. Mills, Edwin S., ed., *Economic Analysis of Environmental Problems*, New York, Columbia University Press (NBER), 1975.
52. OECD, *Macroeconomic Evaluation of Environmental Programmes*, Paris, 1978.
53. Okun, Arthur M. and George L. Perry, *Curing Chronic Inflation*, Washington, D.C., Brookings, 1978.
54. Okun, Arthur M., "Stop the Self-Inflicted Wounds," *Challenge*, Vol. 21, No. 1, March-April 1978, 33-34.
55. Pfaff, Martin, ed., *Grants and Exchange*, Amsterdam, North-Holland Publishing Co., 1976.
56. Pfaff, Martin and Anita B. Pfaff, "The Grants Economy as a Regulator of the Exchange Economy," in U.S. Congress Joint Economic Committee, *The Economics of Federal Subsidy Programs, Part 1: General Study Papers*, May 8, 1972, 120-55.
57. Phelps, Edmund S., "Inflation Planning Reconsidered," *Economica*, Vol. 45, No. 178, May 1978, 109-123.
58. Phelps, Edmund S., et. al., *Microeconomic Foundation of Employment and Inflationary Theory*, New York, Norton, 1970.
59. Portney, Paul H., ed., *Current Issues in U.S. Environmental Policy*, Baltimore, Johns Hopkins University Press (RFF), 1978.
60. Posner, Richard A., "Taxation by Regulation," *Bell Journal of Economics and Management Science*, Vol. 2, No. 1, Spring 1971, 22-50.
61. Ruebling, Charlotte E., "Motives Behind Inflationary Monetary Expansion," in *Redistribution Through the Financial System* (Boulding-Wilson, ed.), 59-69.

62. Rutledge, John, *A Monetarist Model of Inflationary Expectations*, Lexington, MA, C. D. Heath Co., 1974.
63. Samuels, Warren J., "Grants and the Theory of Power," *Public Finance Quarterly*, Vol. 3, No. 4, October 1975, 320-345.
64. Santomero, Anthony M. and John J. Seater, "The Inflation-Unemployment Trade-off: A Critique of the Literature," *Journal of Economic Literature*, Vol. XVI, No. 2, June 1978-499-544.
65. Solow, Robert M., "Alternative Approaches to Macroeconomic Theory: A Partial View," Queen's University Institute for Economic Research, Discussion Paper No. 335, 1979.
66. Stigler, George J., "The Theory of Economic Regulation," *Bell Journal of Economics and Management Science*, Vol. 2, No. 1, Spring 1971, 3-21.
67. Tobin, James, "Unemployment and Inflation: The Cruel Dilemma," in A. Phillips and O. E. Williamson, ed., *Prices: Issues in Theory, Practice, and Public Policy*, Philadelphia, University of Pennsylvania Press, 1967, 101-107.
68. Van Tassel, Alfred J., ed., *The Environmental Price of Energy*, Lexington, MA, D. C. Heath and Co., 1975.
69. Vickrey, William S., *Metastatics and Macroeconomics*, New York, Hartcourt, Brace & World, 1974, 278-780.
70. Wachtel, Howard M. and Peter D. Adelsheim, "How Recession Feeds Inflation: Price Markups in a Concentrated Economy," *Challenge*, Vol. 20, No. 4, September-October 1977, 6-13.
71. Wachter, Michael L. and Oliver E. Williamson, "Obligational Markets and the Mechanics of Inflation," *Bell Journal of Economics*, Vol. 9, No. 2, Autumn 1978, 549-571.
72. *Wall Street Journal*, "In Pennsylvania a Man Can Be a Lawbreaker for Selling Milk Cheap," 24 May 1971.
73. *Wall Street Journal*, "Relaxing Regulations," 2 August 1971.
74. *Wall Street Journal*, "Business, Labor Reviews of Carter's Anti-Inflation Proposals are Mixed," 26 October 1978.
75. *Wall Street Journal*, "Many Western Nations Can Spur Growth Without Worsening Inflation, OECD Says," 21 July 1979.
76. *Wall Street Journal*, "Captive Customers: Utility Ownership of Coal Mines, Meant to Assure Fuel, Often Lift Power Cost," 10 May 1979.
77. *Wall Street Journal*, "Relaxing Rules: Federal Agencies Ease, Lift Some Regulations that Burden Business," 4 September 1979.
78. Wallich, Henry C., "Stabilization Goals: Balancing Inflation and Unemployment," *American Economic Review*, Vol. 68, No. 2, May 1978, 159-164.
79. Weidenbaum, Murray L., "A Free Market Approach to Economic Policy," *Challenge*, Vol. 21, No. 1, March-April 1978, 40-41.
80. Weidenbaum, Murray L., *Government-Mandated Price Increases*, Washington, D.C., American Enterprise Institute, 1975.
81. White, Ron D., "The Anatomy of Nonmarket Failure: An Examination of Environmental Policies," *American Economic Review*, Vol. 66, No. 2, May 1976, 454-458.

REGAINING CONTROL OVER AN OPEN-ENDED MONEY SUPPLY

By Albert Gailord Hart*

CONTENTS

	Page
Introduction.....	86
Financial Innovation and Monetary Control in Historical Perspective.....	86
Postwar Innovations and Their Driving Forces.....	87
I. New Forms of Transactions Balances and Their Place in the Monetary Aggregates.....	89
Transactions Balances Versus Money.....	89
Nonreservable Liabilities.....	90
"Overseas" Holdings.....	92
Savings Balances of Local Governments and Business Firms.....	94
Shares of Money-Market Mutual Funds.....	95
TVTBS and the Official Monetary Aggregates.....	95
"Invisible" Transactions Balances.....	98
Credit Availability.....	100
"Open Endedness" in the Large.....	103
II. Policy Permissiveness in the Monetary Muddle.....	104
The ATS Episode.....	104
The RP Issue.....	106
Banking Operations Actually and Purportedly Outside the United States.....	107
The Federal Reserve's Membership Problem and the Erosion of Monetary Control.....	109
III. Agenda for Monetary Reform.....	113
Abating the Overload on Monetary Policy.....	113
Growth Industries and Monetary Policy.....	115
Monetary Constitution Versus Monetary Tactics.....	116
Urgent Need for Retooling.....	118
Reserves Against Transactions Balances.....	118
Inclusion of Missing Items.....	120
Protecting the Dividing Line Between Transaction and Time Accounts.....	120
Initial Sorting Out of Transactions From Other Balances.....	121
Interest on Reserve Balances and on Transactions Balances.....	122
Restoration of Transparency to the Monetary System.....	124
Leadership in Monetary Policy.....	125
Afterword: Monetary Legislation of March 1980.....	126
Appendix. Alternative Measures of Money Stock and Transactions, and Some Preliminary Tests.....	127

*Professor emeritus of economics, Columbia University. In the development of this paper, my deepest debt is to the late Henry C. Simons, who was in my judgment the real prophet of the "Chicago School" in relation to economic policy before its approach was trivialized by neglect of some of his major insights. Stressing the social values of letting market forces guide economic processes, he kept drawing attention to considerations often neglected: (1) that it takes eternal vigilance to maintain a framework that canalizes the market forces, safeguarding against monopolistic tendencies; (2) that the great exception against giving free play to market forces is money, too much "production" is inflationary; and (3) that it is essential to maintain a difference of kind between money and other claims, in the face of market forces which tend to confound the two.

For numerous positive suggestions, guidance in handling quantitative problems, opportunities for discussion, and pruning back of possible exaggerations, I am indebted to my colleagues James Albrecht, Phillip Cagan, Phoebus Dhyrnes, Keith Johnson, Robert Mundell and Lucas Papademos at Columbia, and to a number of members of the Monetary Workshop and of the Finance Seminar at the School of Business. Literary debts, which have largely vanished from the surface of my manuscript during condensation but are nonetheless real, run to John S. Atlee, Gillian Garcia, Stephen Goldfeld, Thomas Mayer, Franco Modigliani, and Marcia Stigum. I have had valuable guidance besides from Peter Bernstein and Gunnar Eliasson, and from staff members of the Joint Economic Committee, the Federal Reserve Board, and the Federal Reserve Bank of New York. None of these helpers, of course, should be held to blame for defects which may have survived their intervention or cropped up since.

INTRODUCTION

This paper is an alarmist report on the state of U.S. monetary policy. It falls into three main sections.

The first section shows how the supply of effective money (transactions balances) has been growing much faster than is indicated by either the traditional or the revised form of the official monetary aggregates, through innovations which have added new types of claims usable to make payments. The second section shows how this process has been fostered by a permissive policy of the Federal Reserve Board—so much so that what has been perceived as an anti-inflationary monetary policy has given strong reinforcement to inflationary forces. The third section sets out an agenda for monetary reform, designed to regain control over a money supply which (as demonstrated in the first two sections) has been allowed to become open-ended.

The responsibility of satisfying myself that my qualitative statements about the monetary situation can be sustained by quantitative analysis has forced me back into laborious data compilations and econometric studies, too technical to fit in this paper. An appendix gives a brief account of the methods and results—(1) explaining the basis of the series on *goods-and-services transactions* and on *total visible transactions balances* which are used in the paper, and (2) showing several sets of econometric equations which I assert demonstrate the need for and usefulness of such compilations, and bear out my contention (with which the official utterances of the Federal Reserve authorities now seem to concur) that the situation can be understood only by treating the new forms of transactions balances as part of the effective money supply.

Financial Innovation and Monetary Control in Historical Perspective

One useful way to see financial history is as a seesaw contest between financial innovators and monetary authorities seeking to curb the inflationary tendencies of innovation. In the United States, an important aspect of the Constitution of 1787 was that it curbed irresponsible issue of bills of credit by the states. Almost immediately, however, note-issuing commercial banks started putting in circulation a new form of paper money. Restrained at first by the policing of the First Bank of the United States, note-issuing banks had a field day during the hiatus until the Second Bank was put in place (coinciding with inflationary government finance of the War of 1812); and when President Jackson blocked renewal of the charter of the Second Bank, there was another inflationary outburst which culminated in the Panic of 1837. Control efforts at the state level were effective in some places between then and the Civil War, while elsewhere wildcat banking was a major problem.

Note-issuing banking was brought under control by the National Banking Act of 1863, which effectively stopped issues by state banks and set a ceiling to issues by National Banks. Banks responded by developing checking accounts into the major form of effective money. Reserve requirements were imposed upon National Banks, but there were no effective controls upon trust companies and other check-banking institutions under state charter, which presently began to

outgrow the regulated sector. The famous panics of 1873, 1893 and 1907 were related to the instability of the uncontrolled segment of the monetary system.

Reintroduction of central banking under the Federal Reserve Act of 1913 extended the domain of control to those state-chartered institutions which elected to become state member banks, and the services provided made it worthwhile for the major state institutions to accept membership. After the banking crisis of 1931-33 (which may be viewed as a slow-motion version of the old-fashioned financial panic, with effects all the more devastating because it was so long drawn out), the banking system was reshaped to a considerable extent by legislation of 1933-35, which included the introduction of Federal Deposit Insurance, interest ceilings on bank liabilities, and the prohibition of interest payments on demand deposits. These interest restraints were explicitly for the purpose of making banks more profitable, in hopes they would replenish their depleted capital. The opportunity to extend the domain of control by making Federal Reserve membership a condition of deposit insurance was rejected. Bank *supervision* was extended more widely, but the system of reserve requirements under the Federal Reserve Act remained inapplicable to insured nonmember banks.

Postwar Innovations and Their Driving Forces

Despite the gaps referred to above, and despite mismanagement, the United States had between the two world wars a system under which the Federal Reserve System possessed the power to determine the size of the money-stock ($M-1$: the sum of currency outside banks plus demand deposits owned by members of the non-bank public). But after World War II a series of financial innovations led to the growth of a large new uncontrolled monetary sector.

Perhaps the most fundamental innovation was a change in the orientation of bankers toward their assets and liabilities. Traditionally, banks developed their business by attracting a clientele of customers, some who held their funds as deposits at the bank, while others generated earning assets for the bank by taking out loans. If a bank was successful in attracting deposits, it placed in bonds the funds for which it had no outlet in loans. During the 1930's, banks found themselves very short of "sound" loan applications: business firms which had high "credit worthiness" either had more cash resources than they needed, were leery of getting into debt, or both; while the firms that urgently wanted loans seemed to have poor business prospects. On the whole, banks adjusted by holding the bulk of their assets in securities, for which they competed so vigorously in presence of an excess of reserves over requirements that the yields on such securities as U.S. Treasury bills fell almost to zero. A few energetic bankers, however, found ways to develop new bankable loans. Notably, they took amortized mortgages, entered the business of lending to consumers, and developed term loans to business to be amortized over several years, to supplement the traditional 6-to-90-day loans that called for lump repayments. With the strong revival of business demand for loans after World War II, these practices were extended, and many banks found themselves in a position to lend much more than they could attract by the traditional building up of clientele.

In these circumstances, there developed an art of "liability management," designed to draw in funds from outside the regular clientele. This development took two main forms: (1) The sale of large negotiable certificates of deposit; and (2) Use of the Federal Funds market to draw in funds from banks whose loan opportunities were less glowing.

In themselves, these developments were not additions to the stock of money, though they must have enabled important holders of cash to reduce their money holdings somewhat. The negotiable certificate of deposit was authorized by Federal Reserve regulations only with an initial maturity of 30 days or more, and issuing banks were debarred from redeeming such certificates ahead of maturity. Thus the certificates were in the first instance money-market securities comparable to Treasury bills or to open-market commercial paper, rather than direct substitutes for money. As for the Federal funds market, it developed as in interbank market. The depositors in banks with excess funds were in exactly the same position as if their banks had invested in bonds.¹ But the banking system as a whole came to hold more loans and fewer bonds than if the banks with the best lending opportunities had to rely on passive receipt of deposits from customers.

The counterpart of the banker's art of liability management is the bank customer's art of asset management. Nonbank financial organizations, nonfinancial corporations, state and local governments and even wealthy individuals have developed a corps of cash-management specialists, who strive to find effective combinations of high liquidity and high interest return on assets held. The legal ban upon interest payments on demand deposits has been from this standpoint a challenge: these managers seek arrangements under which they can collect interest while simultaneously enjoying the advantages of having funds instantly available. The money-creating forms of bank liability management to be examined in a moment result from the efforts of bankers to accommodate this demand for eating-the-cake-and-having-it-too. True, the bankers who do this create a situation where banks (and also nonbank financial institutions) incur heavier and heavier interest costs, losing the advantage of interest ceilings for their net earnings. But this adverse effect applies to banking (or financial-institution management) as a whole. For each individual bank, the question is one of attracting funds whose alert managers would otherwise find it preferable to place them elsewhere. Particularly where the privilege of getting interest on such funds can be restricted to the most alert managers (with the less alert getting less advantageous treatment), the individual bank gains competitively by offering such facilities. And

¹ In some ways, the situation came to be like that in countries with nationwide branch-banking systems, where as a matter of course some branches have more loans than deposits while other branches have more deposits than loans. Transfer of resources through the Federal funds market abates the tendency of the traditional U.S. unit-banking system (with its inhibitions on interstate operations) to hold down loans at offices where deposits are not large.

The Federal funds market is still sometimes described as a mechanism by which 'excess reserves' are recycled to banks which would otherwise have a reserve deficit. Such recycling may have been the main feature of the market in its earliest days—but not recently. In late 1979, for example, there were well over \$100 of Federal-funds obligations outstanding for every dollar of excess reserves in the system.

advertising by competing institutions keeps extending the roster of "alert" managers to smaller firms and government bodies, and to less-than-plutocratic individuals.

I. NEW FORMS OF TRANSACTIONS BALANCES AND THEIR PLACE IN THE MONETARY AGGREGATES

In recent years, there has been a rapid development of innovations which create new forms of effective money. The example most widely known to the public (though so far not one of the most important) is the savings account on which the bank contracts to provide automatic transfer services. The depositor has at his bank a checking account (demand deposit) and also a peculiar type of savings account.² Whenever a check comes into the bank for payment which otherwise would constitute an overdraft (or would draw the checking balance below an agreed minimum), the bank makes an appropriate transfer out of the savings account into the checking account. The bookkeeping takes the form of a monthly statement just like that on a regular checking account except for a few minor technicalities, in place of the traditional passbook entries.

When a depositor has such a contract with his bank, the funds in the savings account are just as fully available to cover payments he wishes to make as are funds in the checking account. His available transactions balance thus includes both accounts, and there is no monetary distinction to be drawn between them. As will appear shortly, there are many other forms in which transactions balances may be held and which are not included in traditional measures of money.

Transactions Balances Versus Money

The term "transactions balance" is used in this paper in contexts where one might say "money", for two main reasons:

(1) The alternative would be to redefine the term "money", but to use a familiar term with a different coverage from what people are used to risks misunderstandings. The unfamiliar term reminds the reader (and the writer) to break out of habits that may get in the way of understanding the actual situation.

(2) The expressions "transactions balance" and "transactions account" are coming to be terms of art in relation to monetary legislation. Their meaning is closely related to criteria as to what should be the basis of reserve requirements set up as instruments of monetary control.

A good working definition of the term "transaction account" was incorporated by legislative draftsmen in a 1978 bill (S3485) aimed to handle the problem of reserve requirements:

² An alternative (authorized for banks in New York State by a special regulation) is to have a single account denominated a commercial-bank NOW (negotiable-order-of-withdrawal) account. Such an account pays interest at some such rate as 5 percent and otherwise is handled just like a regular checking account, though with higher minimum-balance requirements. Legislation of March 1980 extended the availability of NOW accounts at commercial banks to all states.

... an account or deposit is a transaction account where such account or deposit may be used to provide funds directly or indirectly for the purpose of making payments to third parties or others.³

A transactions balance is the amount available in a transaction account.

Under this definition, the items of currency (coin and paper money outside banks) and demand (checking) deposits which have traditionally composed the monetary aggregate M-1 are elements also in any total of transactions balances.⁴ In addition, there are a number of other items which must be described.

For analytical purposes, I have built up a new aggregate which I call "Total Visible Transactions Balances" (TVTB). In addition to the totals included in the new Federal Reserve aggregate M-1B, the following items are added TVTB:

- (1) Nonreservable liabilities of commercial banks, in the form of so-called repurchase agreements and Federal funds liabilities to nonbankers.
- (2) Liabilities to residents of the United States (other than parent bank) of branches of U.S. banks purporting to be located in the Bahamas and Cayman Islands.
- (3) Savings balances of state and local governments, and of business firms, at commercial banks.
- (4) Shares outstanding at money-market mutual funds.

I make no claim that TVTB constitutes an ideal measurement of transactions balances. But I do assert that in face of the numerous gaps in the data which the Federal Reserve has unfortunately tolerated, TVTB is a respectable approximation and a marked improvement on the official aggregates. As will be shown in a moment, TVTB climbs much faster than the M-1B aggregated through most of the 1970's, and of the expansion in TVTB during the 1970's, well toward half must be accounted for outside M-1B.

Nonreservable Liabilities

The most important of the elements outside M-1B which enter TVTB is an item of which the general public has heard only vaguely

³ S. 3485, Sec. 3. This language comes from a provision authorizing the Board of Governors of the Federal Reserve System to "determine, by regulation or order" that proposed reserve requirements etc. apply to a particular account. In the formal section on definitions (Sec. 2), S. 3485 states that:

"The term "transaction account" means a deposit or account on which the depository or account holder is allowed to make withdrawals by negotiable or transferrable instrument or other similar item for the purpose of making payments to third persons or others. Such term includes demand deposit, negotiable order of withdrawal, and share draft accounts."

It is evident that a legislative definition gains usefulness if it is supplemented by a list of items included (preferably labeled "such as"), and backed by provisions (like those of Sec. 3) to cover relevant items which may have been omitted from the original list or may have come into being by innovations since the law was revised. The expression "to provide funds *directly or indirectly*" in Sec. 3 is functional. In its absence, the definition might be read to exclude the savings component of an ATS (automatic-transfer-service) account.

⁴ A Federal Reserve announcement of February 7, 1980, makes it official that a revision of the aggregates which has been under official consideration for some time is going into force. In the course of this revision, one or two items which should never have been there in the first place have been expunged from M-1. The new aggregate M-1A is old M-1 less checking accounts held by foreign banks and official institutions.

The new aggregate M-1B consists of M-1A plus a collection of other checking accounts, which are small relative to M-1A but have grown rather fast in recent years. These include ATS accounts (and the equivalent commercial-bank NOW accounts), NOW accounts at savings banks, and corresponding accounts at savings and loan associations and credit unions.

In the econometric work reported in the appendix, I have represented M-1 by the interim-availability series "M-1" with approximately the coverage of M-1B.

(though it is familiar enough to corporate cash managers)—what the Federal Reserve authorities described (in releasing the new monetary aggregates in February 1980) as “large overnight desposits by corporations known as repurchase agreements.” The discrepancy between form and substance in these operations is so enormous that a somewhat extended explanation is needed.⁵

The mechanics of the RP operation are set up to combine speed and lack of fuss with a great deal of safety for both parties to the transaction. Suppose that in the latter part of the morning a corporate cash manager can see that the balance in his company's checking account will cover all checks likely to come in that day, with several million dollars left over. He can then telephone his bank and ask it to place the \$5 or \$10 million of excess in RP's. As of the bank's close of business, this number of millions disappears from the company's account. In its place, the company gets a piece of paper attesting that the bank has sold the company a corresponding amount of some specified issue of U.S. Government securities, which are to be sold back to the bank the next day. This does not mean that messenger boys are running back and forth between the bank and the company with packets of Treasury bills: on the contrary, the securities in question probably have existence only as book entries at the Federal Reserve Bank. Furthermore, the bank's balance sheet continues to show the securities among the bank's assets: the change in the bank's books consists of the reduction of demand deposits by five million and the setting up of a \$5-million liability under the heading “securities sold under agreements to repurchase”. This liability is simply the form which the corporation's cash holdings takes overnight. Tomorrow the transaction will be reversed; and the funds will be just as fully available to meet checks that come in for payment tomorrow as if they had remained in the demand-deposit form. But the customer is able to collect $\frac{1}{360}$ th of a year's interest, whereas on a demand deposit no interest would be paid. Furthermore, the customer is protected by government-security collateral on a sum too large to be covered by Federal Deposit Insurance. The bank escapes having to hold reserves (figured as of the close of business, and for most banks involved at over 16 percent of the deposit) and escapes the FDIC insurance premium. True, the bank would be better off if it could hold the same funds at zero interest; but if the bank selling the RP balked, some other bank would step in, and besides, the bank might not be able to hold the interest-bearing securities in question.⁶

⁵ A useful technical explanation is presented in Marcia Stigum, *The Money Market*, Homewood, Illinois: Dow-Jones/Irwin, 1978, pp. 312 ff. She begins as follows: “To people who come upon repos (short for repurchase agreements, also tagged RP's) for the first time, they are the most confusing of all money market transactions. . . . In any repo . . . transaction, there is first a sale of securities and subsequently a repurchase. The essence of the transaction, however, is most typically that the buyer of the securities is making a secured loan to the seller—the securities sold serving in effect as collateral for that loan.”

⁶ It is the bank which pockets the interest paid by the government on the securities; the customer gets interest at the RP rate, which is lower. A bank which balked at selling RP's would be forgoing one type of opportunity to buy money, and one valid way to look at RP's is as a way to finance government-security holdings.

Incidentally, the customer whose funds are put into RP's is not necessarily lending to his own bank. The amount of RP's a bank wants to sell on a particular day is pretty well determined by the size of its portfolio of governments. The amount the same bank's customers will want to buy depends on the vagaries of each customer's impayments and outpayments. While the aggregate for all a bank's large corporate customers will be less unstable than the individual accounts, it will still show random bounce. But banks can readily communicate and offset their excesses and shortfalls. Broadly, the RP market seems rather close to the pure-competition model, in the sense that both buyers and sellers will find they can execute their chosen volume of dealings at the open-market price.

Repurchase agreements are held not only by corporations, but also by state and local governments. Nonbank financial institutions are also prominent among RP-holders. Fairly substantial amounts of RP's are issued to nonfinancial holders by nonbank dealers in government securities, who (like bankers) use them to finance an inventory of government securities.⁷

Nonreservable liabilities in the form of Federal funds held by non-bankers are on an appreciably different footing. Available data run in terms of transactions rather than of outstandings; and while the great bulk of transactions are in overnight funds or renewals of continuing contracts which may be cashed any day, the contribution to outstandings of longer contracts is appreciable. A study of the transactions for a week in December 1977⁸ suggests that nonbank holders of Federal-funds claims held at that time some \$10 billion. These holdings are not fully comparable to the balances of "individuals, partnerships and corporations" (a term which for some reason also includes state and local governments) at which M-1 statistics aim. Corporations and municipalities are not admitted as transactors on the Federal-funds market, and the nonbank transactors are still financial institutions—securities dealers, savings and loan associations, and savings banks for the most part. Their Federal-funds holdings—and also their substantial holdings of RP's—constitute their equivalent of the reserves held by banks against their liabilities. To include these Federal-funds holdings in TVTB is to be seen as indirect representation of the moneyness of accumulated savings held with these institutions.

"Overseas" Holdings

In today's richly interlinked world economy, a major part of corporate cash balances (which constitute the lion's share of M-1 as well as of RP's and the like) is held by companies which have widely dispersed operations. Multinational companies have daily receipts and disbursements in a number of currencies, and may have important sums in Deutschmarks, French and Swiss francs, sterling, etc. Unless we are to take the world as a unit for monetary studies (which is difficult in terms of measurement with the recent gyrations of exchange rates, and hard to relate to the problems of national policymaking centers), we seem to have to disregard funds held by U.S. firms in foreign currencies—or to assume some rough offset between these holdings and the holdings in the United States of foreign-based firms.

To a large extent, however, monetary holdings and banking transactions outside the United States are denominated in dollars, and Euro-dollar operations cannot properly be disregarded in studying the mone-

⁷ I considered including dealer-issued RP's in my TVTB aggregate, since from the standpoint of the holder they have much in common with bank-issued RP's. But I decided against this inclusion on two grounds:

(1) At the time when the statistical series for dealer-RP's starts (1968), their outstandings were already substantial, and it appears that dealers had been issuing them long before banks. Hence to include them entails a discontinuity in the series of TVTB's—not great enough to distort the level, but enough to distort rates of growth of TVTB's appreciably.

(2) The fact that repurchase by dealers does not automatically put funds directly into the holder's checking account seems to reduce the moneyness of these holdings somewhat below that of bank-issued RP's.

These arguments would not seem altogether conclusive, and the difficulty illustrates that there is no way to be entirely correct in such a compilation.

⁸ Reported in *Federal Reserve Bulletin*, May 1978.

tary position of U.S.-based companies and individuals.⁹ I represent these operations in my compilation of TVTB by including the claims of U.S. holders (other than the parent bank) on U.S. bank branches purportedly operating in the Bahamas and in the Cayman Islands.

In actuality, the operations of these branches do not take place in these offshore islands. As is explained by the international-finance expert on the Federal Reserve Board, "... the Bahamas and Cayman Islands are booking centers for financial transactions that have been negotiated elsewhere. Virtually all of the branches of U.S. banks in these centers are consequently 'shell' branches—that is to say, they are a set of ledgers managed and kept by an agent rather than a physical location where business is transacted."¹⁰ The actual decisionmakers of the banks and of the companies with which they deal are apparently with rare exceptions working in the continental United States. Supposedly these branches restrict their activity to international as against domestic transactions. But since the multinational companies which are their principal clients have large operations both within and outside the United States, they can readily shift their borrowing operations and their holdings of liquid resources from one category to the other. The mushroom growth of total liabilities attributed to these branches (from \$9.0 billion at the end of 1970 to \$91.1 billion at the end of 1978) has to be compared with a rise of 145 percent in domestic liabilities and of about 400 percent in liabilities of other foreign branches. Hence the reported growth of Bahamas/Caymans operations can scarcely represent the growth of actual international operations. Rather, it must refer to what it is convenient to categorize as international. It is a reasonable inference that virtually all the Bahamas/Cayman activities record transactions which a few years ago would have been reported as U.S. domestic operations.¹¹

Information published about these operations is scanty compared with that on domestic banking: for example, deposits are not separated from other liabilities, let alone classified. It seems that demand deposits are rather rare among the Bahamas/Caymans liabilities. But according to bank sources, time deposits of short maturities are typical, and longer term time deposits can be redeemed ahead of schedule with little loss of income. I have elected to represent the transactions-balance

⁹ Marcia Stigum's discussion of Eurodollars (*The Money Market*, pp. 101-105) states that in Eurodollar operations "the dollars never leave New York." The sense in which this is true is somewhat peculiar. Suppose a banker persuades a customer to handle part of his funds as a London Eurodollar holding instead of a New York account, and to do a corresponding part of his borrowing at the London office. The customer will be in touch with the London branch in handling these funds—though readily able to use them as he would otherwise have used New York funds. What never leaves New York are the *bank reserves* the banker would otherwise have held at the New York Fed. Since the transfer eliminates the required reserve on the funds now attributed to London, the bank has acquired excess reserves and in consequence can lend and create new U.S. funds. These funds and the London funds will coexist.

¹⁰ Statement by Henry C. Wallich, Member, Board of Governors of the Federal Reserve System, before the Subcommittee on Oversight of the Committee on Ways and Means, U.S. House of Representatives, April 25, 1979.

¹¹ The somewhat euphemistic description of these activities in Dr. Wallich's statement quoted above is illuminating:

"... As business has become more and more internationalized, needs for international financial services have expanded and become more diverse. Companies operating in a variety of countries have required funding sources in different currencies, outlets for temporarily idle funds, access to different kinds of credit facilities, and the means for transfer of monies across international frontiers. Tax laws and foreign exchange restrictions are, of course, among the crucial factors influencing the way international business is transacted. . . .

"... For many bank customers, these locations [the Bahamas/Caymans] provide advantages as tax havens, while for other secrecy laws are important in their decisions to place funds. . . ."

equivalence of these operations by entering the total liabilities of Bahamas/Caymans branches to U.S. residents other than the parent bank. The figure used is over inclusive in that some fraction may represent funds tied up for so long that they are not effectively available for transactions use; and, in that, the total includes some liabilities to "other banks [than parent] in United States", for which we have no separate figures before 1978. On the other hand, the "nonbank foreigners" who seem to hold roughly half as much as U.S. nonbanks, probably consist in good part of subsidiaries of U.S. companies which purport to be foreign though in fact their operations are closely coordinated with those of the parent companies.

There must also be substantial amounts of U.S. transactions balances hidden among the Eurodollar liabilities of non-U.S. banks, and of authentic operating branches of U.S. banks located in London and other foreign centers. Dr. Wallich in another recent statement remarks, in connection with the inflation process of the industrial world as a whole, that "the Eurocurrency market adds to inflationary pressures because liabilities to non-banks in this market are rising faster than domestic money supplies." In relation specifically to the United States, he indicates that "with higher interest rates generally, *demand deposits* [my italics] tend to be attracted from the U.S. banking system to the Eurodollar market, since such deposits cannot, by law, earn interest in the United States," and that "there is a somewhat paradoxical tendency for the growth of the [Eurocurrency] market to accelerate relative to the domestic [U.S.] market when monetary policy becomes more restrictive and interest rates rise."¹² Any overinclusiveness of the Bahamas/Caymans claims as a measure of effective U.S. money supply disguised as Eurocurrency must be much more than offset by elements of such money supply at other branches and at non-U.S. banks. To use the Bahamas/Caymans claims as a proxy, therefore, cannot overstate the level of total transactions balances, though we cannot be sure it does not slightly distort the time shape.¹³

Savings Balances of Local Governments and Business Firms

Traditionally, the holding of savings accounts has been a facility for households accumulating funds for long-term purposes; banks and savings institutions have been barred from setting up such accounts except for households and non-profit institutions. But changes in 1974 and 1975 in Federal Reserve regulations have enabled commercial banks to accept savings deposits from state and local governments and from "partnerships and corporations operated for profit"; in early 1979, these groups held \$4.0 and \$10.5 billion respectively of such balances. These funds, which in practice are available on demand (and which can presumably be switched into checking accounts by telephone order), are apparently less active than checking accounts, but considerably more active than other savings (except ATS). Their presence places holders in a position to rely on them for contingencies,

¹² Statement by Henry C. Wallich, Board of Governors of the Federal Reserve System, before the Subcommittee on Domestic Monetary Policy and the Subcommittee on International Trade, Investment and Monetary Policy of the Committee on Banking, Finance and Urban Affairs, July 12, 1979.

¹³ The likelihood of distortion is reduced by the fact that the Bahamas/Caymans claims are a large fraction of the total. In early 1979, the report on "Foreign Branches of U.S. Banks" in the *Federal Reserve Bulletin* (table 3.13) showed as "total, all currencies" for all branches outside U.S. in liabilities "To United States, nonbanks" of \$21.0 billion, of which \$16.0 billion was at Bahamas/Caymans branches.

while drawing interest on funds which otherwise would be in non-interest-bearing demand deposits. This arrangement would not seem advantageous for large businesses and municipalities, which can do better by holding RP's. But it provides a "poor man's RP equivalent" for smaller organizations.

Shares of Money-Market Mutual Funds

Another mushroom development of recent years has been the growth of Money-Market Mutual Funds (MMMF's) organized along much the same lines as funds previously organized to hold equity securities, municipal bonds, etc. The MMMF's advertise that they can offer instant availability of funds (by telephone order, or if the customer wishes by check), together with rates of return close to those on such money-market assets as Treasury bills. Their clientele presumably consists of customers who are interested in active cash management but whose scale of operations is too modest to bring them onto the RP market (where dealings are in blocks of several million dollars) or even onto the market for such liquid assets as negotiable bank certificates of deposit (in units of \$100,000). The MMMF's may be described as being in the business of "monetizing" liquid assets of the character just mentioned. Such assets constitute the bulk of their total assets; and their interest earnings (less a management fee) are passed through to the holders of shares, which for practical purposes are interest-bearing transactions balances.¹⁴

TVTB and the Official Monetary Aggregates

Taking account of transactions balances other than currency and demand deposits, the official aggregates published by the Federal Reserve have been and continue to be deficient. It is only in 1980, with the establishment of aggregate-series M-1B, that other checking accounts (ATS and NOW) need inclusion as transactions balances. And series M-1B continues to exclude the more important elements of RP's, Federal-funds holdings, Eurodollar holdings, municipal and corporate savings accounts, and MMMF's.

True, there are official aggregates broader than M-1B. Many economists have tried to characterize the monetary situation by watching the series called M-2; and the Federal Reserve Board, under legislative directives, has used M-2 as well as M-1 in the setting of policy targets. But conventional M-2 has omitted such elements as RP's and MMMF's altogether. This omission is being rectified in the new M-2 series, which is announced as an aggregate that "will encompass M-1B as well as most kinds of savings deposits, including money market mutual funds and large overnight deposits by corporations known as repurchase agreements."¹⁵ Just how MMMF's and RP's fit into the

¹⁴ Most of the fairly comprehensive information available on MMMF's we owe to the diligence of a private compiler—*Donoghue's Money Fund Report*. The MMMF may be seen as a quasi-bank, with the peculiarity that the depositor (share-holder) is protected neither by deposit insurance nor by a cushion of capital funds. On the other hand, the MMMF holds virtually no assets on which there might be a capital loss or a payments-freeze in case of rapid withdrawals requiring liquidation: it has no long-term bonds, mortgages or business loans requiring management. Imagining some sort of crisis in this business, about the worst that could happen to the share-holder would be that he might have to choose between losing some weeks of income (if for example CD's must be sold on a tight market with CD-interest considerably higher than when the MMMF had purchased the CD's a few days or weeks earlier) or accepting a delay of redemption till the interest had been realized by the Fund.

¹⁵ New York Times, Washington dispatch dated Feb. 7, 1980.

concept of savings deposits is hard to understand. In any event, the improvement scored by substituting the new for the old M-2 is limited when we take account that the difference between M-1 and M-2 on either the new or the old system consists primarily of authentic long-term accumulations belonging to households; the transactions-balance component of the difference is a relatively minor though rapidly growing element, whose time shape is not at all like that of the total excess of M-2 over M-1.¹⁶

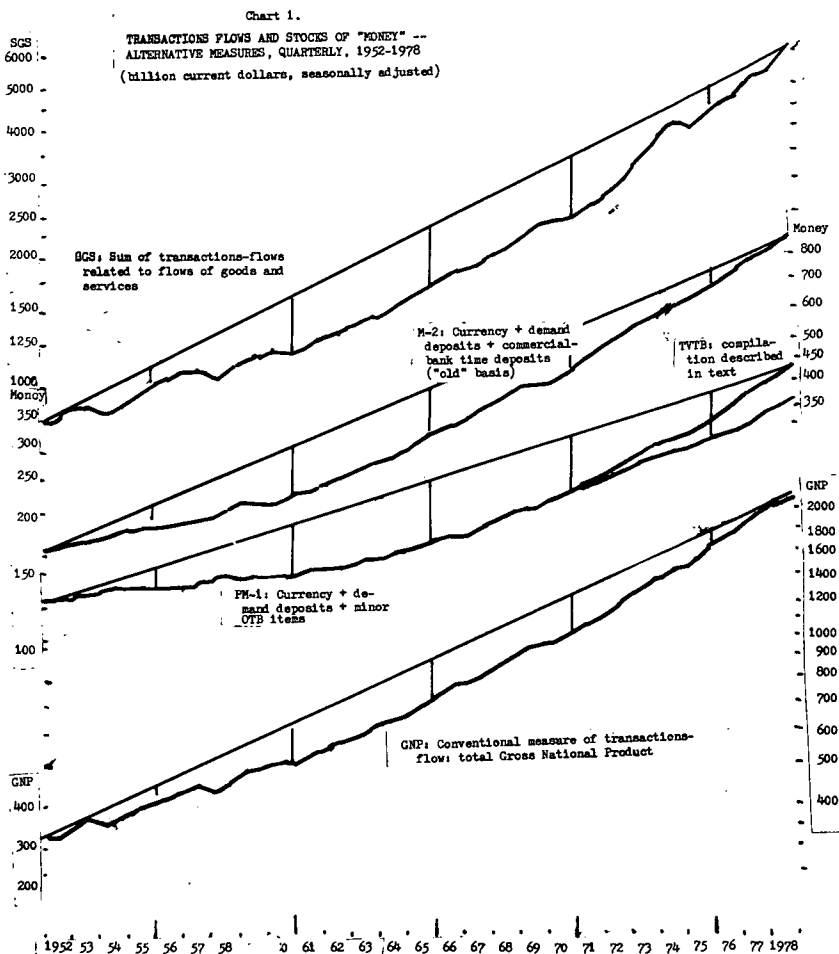
In these circumstances, if a meaningful estimate of the course of "money" in the sense of transactions balances can be formulated, it must be a different type of compilation; of the sort represented by my series of TVTB. Taking M1-B as a starting point, we must obtain estimates of the course of the other significant elements of TVTB and add them in. There is no way to tell *a priori* whether such a compilation will be meaningful; for there may be important invisible elements of transactions balances, and because of data limitations our estimates of some components may be low grade. But those interested in monetary policy had better hope that a meaningful compilation can be had, because estimates of the effect of monetary-policy actions can be made only by analyzing the record of the past. For reasons just given, neither M-1 nor M-2 (either in the traditional version or as recompiled in 1980) offers a respectable measure of the course of transactions balances during the 1970's, so that any prospect of a useful set of uniformities in the relations between money and other economic variables depends on the validity of TVTB (or of course of some alternative compilation which strives to include all transactions-balance components and excludes non-transactions components).

To maximize the reliability of a set of monetary uniformities calls for extensive econometric work (of which some preliminary stages are reported in the appendix to this paper). Unfortunately, it turns out that not only the course of transactions balances but also the course of the relevant flows of transactions is misrepresented by the conventional data series, so that the extensive literature of monetary econometrics will not help much to establish what has happened since (say) 1970. But a preliminary impression of the situation may be formed from chart 1 which compares two measures of transaction flows and three measures of money stocks, all in billions of current dollars on a semi-logarithmic scale where equal slopes of the curves register equal percentages rates of growth. For transactions flows, the bottom curve on the chart shows the course of gross national product (the conventional flow measure used in monetary econometrics), while the top curve shows the course of a new compilation which I call "Sum of Goods and Services transactions" (SGS).¹⁷ The second curve from the top traces

¹⁶ *Analogue.* Suppose you have the job of tracing the human population of New York City over time, and the data you are supplied trace the course of the mammalian population of each of the five boroughs. You are given the supplementary information that the only mammals in Manhattan have been humans, but that the mammalian population of the other four boroughs has included a large and growing number of cats and dogs, rats and mice. From these data, your task is hopeless. But a few scraps of information about the history of the human minority of the mammalian population in Brooklyn, Queens, the Bronx and Richmond might enable you to turn out estimates with at least some limited value.

¹⁷ This compilation yields a total which is much more gross than GNP, because, *inter alia*, it includes flows of intermediate products and materials (where GNP shows only final products); because it includes *both* the receipt and the expenditure of personal income; and because it includes the *sum* of exports and imports (rather than the *difference*, which enters GNP). My object is to use data for sales of manufacturing and trade, gross revenues of utilities and transport, and the like to arrive at a total which approximates the volume of goods-and-services-related payments that call for payment by check or equivalent.

the course of the traditional M-2 aggregate, and the second from the bottom the course of Proposed M-1 (essentially the same as the new Federal Reserve aggregate M-1B). The curve for TVTB is shown as an upward branching (which begins to diverge appreciably in the early 1970's and gains rather substantially and rapidly on PM-1 thereafter) from the PM-1 curve. To guide the eye, I have shown secants from 1952 to 1978 observations on each curve.



It leaps to the eye that each of the curves shows an upward concavity over the timespan 1952-78—expanding more rapidly in the later than in the earlier years. In the transactions curves, this acceleration represents partly a breakout from the comparative stagnation of the U.S. economy from 1957 to 1962, and partly the acceleration of inflationary price rises beginning in the later 1960's. But whereas the GNP curve rises at much the same percentage rate in the 1960's and 1970's,

the SGS curve rises much faster in the 1970's. This fact, which is clearly relevant to the public's demand for transactions balances, registers a major change in the structure of prices in the United States and worldwide—namely, the rise in prices of primary products (and hence of intermediate products) relative to final products. The sharp bulge of SGS which culminates in 1974 also reflects this price change.

If we adopt a monetarist view, we should expect the major swings of transactions flows (and also at least some of the smaller movements) to correspond to simultaneous or earlier changes in the course of transactions-balance stocks. From this standpoint, both the PM-1 curve and the M-2 curve are unconvincing—failing to match the acceleration of the SGS curve between the 1960's and the 1970's. On the other hand, the TVTB curve does show an appropriate acceleration here, and also a slowdown that seems to approximately correspond to the setback of SGS in the mid-1970's. It will be evident that the monetary situation is too complex for any simple chart-book analysis like this to be conclusive. But the more rigorous econometric work reported in the appendix indicates that the implications suggested by chart 1 stand up rather well when the relationships are more completely specified.¹⁸

"Invisible" Transactions Balances

Once it is recognized that there are transactions balances other than currency and demand deposits, we must face the fact that there may be appreciable amounts in forms that do not lend themselves to measurement. Visibility hinges on whether the Federal Reserve or some other compiler of data happens to have provided us with usable records. In the case of security-dealers' RP's, mentioned above, I have left a gap because they became statistically visible long after they became of some importance. And so far as Federal Reserve activity goes, MMF's might have been invisible; they can be taken into TVTB because a private service provided data.

An interesting example of the invisible in the banking field is the development of overdraft facilities for households with checking accounts, under such labels as privilege checking. Traditionally, the U.S. banking system has operated with a taboo on overdrafts, and a depositor whose check was presented when he had insufficient funds was subjected to considerable inconvenience and embarrassment. But in recent years many banks have offered no-bounce contracts, under which a check which would otherwise constitute an overdraft is treated as an application for a loan that will *automatically* be granted as long as the overdraft stays within an agreed limit. If a customer persistently uses this privilege, he is as likely to be asked to raise the limit as to be warned that he is out of line. For the banker, this is good business: he collects interest at a good rate, and the default rate is low. For the customer, this is an attractive form of credit: though the interest rate may be rather high, he pays only on the amount actually used. And even if the customer is averse to carrying an overdraft month

¹⁸ The public's demand for transactions balances should according to monetary theory and previous econometric work be responsive not only to the volume of transactions to be handled but also to the costs of holding money represented by interest rates, and/or the costs of inflationary erosion of the purchasing power of a stated number of dollars.

My experiments indicate that incorporating these elements of cost in the model does not upset the preliminary view one forms from the chart. It remains true that TVTB fits well with SGS, and that PM-1 and M-2 fit much less well.

after month, the fact that he is free from unpleasant consequences if he overdraws makes it safe to work to a zero balance at his monthly low point, not holding a margin for such purposes as meeting an emergency, buying an unexpected bargain, or holding out if some expected item of receipts does not arrive on schedule. Hence having such a contract is equivalent in terms of the balance required to handle transactions to several hundred additional dollars in his checking account. No evidence on the scale of use of such overdraft facilities has fallen into my statistical net; but it seems likely that in aggregate they are equivalent to several billion dollars of actual demand deposits.¹⁹

Another form of invisible transactions balance is the savings deposit which can be instantaneously transferred into a checking account by telephoned instructions. Such transfers have been recognized by the Federal Reserve as legitimate since a change of regulations in 1975, and may well have been feasible for many customers before then. Not very different in substance (except that one must leave the house to make arrangements) is a transfer made by putting a card into a bank's cash machine and punching in a few symbols. Such an arrangement comes almost as close to providing an interest-bearing checking account as does ATS. To get the full advantage, a customer with such an account can route his paychecks and other receipts into his savings account, and nourish his demand-deposit account only by transfers out of savings. The only difference from ATS is that if the transfer is not automatic, the customer must keep closer track of his checking-account balance. Even this minor inconvenience is avoided if the checking account has a "no-bounce" feature. Unfortunately, lack of data makes it a matter of guesswork what is the aggregate amount held in savings accounts subject to such transfers, and what proportion of that aggregate serves instead of demand-deposit balances that would otherwise be held. From fragmentary evidence, I suggest that the aggregate amount in such savings accounts is of the order of $\$(35 \pm 15)$ billion, and its demand-deposit equivalent of the order of $\$(15 \pm 10)$ billion.²⁰

The two arrangements just discussed seem to be the two main forms of invisible transactions balances held by households. On the business side, banks have considerable willingness to tolerate overdrafts (which bankers tell me are often dealt with for large customers

¹⁹ If banks had been required to report the aggregate of unused lines of credit under privilege checking the outcome might have been a substantial overestimate of their demand-deposit equivalence—for there is no fee for having an overdraft privilege, and it seems that many customers casually set the limit far above any amount they think they might actually use.

²⁰ If the reserve-requirement system were amended to subject such balances to transaction-balance requirements (as I recommend below), the system would (1) give bankers and their customers an incentive to sort out actual working balances from long-term savings accumulations and (2) generate operating statistics which would inform the Federal Reserve and the public about these holdings.

It is not quite out of the question that an historical series could be constructed by persuading banks to analyze their records of a sample of savings accounts and classify them. Two classification tracers suggest themselves. (1) Since the transfers in question must be made without presentation of the passbook at the counter, it seems likely that the amount of savings deposits held in accounts that use *monthly statements instead of passbook entries* may be a good proxy for the amount subject to transfer by telephone or cash-machine entry. And (2) Since taking advantage of such transfer arrangements entails bringing funds into the bank through the savings rather than through the checking account, one might get a good proxy by finding out how much was held in accounts where the savings account did and the depositor's checking account did not show regular deposit of paychecks and the like. Either of these procedures would yield an overestimate of actual demand-deposit equivalence, since it would not avoid counting authentic long-term accumulations in the savings account. This overestimate could be reduced though not eliminated by excluding from the deposit aggregate any excess of the savings balance over (say) two months' checks drawn on the checking account.

simply by charging overnight interest at the prime rate). Furthermore, a recently established series of Federal Reserve statistics indicates that unused facilities under *contractual lines of credit* are well over \$100 billion. These contracts put a business customer in a position where if he wants to draw more than there is in his account, he must notify his banker, but need not ask his permission. A good case could be made that these unused facilities (less some fractional allowance for cash-balance requirements linked to an increased rate of loan repayments) are fully equivalent to demand deposits in their ability to support a flow of outpayments or meet unexpected contingencies. On the other hand, there is no clear difference of kind between a contractual line of credit and an informal understanding that a firm (in view of its credit record, ability to post collateral, access to alternative sources of credit, etc.) can rely on being able to increase its indebtedness on short notice. It may even be that an expansion of *contractual* lines of credit can register a situation where such informal credit availability is becoming more doubtful, rather than one where companies sense a need to be able to draw a large volume of checks. And of course, while the Federal Reserve's monthly series of line-of-credit availabilities is recent, the practice of expending such lines of credit is ancient; hence we reduce the comparability of recent and older statistics if we try to exploit this piece of evidence in compiling TVTB.

Invisible transactions balances (like such visible items as security-dealers' RP's and MMMF's) may represent relations between individuals, partnerships and corporations and organizations which are not banks or even depository institutions. Travelers' checks issued by American Express or Cook's (as well as those issued by banks) are nearly the same thing as paper currency, even though not in M-1. Credit cards are widely and increasingly used as a means of payment, and a line of credit available under a credit card has much in common with a line under privilege checking. But we lack data on such lines of credit; if they are on the same scale as credits actually used under credit cards, they may have amounted to some \$25 billion.²¹

Credit Availability

In an inflationary economy, it is a valuable privilege to be able to borrow. If our receipts are linked to the price level, so that inflation will insure that we get more money next year than this year, to spend next year's income now rather than then means that it will buy more goods and services. In these circumstances, we would expect one of two results. Either the interest-cost of borrowing will be so high as to offset the advantages of buying sooner, or else the privilege of borrowing will be "rationed."

But in the recent inflationary years in the United States, neither of these consequences seems to follow. True, *nominal* rates of interest have soared far beyond the accustomed range; but if we correct to "real" rates (subtracting the annual rate of inflation from the nominal rate of interest), we find that for most recent years the real rate is low

²¹ Call-date statistics for all commercial banks as of September 30, 1978, include an asset item tagged "Loans to individuals, credit cards and related plans," of \$21.9 billion.

or even negative.²² At the same time, with the important exception of intermittent pinches on mortgage loans, credit rationing is becoming less rather than more prominent in the US economy. "Yes is a Chemical reaction", one prominent bank tells would-be borrowers. And an energetic effort is made to persuade every household and firm of some degree of financial respectability that lenders will make him welcome.

Since loan expansion at banks is an operation which "creates money", the absence both of credit rationing and of deterrent rates of interest reinforces inflation. This view of the inflationary effect may be verified by considering the effects of easy credit in inflation upon saving. The proportion of disposable income saved in the United States has suffered severely. And is this surprising when one considers some of the uses to which borrowing is put? Not only can consumers borrow to buy durable goods they may also run in debt to meet such burdens as the high cost of having children in college. Those who sell houses tend to borrow much more on the new house than they paid off in selling the old, and funds are left over which can be put into spending. (Or without selling the house, one may refinance the mortgage to get funds for college bills and the like.) In corporate mergers, it is common to borrow funds to pay off stockholders in cash; and while the stockholders will ordinarily reinvest the proceeds in other securities, part of the proceeds will commonly slip through their fingers.

Back of easy credit, of course, stands the confidence of lending institutions that they can readily raise funds in their turn. The art of liability management is at their disposal. And of course the lending operations of the banks (on the Eurodollar as well as the domestic markets) "create" the funds that are lent. Without adopting the stance of the monetary monists who say that only money matters much in relation to the course of expenditure flows and prices, it is easy to see that this kind of credit market helps make the inflation process self-reinforcing. Insofar as financial stringency brakes inflation, it does so by producing periodic squeezes on the mortgage market where the chief lending institutions (savings and loan associations and mutual savings banks) are prevented by interest ceilings from making full use of liability management.²³

An important aspect of the credit situation is the interplay of the inflation process with the *quality* of bank credit. Traditionally, prudence on the part of both borrower and lender has worked as a safeguard against extension of unsound loans. But as transactors on the credit market have become accustomed to inflation, there seems to be a wholesale substitution of inflation-secured loans for prudence-secured loans. From the borrower's standpoint, it is good business to

²² A further adjustment should perhaps be made for taxation. If a borrowing household subject to the income tax itemizes its deductions, then it is effectively subsidized on its interest payments. If its marginal tax rate is (say) 40 percent, then to pay \$1000 in interest is to attract a tax benefit worth \$400. So if the rate of inflation is 10 percent, a nominal interest rate of 10 percent implies a real rate before tax adjustment of 0 percent and a tax-adjusted real rate of -4 percent.

The *receiver* of interest, of course, is in a reciprocal tax position. If he gets a nominal 10 percent interest which constitutes income taxable at a marginal rate of 40 percent, at most 6 percent can be regarded as after-tax income. And if he spends this 6 percent, the effect of inflation on the real value of a sum invested (for example) in an MMMF is a capital shrinkage of 10 percent; to maintain the real value of his capital, he would not only have to refrain from spending the 6 percent, but would also have to dredge up from somewhere an extra 4 percent to replenish his savings accumulation.

²³ Attempts to remedy this situation by authorizing savings institutions to pay full market rates on money-market time deposits and the like have their own drawbacks. The rates of interest *received* by the savings institutions on their mortgage assets are frozen by long-term contracts; and it is only because they pay below-market rates on a large share of their liabilities that the savings institutions can avoid running serious operating deficits.

borrow now in order to purchase or produce goods which will be sold later in competition with goods acquired from competitors at higher costs. From the lender's standpoint, the debtor's ability to pay off a loan which under noninflationary conditions would be imprudent is enhanced by the presumption he can get higher prices for his products (or sell his services for more, if he is an employee or self-employed worker) at a later date and thus be well able to repay a loan which after all is fixed in nominal terms.

This transformation of loan standards has its agreeable aspects. Since debtors are dealing not with ultimate savers (who may be hard hit by inflation) but with financial middlemen whose liabilities as well as assets are fixed in nominal terms, relations between debtors and creditors are perhaps smoother than usual: the borrower gains and the immediate lender does not lose from inflation. In public-interest terms, the debt situation is one reason why it is fairly easy for the economy to work at high levels of activity: the expectation that goods will be more expensive if acquired later damps the fear of loss through carrying inventory, and reduces the danger that accelerator effects in the inventory field will transform a slowdown of activity into a downswing.

On the other hand, whether a borrower is well-placed in relation to the inflation process takes precedence over whether the borrower is an effective manager of a genuinely constructive operation. To the degree to which economic efficiency depends on credit allocations that favor effective and constructive management, it is impaired by this aspect of inflation.

Perhaps the most serious problem in the relation between credit and inflation is how banks and their debtors are to climb off the inflationary merry-go-round. If inflation can make sound loans out of unsound ones, it is also true that cessation of inflation can expose the unsoundness of loans which a short time ago looked good.²⁴ Even though interest rates may not have risen enough to keep up with the rate of inflation, they have reached heights which would not be bearable for debtors if inflation stopped. To some degree, debtors under bonds and mortgages have contracts which enable them to refinance at lower rates; but many contracts lack this protection. Debtors under shorter term contracts presumably can refinance as their loans fall due. On the other hand, the lending institutions may have difficulty, if inflation stops, with some of their medium-term high-interest debts.

The fact that creditors—supposed to be those who hold the bag in inflation—are not in reality active in bringing about policy changes that will stop inflation is in part explicable on these grounds. People in such a position may “pray to become virtuous, but not yet.” When any really effective stop to inflation may entail “shock treatment” with an *abrupt* stop to price increases, it becomes even more plain why inflation must be viewed as a social addiction which is hard to shake off.

²⁴ One far-from-trivial aspect of this problem is the debt position of “fourth world” countries—underdeveloped countries without major oil resources. Their heavy hard-currency debts keep getting built up by rising oil prices and the like—but at the same time, their previous debts are being scaled down in real value by the process of inflation which raises the nominal value of these countries' export proceeds. It has proved just-about-feasible to roll over these countries' debts under inflationary conditions. If inflation ceases and their export prices no longer rise, major breakdowns in some of these debt positions might prove unavoidable. This would affect the position of lending institutions both on the Eurocurrency side and on the U.S.-dollar side.

"Open Endedness" in the Large

Students of U.S. monetary economics have long assumed that the stock of money held by the U.S. public is "policy exogenous". When it was proper to identify money with M-1 and when the checking-deposit component of M-1 held outside member banks of the Federal Reserve System was trifling, it was possible to say with fairly high precision that the money stock was determined by the volume of deposits for which the Federal Reserve chose to provide reserves.²⁵ But when the money stock consists increasingly of items outside M-1, the situation becomes much more complex and much less manageable. Decisions of banks and their customers about the scale on which operations are attributed to Bahamas/Cayman branches, for example, may have considerable impact. And so can the extent to which payments are handled through checking/savings accounts of various types rather than through old-fashioned checking accounts. Besides, the provision of new types of credit facilities (such as overdrafts) may permit substitution of invisible-transactions balances for old-fashioned M-1 items.

For purposes of estimating the influence of monetary events on the flow of expenditures and on prices, the investigations reported in the appendix suggest that we can still do reasonably well by using a data-series like my TVTB compilation in analysis in essentially the same way in which it used to be appropriate to use M-1. On the other hand, it is much harder to say what determines the course of TVTB than it used to be to say what determined the course of M-1, so that the situation becomes open-ended in the sense that our models for explaining the "supply of money" are less and less satisfactory.

There exists a disquieting possibility that the U.S. money supply may become open-ended in a still more fundamental way. The processes of innovation discussed above have gone far toward obliterating the difference of kind which used to exist between claims which do and claims which do not constitute money. The phenomenon of the checking/savings account (including but not limited to ATS accounts) means that holders of savings deposits have acquired an option to monetize funds which they have held as long-term accumulations. For the present, the Federal Reserve's "new M-2" series (which includes most of the items included in TVTB plus other types of savings deposits) may be said to overestimate the effective supply of money by the large amount of authentic long-term accumulations included in savings deposits. But a new element of uncertainty is introduced by the fact that for a good fraction of this amount there is now the holder's option to monetize. Without any change in monetary arrangements, it is possible to visualize a pro-inflationary shift in depositors' view of the future which would sharply increase the monetary component of savings balances.

The attempt to run a money-and-credit system in an inflation without either credit rationing or a deterrent interest structure compounds

²⁵ Changes in the position occasioned by shifts in paper-money circulation, in Treasury cash balances, and in the international situation could be promptly measured by the Federal Reserve, and any undesired effects offset by open-market operations in U.S. securities (or recently in Federal funds). Member banks had some scope to influence the situation by decisions about the scale on which they held excess reserves or borrowed at Federal Reserve Banks; but this scope was limited, and the bank decisions could be shaped to a considerable extent by policy instruments.

these difficulties. In principle, such a phenomenon as a commodity-inventory boom financed by drawing upon lines of credit might be dealt with by the Federal Reserve through a credit policy so restrictive that other borrowers would have to let themselves be crowded out by those drawing down their credit lines. In practice, such a surge of credit demand handled in this way would create so many difficulties for other borrowers, for banks and for the savings institutions that it is hard to believe the authorities would dare impose rigorous restrictions. Already the interplay between OPEC oil prices, attempts to manipulate other primary-product prices, business inventory policies, and speculative attitudes toward commodities contains major inflationary hazards. The large-scale commitment of the U.S. financial system toward drawdowns of lines of credit compounds these hazards—and makes it more and more likely that the U.S. will try to surmount any primary-commodity pinch by financing deficits for those who want to buy as usual rather than by adjusting operations to work with reduced commodity flows.

II. POLICY PERMISSIVENESS IN THE MONETARY MUDDLE

It has been the popular impression that throughout the inflationary period of the 1970's the Federal Reserve System has been working strongly to limit and stop inflation. Unfortunately, this view cannot be sustained when considering the financial innovations which have created new forms of money and pushed the country toward an opened money supply. The new measures adopted in October 1979 constitute a serious effort to set limits to at least some of these inflationary factors. But a candid account of Federal Reserve policy toward potentially and actually inflationary innovations, down to the autumn of 1979, must admit that in many important ways it has been pro-inflationary.

The ATS Episode

A rather dramatic example of such permissiveness—which is what alerted me to this whole range of problems—is the change in regulations which authorized member banks to set up automatic-transfer-service accounts. This was an amendment to Regulation Q, announced in May 1978 to take effect in November of that year.

In monetary terms, as shown above, the ATS innovation is a way to make balances denominated as savings deposits function as transactions balances, available to cover checks as they come in for payment, and thus to provide, interest-bearing checking accounts. It is sufficiently obvious that in fact, since they can be drawn upon at any moment by check, ATS balances are demand deposits, and by rights would be subjected to the reserve requirements that apply to demand deposits. But the Federal Reserve stipulated that all ATS customers must be notified that the bank reserved the right to call for 30 days notice of withdrawals from the savings account. Actually, this notification was meaningless: (1) it could not be handled within the monthly-statement format set up for ATS accounts; and more important (2) customers knew full well that similar rights to call for notice

of withdrawal on passbook savings had been a dead letter for decades. Nevertheless, the Federal Reserve treated this stipulation as subjecting the deposits to the 3 percent reserve requirement assigned to savings deposits rather than the requirement of 7 percent to 16¼ percent assigned to various classes of demand deposits.²⁶

Something much like a landslide toward handling household accounts on an ATS basis might conceivably have resulted. Since such a shift in an account would of course entail an interest cost for the bank, there was an incentive for the bank to avoid the shift if confident that it could hold the customer's business on a basis of zero-interest demand deposits as the only form of transaction account offered. On the other hand, competition among banks tends to generalize such offers of service, and a bank could always protect itself by insisting on a substantial balance in the savings component of the double-barreled account.²⁷ The potential of ATS as a revolution in banking practice has not been fully tested, since the amendment to Regulation Q met with formidable legal challenges (notably from the U.S. Savings and Loan League), and in April 1979 the U.S. Court of Appeals in the District of Columbia ruled that ATS arrangements were illegal—though permitting their continued use until the end of 1979 and thus giving Congress the opportunity to pass authorizing legislation if it thought this wise. At the present writing, the situation is that *temporary* authorization has been passed, deferring decision for some months into 1980.

The stance of the Court of Appeals was that the authorization of ATS was in effect an amendment of basic banking laws and not merely of regulations in that it rested on a clearly artificial claim that the balances in question were savings rather than demand deposits, and in effect nullified the provisions in banking law which forbade the payment of interest on demand deposits. The willingness of the Federal Reserve authorities to connive at an evasion both of the law against interest and of the principles of classification of deposits for reserve-requirement purposes was certainly disquieting.

Another disquieting aspect of the matter was that the change was put before the public not as a shift in policy toward interest on demand deposits and toward reserve requirements, but as a piece of convenience legislation. The press announced the change in regulations as a technical arrangement to prevent checks from bouncing. The only public-interest consideration in favor of the change mentioned in the official Federal Reserve announcement was that it would save the resources used to handle a check for a second time when it was returned for

²⁶ In view of the fact that different categories of time deposits were assigned ratios all the way from 1 percent to 6 percent, and that the legal maximum for time deposits was 10 percent, failure to put a higher reserve percentage on ATS deposits can only be interpreted as a deliberate move to encourage their use.

²⁷ Although the change in regulations permitted savings institutions also to offer ATS; they would have had to work in collaboration with a commercial bank to make it effective. Hence the advantage of everything under one roof gave commercial banks a chance to draw in funds at the expense of savings institutions—enhancing the likelihood that commercial banks would rapidly adopt the procedure as a competitive instrument. Hence the funds that would have been located in ATS accounts had the shift been made on a large scale would have been in considerable part long-term accumulations rather than funds that would otherwise have been in demand deposits; though customers also would have worked to low demand-deposit figures and routed their check-inflow through the "savings" account for reasons given earlier.

insufficient funds. This is scarcely an adequate basis for a major change in monetary arrangements. And incidentally, the argument implies an expectation that ATS would rapidly extend itself to cover not only large accounts but also the small and unstable accounts which must be presumed to cause most bad checks.

ATS remains an economic cliff-hanger. When in October 1979 the Federal Reserve shifted to a more restrictive stance, ATS balances were one of the items subjected to stiffer reserve requirements, and the inclusion of ATS in the new monetary aggregate M-1B implies recognition that these are in fact transactions balances. If given a solid legal foundation and administered along the lines the Federal Reserve started in 1978-79, it might well become the main form for household transactions balances—greatly impairing the manageability of the whole monetary system. The logic of the proposal is contrary to what seems the main thrust of the new Federal Reserve effort to bring the monetary situation under control. Yet the Federal Reserve authorities do not seem willing to withdraw their support. One may surmise that advocacy of ATS is regarded as a gesture of solidarity with the advocates of paying full market interest on demand deposits—a policy which has many influential advocates in the banking community and among monetary economists, though I myself oppose it.

The RP Issue

The issue of RP's is another horse of the same color. The recent shift in the way the Federal Reserve authorities talk about RP's (now characterized as large overnight deposits by corporations *known as* repurchase agreements) makes it clear that there is no real dispute about the fact that they constitute part of the stock of transactions balances. Yet their standing as nonreservable liabilities rather than demand deposits depends on a contention that they are aspects of security dealings between banks and their customers rather than balances held by customers with banks. This has all the air of a legal fiction, since in practice the bank remains the owner of the securities while the RP is outstanding—receiving the interest, and retaining the right to sell the securities as long as other collateral is brought in instead to protect the customer.

Here again the Federal Reserve authorities seem to have gone out of their way to help banks evade the law against interest payments on demand deposits. Until the reformulation of the monetary aggregates announced in February 1980, Federal Reserve releases about the course of the stock of money have contained no reference to this monetary component. And even in the reformulated system of aggregates, RP's are to be included in new M-2 and new M-3 rather than in M-1B—that is, treated statistically as being savings balances rather than transactions balances. In view of the extreme public confusion about this element of the stock of effective money, it would have seemed to be an obligation of the Federal Reserve to give them an appropriate rather than a misleading place in the new system of monetary aggregates.

With the policy shift of October 1979, RP's became one of the items to which the Federal Reserve applied some restrictive pressure in the form of an 8 percent marginal reserve requirement—that is, a reserve required against the excess of the item over a base amount at each bank. But there is no clear signal that the Federal Reserve proposes actually to treat this subclass of demand deposits *as* demand deposits, and the groundwork is not being laid for public understanding of any such move.

Banking Operations Actually and Purportedly Outside the United States

As was indicated in the discussion of Bahamas/Caymans operations above, the activities of extra-U.S. branches of U.S. banks are of considerable monetary importance. They are also important to the banks involved, some of which have reported years when they earned more on overseas than on U.S. operations. It is not impossible that such a report may reflect accounting practices that book profits where they are least taxable; but there is no doubt that U.S.-based multinational banks, like other multinational corporations, put much stress on their overseas activities and regard them as a major growth area. But the supervisory authorities, though they do not ignore these activities, seem to have treated them as peripheral. And compared with the rich output of statistical information about domestic operations, such information about overseas information is very sparse.²⁸

Important banks in all countries have for decades run branches in foreign financial centers. These have been useful in the financing of international trade, helpful to businessmen and tourists abroad, and presumably helpful in legitimate coordination of activities with foreign commercial banks (for example, arranging for syndication of loans). Much more recent (dating only from the 1960's) is the mushrooming of overseas-bank activity as a fundamental part of the growth of exocurrencies, of which the Eurodollar is the leading example. A great stimulus to this development was given when the United States Government (in the early years of its worries about what now look like trifling payments deficits) required overseas financing for overseas investment by U.S.-based industrial companies. It proved that it was perfectly feasible to find customers who would hold funds in overseas branches rather than in mainland-U.S. bank offices (particularly since the bank could offer interest payments without running afoul of the U.S. law against interest on demand balances), and that loans denominated in dollars but contracted with overseas branches could thus be financed.

A crucial aspect of Eurodollar banking proved to be that by shifting activities to this form, a bank—and not only a U.S. bank but a British or continental bank—could climb outside the regulatory jurisdiction

²⁸ In the "Anticipated Schedule of Release Dates for Public Periodic Releases" on p. A76 of the *Federal Reserve Bulletin* for December 1980, the Federal Reserve lists 12 weekly, 16 monthly and 10 quarterly releases. Of these, zero, 1 and 1 are the number containing information about nondomestic bank operations. Besides, as I mentioned previously, the itemization of reported data is incomparable with that for domestic banking, and on the whole unilluminating.

of its own central bank without subjecting itself to any other central bank.²⁹

Where choice exists between booking a loan at a New York head office or from a Nassau branch, the bank need not concern itself with such restrictions as the fraction of its total capital that may be represented by loans to a single borrower, can keep its relations with the customer more confidential, and can offer interest rates that are shaded somewhat because the bank can use funds not subject to U.S. reserve requirements. And in buying money to finance its lending, the bank can offer somewhat more favorable interest and subject the creditor to fewer inconveniences if customers will hold funds in CD's or deposits (ordinarily time deposits, though they may be of very short maturity) purporting to be in Nassau.

An awkward side of the Eurobanking situation is that since the first OPEC oil crisis of 1973-74, the Eurobankers have to a considerable degree placed the governments of the United States and other industrial countries under obligation by what is called "recycling of petrodollars."³⁰ Eurodollar loans eased a potential payments crisis arising from the payments deficits of oil buyers—doing something which governments much wanted done, but for which they had no machinery in

²⁹ *Qualifications:* (1) The home-country central bank (and in the U.S. case the regulatory office of the Comptroller of the Currency) still kept some track of what went on. A small bank-examining staff has been kept in London by the U.S. authorities, for example; and the bank's home office has been called upon for frequent if not fully informative reports. The home bank has not been allowed simply to set up separate foreign corporations and walk away from them, but its responsibility for the solvency and orderly operation of the branch has been maintained.

And (2) the monetary authorities of the host country claimed some authority. Licenses were required for foreign branches, and attempts to play fast and loose with local banking practices in centers like London and Frankfurt would surely have produced difficulties. Some host governments required branches that carried on banking on their territory to have substantial capital funds of their own. Implementation by the United States of the International Banking Act (IBA) of 1978 codifies a standard of equal treatment of local and foreign banks, and its example may nudge other countries in the same direction. But note that IBA focuses on operations that may be viewed as within the United States, whereas the exocurrency problem relates to operations that somehow fall between countries.

Insofar as external-branch banking could be carried on outside the major financial centers, banks have been able to shop for the jurisdictions where they would be least inconvenienced by matters such as local regulations, capital requirements, and taxes. Hence the prominence of the Bahamas/Caymans branches, which in recent years have been showing about one-third of the total assets in statistics of all "foreign branches of U.S. banks."

³⁰ "Recycling." In this connection, is a euphemism. The term would usually mean a process by which the same thing is used over and over, like copper scrap being melted down or broken bottles being turned into new bottles. As dollar bills in an American city change hands often several times daily, they might also be said to be in a recycling process. But petrodollars are not like that.

As the OPEC countries began to sell their oil for enormously more than they were spending on all imports, they found themselves accumulating cash assets quickly. If they had insisted on placing all these accumulations with the International Monetary Fund, transfers of claims on IMF to the OPEC countries could have largely drained the reserve funds of monetary authorities outside OPEC. But cash managers for OPEC found the combination of high interest and high liquidity offered by Eurodollar deposits and CD's attractive, and put most of their accumulations into that form.

The counterpart of the OPEC payments surpluses was of course an equal amount of payments deficits elsewhere in the world, falling especially hard upon underdeveloped countries without oil resources. Eurodollar institutions made large loans to the governments of deficit countries (and to enterprises there such as oil-distributing companies wanting to finance inventories at the new high prices), and thus created new funds which filled the void where OPEC had withdrawn funds from circulation. But it must be stressed that these new funds were not just the old funds turning up again, as you may receive today one of the same dollar bills you paid out yesterday. When a bank makes a loan, it never tells one of its depositors "Though you may think you have \$10 million at our bank, you really have only \$1 million because we lent \$9 million to Jones." On the contrary, Mr. Smith who brought in the \$10 million still has \$10 million at his disposal; and in addition, Jones has disposal of \$9 million of loan proceeds. It is misleading to say that Mr. Smith's funds have been recycled.

place and could not quickly improvise machinery. Thus while Euro-banking remains one of the most private operations in the industrial world in terms of regulation and reporting of information, it has become affected with a public interest in a way that may create moral obstacles to needed reform measures.

Especially disquieting has been a push by some of the large money-market banks (with backing of New York State authorities and considerable encouragement from some Federal Reserve quarters) to create in New York a bankers' trade zone. This would allow certain bank offices in New York to operate under the same rules as if they were located overseas.³¹ An argument in favor of this arrangement was stated by Professor Nicholas Deak in a letter to the *New York Times* in terms which could not be bettered as an explanation of the reasons why the proposal deserves rejection: "It is not dignified," Professor Deak tells us, "for respectable banks to set up quasi-banking operations on small islands . . . in order to circumvent the Federal Reserve Q regulations and reserve requirements."

There may be some misunderstanding here since Manhattan Island has fewer square miles than either the Grand Cayman or the Grand Bahama. But surely the notion of legislative enactment of a loophole so that these regulations (and also the law against interest payment on demand funds) can be circumvented in Manhattan is highly repugnant. The laws and regulations exist to defend the public interest against inflationary money creation. It is dignified to waive this public interest by explicitly allowing banks to do their "circumventing" in New York?³²

The Federal Reserve's Membership Problem and the Erosion of Monetary Control

It will be evident from the account above that over a number of years there has been an erosion of the Federal Reserve's power to control the U.S. monetary situation. Permissive treatment of a whole series of monetary innovations has rapidly increased the range over

³¹ Analogy: Bottlers and distillers of liquor can get permission to carry on their bottling and distilling "in bond." The product is not considered to enter the U.S. economy until revenue stamps are affixed and the bottled liquor started into marketing channels. Suppose we faced a legislative proposal to allow companies that handle bonded liquors also to run chains of bars in which the liquor drunk was deemed to be outside the United States. If companies not owning bonded bottling works and distilleries called foul, most people would agree. Furthermore, the danger that a drunken driver might ram my car and wipe out my family would not be less because he had been drinking "in bond": it might even be greater because he could afford to imbibe more.

³² The example of London might of course be cited to the effect that the activity of a financial center can be invigorated by allowing extraterritoriality in financial operations; and as a patriotic New Yorker who feels that New York deserves to get all the help it is decently entitled to, I find it hard to reject this argument entirely.

But in at least one very fundamental respect, the London example fails to fit. The extraterritorial operations in London are not in sterling, but in Eurodollars, Euromarks, etc. A New York "bankers' trade zone" where transactions were denominated in dollars would represent a major leak in U.S. monetary controls; and the degree to which Caymans/Bahamas operations seem to be used for circumvention of U.S. laws and regulations is not encouraging regarding the value of self-policing by the bankers. I might reconsider my view if the New York "trade zone" were redesigned to apply only to transactions denominated in deutschmarks, yen or Swiss francs, but never in dollars. Would the advocates of the plan still want it, though?

which money creation is going on in areas where the Federal Reserve asserts no effective control.³³

It is hard to believe that erosion could have been completely avoided, in view of the momentum for developing big business (with banking only one aspect) as multinational enterprise. But at point after point, ability to control the stock of money has been reduced by deliberate abdication of authority, encouraging subterfuges to pull out from under Federal Reserve control activities which could and should have been limited by reserve requirements and other Federal Reserve instruments.

Federal Reserve spokesmen have frequently taken occasion to explain that the System had a membership problem, such that imposing burdens upon commercial banks may drive them away and make the situation still more unmanageable.³⁴ This problem arises out of a peculiarity in the U.S. system of relating commercial banks to the central bank; most powers of regulation are applicable *only to commercial banks that are members of the Federal Reserve System*—and membership is voluntary. Consider an analogy: Imagine a voluntary association of airlines, whose members obligate themselves to file flight plans and to accept control-tower instructions on takeoffs and landings. Airlines which do not choose to enroll as members, however, are left free to take off, fly and land as they please, without consulting the authorities. Nobody could defend such a system unless it was certain that virtually all flights would be by member airlines.

Retention of member banks in the System, under these circumstances, became a matter of balancing incentives and deterrents. The advantages of membership have focused on access to the Federal Reserve discount window, and still more on access to the Federal Reserve's system for clearing checks between cities and Federal Reserve Districts (recently a wire network into which individual member banks have computer linkups, permitting instantaneous transfers in "immediately available funds"). The major drawbacks of membership is the tying up of funds in noninterest-bearing reserve balances at Federal Reserve Banks; member banks think of the potential interest on these funds as a tax on their activities. The advantages have been enhanced by the ability of member banks to attract business from nonmembers in exchange for indirect access to clearing facilities, the drawbacks by the

³³ At certain points the Federal Reserve has taken a stand to block or mitigate inflationary innovations. Refusal to authorize banks to make a market for their own outstanding certificates of deposit, and to authorize CD's with initial maturity under 30 days, prevented the development of CD's as a full-fledged substitute for checking deposits. An effort by some banks to buy money by issue of negotiable capital notes (purporting to represent part of the bank's capital funds, and not booked as a liability at all) led to an adverse Federal Reserve decision. The Federal Reserve also took the field rather aggressively in 1979 to block the development of interbank arrangements for remote disbursement, which were designed to facilitate further the drawing of checks by business firms beyond what their balances could cover.

More positively, the Federal Reserve has made serious efforts to foster use of types of time deposits where the holder's liquidity is reduced in consideration of a favorable interest return. A special preferential reserve requirement of only 1 percent has been set up for certificates of deposit which are nonmarketable, have initial maturities of at least four years, and carry substantial interest-loss penalties for premature withdrawal (though these penalties were softened somewhat in 1979). And in 1978-79 the Federal Reserve took steps to encourage issue of six-month or longer "money market time deposits," with interest rates tracking those on Treasury bills, and which are nonnegotiable. Large amounts of long-term-accumulation funds have been attracted into these forms.

³⁴ A characteristic statement of this type by G. William Miller as chairman of the Federal Reserve Board appears in the *Federal Reserve Bulletin* of March 1979 (pp. 229 ff.). It complains loudly of the "Inequity of Cost Burden Borne by Member Banks," and points to a decline from 81 percent to 72 percent in the proportion of commercial-bank deposits held by member banks between 1970 and 1978.

annoyance of having Federal Reserve Board (FRB) supervisory authorities breathing down the banker's neck.

During the period since the celebrated monetary Accord of 1951 between the Federal Reserve and the Treasury, the Board has periodically reduced the burdens of membership by marking down the required ratio of reserves to deposits. The Federal Reserve Act as amended authorized the Board to fix reserve requirements as high as 22 percent on demand deposits at reserve city banks, as high as 14 percent on deposits at other member banks, and as high as 10 percent on time deposits; and in 1952 the aggregate amount of required reserves held was slightly below \$20 billion—amounting to 16.1 percent of the aggregate of demand and time deposits. Down through 1964, through total reservable deposits rose to over \$217 billion as compared to \$123 billion in 1952, reserve-requirement percentages were lowered from time to time, holding the aggregate of required reserves in a range from \$17.8 to \$20.7 billion. The ratio of required reserves to total reservable deposits dropped (partly through a relative expansion of time deposits) to 9.5 percent. After 1964, the pace of reduction in required percentages slowed down, and the aggregate of required reserves was allowed to expand, bringing the System by the end of 1978 to a position where required reserves of about \$40 billion were 6.3 percent of aggregate reservable deposits of \$639 billion. Demand-deposit requirements (graduated by size of bank) ranged from 16¼ percent down to 7 percent, and time-deposit requirements from 6 percent down to 3 percent—with a special 1 percent for a certain class of long-term deposits.

Reserve requirements have been eased also by allowing the growth of nonreservable liabilities, as seen above. The new table 1.311 in the Federal Reserve Bulletin for "major nondeposit funds of commercial banks" (introduced in September 1979) shows late in 1979 an aggregate of about \$130 billion; if we add this to the reservable-deposit denominator of the reserve-requirement ratio, we come up with an average requirement of 5.2 percent.

The benefits of membership are due to take a sharp drop fairly soon, with the prospective enactment of legislation to require the Federal Reserve to make its clearing services generally available (to savings institutions as well as to nonmember banks) and charge for these services on a cost-recovery basis designed to be comparable with what private concerns would call cost.³⁵ This change could quite conceivably leave a voluntary subjection to controls through Federal Reserve membership so unattractive as to set off massive resignations, unless combined with measures to reduce burdens.

This membership problem is a strictly artificial one, arising from carrying into the 1980's the anachronistic terms of a compromise arrived at in 1913. (Should the United States perhaps go back to the original system of counting only three-fifths of the black population to determine how many Congressmen a state should elect?) Two remedies

³⁵ This change becomes effective with legislation of March 1980: see the afterword at the end of this paper. It is odd that nobody seems to be attacking this proposal as a tax on banking operations—as it certainly must be seen if we suppose gratuitous services for Federal Reserve members to be part of the order of nature. An economist would prefer to call this move the withdrawal of a subsidy to members, which up to now has roughly offset the tax of income-loss on required reserves.

offer themselves. The most satisfactory—embodied in Bill S. 85 before Congress in 1979, and endorsed by Federal Reserve Chairman Paul A. Volcker—is to set up a system of universal reserve requirements on transactions balances, to apply whether or not these balances are liabilities of member banks, and in fact whether or not they are liabilities of banks at all. Taken with the proposed change in the service-charge system, this would make the scale of Federal Reserve membership a trivial matter. The alternative would be to make membership compulsory, which would not be as different as one might suppose at first glance.³⁶

Another solution which would have similar effects on the membership question would be to eliminate the “tax” on required reserves by having the Federal Reserve pay interest upon them; this has been presented on occasion by Federal Reserve spokesmen as a second-choice arrangement if universal reserves and compulsory membership are ruled out. One difficulty is that a half-hearted application of this remedy under voluntary membership would still leave banks with powerful incentives to resign. A second is that paying interest on reserves is a move in the direction of abolishing distinctions between claims that do and do not serve as money. On close inspection, these two considerations converge.

In some quarters the hesitancy of Members of Congress to deprive the Treasury of the revenue it gets from the Federal Reserve Treasury System is viewed as demagogic. Because the Federal Reserve holds interest-bearing assets and non-interest-bearing liabilities (member bank required reserves and Federal Reserve Notes), the System has a substantial net income: in 1978, this was \$7.1 billion, of which \$7.0 billion was remitted to the Treasury. If interest on reserve balances is set in line with money-market rates, most of this income will disappear. Proposals to pay so little in interest as to preserve the bulk of this revenue will scarcely swing the incentive-balance enough to make voluntary membership workable.

My judgment is that the “tax” inherent in noninterest-bearing required reserves is a good tax because it is essentially a tax on liquidity, falling in the first instance upon banks, but quite directly through tax shifting upon depositors. Among students of public finance, it is widely agreed that the fact any given activity has adverse externalities sets up a presumption in favor of taxing that activity rather than others which present favorable externalities or are neutral in this respect. And it seems to me that liquidity does have adverse externalities. The greater is my liquidity, the more strongly I can bid for things you may need to buy, and the greater therefore is your exposure to inflation. Holding down excess liquidity by setting bounds to the growth of money supply is what monetary policy is about; and if the policy instruments used have the dimensions of a tax on liquidity, so much the better. In short, I assert that the reluctance of Treasury and Congress to throw away this revenue can be fully justified by economic logic and facts, and is far from irrational even though often not well supported by the arguments explicitly presented.

³⁶ If reserve requirements cannot be avoided by refusing membership, no organization subject to reserve requirements has grounds to object to compulsory membership. To require membership, however, will still leave the authorities with the problem of classifying deposits and other arrangements according to whether they are or are not transactions balances.

The second consideration is related to the first. There are two dimensions in which liquidity can be increased and inflationary pressure heightened. One such dimension is purely quantitative—expansion in the quantity of M-1B, or if my proposals were adopted, in the sum of an enumerated list of types of transactions balances. The second dimension is the degree to which unenumerated items serve as transactions balances. If matters are so set up that every holder of accumulated long-term savings is free to monetize them by using quick-transfer facilities, the economy is subject to the risk of inflationary surges of spending even though the expansion of officially recognized transactions balances is gradual. Furthermore, there is room for longer term shifts which will increase the moneyness of claims which at the outset seem clearly not to be transactions balances. Hence an important objective of monetary policy (though one which is not kept in the spotlight), must be in Chairman Volcker's expression "to protect the dividing line between transaction and time accounts"³⁷ To reject the payment of interest on reserve balances does not in itself help with this problem—in fact, to do so may even increase pressures to shift the dividing line. But it is important to face this issue rather than bury it, and I must express a puritanical liking for zero-interest reserve balances as a way for keeping this problem out in the open.

III. AGENDA FOR MONETARY REFORM

To conclude this paper, I offer a rather sweeping set of policy recommendations. For the sake of clarity as to what the issues are, I have stated with possibly excessive firmness conclusions which may need some qualification. But I have tried to steer clear of counsels of perfection, and to recommend only measures which are practical in the sense that if enacted they can be administered, and if enacted and administered they will work effectively in the desired directions.

Another type of practicality, however, I have avoided. This is the inclusion of proposals which contradict the basic policy or make disabling or ineffectual modifications, in the hope of making the proposal easier to enact. Concessions of this sort must be made in the political process, particularly where positions the economist may regard as erroneous represent honest convictions of those who must frame legislation, or points on which they cannot move too far away from the views of their constituents. The likelihood of getting a fair trial for a new program is enhanced by well-chosen political concessions of this sort. But the economist's judgment as to who will place how much value on which concession is ordinarily not the best; and in proposing such concessions there is always a temptation to present arguments that obscure the basic issues.

Abating the Overload on Monetary Policy

At the outset, I urge that monetary policy must be seen in perspective, as one important element in the policy mix government should use to keep the economy on course without avoidable unemployment or inflation, and that exaggerated expectations should be avoided. For this reason, I shudder at the utterances of some of my professional

³⁷ Federal Reserve Bulletin, October 1979, p. 829.

brethren (those I would call monetary monists) to the effect that in the field of economic stabilization only money matters much. My position is that of a moderate monetarist. I hold that money matters so much that no combination of other policies can bring about a decent degree of economic stabilization in the face of perverse or grossly inadequate monetary policy. But reciprocally, even an ideal monetary policy cannot hope to stabilize the economy if other branches of stabilization policy are perverse or grossly inadequate. To cultivate excessive hopes in monetary policy is to tempt the framers of policy in other areas to disregard their responsibilities toward stabilization.

Since this is a monetary report, a lengthy discussion of other branches of stabilization policy would be a misfit. But it will help put monetary policy in context if I raise a few selected points which seem understressed in public discussions and whose neglect throws upon monetary policy more responsibility than it can bear.

(a) *Disregard of nonmonetary areas of policy flexibility.*—In recent years it has been fashionable, not least among monetarists, to pour scorn on proposals to influence the course of inflation or on employment by *temporary* tax changes or by shortening or lengthening the queue of public works projects awaiting financing. This view has not prevented budgetary measures aimed at stabilization, but has had the paradoxical effect of letting transitory situations bring about *permanent* tax cuts or permanent increases in important public-expenditure programs—a drift which has a good deal to do with chronic deficits. Besides, the economic logic of the argument that temporary tax adjustments cannot be helpful is badly flawed.³⁸ Admitting that forecasting difficulties are real, measures could be designed that do not call for a very great decision lead. An example is the setting of temporary abatements (expiring at a date not far in the future) on withholding taxes and excises, with basic rates slanted above rather than below what will probably be necessary.

(b) *Indexation.*—There is wide support for trying to mitigate the effects of inflation by making arrangements to get automatic upward adjustment of most people's incomes in line with the course of inflation. I agree that any given rate of inflation would be more livable if a larger share of incomes were indexed. But unfortunately, to extend the scope of indexation means that a given set of inflation-creating stresses will generate a higher rate of inflation. On the side of monetary policy, indexation tends to enlarge government deficits and to increase the business demand for bank loans, and thus set up an inflationary feedback.

(c) *Perverse effects of social security.*—A neglected weapon against inflation is the reform of social security to reduce the extent to which elderly people consume and dissave, and make it worth their while to produce the counterpart of much of their consumption. A program originally designed to spread the work in a situation of chronic

³⁸ The same professional voices tell us (1) that an income change viewed as transitory (because it rests on a temporary tax concession, in the case in view) will not affect consumption, and (2) that the change will not affect people's decisions as to how much cash or other liquid assets they should hold. The joke is that those who talk in these terms define "consumption" on the side of durable goods as a rise in the use of *services* from durable goods, regarding actual purchase of durable goods as investment rather than consumption. When the economy goes slack, it is commonly just investment in consumer durables which is insufficient. When the economy is overheated, pressure to *postpone* outlays because of a temporary tax may be just what the doctor would order.

depression threatens to evolve into an unbearable deadweight load on an economy plagued with inflation.³⁹

(d) *Avoidable uncertainties affecting investment.*—I feel a great deal of sympathy with the businessmen who complain about uncertainties which arise from programs for environmental protection, energy conservation, and the development of new sources of energy. It is hard to place bets on the race when you do not know what horses will run. Even if it is taken as sure that general prosperity will be maintained and that the demand for almost every major type of product will grow, if it is unclear what processes, what locations, and what types of materials will be acceptable under regulations to be formulated some years in the future under standards not yet laid down.

It does not follow either that environmental programs should be dropped or bypassed or that hasty codification of all the rules should be rushed through, making bad decisions now when better ones could be reached later on, merely to reduce uncertainty. But to cut through the mess by taking steps that will clarify the prospects has enormous advantages over dithering, and a few well-selected moves may carry us a long way.⁴⁰

The above sampling of nonmonetary policies that relate to economic stabilization obviously only scratches the surface of an enormous field. But it should be enough to make it plain that it is inexcusable to treat monetary policy as "the only game in town" for economic stabilization.

Growth Industries and Monetary Policy

Point (d) of those just listed is of special interest because it leads to a crucial point which is glimpsed only intermittently when people look at monetary problems—*monetary policy has its best prospects of usefulness in a context where the economy has vigorous growth industries.* Adaptation of the economy to the energy shortage and to environmental-protection needs is widely viewed as an inconvenient necessity rather than as an opportunity. But in fact,

³⁹ Even though the mandatory-retirement age has been moved upward (a move well justified by considerations of physical and mental health of the elderly), the scaling of benefits that can be drawn by starting them at different ages is still slanted to encourage premature retirement. Besides, the rules that reduce benefits by one-half of any earnings above a minimum far below full-time pay scales produce powerful deterrents for people who have retired prematurely and wish again to become economically active. Both this loss-of-benefits rule and (paradoxical as it may sound) the tax-exempt status of benefits play into this perverse incentive/deterrent situation. If both can be reformed, the real inflationary force of the prospective rise in Social Security contributions over oncoming years can be turned off or even reversed.

⁴⁰ A poignant example is in the field of nuclear energy. For decades the public has been told that when they get around to it the authorities will provide for sale and permanent disposal of nuclear wastes; but we have not yet a single such facility in operation to help gauge the costs and advantages of the various somewhat promising procedures. The lack of such disposal facilities is an increasing obstacle to further development of nuclear power.

Surely it will provide much-needed clarification if the Federal Government will now set about rapid creation not merely of one such disposal facility but of several using alternative procedures. It may be saddening to write off the costs of several such facilities if one or two procedures prove so much the more satisfactory that the others are dropped. But this "loss" is trifling compared to the cost of stepping up the rate of waste generation with no disposal facilities, or with the cost of stopping nuclear expansion because of a curable lack of such facilities.

If the pessimists are right, furthermore, in their fears that no disposal system will really be adequate, it is important to put suggested systems of disposal to the test. Quite conceivably all the proposed systems will show insuperable effects and abandonment of fission plants will prove necessary. In that case, those making investment decisions will have to place their bets on quite a different stable of horses. But how can the Nation satisfy itself about a decision to accelerate, decelerate, or terminate development of nuclear-fission energy without operating-scale tests of disposal possibilities?

adaptation of the economy to a new situation creates just the kind of opportunity that can create a whole cluster of growth industries. New equipment, new types of buildings, new locations, new materials, and new technology must be developed. But avoidable uncertainties are hampering this development.

From the standpoint of the broad issues of monetary policy, it is crucial whether the economy has vigorous growth industries. If the economy tends to stagnate, the remedies available to monetary policy are unsatisfactory. It used to be said, "You cannot push on a string!" The essential character of monetary policy is restrictive. If the demand for new plant, equipment, and the like in the economy is very strong, effective monetary policy can weed out the less urgent lines of expansion by making them face formidable costs of funding, and can build up a line of private projects waiting for finance. Lacking vigorous growth industries, however, to rely on monetary policy to energize the economy is risky. And the recent situation where monetary policy is called upon simultaneously to combat unemployment by expansion and to check inflation plainly makes intolerable demands upon the monetary authorities.

Monetary Constitution Versus Monetary Tactics

Monetary policy is commonly discussed in purely tactical terms. But plainly there is room also for a strategic approach and for policy toward the underlying framework or monetary constitution under which the country operates.

Changes in monetary constitution have been few in U.S. monetary history: one may think of such milestones as the establishment of the Bank of the United States, the Jacksonian decision to let the Second Bank of the United States be wound up, the National Bank Act, or the Gold Standard Act of 1900. Between such milestone events, there is always a process of piecemeal adaptation. But the long period since the last major monetary overhaul (the Federal Reserve Act of 1913—or at latest the half-way restructuring in the monetary legislation of 1933–35) sets up a strong presumption that there is accumulated obsolescence. The Federal Reserve's membership problem is a good specimen of the trouble that comes from letting decades pass without bringing the policy structure up to date.

The most celebrated monetary-constitution issue is of course the independence of the Federal Reserve System. There is a worldwide belief that if central banks are subservient to elective officials, it becomes too easy for governments to refuse to face their fiscal problems and call on central banks to finance deficits. In the United States there are a number of independent commissions with governing bodies whose members turn over slowly and on a timetable divorced from the election calendar; with its seven members appointed for 14 years, the Federal Reserve Board has a maximum of this kind of independence, though the Chairman of the Board does not have tenure as such. In addition, the Federal Reserve Banks have a structure which started out as a sort of chain of bankers' cooperative societies, and the member-bank stockholders retain power to elect a third of the Directors. Furthermore, the pivotal Federal Reserve powers lie not with the Board but with the Open Market Committee, on which several presidents of Federal Reserve Banks have votes along with members of the

Board. My provisional judgment is that a good deal is gained by having a Board of several members with long terms—if only because accountability to the general public is served by the open record of votes and decisions and the necessity of public explanations. The quasi-private character of the Federal Reserve Banks with their member-bank stockholders strikes me as obsolete, and the diffusion of authority between Board and Open-Market Committee as creating avoidable confusion. But I am not much excited about the prospect that structural changes within the System will much alter the formulation or effectiveness of policy.

The constitutional issue where decisions in the next few years are likely to make the most practical difference is that linked with the Federal Reserve membership problem. As indicated above, the fact that subjection to monetary regulation is voluntary is a serious handicap to monetary policy, and must have a great deal to do with the permissive tendency which has done so much damage. If the time has come to do away with commercial-bank election of Federal Reserve Bank directors and to put clearing services etc. on a sale-at-cost basis, membership becomes comparatively meaningless and might simply be abolished. The Federal Reserve must of course continue to have relations and two-way communication with private financial institutions. But surely the basis must be that money-creating activities are unavoidably the Nation's business, and that organizations which engage in such activities are subject to regulation. Reformulation of the Federal Reserve's legislative mandate to stress responsibility for maintaining an orderly and non-inflationary financial structure would be helpful.

A puzzling issue of constitutional structure is that of Treasury/Federal Reserve relations. It is clear that the Federal Reserve should not merely become a bureau of the Treasury, and also that the Treasury cannot give up all monetary concerns, so that a boundary of potential policy-conflict remains. Possibly the area of international monetary relations might be made more strictly one of Federal Reserve responsibility. It is disconcerting how often one reads of negotiations where the United States speaks with a number of voices—Treasury, Federal Reserve Board, State Department, and on occasion Federal Reserve Bank of New York. On the other hand, most countries seem to speak with several voices in the same sense; and given the general decentralization of the U.S. Government, it may well be reassuring to our negotiation partners to be able to feel out how the U.S. Government would actually operate under a contemplated agreement. On the domestic scene, it might be useful to reorganize so as to get the Treasury out of the business of open-market operation, though such changes have had such little discussion that it is hard to be sure how they would work.⁴¹

⁴¹ One of the standing problems of U.S. monetary policy has been that the Treasury has full authority to determine the size and terms of any new issue of securities to be sold to the public. While the Federal Reserve is not allowed to be the buyer of first instance, it has almost never failed to support the market about the time of a new Treasury issue by buying enough comparable securities to make the flotation succeed. This pattern shifts the power of effective monetary decisions in the direction of the Treasury just at the times when there are deficits to be financed, and may make a mockery of Federal Reserve independence.

Some years ago, I suggested that paradoxically the way to preserve Federal Reserve authority over monetary policy might be to reverse the taboo and let the Federal Reserve rather than the Treasury be the only issuer of bonds, notes and bills to be sold to banks and the general public. But I hesitate to propose this idea as basis for an actual policy move since it has not been thrashed out enough to reveal what might be its drawbacks.

At least one of the basic issues of monetary constitution seems clean out of reach of reform for the visible future. This is the question of a monetary standard. Like most U.S. economists of the last two generations, I have always been skeptical of the virtues of a gold standard, and suspected that what passed for a gold standard in the 1950's and 1960's was really a world U.S.-dollar standard in disguise. A few years ago, I would have said that the U.S. could do without a monetary standard, counting on the prudence of central banks and governments for the necessary discipline—which in any event has often been breached by infractions of the rules under gold standard or dollar standard. In view of the sorry record of monetary policy all over the world since the end of dollar-convertibility in 1972, however, I find myself shifting to the opinion that even though an official standard might not make monetary good behavior compulsory, it might be helpful by making bad behavior more odious. But what to use for a standard? Gold by now has become more an engine of inflation than a fixed anchor to which one could tie policy. At least a breathing spell might be gained if the deutschmark or the yen would take over the role of key currency (or if the new European common currency would serve); but U.S. and British experience with key-currency responsibilities was so painful that there seem to be no volunteers for this role. The best prospect in sight seems to be that of a market basket of currencies to be administered by the IMF. It will be well worth the while for the United States to cooperate in the working of conversion accounts. But without some years of experience there will be no way to tell whether there is anything here to tie to; and U.S. public opinion is as yet totally unprepared for any permanent attachment to international currency standards.⁴²

Urgent Need for Retooling

In view of the lapse of decades since the basic structure of monetary policy was last overhauled, I am inclined to urge changes that are sharp enough to be somewhat dramatic, rather than try to cure deficiencies by tinkering with existing arrangements. Hence reshaping the monetary constitution in the ways just suggested should help persuade the public that we cannot afford to be euphoric about the U.S. monetary structure we happen to have drifted into, happy as it may make the private financial innovators.

Closer to the operating level, I urge substantial changes in law and practice with relation to reserve requirements on transactions balances, the treatment of time deposits and other highly liquid claims that are not transactions balances, the treatment of interest rates, and the "transparency" of the monetary system.

Reserves Against Transactions Balances

As will be seen from the discussion which follows, I view a system of universal reserve requirements against transactions balances as the most important step toward putting the country's monetary house in order. Open-market operations will clearly continue to be the main moving part in the system; reserve requirements provide a fulcrum for

⁴² The same must be said for a proposal to base an international standard on a market basket of primary commodities, of which I have been one of the advocates.

the open-market lever to work against. True, some economists take the view that monetary policy could be just as effective in the absence of reserve requirements; but it would be rash to base policy on mere surmises as to how the U.S. monetary system would function without them.⁴³

I agree with the proposal of my colleague Phillip Cagan for a uniform reserve requirement at some such rate as 10 percent on all transactions balances. Traditionally, there have been higher percentages on demand deposits in major financial centers (notably New York and Chicago) than on deposits in country banks; and today requirements are graduated by the size of total deposits in each bank. The original basis of differentiation—the holding of country-bank reserves in reserve city banks—is generations obsolete. Attention is drawn to indications in statistics of deposit turnover that a given amount of deposits in money-market banks may lubricate more transactions than the same amount in country banks. I am inclined, however, to the view that such interbank differences are much less important than they may seem at first glance, and would urge in favor of uniformity—the ease within which funds may be shifted from one form of transactions balance to another.⁴⁴

⁴³ I find very persuasive a comment of Chairman Volcker before the Senate Committee on Banking, Housing and Urban Affairs (*Federal Reserve Bulletin*, October 1979, p. 826) :

"I know that the committee has already heard theoretical debates about whether reserve requirements are essential at all to the conduct of monetary policy—inued I have engaged in such theorizing myself. But we in the Federal Reserve have the practical responsibility of operating monetary policy, and you will properly hold us accountable. We are not interested in committing ourselves to the conduct of monetary policy on the basis of untested and controversial theorizing."

As a monetary theorist, I would add that the theories in question (dealing with banks' spontaneous demand for reserves) seem to me not only untested but unreasonable. I would agree that in any given situation there would always be an equilibrium quantity reserves which if held by banks would leave them feeling they had neither too much nor too little. But it would seem likely that the equilibrium quantity might be quite different on a given day from what it had been a few days or weeks earlier. The erratic movements of securities markets suggest that each day's news about events of many kinds can sharply change the view of the future and the degree of uncertainty held by those who operate in financial markets. Furthermore, the processes of adjustment set up by a discrepancy between equilibrium and actual quantity of reserves might constitute serious economic disturbances.

The function of required reserves, as I see it, is largely to reduce the impact of any changes in the spontaneous demand for reserves. It seems likely that the combination of required plus spontaneously demanded reserves will not often exceed the required reserves, because most of the motives for holding spontaneously demanded reserves can be satisfied by reserves held to meet requirements. (Witness the fact that in recent decades the aggregate excess reserves of member banks have never been appreciable in relation to required reserves.) It is possible for the sum of the two to fall below the amount of required reserves, as attested by episodes when bank borrowings at the Fed exceed excess reserves. But in recent decades, total borrowings have never exceeded 5 percent of aggregate reserve deposits except during the episode of the Franklin National Bank failure. As a proportion of the amount of reserves spontaneously demanded, however, the movement of bank borrowings at the Fed would have loomed large.

It is a fact, of course, that elsewhere in the world some reasonably well-functioning monetary systems work without reserve requirements closely comparable to ours. I would argue, however, that in such countries the commercial banking system has been consolidated to the point where a group of three to six banks does almost all the business—giving much more scope for working through directives to individual banks than can exist in our much more dispersed system. Furthermore, the fixity of interest rates on existing contracts, which in the U.S. has a foundation in the Federal Constitution, is a problem which can be bypassed in other countries. The Bank of England, notably, moves interest rates on all outstanding mortgage contracts when it changes bank rate.

⁴⁴ The impression of major differences of kind between different transactions-balance dollars rests largely on the dramatic spread of turnover rates reported in data on bank debits. In the autumn of 1979, for example, the seasonally adjusted annual ratio of "debits to individual account" to corresponding holdings of deposits was 712 for major banks in New York City, compared to 118 for other banks. My impression is that the difference arises primarily from what the experts on this topic have christened "fluff"—that is, transfers of purely financial character, in a small number of accounts where balances are allowed to turn over many times a day. In addition, there are elements of statistical freakishness. A notable example is the effect of RP's, which are excluded from the deposit-balance denominator of the ratios while contributing to the numerator almost a dollar of daily debits per dollar of RP's outstanding. Correction for this single item would bring the New York ratio down to 400.

Inclusion of Missing Items

For clarity, let me reiterate the point made above that the concept of transactions balances needs to be defined so as not to omit such major components as repurchase agreements and highly available funds which purport to be held in Bahamas/Caymans branches of U.S. banks. These items should be included, for reserve-requirement purposes, in the enumeration of subitems covered by the definition; while the conceptual side of the definition should require the Federal Reserve to cover additional types of transactions balances which may result from new innovations or be discovered by close scrutiny of arrangements already existing.⁴⁵

Protecting the Dividing Line Between Transaction and Time Accounts

I again agree heartily with Chairman Volcker when he suggests "concentrating the focus of reserve requirements" on transactions balances and giving up the idea that monetary control is strengthened by requirements at a lower but still appreciable rate upon deposits which represent authentic long-term savings accumulations.⁴⁶ The optimum level of requirements against deposits which are not transactions balances should then be taken as zero (or possibly some fraction of 1 percent as a token rate to help in monitoring areas where potential new forms of transactions balances must be looked out for).

A further consequence of this position, not so clearly put in Mr. Volcker's comments, is that *monetary targets* should be set in terms of transactions balances. I can see no reason why monetary policy need be concerned with the quantity of liquid assets held in forms that are not available for transactions uses, as long as the two types of liquid assets are kept distinct from each other. If elements of so-called savings balances are de facto transactions balances, the remedy is not to subject them to a low reserve requirement but to reclassify them into the transactions category. The formulation of monetary targets in terms of M-2 (either on the old or on the new classification which will consist largely of authentic long-term funds held in savings balances) is merely confusing to the public.⁴⁷

A neglected key proposition in monetary policy is that the dividing line between claims that do and do not constitute money (transactions balances) does not take care of itself. Forces of financial innovation

⁴⁵ To quote Chairman Volcker (Federal Reserve Bulletin, October 1979, p. 824):

"... financial technology does not stand still, and the definition of a transactions balance—in principle an account from which payments to third parties can be made—is critical. For instance, we can now observe burgeoning growth of money market mutual funds. . . . raising the question whether such funds do not perform the economic function of a transactions account."

The omission of RP's or of highly available funds in "overseas" branches which actually are domestic operations would plainly be in total contradiction of the view just quoted.

⁴⁶ Cf. Mr. Volcker's comparison of the reserve-requirement provisions of two competing bills before Congress (S. 85 and H.R. 7) in the same October 1979 article just cited. The words in the heading come from p. 829.

⁴⁷ Incidentally, if reasons were developed for trying to influence both of two variables—transactions balances and the additional elements which enter M-2—it would be ineffective to try to influence both through a single type of reserve funds that could be applied to either component.

It would be entirely possible to design a system with two distinct types of reserves, one for transactions balances, the second for savings balances. The reserve for savings could be required to take the form of a holding of a special Federal-Reserve issued security, having no other use, transferrable only among banks or among depository institutions, and whose outstanding quantity would be set by the Federal Reserve. The fact that those who advocate having M-1 and M-2 targets never seem interested in such a structure of distinct types of reserves is an index of the confusion with which monetary targets are encumbered.

are always at work to make this boundary (using a word of Mr. Volcker's) "fuzzy." One of the main considerations in the framing and administration of monetary legislation must be to protect this dividing line.

In case, by neglect, this dividing line is left vague and it is made too easy to develop transactions balances in forms not specified in the official definition, we will be back in the quagmire of open-ended money supply: policy can be frustrated by shifting actual transactions balances into unofficial forms.⁴⁸ I infer that the counterpart of freedom from reserve requirements for time deposits and similar liabilities must be to insist upon contract terms which make them different in kind from transactions balances—or at least open a wide difference of degree. These terms must involve such deterrents to attempts to use other funds for transactions purposes as slight delays in obtaining cash, appreciable loss of interest that would otherwise be earned, brokerage costs, and exposure to moderate risks of adverse market fluctuations.

My counsel would be to start with a refutable presumption that any dollar-denominated claim is a transactions balance. To refute this claim and establish freedom from reserve requirements, it must be shown that one of several situations exist. Perhaps the claim is a marketable security, originally issued with a maturity of at least some months, and subject to some market uncertainty. Perhaps it is a deposit with guaranteed principal value, but set up for a medium or long maturity and with a substantial amount of interest to be canceled if the funds are withdrawn prematurely. Bonds, debentures, and long-contract certificates of deposit would then attract no reserve requirements; but for MMMF shares the presumption could not be refuted and transactions-balance requirements would apply. The object of the policy would be to set up a real distinction between the two groups, so that everybody would know which was which. A useful rule might be that rule which applies to negotiable certificates of deposit issued by U.S. mainland banking offices: No initial maturities under 30 days, and no redeemability.⁴⁹

Initial Sorting Out of Transactions From Other Balances

A disconcerting aspect of the problem of reforming reserve requirements is that nobody knows at all closely how large is the stock of invisible transactions balances, nor yet how far some of the subclasses of visible transactions balances may be diluted by inclusion of what are really long-term savings accumulations. This ambiguity is not a defect of the reform proposals, but rather the result of the permissive policy by which the money supply has been permitted to become open-ended.

⁴⁸ *Analogue.*—Suppose the city fathers have decided to restrain the explosion of canine population by setting a ceiling upon the number of dog licenses. But the draftsmen of the ordinance have rashly used the word "hound" where "dog" would have been appropriate. The new ordinance will set limits on the total number of canine quadrupeds whose varietal names are Afghan hound, basset hound, bloodhound, . . . , wolfhound. But unfortunately it sets no bounds on the total number of Airdales, boxers, Chihuahuas, . . . , Yorkshire terriers—not to mention mongrels.

⁴⁹ One reason for concern about the moneyness of offshore time deposits is the excessive liquidity of time deposits and CD's booked for the very short periods allowed in offshore operations. For example, a holding of "seven-day" funds (which means five business days) can readily be so set up that a fifth will run off tomorrow, another fifth day after tomorrow, and so forth. With such a holding, no appreciable risk or cost may be entailed in using overnight borrowing to withdraw the entire amount tomorrow.

But however this ambiguity has arisen, it would not be good policy to overlook its existence.

My suggestion is that when the new system is introduced, banks and other institutions involved should be called upon for a preliminary declaration of the amount of transactions balances they administer under various subcategories. A preliminary adjustment of reserves to match the stock of transactions balances would then be made by Federal Reserve open-market operations. There would then have to be a shake-down process because banks and their customers would find themselves engaged in a mutual-adjustment process. As customers got used to the differences in contract terms between transactions balances and other claims, there would be customers who would want to reallocate toward transactions balances and others who would want to reallocate in the other direction. Furthermore, bankers' experience might lead to alterations in their proffered contract terms. Rather than freeze the aggregate amount of transactions balances at the amount to which preliminary declarations added up, the Federal Reserve would probably be wise to accommodate shifting in the first few months, and to take account of indications of slower-acting adjustments in setting monetary targets for the first few years. True, this suggestion implies a certain amount of fluidity in setting monetary targets. But the ambiguity of the situation would be trifling compared to what we are headed for under the present arrangements. Without the reforms proposed, the Federal Reserve is reduced to setting targets in terms of variants of M-1 and M-2, none of which corresponds at all closely to the way the money supply takes hold on the operating economy, and to operate with hybrid time-deposit/demand-deposit reserve requirements which have an ambiguous impact.

Interest on Reserve Balances and on Transactions Balances

My sense is that the United States can have a workable monetary system with or without having interest paid on the reserve balances held at the Federal Reserve against transactions balances, or on the transactions balances held by the general public. I agree with the widely held view that to pay such interest can abate some of the financial tensions which have led to the mushroom growth of transactions balances outside traditional M-1. But I point out that a policy of letting interest rates find their level can produce a fresh set of tensions (especially among the savings institutions), and that holding transactions-balance interest at zero (or at any event well below that on long-term claims) will be helpful in keeping a clear difference of kind between items that do and do not function as money.

I repudiate the view, which seems to be held in many financial circles and by a good many economists, that to decontrol interest rates and let them find their level would somehow be a panacea for everything that ails the U.S. economy in general and its financial sector in particular. For one thing, as I mentioned above, interest-rates on outstanding contracts have been brought forward from the past, and can be adjusted only as the contracts are paid off or as both sides agree on refinancing. The transmission of interest-rate pressures to the savings institutions forces them to meet the market on the liability side without being able to match the market on the asset side; this fact

is one of the major drawbacks of inflation (and especially of accelerating inflation) in the U.S. economy.⁵⁰

And in any event, the advocates of interest decontrol seem to be confusing equilibrium theorizing with practical counsel. The interest rates paid to depositors and those paid to borrowers will not be made on markets that actually behave according to economic laws of pure competition. The expectations about inflation of participants in the market cannot be conjured out of existence, will continue to bear heavily upon interest rates, and will probably continue to be reshaped fairly rapidly with fluctuating experience. And finally, the quality (or risk classification) of obligations, which in theoretical discussions is taken to be standardized, cannot be judged in real life without taking account of inflation prospects; and in view of the huge volume of what I have termed above "inflation-secured loans", the notion that the financial system would stabilize itself but for misguided controls upon interest rates seems implausible.

To digress slightly, I must repudiate also the view that an adequate monetary policy can consist solely in exerting influence on the course of market rates of interest, making control over the quantity of money unnecessary. I can imagine a world in which this were true—where for example the central bank had the kind of ability to shift the whole interest structure (including existing contracts) possessed by the Bank of England, and where also the public had no serious expectations of inflation and by some convenient dispensation of providence would never develop such expectations. But I submit that this hypothetical world is very different from the situation of the United States now or in the foreseeable future. The very meaning of market interest rates is so uncertain—so much a function of future events that can only be guessed at—that the notion they can operate as the steering wheel of the economy is hard to defend. This is why I am taking such a firm stand on the importance of having the Federal Reserve in a position to govern the course of the effective supply of money—to steer the growth of transactions balances, and to deter their transformation into invisible forms.

A workable monetary system can be reestablished in the United States either with or without allowing transactions balances to bear interest. To allow interest payments on a substantial scale (even if below market equilibrium rates) will ease some of the tensions which have fostered the innovations that have created new forms of transactions balances, at the expense of making more difficult the position of the savings institutions and hence impeding the finance of mortgages. On the other hand, to come close to equalizing rates on transactions balances and on other claims risks open-ending the money supply in the sense of encouraging firms and households to have mixed balances (the mongrels of my dog-license metaphor above),

⁵⁰ As the final draft of this paper has been in the typewriter, the press has been reporting very ominous operating results for 1979 (and especially its fourth quarter) for mutual savings banks squeezed between rising deposit-rates and lagging mortgage-rates. The situation of savings and loan associations is probably even tighter. While in some states there has been legislation to permit savings institutions to offer "variable-rate mortgages," they are nowhere able to insist that all new contracts be on a variable-rate basis, let alone that old contracts be refinanced on such a basis.

A related ominous symptom is that one hears of a rapid acceleration in the public's "borrowing" against life insurance policies, where the policyholder in most cases can get command at 5 percent interest of funds corresponding to the bulk of insurance reserves. I will not attempt here to trace any scenarios for the consequences of the large financial shifts which could arise from pressure on the insurance companies.

where long-term accumulations are mixed in with transactions balances. Attempts to cool an overheated economy by restricting the growth of transactions balances may then be frustrated because they activate some of what had been long-term funds held in the same form as transactions balances.

To require the holding of noninterest-bearing reserves against transactions balances will give bankers an incentive to hold yields on transactions balances below those on nonreservable longer term obligations; for if a million of additional funds the bank may attract will support only \$900,000, instead of \$1,000,000 in additional loans, the bank cannot afford to buy the funds at such a high rate. On the other hand, the yield differential resulting from a 10 percent requirement might strike many depositors as trifling. It might be wiser to have an interest ceiling on transactions balances well below that on claims with contracts that reduce their liquidity. This would encourage depositors to keep their transactions balances lean during the shakeout period when transactions balances and other claims were being sorted out, and thus create a more manageable monetary situation. Even down to the traditional interest ceiling of zero. I would argue that the implicit tax is acceptable in public-policy terms, on account of the inflationary externalities of high liquidity. But as indicated above, the whole mechanism of monetary control depends on setting narrow limits to the ability of balance holders to evade the liquidity tax by finding ways to hold funds which give them both full interest and full liquidity.

Restoration of Transparency to the Monetary System

A key element in any public-policy program which calls upon a large number of people to accept restraints upon their actions is *willing compliance based upon understanding of the program*. There has been a regrettable tendency to treat monetary policy as purely a domain for the experts, and to view restraints upon banks, depositors, and nonbank financial institutions as manipulative devices applied to the rest of us by a mysterious governing elite. A situation so perceived tends to degenerate into a game where individuals, companies and financial institutions figure out how to find chinks in the situation for individual advantage, and where financial innovators and lobbyists feel no inhibitions about creating loopholes in the system of restraints.

Democratic society rests upon widespread willingness to accept restraints upon private action in the public interest. But restraints are not accepted merely because "Big Brother" proposes them. People must be persuaded of two things: (1) That the proposed restraints are reasonably well designed to steer private actions in ways that will benefit the community; and (2) That if the individuals addressed comply, they will not find that the benefits of their compliance will be pocketed by noncomplying neighbors, such that their goodwill is exploited for private rather than public benefit.

The role of compulsion in public programs is to take care of point (2). Compulsion will not make a majority (or even a substantial minority) do things they really see no sense in. But compulsion can save a general willingness to comply from running to waste, because it gives assurances that noncompliers will not be the main beneficiaries

of compliance. One of the main advantages of monetary policy is that it can apply compulsion in this healthy way, along lines that are widely perceived as fair and evenhanded.

Unfortunately, the way in which monetary policy has been put before the public fritters away many of its potential benefits. To mobilize a public willingness to accept constraints, a program must have transparency. People must understand in broad terms what is going on, and be able to see their share in compliance as helping with a program that will take hold toward meeting widely accepted public objectives (of which abating inflation is the example immediately in question). Not everybody need understand the total situation in fine detail. But people must perceive that restraints they themselves find inconvenient are needed to deter other people from misbehavior. And experience must be interpreted in a way that tests the appropriateness and effectiveness of the program and reinforces people's acceptance. In monetary policy, these standards have not been met.

There is a general impression in the United States that the Federal Reserve is struggling to check inflation by limiting the growth of money. So far, so good. But the way the monetary aggregates is measured takes the meaning out of the announced targets. Down through 1979, these have been put in terms of growth in M-1 and M-2—two aggregates about which most people have rather vague ideas. The confusion has been compounded because official and journalistic commentators have tended to stress one or the other of the two aggregates according to which seemed to fit the interpretation they wanted to put on events of the last few days. Besides, the public has been trained to take seriously *week-to-week* changes in the aggregates, which are composed largely of statistical noise.⁵¹

To rest a bid for public acceptance of monetary authority on more solid foundations, I urge that both monetary targets and the focus of reporting on monetary events should focus upon the *aggregate of transactions balances*. To get the system of reserve requirements refocused calls for legislation; something which is not clearly within the domain of authority of the Federal Reserve Board. But the Board has authority to set the basis on which published statistics and weekly news releases are framed. Transparency suffers because the announced new monetary aggregates do not include a pivotal one designed to measure transactions balances: the new M-1B is too incomplete, the new M-2 too heavily loaded with savings deposits that are not transactions balances, for them to direct the public's attention to the actual course of monetary affairs.

Leadership in Monetary Policy

Clearly, the cause of monetary reform needs to be supported by stronger forces than the Federal Reserve Board and a scattering of reform-minded economists and commentators can bring to bear. Various attempts since World War II to imitate the establishment after the

⁵¹ If the public insists on weekly reports, I urge the authorities to concentrate on changes over the 52-week period just ended, together with (seasonally adjusted) 13-week changes. The stockholders of R. H. Macy do not expect to be able to figure out how things are going by poring over weekly sales reports. Why should money watchers be encouraged to feel that the latest wobble in the monetary curve is of earth-shaking importance?

panic of 1907 of the famous National Monetary Commission and re-plan the monetary structure have failed to produce and push through adequate monetary legislation. A fresh start at such a Commission might still be worthwhile. But at the beginning of 1980, a monetary emergency exists. The waning of confidence in anti-inflation policy and (despite the appointment of a new and highly qualified Chairman of the Board) in monetary policy specifically, is producing considerable confusion. Legislative proposals before Congress in 1978, though in my judgment far from adequate to rectify the situation, cut deep enough so that we may find important decisions foreclosed unless national leadership steps in.

In the formulation of legislative proposals in recent years, lobbies for various special interests seem to have had almost as much of a hand as the Federal Reserve. In fact, the Federal Reserve seems to have been perceived (and perhaps even to have conceived itself) at least as much as the advocate of special interests—of the System itself and its member banks—as the spokesman for national interests. The basic fact that the national interest needs defense against inflationary creation of effective money by unconventional operations has not been kept in focus in discussions before the congressional committees—let alone conveyed to the general public by reports of legislative proceedings and of official comments. There exists a widespread awareness that the monetary system is seriously out of gear, but not of the nature of the trouble or the remedies available. I urge the Federal Reserve and the congressional leadership to call upon the President of the United States to make monetary reform his business, to assign highly qualified advisers to work on it intensively, and to come before the country as leaders in a major reform effort which can restore the usefulness of the most powerful single tool available to combat inflation.

Afterword: Monetary Legislation of March 1980

As this paper was on its way to the printer, the press carried accounts of an agreement by a House/Senate conference committee on the substance of a monetary bill which commentators say “paves the way for some of the broadest changes in the banking structure in the last half century.” It is anticipated that this legislation will stop the threatened defections of member banks from the Federal Reserve System, clarify the reserve-requirement situation for transactions balances, regularize the banking operations of thrift institutions, and enable the Federal Reserve to make more effective use of powers under the Credit Control Act of 1968 which prior to Mr. Volcker’s accession to the Board chairmanship in October 1979 had little monetary impact.

It might seem that such legislation constitutes a solution to almost all the problems discussed in this paper. But no! True, the membership problem will cease to exert pressure on the Federal Reserve Board to connive at evasions of law and regulations so as to reduce the burdens of membership. Reserve requirements are to be universal, depending on the type of operation rather than on whether or not an institution volunteers to be a member bank—at least at the end of a phase-in period of several years. Authority to carry transactions balances in the form of NOW accounts will be extended to all institutions. Federal Reserve services (notably wire-service fund transfers and clearings) will be

available to all on a fee basis. But the major problems I have analyzed will remain unsolved.

The universal requirements will not take hold fully for four to eight years. Furthermore it does not appear that the major new types of transactions balance will be covered by the requirements: in particular, repurchase agreements and funds held with "overseas" branches of U.S. banks are left outside. If service charges on transactions are made explicit at the wholesale (Federal Reserve) level and passed through to the owners of transactions accounts, competition will presumably bring the interest rates on transactions balances into the same range as those on savings accumulations. Thus the essential difference-of-kind between transactions balances and other claims will be further eroded, and we may expect a further evolution of dodges to make effective as transactions balances funds which are otherwise classified. Although the aggregate of items subject to transactions-balance reserves will become more controllable, high substitutability between these items and those deemed to be savings balances will mean that the purported quantity of money may have little relation to ability to carry out transactions.

It is not inconceivable that some of the gaps in the control system may be largely closed by firmer use of Federal Reserve powers under the Credit Control Act. Such powers are being used to subject to reserve requirements the shares of money market mutual funds. Very likely they could be interpreted to authorize the Federal Reserve to forbid the use of RP's, to subject to transactions-balance treatment funds in accounts from which transfers can be made by telephone and the like, and together with latent powers under the Federal Reserve Act to clean up the substitution of nominally overseas operations for regulated domestic operations. If the Federal Reserve turns out to have recaptured its independence not only from the Treasury but also from the influences which have caused policy to go soft and pro-inflationary policy to be presented to the public as anti-inflationary policy, much may be gained. But no attention is being paid to restoring the transparency of the system; and if the public is invited to judge results by the course of the aggregates M-1B and New M-2, any amount of room is left for disguised monetary expansion. For M-1B omits many of the transactions-account items which are most capable of rapid growth; new M-2 is dominated by items whose growth is more or less irrelevant to the monetary situation; and neither takes account of the phenomenon of "multinational money". The public and the monetary authorities themselves will find the statistical record and the control situation so cluttered with misleading elements that it will be hard to learn and guide policy by monetary measurements with the money stock still in so many respects open-ended.

APPENDIX

ALTERNATIVE MEASURES OF MONEY STOCK AND TRANSACTIONS, AND SOME PRELIMINARY TESTS

This appendix is necessary to complement the text of my paper because of the quantitative implications of what is there presented as a qualitative argument. The main jobs for this appendix are the following:

(1) To sketch the procedures and results of two major compilation jobs which I was forced into by the accumulation of evidence about the misleading

character of "M-1" and "M-2" as measures of money stock and of GNP as a measure of transactions flow:

(a) The alternative money-aggregate TVTB.

(b) A whole family of alternative transactions measures, of which summation of goods and services (SUMGS) is the representative used in the text but others also deserve study.

(2) To verify or refute my intuition that by using my new measures we can deal coherently with the new forms of money by treating them as changes on the supply side.

(3) To verify or refute my intuition that parallel treatment of the conventional measures for the same observation span (1952/1978) will yield incoherent results.

(4) To consider the problem of foresight in monetary policy in the light of my provisional results.

The reader must be warned that the equations presented are of rather rough-and-ready character. While my colleagues at Columbia include some of the country's ablest econometricians, the time-requirements of the compilation jobs proved so heavy that I was not able to meet the publication deadline of this report except by pushing ahead in advance of thoroughgoing planning with full benefit of econometric consultation. My econometric colleagues have been kind enough to offer some advice on how certain first-round equations could be re-shaped for greater usefulness, but have not had opportunity to sit down for a careful consideration of how best to specify the equations. In any event, I am working here with "single-equation models"—as one does to a disquieting extent in quantitative monetary economics, where the underlying logic of monetary economics calls for fitting new data and intuitions into the framework of some multi-equation model of the economy.

Money-Stock Compilation: "The Search for Missing Money"

My compilation of the aggregate I call "Total Visible Transactions Balances" (TVTB) embodies my contribution to what Stephen Goldfeld has christened "the case of the missing money."⁵³ What first drew me back into intensive monetary studies was my disquiet because most monetary economists were so calm about the Federal Reserve moves to encourage evasion of reserve requirements and the law against interest on demand deposits by expanding ATS accounts—particularly when I got it through my head that the large-scale use of RP's was another specimen of the same evasions, and that monetary economists were not bothering their heads about that either. Presently I found that a few other monetary economists were taking notice, and specifically that Gillian Garcia was following up Goldfeld's suggestion of supply-side treatment by trying the effect of including "immediately available funds" as an element of money-supply. The Federal Reserve staff report of January 1979 on the monetary aggregates seemed to me to present strong indications that an aggregate for "visible transactions balances" would be feasible and useful, but to find excuses for *not* excluding relevant items rather than to work them in.⁵⁴

The aggregate TVTB which I use in the equations reported below (and of course in chart 1 of my report) is made up as follows:

Its nucleus is the Federal Reserve's interim statistical series called Proposed M-1 as it stood in 1979.⁵⁴ This includes the traditional currency-plus-demand-deposit aggregate (purged of a few irrelevant items which had crept in), plus several items of "other checking deposits", including ATS and NOW accounts which prior to 1979 had been left outside M-1.

To this I add a collection of "other visible transactions balances", made up of:

(a) Nonreservable liabilities to nonbanks of commercial banks—repurchase (RP) agreements and federal funds (FF)⁵⁵

⁵³ Stephen M. Goldfeld, "The Case of the Missing Money" in *Brookings Papers on Economic Activity* 3 [1973], pp. 577-638.

⁵⁴ The announcement in February 1980 of the new aggregates to be published henceforth perpetuates these defects. Specifically, while describing RP's correctly as "large overnight deposits of corporations," the new system omits them from the transactions-balance aggregate M-1B and treats them as a class of savings deposits.

⁵⁴ The new Federal Reserve monetary aggregates became available only in March 1980. Aggregate M-1B instead of the provisional "proposed M-1" should now be treated as the nucleus.

⁵⁵ I have used in my calculations a provisional series for RP's and federal funds, pieced together by grafting 1969/1978 data from preliminary Federal Reserve Board (FRB) calculations onto a series based on FDIC call-report data on the net liability prior to 1969 of all commercial banks on RP/FF account. New FRB series will make it feasible to upgrade my series considerably, though some problems remain.

(b) Savings balances at commercial banks of state and local governments and of corporations.

(c) Shares outstanding of money-market mutual funds.

(d) Liabilities to residents of U.S. (other than the parent bank) of branches of U.S. banks purporting to be in the Bahamas or the Cayman Islands.⁵⁶

Without pretending that this compilation is identical with what would result from mature consideration applied to data much finer-grained than we actually possess, I urge that it is markedly superior to any of the Federal Reserve's new aggregates as a measure of transactions balances, and claim that the rough tests described below are a decisive justification for treating TVTB as a respectable proxy for the ideal measures we cannot construct from available data.

Transactions-Flow Compilation

In postwar monetary economics, it has been conventional to represent the flow of transactions by Gross National Product.⁵⁷ But if we think more concretely about payments that have to be made by check or equivalent, the gross national product must be seen as suspiciously "net." GNP corresponds to a flow of *final products*. Items which constitute outputs of one economic operation and inputs of another operation (intermediate products) are netted out. Thus GNP includes the value of clothing bought by consumers but avoids the duplication which would be entailed in the value of cloth, yarn, raw fibers. . . .⁵⁸ On the other hand, if we think of payments that have to be made to lubricate the flow of production, it is just as necessary for retailers to pay for garments bought from the factory as for consumers to pay for garments bought from the store: transfers of intermediate products are just as much transactions as are transfers of final products.

Furthermore, GNP represents foreign trade only by the net excess (which may be negative;) of exports over imports, whereas gross exports constitute sales of output and gross imports a stage of wholeselling where imported goods enter the production flow.⁵⁹ The fact that both the elements of gross income and the elements of gross purchases enter transactions suggests that the transactions flow will be at least double that of GNP, and taking account of intermediate products builds the transactions total up further.

The fact that GNP is an underestimate of the transactions flow would not impair the usefulness of GNP as a transactions proxy if the two series were going to turn out proportionate. But we must expect intermediate-product transactions to vary relative to final products in "business cycles"; and structural changes may cause long-term relative drifts between these two. In addition,

⁵⁶ As I argue in the text, this entry is too inclusive on the side of liabilities to banks other than the parent bank; one hopes this error offsets omission of liabilities to non-banks at other "overseas" branches.

⁵⁷ In the classical statement of the quantity theory of money by Irving Fisher, "transactions" were broadly conceived to include all dealings in which money is paid for currently produced goods and services or for existing assets (including financial claims other than those classified as money). Transactions could then be decomposed in either of two ways—into a price vector and a quantity vector, or into a money-stock vector and a velocity vector. Hence the Fisher quantity-theory formula: $MV=PT$, where T stands for a physical-quantum counterpart of transactions.

With the development in the interwar period of national accounting and of macro-economic concepts, economists found it congenial to move away from the rather nebulous concept of "general price level" and to deemphasize the flow of financial transactions on the stock market, etc. (suspected of being only loosely connected with total holdings of money). The concept of "income velocity" came into fashion. As GNP rather than "national income" has become the focus of macroeconomic studies, transactions and GNP-flow came to be identified.

⁵⁸ If we look at GNP as a flow of *gross incomes*, what is included at each stage is "value added" in the retailing of clothes, the manufacture of garments, the fabrication of yarns, etc., and the growing or synthetic production of fibers. Value added may then be classified by industries. But national accounting works with the identity (Total value added) \equiv GNP \equiv (Total value of final products). In estimating "real" GNP (alias "GNP in 1972 dollars"), we work with current and price-deflated values of consumption, residential and nonresidential construction, etc.—and back of that with current and deflated values of subelements each of which is some kind of final product.

⁵⁹ GNP also includes two classes of items, however, which we will want to omit from a compilation of transactions. The first is a collection of items-in-kind which are not paid for in "money": the two major items are the rental value of owner-occupied homes and the value of farm-consumed food. The second consists of purchases by the Federal Government, which need to be omitted because by convention (a) the money stock which economists analyze is money stock held by "individuals, partnerships and corporations" (IPC) (a concept which includes state and local governments:), and (b) Federal Government cash balances are not included in the money stock.

transactions will include payments of more strictly financial character, such as taxes, insurance, and loan turnover, which may vary relative to GNP.⁶⁰ Hence it seemed likely that if I made a compilation of transactions starting from such data as the sales of manufacturers, wholesalers and retailers and building up to more and more inclusive totals, I would arrive at aggregate transactions-flow figures with time shape different from that of GNP. And when I actually carried out the compilation, this was indeed the case.

The structure of my compilation can be stated in tabular form, as follows:

Manufacturing sales plus other business sales:

Sales of primary industries (agriculture, mining), plus

Sales of wholesalers and retailers, plus

Operating revenues of transport (railways, airlines, truckers), plus

Operating revenues of utilities (electricity, gas, telephone, telegraph).

equals

Total business sales plus national-accounts items not included in business sales:

Construction, residential and nonresidential, plus

Employee compensation, except Federal Government, plus

Cash rentals of tenant-occupied housing (as distinct from imputed rents).

plus

Exports of goods and services, plus

Imports of goods and services.

equals

Total goods-and-services transaction [SUMGS] plus GNP-linked financial operations:

Government revenues (excluding Federal grants to state and local governments and taxes included in employee compensation), plus

Premiums plus benefits of insurance companies and funds, plus

Retirements of consumer installment credit, plus

Repayments of short-term business debt.

equals

Total GNP-linked transactions [SUMGNP] plus visible financial operations not GNP-linked:

New issues plus retirements of corporate and municipal bonds and of common stocks, plus

Extensions plus repayments of mortgages, plus

Turnover of privately held short-term securities.

equals

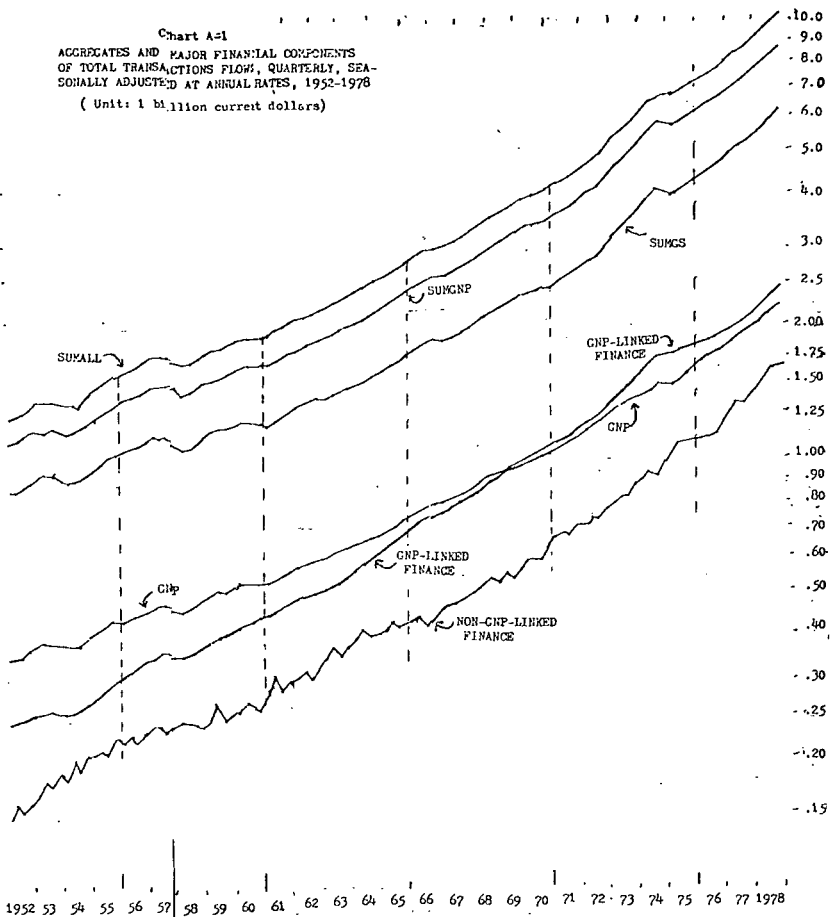
Total visible transactions-flows [SUMALL].

It should be noted that my manufacturing-sales series (derived from "Quarterly Financial Report") is on a companies rather than an establishments basis; it nets out intrafirm shipments of intermediate products, but includes the shipments of manufacturers' sales branches, etc. which are left out of the census series of wholesale sales.

The history of the three main transactions-aggregates compiled for this study (flagged SUMALL, SUMGNP and SUMGGS) is traced in the three top curves of chart A-1. At the foot of the chart (flagged non-GNP-linked finance) is the series for visible financial operations not GNP-linked, and the series for GNP-linked finance starts just above it. The curve for GNP, which has the flattest growth-rate gradient of all the series on the chart, starts about 50 percent above GNP-linked finance and ends up almost 10 percent below it. As I remarked in connection with chart 1 in the text of my paper, the transactions-flow aggregates all show more acceleration in the 1970's than does GNP, and all show a bulge in 1972-74 which is missing from the GNP series.⁶¹ In addition, the eye registers somewhat more cyclical amplitude in the transactions-flow aggregates than in GNP.

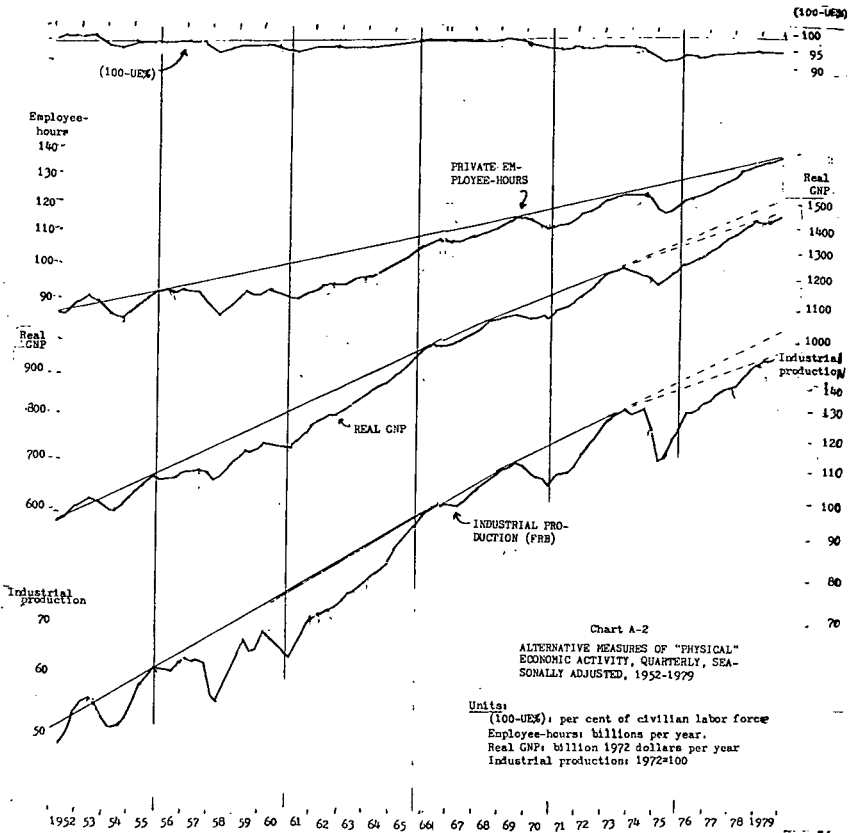
⁶⁰ Extension of a loan by a bank does not entail a check drawn on the funds by "individuals, partnerships and corporations", since bank funds are not included in the IPC aggregate. But bank-loan repayments are made out of the funds of IPC. And of course both extensions and repayments of loans by non-banks must be included in a full listing of transactions flows.

⁶¹ See above.



The greater acceleration of transactions-aggregates in the 1970's, and also the 1972-74 bulge, must result in good part at least from the change in price-structure cited in the text—a higher level of prices for raw materials (hence also for intermediate products) relative to the prices of the final products which GNP aims to measure. I am inclined to suspect that part of the difference may result from a downward bias in GNP-estimation since the date (1972) of the last fully-incorporated census benchmark data. Grounds for this suspicion are indicated by the course of the curves in chart A-2, which represent "real" magnitudes excluding (one hopes) price-changes. In this chart the top two curves represent employment: above the proportion of civilian labor force employed (100 percent minus the unemployment rate), and the next-to-top employee-hours in the private sector. The next-to-bottom curve traces GNP in 1972 dollars, the bottom curve the Federal Reserve index of industrial production. To guide the eye, I have drawn thin lines for each curve on a peak-to-peak basis, which may be taken to approximate the course of a "full-production level" (for GNP, approximating so-called "potential GNP"). The 1952-53 peaks are not used in drawing these lines since we then had an "overtime economy" in

relation to the Korean War; some ambiguities for the 1970's will be examined in a moment.⁶²



It is clear that the employee-hours index tracks quite well with the real-GNP series and the FRB production index, from the early 1950's to 1972. Allowance must of course be made in this comparison for the upward trend of the ratio between output and labor input ["productivity"], and for the greater volatility of industrial production because it is not ballasted by the relatively stable service components of national output. At the right-hand end, however, the 1979 peak of employee-hours falls neatly in line with what would be projected from the peaks of 1955-56, 1968-69, and 1973-74; while the GNP-curve shows a marked retardation. The dotted line which extends the 1969-73 course of real GNP runs considerably steeper than that which links 1973 to 1978. There is a strong resemblance between this observation and what one sees in the FRB industrial-production index. But there is good reason to believe that the FRB index has had an increasing downward bias since 1972 because it embodies assumptions which project pre-1973 relations between output and energy consumption in a number of industrial branches. While the FRB index as such does not enter the estimation of

⁶² The reader may find it disconcerting that I do not round out my set of "physical" aggregates by including one or more price-deflated versions of my transactions-flow aggregates. The difficulty is that we lack any prefabricated price-index suitable for use as a deflator; and while a new compilation might be attempted, it would be laborious and would have to embody some highly-debatable assumptions. The GNP-deflator, as noted in the text, fails to register changes in price structure which make its final-product-price basis inappropriate to deflate the transactions aggregate. The wholesale-price index (in its old-fashioned form) covers primary materials and intermediate products, but seems to give them exaggerated weight. Some sort of average of the GNP-deflator and wholesale index might be applied; but the time-shape of the average would depend on the selection of weights, which could readily be slanted to favor one interpretative position or another.

GNP, it must affect the judgment of GNP-compilers as to the validity of their results, raising the probability that downward-biased GNP estimates will survive internal criticism in the Bureau of Economic Analysis. Part of the widely-deplored decline in the rate of rise in productivity of labor may then be fictitious, resulting from progressive underestimation of GNP.⁶³

For the formulation of policy targets, GNP seems the most interesting of the aggregates studied—or at least it would be if we could clear it of the suspicion of increasing downward bias. But from the standpoint of locating the suspicious relationships that express the public's demand for cash balances and have some prospect of remaining invariant through the changes in structure which are observable both in transactions-flows and in stocks of transaction balances held by the public, GNP seems much less promising than my transactions-flow aggregates. Of these aggregates, SUMGS comes closest to measuring the current-dollar volume of transactions linked to actual production and employment. Hence if apparently-reliable relationships can be established between SUMGS and some measure of money stocks, it will be important to analyze and monitor these relationships. On the other hand, it seems likely that any reliable relationships that can be found will link the stock of money with wider transactions-flow aggregates such as SUMALL or SUMGNP rather than with SUMGS. Such components of the financial flows as tax payments, premiums and benefit payments of insurance, and loan repayments would seem to have just as good credentials as generators of cash requirements for households and firms as do goods-and-services transactions. Conversely, the transactions in outstanding stocks and government securities which I have left altogether outside my aggregates (meaningful data seeming to be absent) probably intensively use a very small stock of cash balances, and surely do not develop per billion of transactions any very large fraction of the cash-balance requirements which correspond to a billion of goods-and-services flows. I am not certain whether the intermediate category of non-GNP-linked financial transactions is closer in its cash-balance requirements to stock-exchange turnover or to GNP-linked finance. I would guess the latter; the rough-and-ready equation-fitting results reported below seem to check with this guess.

Simulation of Classical Demand-for-Money Equations

The classical approach to the search for empirical monetary uniformities likely to persist is to deflate both transactions flows and cash-balance aggregates to a constant-price-and-population basis, and explain the real cash balances by real transactions flow and supplementary variables which represent costs of holding assets in the form of money. This is the procedure, notably, in Goldfeld's "Missing Money" paper, and in his earlier work. Goldfeld's spread of explanatory variables includes two interest rates—that on passbook savings and that on U.S. Treasury bills—and the lagged dependent variable.

I have fitted equations of this type; but they need considerable further work after which they may prove satisfactory or may need to be abandoned. My reasons for putting most of my effort into equations of other types will appear presently.

Very close to the Goldfeld model (except that my span of observation is longer: 1952Q1 through 1978Q4) is an equation where I use the implicit deflator of GNP and Census quarterly population estimates to reduce to a basis of 1967-average prices and population the conventional money stock (represented by $M = \text{Proposed } M-1$) and transactions flow (represented by $Y = \text{GNP}$). All variables are stated in logs. For the interest variables I_1 denotes the log of (1 plus Treasury-bill interest), and I_2 denotes the log of (1 plus (ceiling interest on passbook savings)). The outcome is the equation:

$$[1.1] \quad M_t = -0.228 + 0.975M_{t-1} - 0.0572Y_t - 0.434(I_1)_t - 0.391(I_2)_t \\ \quad \quad \quad [-1.8] \quad [58.7] \quad [3.3] \quad [-6.0] \quad [-1.0]$$

This equation carries an R^2 , adjusted for degrees of freedom, of 0.99146. But unfortunately the corresponding R^2 for the lagged dependent variable alone is no less than 0.98843. Hence the multiple partial R^2 for the combination of three

⁶³ There seems no doubt, however, that the greater part of the reported retardation of productivity-growth reflects a reality. The array of "explanations" for the retardation contains so many convincing arguments as to shift the burden of proof: we should be suspicious if the comparison of aggregates for output and labor input did *not* show a slower rate of advance in productivity! The experts report that examination of sub-aggregates (with care to preserve comparability of labor input and of output) confirms the results of the aggregates. Furthermore, the retardation seems to go back before the 1972 benchmark year, suggesting a long-continuing process. Close inspection of chart A-2 will show that real GNP shows a peak in 1966 which is neatly in line with those for 1955 and 1968, whereas the 1966 peak for employee-hours is submerged.

actual explanatory variables is less than overwhelming—0.262. And the Durbin-Watson statistic is only about 0.2, corresponding to long runs of negative and of positive deviations. Reading the coefficient of 0.975 for lagged-dependent variable as a survival rate for influences carried forward from past quarters, the explanatory variables of the current quarter represent rather hefty elasticities of M_t on Y_t ($0.057/0.025=2.3$), on I_1 ($-0.434/0.025=-17.3$), and on I_2 ($-0.391/0.025=-15.6$). A rate of decay of only 2.5 percent per quarter for past influences is of course so low that no sensible interpretation can be put on the equation.

An alternative relationship of the same sort can be framed by dropping the lagged-dependent variable and inserting a time variable (the number of quarters of deviation of t from the midpoint at 1965.0, denoted by T). The result is:

$$[1.2] \quad M_t = -1.261 - 0.0077T + 0.967Y_t - 0.524(I_1)_t + 2.328(I_2)_t \\ \quad \quad \quad [-2.2] \quad [-12.8] \quad [11.5] \quad [-1.9] \quad [1.4]$$

The adjusted R^2 is 0.88002, while the adjusted r^2 for trend alone is 0.71657, yielding a multiple partial R^2 of 0.573; the Durbin-Watson statistic continues low. This equation can be found plausible only if the positive T -value of 1.4 for (I_2) is non-significant while the T -value of -1.9 for (I_1) is significant. The proportion of variance explained can be pulled up to a multiple partial of 0.719 if we introduce lagged terms in Y , (I_1) and (I_2) —going four quarters into the past—but (I_2) continues to carry positive weights.

More plausible results come out of the computer if we adopt as M the deflated series for TVT_B , and as Y the deflated series for $SUMGS$. At least a pretext can be found for dropping the interest rate (I_1) , since some of the components of TVT_B bear interest, and this rate may be seen as bearing upon the composition rather than the size of TVT_B . On this basis we arrive at the equation:

$$[1.3] \quad M_t = -1.597 - 0.0060T + 0.920Y_t - 1.582(I_1)_t \\ \quad \quad \quad [-4.2] \quad [-18.9] \quad [18.8] \quad [-6.0]$$

The adjusted R^2 is only 0.80148; but since the adjusted r^2 for the trend is only 0.11635, the multiple partial R^2 is a reasonably convincing 0.775, which can be raised somewhat by introducing lagged terms. The Durbin-Watson statistic remains absurdly low, with long runs of like-signed deviations.⁶⁴

I am skeptical that the fitting of Goldfeld-type equations is likely to clarify the question of existence of invariant monetary uniformities, or to give a clear answer as to whether my reformulated cash-balance and transactions-flow aggregates have a clear superiority over the conventional aggregates. It can be said fairly, I think, that equations using lagged dependent variable must be rejected. The coefficient for the lagged dependent variable comes so close to unity as to make this formulation somewhat absurd.⁶⁵

A further difficulty with Goldfeld-type equations is that of price deflation. On the hypothesis that the conventional $M-1$ and GNP are the proper aggregates to use in monetary analysis, the GNP -deflector has good credentials as price deflator. Using this deflator also for TVT_B and $SUMGS$, as is done in framing equation [1.3] is not unreasonable for comparing these aggregates with the conventional $M-1$ and GNP . The outcome supports my view that the revised aggregates can yield correctives to unreasonable inferences which would be forced upon us by insisting on the conventional aggregates. But when we want to use the revised aggregates in their own right, we must face the fact that the lack of representation of intermediate products in GNP and its deflator renders

⁶⁴ In my first gallop through these relationships, I did not attempt filtering operations taking account of the structure of the variance-covariance matrix. It seems likely that for this equation as for those examined below, allowance for a black-box factor of moderate persistence as represented by the two latest previous deviations would cure the absurdity of the Durbin-Watson while raising the T -values of explanatory variables. But this likelihood remains for the present an untested surmise.

⁶⁵ *Paradox*.—A very high regression coefficient for lagged dependent variable, with time series of the general shape we are examining, can arise only if the lagged dependent variable tracks very well with the accelerations and decelerations of the dependent variable proper. But the high regression coefficient implies also a high degree of persistence of influences a number of quarters back—which should make the dependent variable incapable of the rather sudden accelerations and of the business-cycle movements which appear in the data. These two interpretations of the high coefficients bump heads rather squarely. It seems that we must infer that to a large extent the lagged dependent variable is preempting the role of explaining the accelerations and decelerations, which should be occupied by the authentic explanatory variables. Hence there must be major distortions of the attributions of influence to the authentic explanatory variables, of which the very high income elasticities of "demand for money" are presumably specimens.

this an inappropriate deflator for the revised aggregates. I am unwilling to claim that I now just how to deflate SUMGS and TVTB.⁶⁹

Equations for Balance-Flow Ratios

A transformation which obviates the deflation problem is to shift the problem of explanation to ratios of money-stock held to transactions-flow. So long as we think the same deflator should be applied to both numerator and denominator, such ratios are obviously invariant as to the choice of deflator, so that deflation errors cannot fatten the correlations. On the other hand, this model builds in a unit elasticity of stock-upon-flow as an assumption, instead of making this elasticity an object of inquiry. Since equations [1.2] and [1.3] yielded elasticities respectively of 0.967 and 0.920, however, the assumption of this version does not diverge much from the findings of the previous version.

Three sets of equations on this basis are shown in table A. The first set (equations 2.1A/2.1C) are on a conventional footing, using the ratio of Proposed M-1 to GNP as dependent variable. The third set (equations 2.3A/2.3C) are on my revised footing, using the ratio of TVTB to SUMGS. The intermediate set (equations 2.2A/2.2C) have a conventional numerator but an unconventional denominator. Within each set, the first equation is a pure-trend version, the second uses Treasury-bill interest and the rate of rise in the GNP-deflator as explanatory variables. The third (C) equation uses a variant of the Cochran-Orcutt correction. To put the matter heuristically, we can imagine that a policymaker watching monetary events is in possession of the B equation and is trying to use it to forecast the money-stock/money-flow ratio, and that this policymaker is alert enough to have noticed that recently the equation has been yielding a string of positive (negative) deviations, whereas a few years back it had yielded a string of negative (positive) deviations. His interpretation might be that some set of "black box" influences (not necessarily the same as those that produced earlier deviations) is at work and will persist awhile. It would then be rational to use experience to figure out a correction factor which was a function of the two latest-observed deviations.⁶⁷ In the equations where SUMGS is used as the flow variable, the effect of this correction is to leave the values of the parameters for the explanatory variables essentially unchanged, while substantially raising their T-values and bringing the Durbin Watson statistic close to its ideal value of 2.0. In the equations which use GNP as a transactions-flow variable, the parameters change rather sharply when the correction is introduced, and one of the price-change parameters changes from positive to negative. It will be noted however that the more important of the price-change parameters remains positive, although theory requires it to be negative. The equations using SUMGS as transactions variable show the effect of price change (to be regarded as a proxy for expectations of inflation) with an appropriate negative sign. In the hybrid version, the expected negative effect of interest does not appear; but in the third set (using rectified figures for both money stock and transactions flow) the elasticity of the balances/flow ratio on interest comes out at -1.3 (or with previous deviations taken into account, -1.4).⁶⁸

⁶⁹ See above, footnote 62. As noted there, I have experimented somewhat with the old form of the BLS wholesale-price index, which purported to represent primary materials and partly finished goods along with final products. But this deflation yields absolute values of deflated SUMGS and TVTB for the 1970's below previously-attained levels, which simply must be read as a major downward bias (from an exaggeratedly high wholesale price index) from at least 1973 onward. Very impressive correlations can be obtained, but since they must rest upon the common error introduced into the M and Y variables, they cannot be taken as meaningful for the substantive monetary situation.

It would seem to be a corollary that the common error introduced into Y and M by using as deflator for TVTB and SUMGS an index which must be considerably too low in the 1970's will also exaggerate correlations and bias the income-elasticity of demand for money towards unity. Hence the apparent superiority of equation [1.3] over [1.2] may be partly a statistical illusion.

⁶⁷ It is a uniform characteristic of all the equations I have treated in this appendix that when we apply this "black box" model we get a positive coefficient somewhat above unity for the deviation in quarter (t-1) and a small negative coefficient for the deviation in quarter (t-2), the difference of the two coefficients being somewhat less than unity. If we define $UM1 = UM2 + \delta$, we may transform these coefficients algebraically. In equation 2.3C, for example, we may infer that the appropriate correction factor to add to the estimated figure for the current quarter is 0.892 times $UM2$ plus 1.266 times δ .

⁶⁸ A curious feature of the results (which seems to hold for the equations to be examined below as well as for this set) is that when we give scope for distinct influences of very recent and somewhat less recent experience as to interest and as to price change, it is the most recent interest level and the somewhat-less-recent price change which have the most influence. If the effect of these variables were through changes in cash-management practices, we would expect the somewhat-less-recent experience to dominate on both sides. My results seem to say that adjustment to interest rates within an established pattern of cash-management takes effect very rapidly.

TABLE A.—PARAMETERS AND STATISTICS OF EQUATIONS TO "EXPLAIN" MONETARY STOCK/FLOW RATIOS FROM INTEREST RATE AND RATE OF PRICE INFLATION (QUARTERLY, 1952Q2 THROUGH 1978Q4)

Equation	Terms of stock/flow ratio		Partial regression coefficients of explanatory variables							Adjusted multiple R ²		Durbin-Watson statistic			
			Treasury bill interest			Annual rate of rise in GNP deflator		Partial regression coefficients of deviations from "B" equations							
			Numerator	Denominator	Intercept	Date	Quarter t	Mean of quarters t-4/t-1	Quarter t on (t-1)				Quarter (t-1) on (t-4)	Quarter t-1	Quarter t-2
2.1A	M-1	GNP	-1.427 [-849.5]	-0.0075 [-89.1]							0.98718		0.21		
2.1B	M-1	GNP	-1.421 [-123.1]	-0.0076 [-47.4]	-1.329 [-4.4]	+0.581 [+1.6]	+0.172 [+.9]	+0.525 [+1.9]			.98965	0.351	.35		
2.1C	M-1	GNP	-1.422 [256.5]	-0.0075 [-96.9]	-1.153 [-8.0]	+0.598 [+3.3]	-0.357 [-3.6]	-0.887 [-6.4]	+1.067 [+12.1]	-0.176 [-2.0]	.99754	.808	1.69		
2.2A	M-1	SUMGS	-2.319 [-563.4]	-0.0088 [-63.3]							.97492		.14		
2.2B	M-1	SUMGS	-2.266 [-144.3]	-0.0079 [-33.5]	-0.069 [-.2]			-1.345 [-4.6]			.98035	.217	.16		
2.2C	M-1	SUMGS	-2.272 [-391.9]	-0.0080 [-90.1]	-0.024 [-.2]			-1.251 [-11.5]	+1.266 [+13.2]	-.374 [-3.9]	.99730	.892	1.99		
2.3A	TVVT	SUMGS	-2.288 [-764.9]	-0.0074 [-73.3]							.98117		.24		
2.3B	TVTB	SUMGS	-2.216 [-176.1]	-0.0064 [-30.9]	-1.384 [-4.3]	+0.073 [+.2]	-0.023 [-.1]	-0.462 [-1.5]			.98732	.326	.29		
2.3C	TVTB	SUMGS	-2.319 [351.0]	-0.0088 [-72.3]	-1.319 [-8.1]	+0.085 [+.4]	-0.096 [-.9]	-0.393 [-2.5]	+1.136	-.313	.99671	.825	1.96		

Current-Dollar-Flow Equations

A conveniently simple form of relationship is an equation where the dependent variable is the current-dollar level of a transactions flow and the level of a current dollar stock of money appears as chief explanatory variable, supplemented by interest and by price-level change. Such equations, which have been used by Milton Friedlan and by the Federal Reserve Bank of Saint Louis, correspond to the widely held hypothesis that we may regard monetary forces as determining current-dollar flows, and the degree to which changes in transactions flows reflect physical-volume change and price change may be left for separate determination.

A collection of equations organized on this principle appears in Table B. Their structure has much in common with that of the equations already presented in table A. Ideally, all the parameters should be positive, and the parameter for money stock should be of the order of unity. Relative to this expectation, the parameters for the mean level of interest in the year before quarter (t) are anomalous; and in the first set of equations (with both transactions flow and money stock measured conventionally), its negative value exceeds the positive value of the parameter for the current level of interest. In the third set of equations, where both stock and flow variables have been rectified, we find the considerably highest money-stock elasticity (though still appreciably short of unit) and a highly impressive parameter for price change (inflation-expectations proxy).

TABLE B.—PARAMETERS AND STATISTICS OF EQUATIONS TO "EXPLAIN" CURRENT-DOLLAR EXPENDITURES FROM MONEY-STOCK LEVEL, INTEREST AND RATE OF INFLATION

Equation	Key variables		Partial regression coefficients of explanatory						Partial regression coefficients of deviations from "B" equations		Adjusted multiple R ²		Durbin-Watson statistic	
			Intercept	Treasury bill interest rate			Annual rate of rise in GNP deflator		Quarter t-1	Quarter t-2	Equation	Equation over trend		
	Transactions flow	Money stock		Date	Money stock	Quarter t	Mean, quarters t-4 to t-1	Quarter t on (t-1)						Quarter (t-1) on (t-4)
3.1A	GNP		6.65 [+990]	+0.0176 [-77.7]							0.98320		0.03	
3.1B	GNP	M-1	2.35 [11.1]	.0093 [21.6]	0.825 [20.8]	1.067 [+3.8]	-1.429 [-3.6]	-0.177 [-1.0]	+0.305 [+1.0]		.99841	0.905	.31	
3.1C	GNP	M-1	2.52 [23.2]	.0097 [43.1]	.793 [38.7]	.981 [+7.2]	-1.670 [-8.5]	+1.42 [+1.6]	-.235 [+1.5]	1.033 [+10.9]	-0.171 [-1.8]	.99962	.973	1.78
3.2A	GNP		6.65 [+950]	+0.0176 [-77.7]							.98320		.03	
3.2B	GNP	TVTb	3.47 [32.4]	+0.04 [+33.8]	.604 [30.6]	1.000 [+5.0]	-.973 [-3.4]	-.132 [-1.0]	+.412 [+1.9]		.99918	.951	.50	
3.3	GNP	TVTb	3.58 [52.4]	+0.107 [+53.2]	.583 [46.2]	.842 [+7.0]	-1.088 [-6.2]	+.074 [+1.0]	+.370 [+2.7]	.926 [+9.6]	-.223 [-2.3]	.99971	.982	1.86
3.3A	SUMGS		7.54 [+736]	+0.02 [+54.5]							.96646		.02	
3.3B	SUMGS	TVTb	2.97 [+18.5]	+0.008 [+20.5]	.001 [29.0]	1.000 [+3.7]	-1.001 [-2.6]	+.008 [+0.04]	+1.344 [+4.0]		.99842	.953	.38	
3.3C	SUMGS	TVTb	3.05 [+32.1]	+0.0084 [+35.2]	.847 [48.3]	1.170 [+6.7]	-1.316 [-5.3]	-.095 [-.9]	+1.486 [+7.8]	+1.016 [+9.9]	-.258 [-2.5]	.99948	.984	2.05

Split-Period Regressions

If we are looking for relationships likely to persist through time despite the structural changes discussed in the text, a very interesting test is whether the parameters are robust relative to a division of the span of observations into two or more subperiods. Since the divergence of TVTB from proposed M-1, and also the divergence of the time-shape of SUMGS from GNP, are marked only since the beginning of the 1970's there would be much to be said for splitting the span of observation unequally, into (for example) 1952-70 and 1971-79. But the number of observations in the 1970's is so small that the resulting parameters are rather unstable. Consequently the results for a split of the span of observation into two halves (divided at date 1965.0) seem the most interesting, and it is these which I report in table C. The second half is to be seen as a subperiod within which (rather than at the start of which the conventional and rectified series pull apart.

TABLE C.—PARAMETERS AND STATISTICS OF EQUATIONS TO "EXPLAIN" CURRENT-DOLLAR EXPENDITURES FROM CURRENT-DOLLAR MONEY STOCKS, INTEREST AND PRICE CHANGE, WITHIN HALVES OF THE SPAN OF OBSERVATION

Equation	Key variables		Partial regression coefficients of explanatory variables						Adjusted multiple R ²		Durbin-Watson statistic
	Transactions flow	Money stock	Intercept	Date	Money stock	Treasury bill interest	Annual rate of rise in GNP deflator		Equation	Equation over trend	
							Quarter t on (t-1)	Quarter (t-1) on (t-5)			
i. Equations derived from data of 1952-55:											
4.1A	GNP		6.52 [+1047]	0.0130 [+62.7]					0.98693		0.28
4.1B	GNP	M-1	3.81 [+6.9]	.0096 [+17.0]	0.517 [4.8]	2.579 [6.0]	0.623 [+1.1]	-0.262 [-.7]	.99476	0.599	.60
4.1C*	GNP	TVTb	3.82 [+7.0]	.0096 [+17.2]	.515 [+4.8]	2.577 [6.0]	.621 [+1.1]	-.265 [-.8]	.99479	.602	.60
4.2A	SUMGS		7.53 [+728]	.0187 [+54.1]					.96564		.02
4.2B	SUMGS	M-1	3.67 [+5.5]	.0079 [+11.6]	.704 [+5.3]	2.841 [+5.5]	1.399 [+2.0]	+.758 [+1.8]	.99136	.748	.55
4.2C*	SUMGS	TVTb	3.69 [+5.6]	.0079 [+11.7]	.699 [+5.4]	2.838 [+5.5]	1.396 [+2.0]	+.754 [+1.8]	.99142	.750	.55
ii. Equations derived from data of 1966-78:											
4.3A	GNP		6.54 [+805]	.0215 [+79.6]					.99186		.11
4.3B	GNP	M-1	-.75 [-.5]	.0013 [+1.0]	1.428 [+1.8]	.286 [+.8]	-1.167 [-1.3]	-.239 [-.9]	.99535	.428	.23
4.3C	GNP	TVTb	+1.72 [+6.7]	.0041 [+4.2]	.948 [18.6]	.063 [+.4]	-.526 [-1.5]	+2.58 [+2.3]	.99918	.788	.86
4.4A	SUMGS		+7.37 [+853]	.0122 [+42.6]					.97215		.22
4.4B	SUMGS	M-1	-.65 [-.3]	.0021 [+.0.3]	1.559 [+3.4]	.630 [+1.1]	+1.417 [+1.0]	+.157 [+.4]	.99185	.707	.15
4.4C	SUMGS	TVTb	+1.53 [+2.3]	.0033 [1.3]	1.139 [+8.9]	.307 [+.8]	+8.088 [+2.3]	+.821 [+2.5]	.99628	.867	.34

* Marked similarity of parameters in equations 4.2B and 4.2C checked back to data and appears authentic

The interesting question, of course, is not the comparability of the intercept and trend parameter, but that of the parameters for the substantive explanatory variables. The conventional measurement-system yields equations 4.1B and 4.3B, which seem radically incomparable. The elasticity of transactions upon money stock, according to these equations, jumps from 0.517 to 1.428 between the two subperiods, the elasticity on the most recent experienced price change from plus 0.623 to minus 1.167, and the elasticity on Treasury bill interest from 2.579 to 0.286. This is scarcely the behavior of a relationship on whose invariance we can count!

The hybrid equations which use TVTB to help explain GNP are scarcely better. The money-stock elasticity stays somewhere within the ball park (moving from 0.515 to 0.948); but the elasticities on price-change experience both change sign, and that on interest drops from 2.579 to a nonsignificant 0.073. The alternative hybrids 4.2B and 4.4B are scarcely better.

Alone of all the pairs of equations, those which use rectified series for both money stock and transactions flow (4.2C and 4.4C) offer some degree of continuity between the two subperiods. Even here, however, the elasticity of transactions on Treasury-bill interest drops from 2.838 to a nonsignificant 0.307. To make out a case for invariance, accordingly, it would be necessary to argue that somehow or other the inflation-erosion cost took over from the interest-rate cost of holding cash as the inflation intensified. A rationalization along these lines would not seem to be out of the question. But at the most it offers some sort of reasonable hope, rather than any kind of assurance, that relations based on 1952-78 data may continue to be serviceable.⁶⁰

Specifiable Missing Variables

When quantitative relations appear chaotic, one can never exclude *a priori* the possibility that there may be some omitted variable whose inclusion would clean up the equations—or some improvement in the specification of variables already used. An example, of course, is the usefulness of recent price-change history as a variable to be added to Goldfeld's list.

Scrutiny of the residuals of some of the equations reported in this appendix suggests that velocity (the reciprocal of the money-stock/transactions flow ratios examined in table A) shows procyclical movements not picked up by my explanatory variables prior to 1970. The deviations in the 1970's however, do not seem to match well with shortfalls in employment. If some cyclical indicator will prove useful, it will thus have to pull in double harness with some variable which has considerable amplitude after but not before 1970. Having a memory well stored with the time shapes of possibly useful variables, I would rather expect to have hit upon such a variable combination if it existed; but oversights are never really unlikely in such matter.

Within the limited range of relationships I have worked with in connection with this paper, I find serious ambiguities about timing. The equations I report are a selection from a collection in which several explanatory variables are allowed to have one or other of two types of lagged relations—either a series of lagged quarterly value, or a set of longer and longer averages over several recent quarters. On the whole, the equations I have incorporated in this appendix are those which use short lags. It seems rarely to be possible to demonstrate conclusively that longer lags yield more invariant relations; the profile of adjusted R^2 values is remarkably flat over sets of equations which recognize (for example) one-period, two-period, three-period . . . averages of lagged explanatory variables. It might be tempting to argue that this result shows short-lag equations offer just as good explanations as long-lag equations. But there is a joker: these equations derive from a data-book where most of the explanatory variables have moved in the same direction over a number of quarter years. The relative performance of short-lag and long-lag equations might be very different if sawteeth were more common among the explanatory series. Probably some light can be had on this question by focusing attention on crucial episodes where there have been sawteeth, or where there have been rather sudden accelerations and decelerations. But my sense is that this sort of research is unavoidably somewhat impressionistic.

⁶⁰ It is not impossible that the "black box" treatment of the deviations in the two preceding quarters, if applied to the subperiods, may yield some convergence. I have tinkered a little with such relations, but have not really explored them.

One of the serious consequences of the permissiveness the Federal Reserve has shown toward inflationary financial innovations is that this process must have made the reshaping of the economic regime more discontinuous than it need have been. If policy manages once more to contain such explosive developments as ATS and money-market mutual funds, we can hope to build up a body of experience under the new regime which by the mid-1980's may yield at least crude uniformities which it can be hoped will persist, permitting some sort of forecast of the consequences of policy moves. If policy continues to foster elements of discontinuity, however, it may continue to be a matter of guesswork how monetary policy takes hold on the operating economy for as many years ahead as we care to look. One of the most important criteria of a good policy is that it should generate experience that will test and guide future policy. If the experience generated is confusing, policy will continue to be confused.

MONETARY DISEQUILIBRIUM THEORY IN THE FIRST HALF OF THE TWENTIETH CENTURY—WITH REMARKS ON DISEQUILIBRIUM IN THE 1970's

By Clark Warburton*

CONTENTS

	Page
Introduction.....	143
The Decade and a Half, 1900-15.....	143
In the 1920's.....	146
Central Banking Theory and Unsolved Measurement Problems.....	147
Disappearance of the Theory of Monetary Disequilibrium.....	148
In the Second Half of the 1930's and in the 1940's.....	150
Disequilibrium in the 1970's.....	151
References.....	154

INTRODUCTION

The essence of the theory of monetary disequilibrium, as I used the terms three decades ago, and use it here, is that major business fluctuations (inflations and depressions) have their origin in disturbances in the monetary system. It is not necessarily a theory of business cycles, and does not necessarily include all of the elements of "monetarism," as that term is now used.¹ The origin of the theory of monetary disequilibrium lies in the distant past. Its major development was in the 18th and 19th centuries, as a corollary of the theory of equilibrium.

This paper summarizes views expressed during the first three decades of the 20th century by a few commentators of the theory and investigators of the factual record, offers an hypothesis regarding the role of economists in its disappearance during the 1930's, and concludes with a paragraph about the beginning of its revival in the mid-1940's.

THE DECADE AND A HALF, 1900-15

One of the problems encountered by 19th century writers concerned with the relation of monetary disturbances to episodes of inflation and of depression was that of the principles and techniques that should be used in measuring the value of money. To this Correa Walsh made notable contributions. His book on "The Measurement of General Exchange Value," published in 1901, was a great advance in the technique of constructing index numbers of prices. He regarded the type of price index that should be stabilized by means of suitable monetary policy so important that he devoted another book to it, published two

*Formerly, Division of Research and Statistics, Federal Deposit Insurance Corporation. Paper presented at Conference of the History of Economics Society (subsequently edited by the JEC/SSEC), and remarks about disequilibrium in the 1970's, Urbana-Champaign, May 1979.

¹E.g., the theory of monetary disequilibrium was supported by Joseph Schumpeter, though he disagreed with its application to business cycles (Warburton, 1953); and Thomas Mayer's description of monetarism includes propositions not contained in the writings of nineteenth and early twentieth century economists.

years later, entitled "The Fundamental Problem in Monetary Science." He concluded that an index of output prices (exchange value) rather than an index of wage and salary rates (labor value) or a mixed index should be kept stable. In these books Walsh gave little attention to commercial crises, but emphasized the importance—for attainment of the maximum rate of economic progress—of a suitable measure of the value of money, and of maintenance of stability in that value.

In the early years of the 20th century, as in the 19th, commentators and investigators of the relation of monetary developments to prices and production emphasized irregularities in the total circulating medium used in making payments, though they used the word "money" in a narrower sense. "Money" was generally limited to metallic coins and circulating notes issued by governments, while bank credit used in making payments, in the form of banknotes or as deposits subject to transfer by check, were called "currency" and often spoken of as substitutes for money. Quantitatively, the monetary disturbances with which they were concerned were sometimes irregularities in the volume of "money" sometimes those in "currency" and frequently in the relation between the two.

In a book by Joseph French Johnson, published in 1905, this terminology was embodied in its title, "Money and Currency." That book contained long discussions of the effect on the price level and business activity of changes in the quantity of money and of bank credit used as money. The terminology was also embodied in Irving Fisher's famous equation of exchange in his "Elementary Principles of Economics", published in 1912, with separate symbols for money and for deposit currency, and for their rates of use ("efficiency" or velocity of circulation). He applied this equation to all transactions of goods and services for which payments (in money or currency) were made.

The great importance of variation in the amount of credit currency, and its impact on savings and investment, were emphasized by Herbert J. Davenport, in his "Economics of Enterprise" published in 1913. "The commercial crisis," he said, "marks the period when money takes on abnormal scarcity and abnormal values from the fact that substitutes for money—credit currency—contract in volume. . . . If . . . for any reason . . . there sets in a contraction of credit, trouble begins." "If banking is to furnish for ordinary times the bulk of the circulating medium, banking must continue to furnish it for all times. Otherwise there must be recurrent disaster. . . . There must be no credit or there must be permanent credit" (pp. 280, 281, 282, and 287-88). Davenport was cited by Harold Reed, in a book published in 1942, as a prior adherent of the Keynesian theory of liquidity preference and maladjusted savings-investment relationship (*Money Currency and Banking*, 1942, p. 453). Davenport did anticipate Keynes in noting that under certain conditions: "Savings, in any considerable volume, become an impossibility because of no market for them; there is nothing for the case but a sharp restriction of the productive output of society" (p. 305). However, there is a vital difference between his view and that in the "General Theory." In comments that emphasize the lack of outlets for savings, the disposition to hoard, and restriction of consumption, Davenport is discussing the phase of busi-

ness depression subsequent to a serious contraction in the circulating medium and the resulting disturbance in prices and business activity. Davenport did not make the Keynesian assumption that restricted output in a time of depression becomes an equilibrium situation.

There was much written, in the early years of the 20th century, regarding specific defects in the monetary and banking system of the United States, particularly the problem described as inelasticity of the currency. This referred to conditions limiting the issue of circulating banknotes. Such issues by State-chartered banks had been eliminated by taxation, and those by national banks were issuable only on the basis of United States Government obligations, the volume of which was being reduced as the government debt was retired. In consequence, the need for more pocket currency during a business upsurge, or a period of moderate economic growth, resulted in gold or silver withdrawals (in coin or certificates) from the banks into circulation. With fixed reserve requirements, and the tendency of banks to maximize profits by keeping "loaned up," this produced a deficiency in bank reserves, necessitating contraction of bank loans and investments and deposits, and therefore stopping business expansion, initiating a recession, and perhaps inducing a financial panic. John Perrin, in an article in the *Journal of Political Economy* in 1911, described the situation and a remedy, which ". . . would be the use of bank notes through which the volume of currency in circulation would have its adjustment in the flow from bank deposits into bank notes in circulation, and from bank notes in circulation into bank deposits, thus protecting from disturbance both bank reserves and the loans based on them" (*Journal of Political Economy*, 1911, p. 865).

In the same year, the National Monetary Commission, which had been established by Congress in 1908 and had published several noteworthy volumes dealing with the previous history of banking and its relation to business fluctuations and crises, reported its recommendation for establishment of a national reserve association. The next year, a book with the title, "Banking Reform," edited by J. Laurence Laughlin, described a major purpose of such an association to be: "To provide an elastic currency whenever it was needed by the public; to make this possible without drawing down bank reserves" (p. 18).

Establishment of the Federal Reserve System in 1913 was the result of this search for a device for removing a recognized cause of monetary disequilibrium. The Federal Reserve Act provided for pooling reserves in Federal Reserve banks, issuing of circulating notes by those banks, and creation of a new type of commercial bank reserves in the form of deposit balances at the Reserve banks. Those deposit accounts, though not recognized as "lawful money" as in the case of the greenbacks, were essentially akin to government issued paper money. In the course of time this addition to standard money or the monetary base, together with recognition of the fact that transferable deposits had become the major portion of generally accepted means of payment, led to a new terminology. Transferable bank deposits, along with coins and other legal tender and circulating banknotes (including Federal Reserve notes), came to be included in the term "money," with metallic

money and commercial bank deposits in Federal Reserve banks described as "high-powered money."

IN THE 1920's

A book by Otto C. Lightner, entitled "The History of Business Depressions," published in 1922, contains a more extensive dating and description of departures from full employment than any other publication with which I am acquainted. After introductory chapters on depressions in foreign countries and in colonial times, he has chapters devoted to each of 19 depressions in the United States, from 1785-89 to 1920-21, and another chapter to a dozen minor depressions. Throughout these chapters there are two basic trends of thought regarding causal influences; speculation and the money question, the latter referring to disturbances in the quantity of the circulating medium. In a summary chapter, Lightner concludes that speculation is the outstanding cause of depression, the universal phenomenon. But he had noted that some depressions did not follow inflation or expansion (mentioning 1848, 1884, and 1893), and hence presumably were not a sequel to speculation though he does not specifically state this. Further, in almost all of his descriptions of the development of depressions he cited banking difficulties, with specific or clearly implied contraction of the circulating medium as an initiating or accentuating force in the downswing; and in many of the cases he associated high rates of expansion of bank operations or circulating medium with the preceding speculation.

William C. Schluter, in a book published in 1923, "The Pre-War Business Cycle, 1907-14," made a more detailed examination of business fluctuations during a much shorter span of time, with chapters on three depressions and the two intervening revivals. He concluded that not only the occurrence of depressions and revivals, but also their lengths, were associated with fluctuations in bank credit related to fluctuations in the banks' reserves.

Arthur C. Pigou, in his book, "Industrial Fluctuations," published in 1927, gave considerable attention to monetary maladjustments both as a cause of fluctuations and as an augmenting influence in fluctuations originating from other causes. He was more explicit than earlier writers in noting the importance of the circulating medium deviations from the upward trend needed for maintenance of a stable price level. He also clarified more than any previous writer the concept of monetary velocity, distinguishing between income velocity, trade velocity, and transaction velocity (in Fisher's sense), and commenting that variations in income velocity and trade velocity cannot be deduced from variations in transactions velocity. Although variations in income velocity may be statistically more closely related to variations in national income than are variations in the circulating medium, Pigou noted that this did not minimize the importance of variation in the supply of circulating medium because changes in income velocity are at least in part a result of changes in the amount of the circulating medium. He attempted to use statistical data to determine the degree to which industrial fluctuations could be ascribed directly and indirectly to changes in money supply relative to reasonable rate of

growth. He thought his results justified him in stressing the importance of monetary factors; but, because of inadequacy of data, they were inconclusive with respect to their degree of dominance.²

CENTRAL BANKING THEORY AND UNSOLVED MEASUREMENT PROBLEMS

In the early decades of the 20th century there was also a developing doctrine pertaining to an active role by central banks in using their powers for the purpose of maintaining a stable but growing quantity of circulating medium. This involved central bank action not only to minimize the disturbances I have mentioned as underlying establishment of the Federal Reserve System, but also to offset external specie (money in coin) drains or large specie inflows. That concept of the function and orientation of central bank policy was expressed by various economists writing in the early and middle 1930's. These included John Maynard Keynes in a 1931 article in the *Encyclopaedia of the Social Sciences*, Gustav Cassel in a 1934 article quoted the same year by Norman Lombard in a book, "Monetary Statesmanship," and Henry Parker Willis, who had been an adviser in the drafting of the Federal Reserve Act, in his 1936 book, "The Theory and Practice of Central Banking." That view of the appropriate role for Federal Reserve operations had been accepted by the Federal Reserve authorities in the 1920's (after the use of their powers in 1917-19 for war financing and near the end of 1919 and in the early part of 1920 for checking the resulting inflation) and was elucidated in the annual report of the Federal Reserve Board for 1923.

However, there were various unsolved or controversial problems of measurement associated with the practical application of that view of the role of central banks. One was how to measure price level stability, with three views: Correa Walsh's view that prices of output should be stabilized; the opposing view that wages or factor costs should be stabilized; and a third view, upheld by Irving Fisher, that the prices should be stabilized of all goods and services for which money payments are made. Another was a parallel difference in attitude toward measurement of monetary velocity—notably, the contrast between Fisher's transactions velocity and Pigou's income or final products velocity. A third unsolved problem was the degree to which and the circumstances under which variation in the rate of circulation: (a) Might produce the same results and therefore accentuate the impact of variation in the quantity of money; or (b) might offset variation in the quantity.

Another problem of differing views regarding the tools of central bank policy and their usage originated from the fact that changes in commercial bank assets and deposits result from transactions between the banks and their customers, representing decisions of depositors and borrowers and also decisions of bank officers. Which set of decisions is the more influential and which should the central bank attempt to influence? One view emphasized the role of bank borrowers

² In later publications, after the unprecedented business decline in the early 1930's, Pigou gave less attention to forces affecting the total stock of money and resulting changes in income velocity, and more to circumstances affecting velocity through changes in the relative size of the active and passive portions of the money stock, but this changed emphasis was not supported by analysis of factual data.

and the demand for bank loans and for money holdings—often confused with each other. With this view, changes in central-bank rate are influential by affecting that demand and consequently the amount of bank deposits—and therefore the need of the banks to rediscount to provide themselves with the required legal reserves. An alternative view, more directly related to the historical theory of monetary disequilibrium, emphasized the role of bank officials in pursuing the profit-making opportunities of banks. In this view, whatever the rate of interest, it is advantageous to acquire additional assets close to the limit permitted by a bank's reserve position—and other legal limitations or circumstances—since additional assets can be acquired by extending the bank's own noninterest bearing obligations. This can be accomplished not only by new loans to its own customers, but also by acquiring existing loan obligations in the securities market, where there is no direct contact of borrower and lender.

From this alternative view of commercial-bank behavior, the crucial focus of central bank operations—for the purpose of maintaining a stable but growing quantity of circulating medium—should be the quantity of commercial-bank reserves. That quantity, of course, may be influenced by changes in the central-bank-discount rate, but it may be more decisively affected by other conditions for discounting or by central-bank acquisition (or relinquishment) of assets by other means, such as open-market operations.

DISAPPEARANCE OF THE THEORY OF MONETARY DISEQUILIBRIUM

When the United States sank into a great depression in the early 1930's and emerged so slowly that it was nearly a decade before full recovery was achieved, it was not attributed (by most of the Nation's economists) to monetary policy or the behavior of the banking system. For the most part, the theory of monetary disequilibrium disappeared, though there was some recognition of it in a few places. Why did this occur? I would offer the hypothesis that the colossal economic downswing, and the disappearance of the theory of monetary disequilibrium, were both the consequence of the position taken by the Federal Reserve authorities and their economists regarding: (a) The divergent view I have mentioned as to usage of central bank tools; (b) the unsolved problems of measurement to which I have referred; and (c) the theory, or more accurately, the absence of theory, they held regarding property values in a situation of economic equilibrium or near-equilibrium as described by classical economists.

Regarding central bank action to check a boom with rising prices or to stimulate business if it appeared to be slackening and prices weakening, the Federal Reserve followed the traditional Bank of England procedure without apparently understanding the unique features of the British economy and banking customs that made changes in "bank rate" effective in that country.

On the measurement problems, the research staff of the Federal Reserve Board developed various measures of production and trade, presumably for use as an indicator of the "needs of business" for bank credit and circulating medium. The Federal Reserve Bank of New York looked at the problem of measuring monetary velocity, and of the value of money in the form of a comprehensive price index. For

these, it was realized that data were needed for periods shorter than a year, and many monthly series were developed. However, this was not done for the circulating medium itself. Although the Board obtained weekly deposit figures from banks in leading cities, these were neither tied in with data for member banks on call dates nor for all banks at mid-year and year-end; nor were they combined with currency outside banks so as to obtain a monthly series as an aggregate or as an index number of the total circulating medium.

All of these data turned out to be defective, misleading, or inadequate, and led to erroneous interpretations by economists both within and outside the Federal Reserve System. Because of "window-dressing" or other short-time operations, the semi-annual aggregate figure for bank deposits was unreliable. At the end of 1928, the figure termed "adjusted deposits" was about 4 percent larger than it was during most of the half-year preceding or following that date, thus concealing the fact that growth of the circulating medium had been halted. In addition, the lack of attention by the Federal Reserve to a monthly or quarterly index number or aggregate for the circulating medium was accompanied by inadequate consideration of the need for growth to accompany the growth of output or trade (or even population) since they provided no computations of money per capita such as those previously published in the annual reports of the Comptroller of the Currency. This inattention to growth was reflected in the 1920's in practically no growth in assets of the Federal Reserve banks. Fortunately, the effective amount of member bank reserves, and therefore the stock of money, did increase until nearly the end of the decade because of a reduction in Federal Reserve notes in circulation and reclassification of deposits by member banks from the demand to the time category.

The measure of monetary velocity prepared at the Federal Reserve Bank of New York consisted of ratios of bank debits to average deposits, and was therefore related to Fisher's concept of transactions velocity. Pigou's warning of the unreliability of that concept for the purpose of understanding and coping with business fluctuations was unheeded by both the research staff and officials of the central banking system and by economists generally. The new measure of the value of money was an index of the "general price level," including wages and securities prices as well as the prices of commodities and services. Correa Walsh's objections to such a mixture of concepts was overlooked, apparently without an understanding of the various concepts of value and the need to distinguish among them. Although this new measure of the price level was not so generally accepted by academic economists as that for velocity, it tended to obscure rather than clarify the problem of detecting monetary disequilibrium.

According to these measures both velocity and prices moved upward during the 1920's, leading to the conclusion that most of the decade had been a time of inflation—too rapid a growth in the stock of money—that showed itself in prices of securities rather than commodities. The duty of the central bank thus appeared to be to check stock market speculation, which had been one of the matters of concern to the founders of the system. In the absence of a theory of property values under equilibrium conditions, there seems to be no challenge to that view. However, had the 19th-century theory of interest rates

under equilibrium conditions been applied to the circumstances of the 1920's, the long rise in stock prices from 1921 to mid-1929 would not have been regarded as evidence of disequilibrium. Nineteenth century economists had noted a tendency for interest rates to fall with accumulation of capital and economic progress. There was an additional circumstance in the mid-1920's exerting downward pressure on interest rates and hence upward pressure on security values. This was the use of taxes to reduce the government debt, without annihilating a part of the money stock, while adding to the savings stream available for investment purposes.

The strong emphasis on speculation by Federal Reserve authorities was expressed early in 1929 in a statement that member banks making loans in the stock market should not borrow from Federal Reserve banks. This was followed by a drastic decline of rediscounting in that year and in 1930. In 1931 and 1932, when substantial currency withdrawals occurred, the Federal Reserve authorities failed to adhere to the principle enunciated by Perrin and Laughlin and implemented in the provisions of the Federal Reserve Act that such withdrawals should be met without contracting bank reserves. During the 1920's Federal Reserve member banks held very small amounts of excess reserves. From the first quarter of 1929 to the first quarter of 1932, the amount of their effective reserves (i.e., adjusted for changes in the relative amounts of deposits subject to different percentage requirements) was reduced by about 30 percent relative to growth at $3\frac{1}{2}$ percent per year.

There seems also to have been very little realization among academic economists in the late 1920's and early 1930's of the tremendous shift in the objective of Federal Reserve policy from its focus in the mid-1920's on fostering stability in industrial output, employment and prices to concentration on speculation in the securities market. This was accompanied by very little attention to the factual record regarding the impact of the policy shift on member bank reserves, and virtually no understanding of the erroneous theoretical basis (to which some of them had contributed) underlying that drastic shift in policy.³

IN THE SECOND HALF OF THE 1930'S AND IN THE 1940'S

The most influential book reflecting the disappearance of the theory of monetary equilibrium was John Maynard Keynes' "General Theory," published in 1936. The central problem on which that book focused was the occurrence of prolonged periods of unemployment and the inadequacy of the classical theory of equilibrium (developed by David Ricardo and other writers including Alfred Marshall and Arthur Pigou), in providing an understanding of their nature and of the causes that produce them. It would be reasonable to suppose that the first tasks in approaching this problem would have been: (a) A review of the simplifying monetary and price level assumptions that had been adopted by Ricardo and Marshall;⁴ (b) examination of the

³ I was one of those economists. During the academic years 1929-31, I was teaching at a southern university, with a semester course in money and banking each year. It was several years later that I took a careful look at the record to see what had occurred. It is still an enigma to me why economic advisers at the Federal Reserve banks and Board appear not to have understood the situation, or if they did, to have been ineffective in influencing policy.

⁴ For these assumptions, see Warburton, 1966, p. 27.

views of Ricardo's contemporaries and successors who traced the effects of the conditions deliberately by-passed in the theory of equilibrium; (c) scrutiny of the writings of the classical economists themselves on business fluctuations and disturbances in money or circulating medium, or other disequilibrium conditions; and (d) examination of the factual data for periods of unemployment, at least in the more recent prolonged cases, to see to what extent they were consistent with the classical assumptions under which equilibrium might be attained, or indicated the existence of monetary disequilibrium conditions. Keynes took none of these steps in writing the "General Theory." In addition, though he had previously made extensive studies of monetary and currency problems including central bank procedures, his references to the United States in the "General Theory" indicate that he was unaware of the character and impact of Federal Reserve policy and operations in the 1929-33 period.

In the United States many economists, in the second half of the 1930's and in the 1940's, gave much attention to analyses of the course of events during business fluctuations, with publication of about a dozen books on business cycles and scores of articles on various facets of upswings and downswings. Most of these, as in the case of Keynes, made little or no use of factual data regarding changes in the quantity of money. Further, they failed to recognize the astounding alteration in central bank operations, and the economic philosophy underlying them, from the mid-1920's to the early 1930's.

Here I will comment on only one of these writers on business cycles, Joseph Schumpeter, whose views have been widely misunderstood. His heavy emphasis on the role of innovations and entrepreneurial activity inspired by them, in the generation of cycles in business is well known. But in fact Schumpeter had a dual theory of business fluctuations, the other part of which pertained to the impact of shocks from external factors, resulting in deep depressions, violent inflations, and other interruptions to the smooth course of economic affairs. Among these external factors were various types of monetary disturbances. He was indeed an adherent of the theory of monetary disequilibrium (Warburton, 1953).

Another significant development in the early 1940's was a substantial expansion and improvement in available data regarding the value of the output of the economy. This made possible (in conjunction with improved estimates of the quantity of money, or total circulating medium) a reexamination of the relation to business fluctuations of variation in the quantity, and of the rate of use or velocity, of money. This was the task I undertook in the middle 1940's, resulting in the publications and views summarized in the two papers regarding my work presented at least year's conference of the History of Economics Society (Bordo and Schwartz, and Cargill).

DISEQUILIBRIUM IN THE 1970's

In the 1970's we have had another episode of serious monetary disequilibrium, this time a long excessive monetary expansion and chronic inflation, in contrast to the violent monetary contraction and great depression of the 1930's.

There are, I would suggest, basic similarities between the two periods with respect to faulty economic theory underlying monetary policy-making, and serious inattention by a large proportion of academic and government economists to the pertinent factual record. These similarities pertain both to the causation process inducing depression in the one case and inflation in the other, and to prescriptions for remedial action.

With regard to causation, the similarity is a fixation on a conspicuous but essentially irrelevant feature of the economic landscape. At the end of the 1920's this was speculation. Now it is the Federal government deficit—an assertion that some of you may find startling and unbelievable. But let us look at a few facts. For the past eight consecutive fiscal years, including the transition quarter resulting from the change in fiscal year dating, there have been large deficits. For this period, which does not include the large military expenses of the early years of the Vietnam war, the cumulative deficit amounted to \$284 billion, of which \$102 billion, or 36 percent, was financed by the monetary system—the commercial banks plus the Federal Reserve banks—in the form of additional holdings of Treasury obligations. However, that increase in Treasury obligations held by the monetary system was less than 16 percent of the increase in the total loans and investments of the commercial and Federal Reserve banks, which amounted to \$650 billion. The annual rate of increase in total loans and investments averaged 11 percent, and the accompanying growth rate of the money stock was nearly 7 percent for M_1 and 10 percent for M_2 . With allowance for the velocity trend of M_1 (as measured by the ratio of gross national product to M_1) the growth rates of both M_1 and M_2 were about three times the historic growth rate of output, and also about three times the current potential real growth rate as estimated by the Council of Economic Advisers. This excessive monetary expansion, like the contraction of the early 1930's, was the consequence of central bank policy, not required for financing the government deficit, that impinged on bank reserves and the scale of commercial bank operations.

With regard to the character of the prevailing policy prescription for treatment of serious disequilibrium after it had developed, the similarity is even greater. For both periods, the chief remedial procedure, that is, the operating target of central bank policy, was manipulation of the interest rate for asset acquisitions by the central bank. In the 1930's, Federal Reserve bank rediscount rates were reduced from 5 percent in the latter part of 1929 to a level of $1\frac{1}{2}$ to 2 percent in 1935. In the 1970's, the Federal funds rate was lifted from less than 5 percent in 1971 and 1972 to 8 to 10 percent in the latter part of 1978. In both cases, this procedure was ineffective. In the 1930's, rediscounting which had been the method of providing reserves to member banks and had been squelched by informing member banks so that those with loans in the securities market were not entitled to the rediscounting privilege—did not revive. Federal Reserve bank assets and therefore member bank reserves increased rapidly in 1934 and 1935 due to a larger gold stock because of the change in the price of gold and subsequent gold imports. In the 1970's the inflationary surge resulting from excessive monetary expansion in the late 1960's, partly

for war purposes, had led to a general belief that inflation would continue, with the rate of inflation embodied in interest rates, so that rising interest rates did not check the demand for loans at commercial banks. In addition, in 1968, the Board of Governors of the Federal Reserve System introduced the two-week lag in computation of reserve requirements, enabling member banks to expand ahead of their existing reserves and catch up with the additional required reserves through the Federal funds market or by rediscounting. That is to say, in both periods, Federal Reserve reliance on interest rate manipulation virtually ignored the nation's need for steady monetary growth at approximately the rate of long-run output growth (with some attention to changes in the efficiency, or rate of use, of money).⁵

Another similarity between the two periods is that the Congress was one place where the character of the disequilibrium situation was recognized, and efforts were made to provide a statutory directive to Federal Reserve authorities to pursue a steady monetary growth policy without inflation. In the 1930's, this took the form of proposed instructions to the Federal Reserve to focus its activities on halting the decline in prices, or pushing the price level back to that in 1929 and thereafter maintaining a stable price level.

This effort was unsuccessful largely because Federal Reserve officials strongly opposed it. However, in 1932, Congressional pressure was sufficient to induce the Federal Reserve banks to increase member bank reserves through substantially large open market operations. This continued for a few months, but ceased when Congress adjourned. It is significant that this procedure was followed by a moderate business revival and then renewed downswing, leading to description of the situation by economists of the National Bureau of Economic Research as a double-bottomed business cycle trough (Burns and Mitchell, p. 82). In the 1970's, Congressional pressure was expressed in the 1975 House Concurrent Resolution asking the Federal Reserve authorities to maintain long run growth of monetary and credit aggregates commensurate with the economy's potential to increase production, and by embodiment of the same principle in the Federal Reserve Reform Act of 1977. However, to obtain Federal Reserve acquiescence, both the Concurrent Resolution and the subsequent amendment to the Federal Reserve Act contained a loophole big enough so that the new directive has been virtually ignored by Federal Reserve authorities. In addition, those authorities have misrepresented the real character of their policy by describing as "moderate" rates of monetary expansion which, judged by long historical experience, are clearly inflationary.⁶

Early this year, a bill was introduced in Congress (H.R. 420) which, if suitably revised and enacted, would greatly strengthen the stability

⁵ A policy of steady monetary growth at approximately the long-run output rate, rather than reliance on interest rate manipulation, would have substantially altered the level of interest rates in the late 1960's and in the 1970's. With that kind of monetary policy the government deficit in the latter part of the 1960's associated with war financing would have accelerated to some extent the rising rates after the 4 to 6 percent level of the mid-1960's. I will not conjecture how fast this would have occurred, or how high a level would have been reached. But it may be assumed, with confidence, that the interest rate level would not have risen as much, nor remained higher than usual for as long a time, as the extraordinarily high rates that resulted from continual highly excessive monetary expansion.

⁶ At 14 out of 19 monthly meetings of the Federal Open Market Committee during the period from July 1975 to June 1977, inclusive, the Committee adopted tolerance ranges for the growth rates of M_1 and M_2 which they described as "moderate." The average mid-points of those ranges were 5.9 and 9.1 percent, respectively. (Record of FOMC policy actions, *Federal Reserve Bulletin*, September 1975-March 1977).

directive to Federal Reserve authorities. This bill would alter the statutory criterion for open market operations. Under present law, which has been in effect since 1933, open market operations are to be governed with a view to accommodating commerce and business and with regard to the general credit situation of the country. This has always been hopelessly ambiguous. The proposed legislation would change this to read: "With a view to maintaining a constant general level of domestic prices and avoiding destabilizing changes in total purchasing power, and to that end shall foster a steady growth in the aggregate of demand deposits and currency in circulation approximately equal to the long-run growth in real national product." To achieve its purpose, this proposal needs modification because of the inadequacy, under present circumstances, of the M_1 concept as the most appropriate measure of the money supply, and because recognition needs to be given to the trend (when such exists) in the rate of use, or velocity, of money.

REFERENCES

- Bordo, Michael D., and Schwartz, Anna J. "Clark Warburton: Pioneer Monetarist." *Journal of Monetary Economics* 5(1979) : 43-65.
- Burns, Arthur F., and Mitchell, Wesley C. "Measuring Business Cycles." New York, 1946.
- Cargill, Thomas F. "Clark Warburton and the Emergence of Monetarism." "History of Political Economy" (forthcoming).
- Cassel, Gustav. Quarterly Report of the Skandinaviska Kreditaktiebolaget, Jan. 1934, quoted in Norman Lombard, "Monetary Statesmanship" (New York, 1934) : 78-81.
- Davenport, Herbert Joseph, "The Economics of Enterprise." New York, 1913.
- Fisher, Irving "Elementary Principles of Economics." New York, 1912.
- Johnson, Joseph French, "Money and Currency." Boston, 1905.
- Keynes, John Maynard. "Credit Control." "Encyclopaedia of the Social Sciences" IV :550-53. New York, 1931.
- "The General Theory of Employment, Interest, and Money." New York, 1936.
- Laughlin, J. Laurence. "Banking Reform." Chicago, 1912.
- Lightner, Otto C. "The History of Business Depressions." New York, 1922.
- Marshall, Alfred. "Principles of Economics." 8th ed., London, 1920.
- Mayer, Thomas, "The Structure of Monetarism." *Kredit und Kapital* 8(1975).
- Perrin, John. "What Is Wrong With Our Banking and Currency System?" *Journal of Political Economy* XIX (1911).
- Pigou, Arthur C. "Industrial Fluctuations." London, 1927.
- Reed, Harold L. "Money, Currency and Banking." New York, 1942.
- Ricardo, David. "Principles of Political Economy." London, 1817.
- Schulter, William Charles. "The Pre-War Business Cycle, 1907 to 1914." New York, 1923.
- Walsh, Correa M. "The Measurement of General Exchange Value." New York, 1901.
- "The Fundamental Problem in Monetary Science." New York, 1903.
- Warburton, Clark. "The Monetary Disequilibrium Hypothesis." *American Journal of Economics and Sociology* 10(1950), reprinted in "Depression, Inflation, and Monetary Policy."
- "Money and Business Fluctuations in the Schumpeterian System." *Journal of Political Economy* LXI (1953).
- "Depression, Inflation, and Monetary Policy." Baltimore, 1966.
- Willis, Henry Parker. "The Theory and Practice of Central Banking." New York, 1946.

INFLATION AND LABOR FORCE PARTICIPATION

By N. J. Simler and Alfred Tella¹

CONTENTS

	Page
Introduction.....	155
The Theory of Labor Force Participation.....	156
The Standard Theory.....	156
The Role of Inflation.....	157
The Bias-Adjusted Labor Force Data.....	159
Estimation and Results.....	160
Controlling for Demographic and Other Changes.....	163
The Growing Importance of Inflation.....	165
Policy Implications.....	166
Bibliography.....	167

INTRODUCTION

The purpose of this paper is to determine the effect of inflation on the labor force participation rate and the size of the labor force. The labor force consists of those persons who are either employed or actively seeking employment. The labor force participation rate is the ratio of the labor force to the population of working age. The theoretical section of the paper considers the economic factors determining the decision to participate in the labor force or not, first in the absence of inflation and then in its presence.

The participation rate has been increasing since the mid-1960's. So has inflation, although at a considerably faster rate and with much more variability. Using multiple regression analysis and quarterly data spanning the 1961-76 period, the empirical section of the study seeks to isolate the principal factors associated with the increase in the participation rate and, in particular, to assess the role of rising inflation.

Our results are not inconsistent with those of other studies that have incorporated some measure of inflation as a determinant of one or another measure of the supply of labor. Lucas and Rapping (1969) found a positive correlation between the deviation of the actual price level from its expected level and the quantity of man-hours supplied annually to the labor market in the period 1930-65. Wachter (1972) found a positive correlation between inflation (using a measure of prices similar to that of Lucas and Rapping) and the participation rates of so-called secondary workers in the period 1948I-1968IV. Wachter (1974) also found that in the period 1948I-1970IV unexpected inflation and the aggregate participation rate were positively correlated. In addition to including data reflecting the inflation of the 1970's, our study differs from these in two principal ways: (1)

¹The authors are, respectively, professor of economics, University of Minnesota, and Special Adviser to the Director, Bureau of the Census.

Instead of using as an explanatory variable the current level of prices relative to some normal or expected level, we use the actual of inflation itself (which we interpret mainly as reflecting uncertainty); and (2) instead of using as the dependent variable a participation rate computed directly from Current Population Survey data, we compute it by using unpublished census data to adjust the officially reported labor force series for response bias.

The final section of the paper outlines some implications for public policy of inflation-induced increases in the labor force.

THE THEORY OF LABOR FORCE PARTICIPATION

The Standard Theory

The decision to participate in the labor force or not is the result of a utility-maximizing choice, subject to a budget constraint, between the consumption of leisure and the consumption of commodities purchased with labor and nonlabor income. Consider a typical member of the working-age population whose preferences, market opportunities, and real nonlabor income are represented in figure 1. Real income is measured vertically, and time horizontally, from the origin. OT is total time available, and hours of leisure are measured to the right from the origin and hours of work to the left from point T.

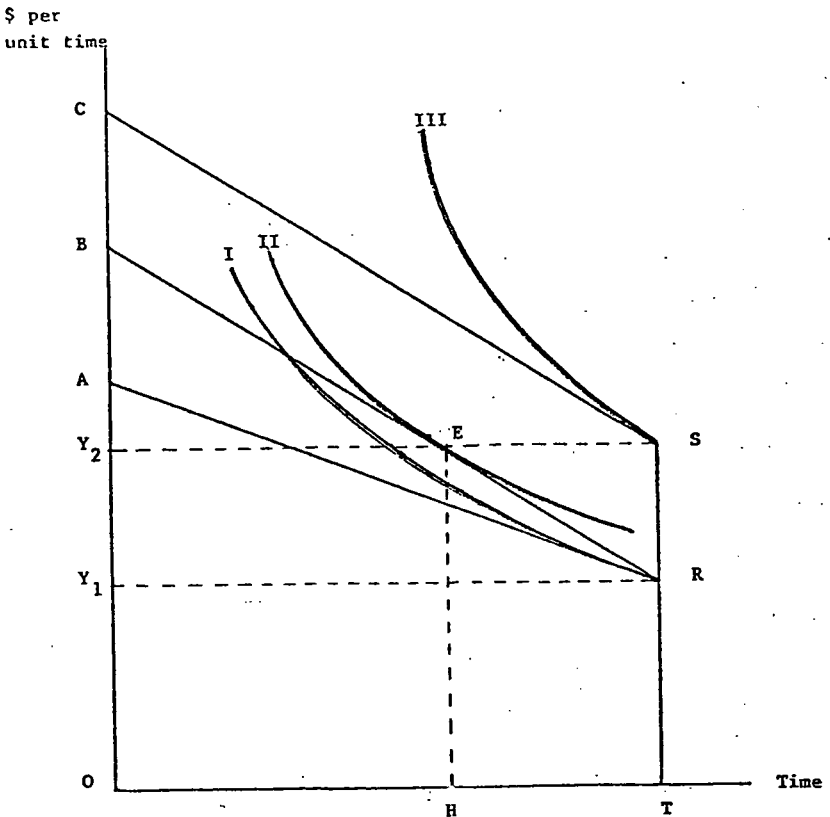


FIGURE 1.—The decision to participate.

With given preferences, the individual's decision to participate in the labor force in the current period depends on the relation between the rate the market will permit him to substitute real labor income for leisure (the real wage rate) and the rate he is willing to make this substitution when all of his available time is allocated to leisure (the reservation wage rate). Assume that the individual decides what to do this period on the basis of his knowledge of last period's real wage rate and real nonlabor income. Suppose the latter is $TR (=OY_1)$ and the former is the absolute value of the slope of the line RA . Since the real wage rate is not greater than his reservation wage rate (the absolute value of the slope of the indifference curve passing through point R), the individual chooses not to be a participant in the labor force. Utility is maximized by not working at all (earning no real labor income) and by consuming OT hours of leisure and OY_1 's worth of commodities. But suppose, with the same real nonlabor income, the real wage rate is the slope of the line RB . Since the real wage is greater than his reservation wage, the individual chooses to become a labor force participant. Utility is maximized by working TH hours (earning Y_1Y_2 real labor income) and by consuming OH hours of leisure and OY_2 's worth of commodities. Evidently, then, an increase in the real wage rate, other things equal, increases the labor force participation rate of a population (or, at least, does not decrease it).

Now suppose the individual's real nonlabor income is $TS (=OY_2)$ but the real wage remains unchanged at that given by the slope of the line $SC (=$ the slope of the line $RB)$. If leisure is not an inferior good, the effect of an increase in real nonlabor income is to increase the reservation wage, that is, the slope of the indifference curve at point S is greater than that of the one at point R . Since the real wage no longer exceeds his reservation wage, the individual chooses to withdraw from the labor force and to maximize utility by consuming OT hours of leisure and OY_2 's worth of commodities. Evidently, then, an increase in real nonlabor income, other things equal, decreases the labor force participation rate of a population (or, at least, does not increase it).

We may conclude, therefore, that the labor force participation rate of a population (LFPR), the members of which have stable preferences, is an increasing function of the real wage rate (W) and a decreasing function of real per capita nonlabor income (Y^N). In a multiple linear regression of the form

$$(1) \quad LFPR_t = a_0 + a_1 W_{t-1} + a_2 Y^N_{t-1},$$

we hypothesize that $a_1 > 0$ and $a_2 < 0$.

The Role of Inflation

So far, all of this is straightforward and conventional. The issue we wish to address next is the effect of changes in the rate of inflation on the labor force participation decision. Variations in the inflation rate may affect agents' decisions directly by creating increased uncertainty about the future as well as indirectly by their effects on agents' expectations about real wage rates and nonlabor incomes.

The outcome of these indirect effects depends on how members of the working-age population expect an increase (or decrease) in the rate of inflation to affect their real wage rates and nonlabor incomes. There are three cases. First, suppose the typical individual expects his nominal wage and nonlabor income to increase (or decrease) at the same rate as the rate of inflation, that is, he expects his real wage and nonlabor income to remain unchanged. Since his reservation wage is unaffected, there is no reason for him to alter his behavior: If he is already a member of the labor force, he will remain one; if he is not, he will not become one.

Secondly, suppose that, given an increase in the rate of inflation, individuals expect their real wage rates and nonlabor incomes to fall. There are two opposing effects here: The effect of a decrease in the expected real wage, given the reservation wage, and the effect of a decrease in expected real nonlabor income on the reservation wage. The real wage effect is to decrease the labor force participation rate; the real nonlabor income effect is to reduce the reservation wage and thereby to increase the participation rate. In this case, the effect of an increase in the rate of inflation on the labor force participation rate depends on whether the expected decrease in the real wage is more or less than the expected decrease in the reservation wage. If it is more, the participation rate falls; if it is less, the participation rate rises.

Finally, suppose that, when there is an increase in the rate of inflation, individuals expect their real wage rates and nonlabor incomes to rise. Again, there are two opposing effects: The effect of an increase in the expected real wage, given the reservation wage, and the effect of an increase in expected real nonlabor income on the reservation wage. The real wage effect is to increase the labor force participation rate; the real nonlabor income effect is to raise the reservation wage and thereby to decrease the participation rate. In this case, the effect of an increase in the rate of inflation on the labor force participation rate depends on whether the expected increase in the real wage is more or less than the expected increase in the reservation wage. If it is more, the participation rate rises; if it is less, the participation rate falls.

Theory cannot predict which of these possibilities will prevail. Although the effect of an increase in the inflation rate is to alter agents' expectations about real wage rates and nonlabor incomes, the effect of changes in expectations on the labor force participation rate is an empirical question.

The outcome of the direct effects of changes in the rate of inflation depends on how members of the working-age population react to uncertainty. Higher rates of inflation mean more variable rates (Foster, 1978). For example, between 1959 and 1968 the average rate of inflation was 1.9 percent per year and the standard deviation around the mean was 1.0, but between 1969 and 1978 the mean was 6.5 percent and standard deviation 2.1. More variable rates of inflation make prediction of the price level more difficult, that is, average forecast errors increase. Consequently, higher and more variable rates of inflation mean greater uncertainty about prices and therefore about future real wage rates and nonlabor incomes as well as future costs of job search.

Increased uncertainty may lead to greater pessimism and anxiety about the future, and the two together will cause risk-averse agents to alter their behavior. When members of the working-age population become less certain and more pessimistic and anxious about their future prospects, some who are not now in the labor force may be induced to enter and others to postpone their entry, while some who are already in the labor force may be persuaded to leave and others to delay their withdrawal.

Again, theory cannot predict which of these outcomes will dominate. Although the effect of an increase in the inflation rate is to increase uncertainty, the effect of an increase in uncertainty on the labor force participation rate is an empirical question.

Equation (1) may now be rewritten as:

$$(2) \quad LFPR_t = a_0 + a_1W_{t-1} + a_2Y^N_{t-1} + a_3\dot{P}_{t-1} + e_t,$$

where \dot{P}_{t-1} = the annual rate of inflation and $a_3 \leq 0$, and where e_t is a random error. This says that the labor force participation rate in the current period is determined by the previous period's real wage rate, real per capita nonlabor income, and annual rate of inflation.

THE BIAS-ADJUSTED LABOR FORCE DATA

The parameters of equation (2) were estimated by ordinary least squares using seasonally adjusted quarterly data for the period 1961I–1976IV. The real wage rate is the ratio of the index of compensation per hour in the private business sector (1967=1.0) to the consumer price index (1967=1.0). Real per capita nonlabor income is measured (in thousands of dollars) by the ratio of rental income of persons, dividends, and personal interest income per person of working age to the CPI. The rate of inflation is the annual rate of change of the CPI and is computed as:

$$\dot{P}_{t-1} = (CPI_{t-1} - CPI_{t-5})/CPI_{t-5}.$$

The labor force data were adjusted for response bias in the officially reported estimates of employment and unemployment (Tella, 1976). Response bias is a type of nonsampling error which results from the interview and enumeration process itself. For example, response errors occur when poorly informed proxy respondents answer questions incorrectly about the labor force status of other household members, when questions or definitions are misunderstood by respondents, and when answers are unrecorded or recorded incorrectly by enumerators. In an effort to measure and control errors in the Current Population Survey (CPS), the Bureau of the Census conducts a repeat survey each month one week after the CPS survey, using different enumerators of a 1-in-18 subsample of the originally interviewed households. The questions and the reference period are the same as in the original interview. The reinterviewers are senior or supervisory personnel, and a special effort is made to interview each person in the household about whom questions are asked. Any differences between the original interview and the reinterview responses are reconciled by further questioning to try to arrive at the correct answers.

The reinterview results have revealed a systematic net understatement of both employment and unemployment and, consequently, the labor force. Some household members who are classified in the original interview as being not in the labor force become reclassified in the reinterview as either employed or unemployed. The net understatement in total employment has averaged about 1 percent per year with little variation from year to year. However, the net understatement in unemployment not only has shown a tendency to rise during recessions and to decline during recoveries, but has increased from an average of 6 percent per year in 1961-65 to 9 percent in 1966-73 and to 10 percent in 1974-76. As a result, the average annual understatement in the civilian labor force has risen from 1.1 percent (about 0.8 million persons) in 1961-65 to 1.4 percent (about 1.1 million persons) in 1966-73 and to 1.5 percent (about 1.4 million persons) in 1974-76.

The quarterly bias-adjustment factors used to adjust employment, unemployment, and the labor force for response bias were calculated by taking the ratio of the reinterview estimates after reconciliation to the original CPS estimates in identical subsample households. The ratios were then applied to the officially reported full-sample national data (seasonally adjusted) to obtain the bias-adjusted estimates. Thus, the labor force participation rate used in this paper is the ratio of the bias-adjusted civilian labor force to the noninstitutional population of working age.² Although the bias-adjusted participation rate and the officially reported participation rate are very highly correlated ($r=0.98$ in the period of 1961I-1976IV), the mean and variance of the former (60.7 and 1.1 percent, respectively) exceed those of the latter (59.9 and 0.9 percent, respectively).

ESTIMATION AND RESULTS

When eq. (2) is estimated, the results are:

$$(3) \quad LFPR_t = 0.544 + 0.125W_{t-1} - 0.105Y^N_{t-1} + 0.184\dot{P}_{t-1}$$

(90.70) (6.74) (-3.77) (7.46)

$$\bar{R}^2 = 0.902$$

$$SEE = 0.00335$$

$$DW = 0.985$$

The estimated coefficients have the expected signs (the interpretation of the positive coefficient of \dot{P}_{t-1} will be addressed later in the paper) and are, to judge from the t -statistics (in parenthesis), statistically significant. But the low value of the Durbin-Watson statistic indicates the presence of positive serial correlation in the residuals. One way of coping with this problem is to assume that the disturbance follows a first-order autoregressive scheme and to reestimate the equation, using a standard procedure to obtain a correction factor, ρ , for first-order autocorrelation. This is done in eq. (4). Another method is to recognize that serial correlation in the residuals may result from the omission of

² Since estimates of the population are not greatly affected by response bias, the population data used are the original CPS estimates.

a variable (or set of variables) that systematically influences the labor force participation rate and to change the specification of the regression equation accordingly. This is done in eq. (5).

When eq. (2) is reestimated with first-order autocorrelation correction, the results are :

$$(4) \quad LFPR_t = 0.542 + 0.126W_{t-1} - 0.102Y^N_{t-1} + 0.171\dot{P}_{t-1} + 0.509\rho$$

(56.72) (4.48) (-2.46) (4.40) (4.26)

$$\bar{R}^2 = 0.922$$

$$SEE = 0.00299$$

$$DW = 2.188$$

As in eq. (3), the estimated coefficients are statistically significant and have the expected signs. We interpret the regression results as follows :

The coefficient of W_{t-1} is 0.126. The ratio of the mean value of W_{t-1} (1.00854) to mean value of $LFPR_t$ (0.607) is 1.662. Therefore, the elasticity (at the means) of $LFPR_t$ with respect to W_{t-1} is 0.209 ($= 0.126 \times 1.662$). The average annual rate of growth of W_{t-1} during the regression period was over 2.2 percent. So, if W_{t-1} increases by 2.2 percent (to 1.0316), then $LFPR_t$ increases by 0.467 percent (to 0.610) and the labor force increases by 383,000 persons (from its mean of 81,934,000 to 82,317,000).

Similarly, the coefficient of Y^N_{t-1} is -0.102 . The ratio of the mean value of Y^N_{t-1} (0.673) to the mean value of $LFPR_t$ is 1.108. Therefore, the elasticity of $LFPR_t$ with respect to Y^N_{t-1} is -0.113 . The average annual rate of growth of Y^N_{t-1} was almost 2.4 percent. So, if Y^N_{t-1} increases by 2.4 percent (to 0.689), then $LFPR_t$ decreases by 0.267 percent (to 0.605) and the labor force decreases by 218,000 persons.

Finally, the coefficient of \dot{P}_{t-1} is 0.171. The ratio of the mean value of \dot{P}_{t-1} (0.0416) to the mean value of $LFPR_t$ is 0.0685. Therefore, the elasticity of $LFPR_t$ with respect to \dot{P}_{t-1} is 0.0117. The average annual rate of increase of \dot{P}_{t-1} was over 15.9 percent. So, if \dot{P}_{t-1} increases by 15.9 percent (to 0.0482), then $LFPR_t$ increases by 0.186 percent (to 0.608) and the labor force increases by 153,000 persons.

The combined effect of increases from their means in all three variables at their average annual rates is to increase $LFPR_t$ by 0.386 percent, from its mean of 0.607 to 0.6095, and to increase the labor force by 318,000 persons, from its mean of 81,934,000 to 82,252,000. About one-half of the increase in $LFPR_t$ and the labor force is due to the joint effect of increases in W_{t-1} and Y^N_{t-1} , and about one-half is due to the increase in \dot{P}_{t-1} .

The rate at which the labor force grows depends upon the rates at which the working-age population and the participation rate increase. To a first approximation, the growth rate of the labor force is the sum of the growth rates of the population and the participation rate. In the regression period, these growth rates were about 2.1 percent, 1.8 percent, and 0.4 percent per year, respectively. The 0.4 percent LFPR is slightly above that predicted by eq. (4). So the increase in the participation rate accounted for between one-sixth

and one-fifth of the labor force increase, and the increase in population accounted for the rest. According to eq. (4), about one-half of the growth in the participation rate was due to the increase in the rate of inflation. Therefore rising inflation accounted for between 8 and 10 percent of the average annual growth in the labor force.

We attribute the positive correlation between the rate of inflation and the labor force participation rate (and, by implication, the labor force) to reduced expectations of (but particularly to increased uncertainty about) future real wage rates and nonlabor incomes brought on by rising inflation rates. The regression results are consistent with the hypothesis that an increase in the rate of inflation leads members of the working-age population not only to revise downward their expectations but also to be more uncertain about them. In particular, the results are consistent with the view that a rise in the inflation rate causes agents to lower their expectations about future real wage rates and to reduce even more their expectations about future real nonlabor incomes. The reason for this difference in expectations is that nominal wage rates tend to adjust more easily to rising inflation than do the components (rents, dividends, and interest) of nominal nonlabor income. The effect of this difference in expectations is evidently to reduce expected reservation wages by more than expected real wages and thus induce an increase in the participation rate: Agents already in the labor force are less likely to withdraw from it and those outside the labor force are more likely to enter it. The combination of a higher rate of entry to the labor force and a lower rate of withdrawal from it implies an increase in the labor force participation rate. Continued increases in the inflation rate mean continued reductions in expected real wages and nonlabor incomes and, therefore, continued increases in the participation rate. Even if real wages and nonlabor incomes actually do not fall as much as agents expect them to fall (or rise by more than agents expect them to rise), it is the expectations of agents that matter. Labor force participation decisions in the current period are made not only on the basis of agents' knowledge of the previous period's real wage rates and nonlabor incomes but on the basis of their expectations of what real wage rates and nonlabor incomes in future periods will be.

The regression results are also consistent with the view that a rise in the inflation rate causes agents to be more uncertain about prospective real wage rates and nonlabor incomes. The reason for this is that higher rates of inflation mean more variable rates of inflation and, therefore, more difficulty in predicting the price level. Forecasting errors increase. As a result, agents attach a greater degree of uncertainty to their expectations of future real wages and nonlabor incomes as well as to their expectations of the future costs of job search. The effect of increased uncertainty on risk-averse agents is to make them more likely to work or to look for work now; that is, to accept current real wages or to incur current job search costs (on the principle, so to speak, that a bird in the hand is worth two in the bush). Thus, labor force participation is encouraged: Agents already in the labor force are less likely to withdraw from it and those outside the labor force are more likely to enter it. The combination of a higher entry rate and a lower withdrawal rate implies an increase in the labor force participation rate. Continued increases in the rate of

inflation mean continued increases in uncertainty and, therefore, continued increases in the participation rate.

Controlling for Demographic and Other Changes

The preceding analysis has focused on the underlying economic determinants of the aggregate participation rate. But the aggregate participation rate is a weighted average of age-sex specific participation rates, where the weights are the age-sex specific shares of the working-age population.³ Up to this point, we have not attempted to control for the influence on the aggregate participation rate of changes in the demographic composition of the labor force and the population. To do this, we have augmented the regression equation by adding two variables, the shares of the labor force accounted for by adult females and teenagers. In addition, we have included a quadratic trend term to serve as a proxy variable for other factors that may have influenced the aggregate participation rate.⁴

The augmented regression equation is:

$$(5) \text{LFPR}_t = a_0 + a_1 W_{t-1} + a_2 Y^N_{t-1} + a_3 \dot{P}_{t-1} + a_4 (AF/LF)_t + a_5 (TA/LF)_t + a_6 T + a_7 T^2 + e_t$$

where

$(AF/LF)_t$ = the fraction of adult females (20 years and over) in the labor force,

$(TA/LF)_t$ = the fraction of teenagers (16-19 years, both sexes) in the labor force,

$T=20$ in 1961I, 21 in 1961II, . . . , 83 in 1976IV.⁵

The share of any age-sex group in the labor force varies directly with that group's participation rate and share of the population. It also varies inversely with the aggregate participation rate. So, when both the labor force share of an age-sex group and the aggregate participation rate are increasing (as is the case here), it means that the product of the age-sex group's participation rate and population share is increasing more rapidly than the aggregate participation rate.⁶ Between 1961 and 1976, the average annual rate of growth of the aggregate participation rate was about 0.4 percent. But the product of the adult female participation rate and population share grew at an average annual rate of almost 1.4 percent and that of teenagers increased at an average annual rate of over 2.6 percent. Consequently,

³ Suppose there are two age-sex groups, i and j . Then the aggregate participation rate is:

$$\frac{L}{P} = \frac{L_i}{P} + \frac{L_j}{P} = \frac{L_i}{P_i} \times \frac{P_i}{P} + \frac{L_j}{P_j} \times \frac{P_j}{P},$$

where L denotes the labor force and P the population.

⁴ We also included a tax variable, defined as the ratio of personal taxes to personal income less transfer payments, to capture the effect that changes in the effective average tax rate may have had on the aggregate participation rate. Although its coefficient had, as one would expect, a negative sign, it was not statistically significant and added nothing to the explanatory power of the equation we report below. This was probably due to multicollinearity, reflecting the fact that real wages, real nonlabor income, and the effective average tax rate all increased during the regression period at approximately the same average annual rate. Thus, the behavior of after-tax real wages and nonlabor income was essentially the same as their before-tax behavior, precluding the effective average tax rate from having an independent effect.

⁵ The only reason for setting $T = 20$ in 1961I is that in the initial stages of this research we had gathered time series data starting with 1956II.

the average annual rate of growth of the labor force share of adult females was about 1.0 percent and that of teenagers was over 2.2 per cent.⁷ By controlling for changes in the demographic composition of the labor force and population, as well as by including a trend term in the regression equation, we hope to improve the estimates of the coefficients of the economic variables.

When eq. (5) is estimated, the results are :

$$(6) \quad LFPR_t = 0.338 + 0.121W_{t-1} - 0.0421Y^N_{t-1} \\
\begin{matrix} (7.97) & (3.13) & (-1.50) \\ +0.0975\dot{P}_{t-1} + 0.581(AF/LF)_t + 0.632(TA/LF)_t \\ (4.37) & (4.12) & (4.10) \\ -0.00222T + 0.0000128T^2 \\ & & (-4.15) \quad (4.33) \end{matrix}$$

$$\bar{R}^2 = 0.955$$

$$SEE = 0.00227$$

$$DW = 2.120$$

As in the preceding equations, the estimated coefficients are statistically significant (although the coefficient of Y^N_{t-1} is significant only at the 10 percent level) and have the expected signs (although we did not form expectations about the signs of T and T^2). The inclusion of the demographic variables and the trend term reduces substantially the coefficients of Y^N_{t-1} and \dot{P}_{t-1} . This implies that the elasticity of $LFPR_t$ with respect to both Y^N_{t-1} and \dot{P}_{t-1} is lower when the effects of the non-economic variables are controlled for than when they are not. The coefficient of W_{t-1} , however, is not appreciably affected. We interpret the regression results as follows:

The coefficient of W_{t-1} is 0.121, and the elasticity (at the means) of $LFPR_t$ with respect to W_{t-1} is 0.202. This means that if W_{t-1} increases by 2.2 percent (its average annual rate), then $LFPR_t$ increases by 0.450 percent and the labor force increases by 369,000 persons.

Similarly, the coefficient of Y^N_{t-1} is -0.0421 , and the elasticity of $LFPR_t$ with respect to Y^N_{t-1} is -0.0466 . So, if Y^N_{t-1} increases by its average annual rate of 2.4 percent, then $LFPR_t$ decreases by 0.110 percent and the labor force decreases by 90,000 persons.

Finally, the coefficient of \dot{P}_{t-1} is 0.0975, and the elasticity of $LFPR_t$ with respect to \dot{P}_{t-1} is 0.00667. This implies that if \dot{P}_{t-1} increases by 15.9 percent (its average annual rate), then $LFPR_t$ increases by 0.106 percent and the labor force increases by 87,000 persons.

The combined effect of increases from their means in all three economic variables at their average annual rates is to increase $LFPR_t$

⁴ Consider age-sex group 1. Its share of the labor force is:

$$\frac{L_i}{L} = \frac{L_i}{P} \bigg/ \frac{L}{P} = \left(\frac{L_i}{P_i} \times \frac{P_i}{P} \right) \bigg/ \frac{L}{P}$$

⁷ Because the monthly reinterview survey is limited to a small subsample (1-in-18) of the original CPS sample, it is not possible to construct reliable bias-adjusted labor force estimates by detailed age-sex or other demographic characteristics. Consequently, the variables $(AF/LF)_t$ and $(TA/LF)_t$ are derived from the original CPS estimates and are not adjusted for response bias. This introduces an unavoidable inconsistency in the data but, in our judgment, not a serious one.

by 0.446, from its mean of 0.607 to 0.610, and to increase the labor force by 366,000 persons, from its mean of 81,934,000 to 82,300,000. About three-fourths of the increase in $LFPR_t$ and the labor force is due to the joint effect of increases in W_{t-1} and Y^N_{t-1} , and about one-fourth is due to the increase in \dot{P}_{t-1} .

As noted earlier, the growth rate of the labor force is approximately equal to the sum of the growth rates of the population and the participation rate and, in the regression period, these growth rates were about 2.1 percent, 1.8 percent, and 0.4 percent per year, respectively. The 0.4 percent is slightly below that predicted by eq. (6), holding constant the values of the noneconomic variables. As before, we can say that the increase in the participation rate accounted for between one-sixth and one-fifth of the labor force increase and the increase in population accounted for the rest. According to eq. (6), about one-fourth of the growth in the participation rate was due to the increase in the rate of inflation. Therefore, rising inflation accounted for between 4 and 5 percent of the average annual growth of the labor force.

The Growing Importance of Inflation

The labor force participation rate (and the labor force) has become increasingly affected by changes in the rate of inflation. That is, the elasticity of $LFPR_t$ with respect to \dot{P}_{t-1} has increased over time. Given the coefficient of \dot{P}_{t-1} in eq. (6), the elasticity coefficient varies directly with the ratio of \dot{P}_{t-1} to $LFPR_t$, and this ratio has increased because inflation has risen more rapidly than the participation rate. In the mid-1960's, when the inflation rate was less than 2 percent per year and the participation rate was less than 60 percent, the elasticity of $LFPR_t$ with respect to \dot{P}_{t-1} was 0.0029. This meant that if \dot{P}_{t-1} increased by, say, 10 percent (from 1.8 to 2.0 percent per year), $LFPR_t$ would rise by 0.029 percent and the labor force would increase by about 22,000 persons. In the mid-1970's, when the inflation rate was in the neighborhood of 10 percent per year and the participation rate was over 62 percent, the elasticity coefficient was 0.016 (or 5½ times as large). This meant that if \dot{P}_{t-1} increased by 10 percent (from 10 to 11 percent per year), $LFPR_t$ would rise by 0.16 percent and the labor force would increase by about 150,000 persons.⁸

It is also the case, of course, that the labor force participation rate (and the labor force) has become more affected by changes in the other two economic variables, the real wage rate and real nonlabor income. But the increase in the elasticity of $LFPR_t$ with respect to both W_{t-1} and Y^N_{t-1} has been much less than the increase in the inflation rate elasticity, reflecting the fact that the inflation rate has increased much

⁸ The increased importance of inflation can be illustrated in another way. We estimated separate $LFPR_t$ equations for the periods 1957-1965 and 1966-1976, which were identical in form to eq. (5) except that real per capita nonlabor income was entered as a contemporaneous variable. The coefficient of \dot{P}_{t-1} was statistically significant in the later period but not in the earlier one. This meant that the elasticity of $LFPR_t$ with respect to \dot{P}_{t-1} was not significantly different from zero in the 1957-1965 period. In the later period, however, it had an average value of 0.0083. The 1957-65 period was characterized by a low and generally declining inflation rate. In contrast, the 1966-76 period was marked by a high and generally increasing rate of inflation. Evidently, the importance of changes in the price level as a determinant of labor force participation depends on how high and how rapidly rising the rate of inflation is.

more rapidly than either real wages or real nonlabor incomes. (In the regression period, \dot{P}_{t-1} increased at an average annual rate of 15.9 percent vs. 2.2 and 2.4 percent for W_{t-1} and Y^N_{t-1} , respectively.)

A comparison of the decade of the 1960's with that of the 1970's (to 1976) shows that, among the economic determinants of the participation rate, changes in the inflation rate have become about twice as important as changes in real wages and nonlabor income.

In the 1960's:

The real wage elasticity was 0.19 so that a 2.2 percent increase in W_{t-1} would raise $LFPR_t$ by 0.42 percent and increase the labor force by 315,000 persons.

The real nonlabor income elasticity was -0.044 so that a 2.4 percent increase in Y^N_{t-1} would decrease $LFPR_t$ by 0.105 percent and reduce the labor force by 80,000 persons.

The inflation rate elasticity was 0.0037 so that a 15.9 percent increase in \dot{P}_{t-1} would increase $LFPR_t$ by 0.059 percent and increase the labor force by 45,000 persons.

The combined effect of increases in all three variables was to raise $LFPR_t$ by 0.37 percent and increase the labor force by 280,000 persons. The increase in the inflation rate accounted for about one-sixth of the total.

In the 1970's:

The real wage elasticity was 0.22 (up by almost 15 percent from the 1960's) so that a 2.2 percent increase in W_{t-1} would raise $LFPR_t$ by 0.48 percent and increase the labor force by 430,000 persons.

The real nonlabor income elasticity was -0.050 (up by approximately 14 percent from the 1960's) so that a 2.4 percent increase in Y^N_{t-1} would decrease $LFPR_t$ by 0.12 percent and reduce the labor force by 108,000 persons.

The inflation rate elasticity was 0.010 (up by almost 175 percent from the 1960's), so that a 15.9 percent increase in \dot{P}_{t-1} would increase $LFPR_t$ by 0.16 percent and increase the labor force by 147,000 persons.

The combined effect of increases in all three variables was to increase $LFPR_t$ by 0.52 percent and increase the labor force by 469,000 persons. The increase in the inflation rate accounted for almost one-third of the total.

POLICY IMPLICATIONS

Additions to the labor force due to inflation increase as the rate of inflation increases. In the 1960's, when the average inflation rate (\dot{P}_{t-1}) was 2.3 percent per year, the inflation-induced increment to the labor force averaged about 285,000 persons per year, or less than 0.4 percent of the 1960's labor force. In the 1970's (to 1976), when the average rate of inflation was 6.5 percent per year, the increment due to inflation averaged about 925,000 persons per year, or more than 1 percent of the 1970's labor force. But, now, with an inflation rate in excess of 10 percent per year, inflation-induced additions to the labor force may be in excess of 1,500,000 persons annually, or about 1.5 percent of the current labor force.

In the 1960's, the labor force increased at an average annual rate of 1.8 percent; in the 1970's (to 1976), the growth rate was 2.4 percent per year. Some part of this acceleration in labor force growth

must be attributed to rising inflation. The implications for public policy follow from the fact that the more rapid growth of the labor force in the 1970's has been associated with higher average unemployment rates and lower productivity increases.⁹ Of course, association is not the same thing as causality. Higher unemployment rates are the result of many factors, and the same is true of declining productivity growth. Yet an increase in the net flow of persons into the labor market in response to the uncertainty and anxiety generated by rising and variable inflation does imply some increase in unemployment. Some inflation-induced entrants move directly into employment, but others experience unemployment while searching for work. If the fraction of inflation-induced entrants that experiences unemployment is greater than that of other entrants, or if the average amount of time spent in job search by (inflation-induced and other) entrants increases, then rising inflation also implies higher unemployment rates. And given the rate of growth of the capital stock (which itself may be adversely affected by rising inflation), an increase in the growth rate of the labor force does imply a decrease in the rate at which the capital-labor ratio grows and, consequently, some decrease in the rate of growth of productivity.

So, inflation-induced increases in the labor force do entail costs in the form of increased unemployment and decreased productivity growth. Our research, however, does not permit us to judge the magnitude of these costs (other than to say that, whatever they are, they increase with the inflation rate) and, consequently, we are not in a position at this time to offer specific recommendations for policy. But, we stress that a substantial and continued reduction in the rate of inflation appears to be, on the above as well as other grounds, the first priority of public policy.

BIBLIOGRAPHY

- Foster, Edward (1978). "The Variability of Inflation." *Review of Economics and Statistics*, 60 :3, pp. 346-350.
- Lucas, Robert E., Jr. and Rapping, Leonard A. (1969). "Real Wages, Employment and Inflation." *Journal of Political Economy*, 77 :5, pp. 721-754.
- Tella, Alfred (1976). "Cyclical Behavior of Bias-Adjusted Unemployment." W. E. Upjohn Institute for Employment Research.
- Wachter, Michael L. (1972). "A Labor Supply Model for Secondary Workers." *Review of Economics and Statistics*, 54 :2, pp. 141-151.
- (1974). "A New Approach to the Equilibrium Labour Force." *Economica*, 41 :161, pp. 35-51.

⁹ The bias-adjusted unemployment rate averaged 5.0 percent in the 1960's and 6.6 percent in the 1970's. Productivity (output per man-hour in the private business sector) increased at an average annual rate of 3.2 percent between 1961 and 1969 and 1.5 percent between 1970 and 1976.

DEMOGRAPHIC ASPECTS OF THE STAGFLATION PROBLEM

By Jeffrey M. Perloff and Michael L. Wachter*

CONTENTS

	Page
I. Introduction	168
II. Unemployment	170
III. Inflation	176
IV. Productivity	179
V. Conclusions	184

APPENDIXES

1. Alternative Methods of Constructing an Unemployment Rate Normalized for the Changing Characteristics of the Labor Market.....	185
2. Potential Output.....	188
Selected References.....	190

I. INTRODUCTION

In the public debate on stagflation, rising inflation and unemployment rates and declining real growth rates are frequently viewed as manifestations of the same problem. The interrelationships among these variables, however, are highly complex. During short-run business cycle swings, stimulative monetary and fiscal policies increase the rate of inflation. According to Okun's Law, there is a short-run relationship between real growth and unemployment; while the Phillips Curve is an asserted relationship between unemployment and inflation. As a consequence, at least in the short-run there appears to be a trade-off between changes in either output growth or unemployment rates and the rate of inflation.

The stagflation discussion, however, rejects these short-run relationships and concentrates on a longer-run perspective. The data indicate that between 1969 and 1979 the performance of the economy as measured by any of these three variables has worsened. The reduction in the real economic growth rate and the unemployment rate have been accompanied by a three-fold increase in the rate of inflation. Moreover, the heretofore stable coefficient linking output and employment has been declining, a symptom of decreasing productivity growth. Lower productivity means that more employees or manhours are needed to produce any given level of output.

The widely accepted negative short-run relationship between unemployment and inflation needs to be reconciled with the long-run stagflation picture where unemployment and inflation have increased together. In addition, the relationship, if any, between the adverse

*The authors are respectively assistant professor and professor of economics at the University of Pennsylvania.

unemployment and inflation developments and the declining productivity growth rate should be explored.

Our argument is that the paradoxes between the short and long-run interrelationships involving real economic growth (or productivity), unemployment and inflation are due, in part, to not identifying the influence of the intermediate-run swings in the economy. Whereas the short-run fluctuations are geared to the traditional business cycle, the intermediate-run fluctuations are related mainly to the impact of the demographic changes involving the baby boom cohort and longer-run trends in investment. In addition, exogenous shocks largely involving the supply of oil and food have tended to further confuse the impact of intermediate-run forces.

A major theme of this paper is that the stagflation problem is best divided into its component parts: real economic growth (or productivity), inflation, and unemployment. Although these three problems have similar causes that will respond to a unified set of policies, they also have distinctive characteristics that will require separate treatment. The central element that is behind many of the developments in the changing relationship among growth, inflation, and unemployment is the demographic changes in the labor force and population. Hence, the focus of this paper is on the importance of the intermediate-run factors and their impact on the stagflation question. Since we have dealt elsewhere with the unemployment and inflation problems, we devote more attention in this paper to the interrelationships among these three variables and to the productivity or growth component in particular.

For example, we argue that the secular increase in the unemployment rate over the past two decades has been only indirectly related to the stagflation issue. The current high levels of unemployment are largely due to changes in the sustainable or equilibrium rates and not to inadequate demand. Policies to lower this type of unemployment, such as manpower training and employment tax credits, need not have any effect on the rate of real growth of the economy or on the rate of inflation.

The problem of secularly rising inflation rates has been due largely to the failure of government policy. Of particular concern has been the tendency of policymakers to systematically underestimate the sustainable unemployment rate and overestimate the potential output of the economy. The target of 4 percent aggregate unemployment was maintained through the mid-1970's. A target unemployment rate of approximately 5 percent was accepted by policymakers only after the empirical evidence suggested that the sustainable rate was closer to 6 percent. In other words, since it was largely being driven upward by demographic forces, the secular increase in unemployment would have occurred regardless of the government's aggregate demand policies. The linkage between rising inflation and unemployment rates has thus been political and not economic; that is, there has been a failure to recognize the limitations of monetary and fiscal policies to deal with the intermediate-run trends in the unemployment rate. Linkages between high inflation and slow productivity growth are also likely to be indirect and based on institutional rigidities. For example, higher

inflation rates have created distortions in the tax structure that have, on balance, decreased the rate of return on business fixed investment and hence slowed productivity growth. That high growth and inflation rates need not be mutually exclusive is shown by the numerous countries that combine high real growth and inflation rates, while others have real growth and low inflation rates.

A second theme of this paper is that the productivity decline began in the 1970's rather than the 1960's. The prevailing viewpoint identifies 1965 as the initial year of the decline. The appearance of a slowdown in the aggregate productivity rate, between 1965 and 1973, is due largely to the impact of the baby boom cohort entering the labor market and the sharp increase in the female participation rate. But, after adjusting for the age and sex characteristics of the labor force, the decline in productivity during the 1970's is even more dramatic than the published numbers would indicate.

The issue of slow real growth is a major concern and is the core of the stagflation problem. Although the exact underlying causes of the productivity slowdown may be difficult to identify, the general policy approach to increase growth must be based on increasing the incentives to invest in physical and human capital.

In the short-run, aggregate demand policies have allowed policy-makers to expand the economy, reduce unemployment, and increase real GNP growth. The only costs have been higher rates of inflation. The problem is that in the long-run, the economy has only been left with the legacy of a higher rate of inflation, as Keynesian policies can neither permanently lower unemployment below its equilibrium rate, nor permanently increase the real rate of economic growth.

II. UNEMPLOYMENT

Although unemployment is often viewed as the largest component of the stagflation problem, this is simply not the case. Significantly, the high unemployment in the United States over the past decade is only indirectly related to stagflation. As indicated above, the high level of unemployment existing in 1968-79 is largely due to changes in the equilibrium level of unemployment and not to lack of aggregate demand. Estimates of the equilibrium level of unemployment suggest that the U.S. economy fully recovered from the 1974-75 recession by late 1978 and experienced excess demand conditions during much of the same year.

The equilibrium rate, as used in this paper, is defined as that unemployment rate that cannot be reduced by general monetary and fiscal policies without accelerating inflation. This rate is independent of what is usually referred to as the full-employment/unemployment rate. The latter term is generally defined in terms of the unemployment goal for government policy. That the equilibrium rate is above the target full-employment level desired by policymakers means only that traditional Keynesian and monetary policies cannot achieve the target. However, structural measures such as manpower, training, and employment tax credits, aided by the demographic outlook in the 1980's, may be helpful in reducing the equilibrium rate—thus closing the gap between that rate and the targeted unemployment goal.

We have used two alternative approaches for estimating the equilibrium unemployment rate, denoted U^* . The first, U_1^* , is based on adjustments both for changes in the demographic composition of the labor force and for government transfer programs. The second, U_2^* , is derived by inverting a wage or price equation for that level of the unemployment rate which is a wage or price equation for that level of unemployment rate which is compatible with nonaccelerating inflation. The methodology for deriving the various U^* measures is given in appendix 1.

Adjusting the equilibrium or full-employment unemployment rate for changes in the demographic composition of the labor force is now a widely accepted procedure. See for example, Perry (1970), Hall (1975), Wachter (1976) and the Council of Economic Advisors (1978). As an expositional device, the aggregate rate of unemployment can be viewed as an average of two component rates: a low rate for prime-age workers and a high rate for younger workers. The high rate of unemployment for younger workers reflects their inexperience in the labor market, their job-seeking activity, and the tentativeness of their job commitments. Without any change in the unemployment rate for either group, a rise in the proportion of youths will raise the overall unemployment rate.

If the equilibrium unemployment rate were 4 percent in 1955, then, as a result of this demographic shift alone, it would be approximately 5.1 percent today. That is, suppose that the equilibrium unemployment rates for each age-sex were the same in 1955 and 1979. Then by construction the entire 1.1-percent increase in the nationwide equilibrium unemployment rate would be solely due to the relative increase in the number of young workers; a group who have a high incidence of unemployment. The data suggest, however, that the increase in U^* over the past 25 years has been greater than 1.1 percent. The reason is that the equilibrium unemployment rates for the younger group have increased over time.

Due to wage rigidities and the fact that young and old workers are imperfect substitutes for each other, an influx of younger workers creates overcrowding in the jobs typically held by young workers. One effect of the demographic overcrowding is to bid down the relative wages of jobs typically held by younger workers. The dramatic fall in relative wages for younger workers is shown in tables 1 and 2. These tables show the income of workers in each of the age-sex groups relative to the income of prime-age males, age 45 to 54. For example, while males age 20 to 24 earned \$73 for every \$100 earned by prime-age males in 1955, they earned only \$58 for every \$100 in 1977.

In a perfectly competitive labor market, cohort overcrowding need not cause relative unemployment rates to change. Rather, relative wages would decline for these groups in excess supply so as to encourage firms to substitute now cheaper inputs for the more expensive inputs. In addition, products that use more of the cheaper inputs would decline in relative price and encourage consumers to use relatively more of those goods and/or services. Indeed, relative wages in the perfectly competitive markets would continue to drop until the cohort overcrowding was absorbed into new jobs.

TABLE 1.—RELATIVE WAGES: MALES

	14 to 19	20 to 24	25 to 34	35 to 44	45 to 54	55 to 64	65 plus
1955.....	0. 4084	0. 7331	0. 9593	1. 0049	1	0. 8816	0. 6698
1956.....	. 4159	. 7465	. 9664	1. 0473	1	. 8878	. 7397
1957.....	. 3274	. 7078	. 9583	1. 0205	1	. 8641	. 6808
1958.....	. 3541	. 6687	. 9747	1. 0400	1	. 9119	. 6879
1959.....	. 3222	. 6889	. 9850	1. 0626	1	. 9304	. 7363
1960.....	. 3477	. 6897	. 9598	1. 0403	1	. 8945	. 7247
1961.....	. 3293	. 6871	. 9606	1. 0515	1	. 9908	. 6830
1962.....	. 3500	. 6793	. 9416	1. 0533	1	. 9052	. 7255
1963.....	. 3537	. 6735	. 9680	1. 0677	1	. 9309	. 7423
1964.....	. 3592	. 6592	. 9540	1. 0588	1	. 9157	. 6987
1965.....	. 4495	. 6882	. 9557	1. 0524	1	. 9196	. 7458
1966.....	. 3271	. 6813	. 9369	1. 0495	1	. 9028	. 7274
1967.....	. 3459	. 6766	. 9266	1. 0289	1	. 8947	. 6990
1968.....	. 3236	. 6776	. 9389	1. 0479	1	. 9134	. 7148
1969.....	. 3385	. 6628	. 9324	1. 0342	1	. 9024	. 7071
1970.....	. 3977	. 6701	. 9189	1. 0329	1	. 9134	. 6801
1971.....	. 3433	. 6244	. 8874	1. 0287	1	. 9013	. 6772
1972.....	. 3568	. 5928	. 8724	1. 0123	1	. 9090	. 6552
1973.....	. 3752	. 5858	. 8878	1. 0120	1	. 9194	. 6995
1974.....	. 3805	. 5865	. 8672	1. 0056	1	. 9039	. 7066
1975.....	. 3820	. 5754	. 8628	. 9947	1	. 9126	. 7782
1976.....	. 3535	. 5632	. 8333	. 9877	1	. 9263	. 7381
1977.....	. 3548	. 5755	. 8297	. 9903	1	. 9201	. 8121

Source: Normalized on the male 45 to 54 group based income data of full-time year-round workers. "Money Income of Families and Persons in the United States," current population reports, U.S. Department of Commerce, Bureau of the Census, series P-60, various issues.

TABLE 2.—RELATIVE WAGES: FEMALES

	14 to 19	20 to 24	25 to 34	35 to 44	45 to 54	55 to 64	65 plus
1955.....	0. 5093	0. 6151	0. 6342	0. 6351	0. 6220	0. 5687	0. 4004
1956.....	. 4742	. 5728	. 6596	. 6173	. 6173	. 5845	. 4044
1957.....	. 4599	. 5755	. 6375	. 6021	. 6097	. 5824	. 3995
1958.....	. 4555	. 5636	. 6110	. 6231	. 6139	. 5996	. 4425
1959.....	. 4351	. 5693	. 6288	. 6034	. 6088	. 5880	. 4196
1960.....	. 4315	. 5557	. 6250	. 5995	. 5805	. 5768	. 4998
1961.....	. 3895	. 5339	. 6112	. 6040	. 5634	. 5645	. 3960
1962.....	. 4458	. 5188	. 5901	. 5727	. 5900	. 5754	. 4268
1963.....	. 4671	. 5260	. 5956	. 5899	. 5907	. 5805	. 3953
1964.....	. 4300	. 5407	. 5915	. 5843	. 5735	. 5558	. 4495
1965.....	. 4108	. 5430	. 5936	. 5956	. 5775	. 5736	. 4525
1966.....	. 3821	. 5136	. 5612	. 5599	. 5664	. 5497	. 4567
1967.....	. 3728	. 5057	. 5720	. 5571	. 5662	. 5429	. 4383
1968.....	. 3691	. 5046	. 5909	. 5579	. 5579	. 5586	. 4486
1969.....	. 3659	. 4984	. 5751	. 5626	. 5697	. 5536	. 5055
1970.....	. 3809	. 4962	. 5964	. 5569	. 5627	. 5507	. 4918
1971.....	. 3272	. 4846	. 5777	. 5399	. 5417	. 5455	. 4671
1972.....	. 3163	. 4528	. 5664	. 5292	. 5231	. 5135	. 4840
1973.....	. 3042	. 4335	. 5555	. 5317	. 5231	. 5164	. 4359
1974.....	. 3299	. 4456	. 5619	. 5481	. 5401	. 5352	. 5131
1975.....	. 3085	. 4456	. 5673	. 5459	. 5389	. 5257	. 4881
1976.....	. 3276	. 4384	. 5626	. 5497	. 5379	. 5319	. 5414
1977.....	. 3307	. 4402	. 5604	. 5451	. 5368	. 5195	. 4654

Source: See table 1.

But there have been several institutional and policy developments that occurred during the 1960's and 1970's to prevent the labor markets from adjusting completely. Perhaps the most important change is the increase in alternative sources of income for nonworkers. Since family income has increased overall, there has been less pressure on younger workers to take lower wage jobs. Rather, additional time has been devoted to schooling, job search, or leisure. The increase in the "reservation wage" places a floor on the market wage. Although more jobs would be created for younger workers if the wage declined below the reservation wage, these jobs would go unfilled. Obviously, it is the younger people from wealthier families who would be most affected by this development.

For poorer individuals and families the liberalization of transfer payment programs has had a similar effect since it represents an in-

crease in overall family income. Essentially, the liberalization of the AFDC program, food stamps, and unemployment compensation have all served to decrease the cost of being unemployed.

These changes in government programs have affected younger workers in several ways. If younger workers live at home, by working they may jeopardize the ability of their family to receive certain welfare benefits. To the extent that younger workers establish their own families that are eligible for benefits, again, an individual would be less likely to work if benefits are considered "liberal" relative to the market wage. In addition, the increase in work registration rules for eligibility served to increase the likelihood that a worker would report himself or herself as being unemployed, rather than out of the labor force. Hence, the demographic overcrowding, by reducing the market wage for younger workers relative to the implicit welfare wage rate for not working has resulted in increases in the unemployment rate.

While the increase in the reservation wage or the decrease in the cost of being unemployed may have reduced the number of younger workers willing to work at low wages, changes in the minimum wage laws may have reduced the demand for low wage workers. Of particular importance are the extension of coverage to the retail-wholesale and service sectors in 1967, and the gradual reduction in the number of special exemptions for low-wage industries over this period. Although the level of the minimum wage itself has remained a nearly constant percentage of the economy-wide market wage, it has become increasingly relevant for younger workers. Due to the effects of demographic overcrowding, the wage of younger workers has declined relative to the overall market wage and hence relative to the minimum wage.

By increasing the equilibrium unemployment rates for the younger age-sex groups, these institutional factors have increased the equilibrium unemployment rate above the 5.1 percent level. One method of estimating the magnitude of this increase is to (a) assume that the equilibrium rate for prime-age workers has remained unchanged, and (b) view the changes in the relative unemployment rates—that coincide with the rise in the proportion of younger workers—as a measure of the increase in the equilibrium unemployment rate for the younger groups. This methodology yields an aggregate U^*_1 of 5.5 in 1979. The changes in U^*_1 between 1955 and 1978 are shown in table 3. The changes in the U^*_1 for the respective age-sex groups between 1955 and 1978 are presented in table 4.

TABLE 3.—EQUILIBRIUM EMPLOYMENT RATE U^*_1

Year	U^*_1	Year	U^*_1
1955	3.96	1967	4.77
1956	3.99	1968	4.81
1957	4.01	1969	4.91
1958	4.03	1970	5.03
1959	4.10	1971	5.16
1960	4.18	1972	5.29
1961	4.22	1973	5.39
1962	4.23	1974	5.42
1963	4.34	1975	5.44
1964	4.46	1976	5.47
1965	4.60	1977	5.48
1966	4.72	1978	5.48

Source: For method of construction see appendix 1. The background reference is Michael L. Wachter, "The Changing Cyclical Responsiveness of Wage Inflation Over the Postwar Period," *Brookings Papers on Economic Activity* (1:1976), pp. 115-159.

TABLE 4.—EQUILIBRIUM UNEMPLOYMENT RATE BY AGE/SEX, U^*

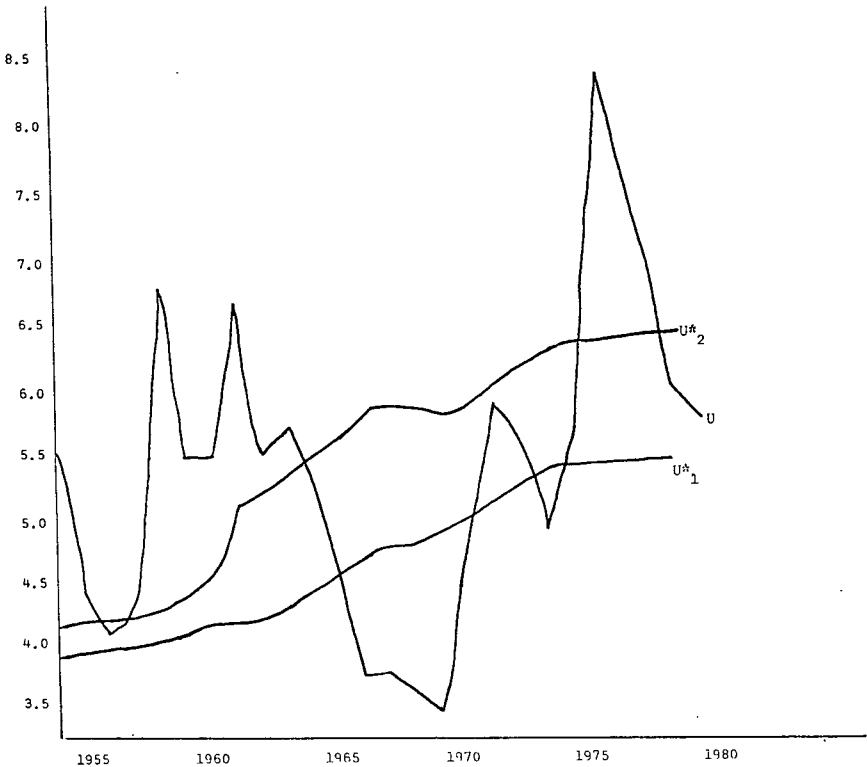
Age/sex	1955	1965	1975	1978
Male:				
16 to 17.....	11.14	15.15	17.92	17.68
18 to 19.....	10.34	12.03	13.07	12.99
20 to 24.....	6.35	7.34	7.94	7.89
25 to 34.....	3.03	3.37	3.56	3.55
35 to 44.....	2.71	2.57	2.49	2.50
45 to 54.....	3.05	2.66	2.46	2.48
55 to 64.....	3.70	3.08	2.79	2.81
65 plus.....	3.55	3.56	3.57	3.57
Female:				
16 to 17.....	11.78	15.76	18.48	18.25
18 to 19.....	8.53	12.51	15.41	15.16
20 to 24.....	5.57	7.59	8.98	8.86
25 to 34.....	4.71	5.65	6.25	6.20
35 to 44.....	3.78	4.32	4.65	4.62
45 to 54.....	3.29	3.53	3.67	3.66
55 to 64.....	3.26	3.16	3.10	3.11
65 plus.....	2.39	3.06	3.50	3.47

Source: For method of construction see appendix 1. The background reference is Micheal L. Wachter, "The Demographic Impact on Unemployment: Past Experience and the Outlook for the Future," Demographic Trends and Full Employment. A special report of the National Commission for Manpower Policy, Special Report No. 12, December 1976, pp. 27-99. The equilibrium unemployment rates have been updated to reflect the latest available data.

Recent results suggest that 5.5 percent may be an underestimate of the equilibrium unemployment rate. The 5.5 percent U^* is related solely to the demographic shifts. In addition to changing labor market factors, numerous other variables including such diverse elements as the slowdown in the trend rate of productivity growth and changes in the terms of trade also may affect the equilibrium unemployment rate.

One indication that U^* may be above 5.5 percent is the shifting relationship between capacity utilization and the unemployment rate. For any given unemployment rate today, capacity utilization is apparently much higher than it was in the 1960's. The availability of labor was the constraining factor in the 1960's; now the availability of capital is the constraining factor. For example, inflation in the Wharton model tends to accelerate when capacity utilization is around 95 percent. But capacity utilization in 1979 will be just above 93 percent and unemployment will be approximately 6.2 percent. That is, the accelerating inflation point on the capacity utilization rate will be reached when the unemployment rate is still 6.2 percent. That is not to say that 6.2 percent is the equilibrium rate of unemployment, but the capacity numbers suggest that the demographic adjustment may be too optimistic.

The second approach to estimating U^* is to confront the nonaccelerating inflation constraint directly (see section B of appendix 1). A wage or price equation is estimated directly and then the nonaccelerating inflation constraint, $w_t = w_{t-1} = \dots = w_{t-n}$, is imposed on the equation. The resulting equation can then be solved for the unemployment rate that is compatible with stability in the inflation rate. The resulting series, denoted U^*_2 is depicted in figure 1. As shown, U^*_2 is always higher than U^*_1 and is currently 6.3 percent. Numerous alternative U^* type series can be estimated by modifying the specification of the wage or price equation. The series depicted in figure 1 was at the low end of the various estimates that we obtained.

FIGURE 1.— U , U^*_1 , U^*_2 .

Source: Jeffrey M. Perloff and Michael L. Wachter, "A Production Function to Potential Output: Is Measured Potential Output Too High?" *Carnegie-Rochester Conference Series on Public Policy*, Vol. 10, January 1979.

It is interesting that much of the difference between U^*_1 and U^*_2 results from the more rapid growth of the latter during the 1960's. Since that was the period when the demographic impact of the baby boom was strongest, it suggests the possibility that U^*_1 understates the impact of this factor. In addition, these results suggest that the food and fuel shocks and the slowdown in productivity of the 1970's have not had further negative impact on U^*_2 . While the stagflation problem has largely emerged during the 1970's and especially after 1973, the estimated increase in our U^* constructs have been largely completed prior to 1973.

The notion that the increase in U^* and the slowdown in productivity growth are independent of each other needs to be tempered by the difficulties in isolating the timing of these events. Moreover, economic theory does suggest some potential linkages between the two phenomenon. For example, the slow growth in productivity and hence in real wages can result in a decrease in the cost of being unemployed as long as transfer payments increase along their trend rate of growth. In addition, a high consumption, low investment oriented economy might generate a high reservation wage for market work as well as relatively low market wages. The result in each of these two examples is an indirect relationship between a slowdown in productivity growth and an increase in equilibrium unemployment rates.

Given our stress on the demographic factors in causing the increase in U^* since 1955, the future outlook for the trend in the equilibrium unemployment rate is favorable, even if government policy is hereafter neutral. As the baby boom ages and the baby bust cohort enters the younger age groups, the equilibrium unemployment rate should decline. Our calculations suggest a decline of approximately 1 percent in the equilibrium unemployment rate over the next decade due to the demographic factors. Government policy and external events can operate to either offset or further this projected decline in the equilibrium unemployment rate. The relatively distinct nature of the unemployment and stagflation problems are indicated by this projected decline in the equilibrium unemployment rates over the 1980's. Slow growth and high inflation can remain as problems even as the demographic factors operate to lower the unemployment rate.

III. INFLATION

The increase in the inflation rate between 1965 and 1979 is largely due to overexpansionary monetary and fiscal policies. Exogenous shocks such as the food and fuel price increase during the 1970's can lead to ongoing inflation only if they are validated by aggregate demand policies. For example, although the large OPEC price increase in 1973-74 and again in 1979 may cause a short-run increase in the inflation rate, the price level should eventually settle down at the new higher level dictated by higher energy prices. If the increase in OPEC prices, however, leads to a higher rate of monetary growth and a large full-employment deficit, inflationary expectations will increase. The result on the inflation rate is that a short-run spike becomes a long-run increase.

The inflationary bias of government policy can be seen by evaluating the GNP and unemployment targets of policymakers relative to attainable levels of potential GNP and equilibrium unemployment. The government's unemployment rate target has been consistently below our U^* series. In the late 1960's, the government target was 4 percent while the equilibrium rate was between 4.9 and 5.4 percent. By the mid-1970's, when the government target was lifted to 4.9 percent, U^* had increased to between 5.5 and 6 percent. The systematic use by the monetary and fiscal authorities of an unemployment rate target below U^* has been a key ingredient in the increase in the inflation rate; from an average of 1.5 percent in the early 1960's to approximately 9 percent today. Moreover, the "full-employment" budget surplus is seriously overstated by calculating that figure on the basis of a 4 or even 5 percent equilibrium (full-employment) rate. The result is a tendency to believe that fiscal policy is more restrictive than it actually is.

The same factors affect potential output. Table 5 shows the measure of potential output that was used by the Council of Economic Advisers during the 1960's. That series is denoted Old CEA. According to that series, potential output was always greater than actual output or GNP. More recently, the Council of Economic Advisers has reduced its measure of potential output. This new variable (denoted New CEA) is shown in column 3 of table 5. Although GNP is now occasionally above potential this is still rarely the case. But if the economy

always had economic slack, what explains the increase in the inflation rate over the past 15 years?

TABLE 5.—ALTERNATIVE MEASURES OF POTENTIAL OUTPUT

	Actual GNP	Old CEA	New CEA	QPOT 1
1955.....	654.8	653.6	651.4	651.6
1956.....	668.8	676.6	673.9	670.8
1957.....	680.9	700.4	697.2	694.9
1958.....	679.5	725.0	721.3	722.5
1959.....	720.4	750.5	746.2	741.6
1960.....	736.8	776.9	771.9	767.0
1961.....	755.3	804.2	798.6	795.0
1962.....	799.1	832.5	826.4	821.0
1963.....	830.7	863.1	851.1	846.0
1964.....	874.4	895.6	890.3	874.2
1965.....	925.9	929.3	925.0	902.6
1966.....	981.0	964.3	960.8	944.1
1967.....	1,007.7	1,000.7	996.3	985.6
1968.....	1,051.8	1,038.4	1,031.7	1,017.6
1969.....	1,078.8	1,079.1	1,068.3	1,050.1
1970.....	1,075.3	1,122.5	1,106.2	1,085.1
1971.....	1,107.5	1,167.6	1,145.5	1,121.3
1972.....	1,171.1	1,214.6	1,186.1	1,157.1
1973.....	1,235.0	1,263.4	1,227.0	1,198.4
1974.....	1,217.8	1,314.2	1,264.2	1,234.7
1975.....	1,202.3	1,367.0	1,302.1	1,271.0
1976.....	1,273.0	1,422.0	1,341.1	1,316.8
1977.....	1,340.5	1,479.1	1,381.4	1,366.8
1978.....	1,399.2	1,538.6	1,422.9	1,404.8

Sources: The actual GNP and the Old and New Council of Economic Advisors potential output series are discussed in the Council of Economic Advisors report of 1979. The methodology for constructing QPOT, is presented in Jeffrey M. Perloff and Michael L. Wachter, "A Production Function—Nonaccelerating Inflation Approach to Potential Output: Is Measured Potential Output Too High?" Carnegie-Rochester Conference Series on Public Policy, K. Brunner and A. H. Meltzer, eds., vol. 10, 1979, pp. 113-163, "Reply," pp. 195-203.

TABLE 6.—UPPER AND LOWER RANGES FOR POTENTIAL OUTPUT, QUARTERLY 1955-78

	GNP	QPOT ₁	QPOT ₂
1955:1.....	641.10	636.68	641.97
1955:2.....	650.80	642.44	645.02
1955:3.....	660.30	650.02	653.37
1955:4.....	667.00	657.74	653.37
1956:1.....	664.10	663.81	662.05
1956:2.....	667.50	668.33	664.68
1956:3.....	667.90	676.42	671.85
1956:4.....	675.70	682.01	675.80
1957:1.....	680.40	688.96	683.22
1957:2.....	680.90	695.50	688.58
1957:3.....	685.60	701.23	696.08
1957:4.....	676.70	704.12	697.77
1958:1.....	663.40	710.21	703.10
1958:2.....	668.20	714.11	712.27
1958:3.....	684.40	722.37	723.18
1958:4.....	702.10	729.48	727.13
1959:1.....	710.70	734.17	727.78
1959:2.....	726.30	739.46	732.51
1959:3.....	718.60	740.74	734.68
1959:4.....	726.20	747.72	744.50
1960:1.....	740.70	756.89	751.96
1960:2.....	738.90	765.02	757.83
1960:3.....	735.70	770.39	762.16
1960:4.....	731.90	772.69	766.16
1961:1.....	736.60	781.31	777.27
1961:2.....	749.00	787.80	784.08
1961:3.....	758.70	793.97	790.21
1961:4.....	776.90	801.24	796.49
1962:1.....	788.10	809.54	805.79
1962:2.....	798.30	814.87	812.99
1962:3.....	804.30	819.46	816.31
1962:4.....	805.80	823.67	816.37
1963:1.....	813.50	832.87	826.05
1963:2.....	823.70	841.59	832.83
1963:3.....	838.80	847.65	843.41
1963:4.....	846.90	852.66	849.77
1964:1.....	861.10	861.42	860.38
1964:2.....	872.00	867.80	866.50
1964:3.....	880.50	875.37	869.95

TABLE 6.—UPPER AND LOWER RANGES FOR POTENTIAL OUTPUT, Quarterly 1955-78—Continued

	GNP	QPOT ¹	QPOT ²
1964:4	883.90	879.76	868.34
1965:1	903.00	891.32	881.43
1965:2	916.40	899.61	888.93
1965:3	932.30	908.48	901.67
1965:4	952.00	915.33	908.01
1966:1	969.60	929.37	924.06
1966:2	976.30	936.99	931.86
1966:3	985.40	946.91	941.35
1966:4	992.80	956.82	951.22
1967:1	994.40	969.87	965.49
1967:2	1,001.3	977.11	972.45
1967:3	1,013.6	990.11	987.08
1967:4	1,021.5	996.55	990.64
1968:1	1,031.4	1,008.1	999.24
1968:2	1,049.4	1,014.9	1,009.7
1968:3	1,061.8	1,026.1	1,017.7
1968:4	1,064.7	1,028.5	1,017.4
1969:1	1,074.8	1,043.4	1,032.9
1969:2	1,079.6	1,054.0	1,040.8
1969:3	1,083.4	1,062.2	1,049.3
1969:4	1,077.5	1,067.5	1,051.1
1970:1	1,073.6	1,080.1	1,065.5
1970:2	1,074.1	1,088.6	1,074.6
1970:3	1,082.0	1,094.5	1,082.0
1970:4	1,071.4	1,103.8	1,092.2
1971:1	1,095.3	1,116.7	1,107.4
1971:2	1,103.3	1,122.7	1,117.2
1971:3	1,111.0	1,128.2	1,120.5
1971:4	1,120.5	1,121.7	1,113.0
1972:1	1,141.2	1,149.9	1,136.9
1972:2	1,163.0	1,155.8	1,148.7
1972:3	1,178.0	1,158.2	1,154.3
1972:4	1,202.2	1,165.4	1,162.3
1973:1	1,229.8	1,181.4	1,178.3
1973:2	1,231.1	1,190.2	1,185.9
1973:3	1,236.3	1,197.7	1,195.2
1973:4	1,242.6	1,211.5	1,207.8
1974:1	1,230.2	1,212.7	1,208.2
1974:2	1,224.5	1,233.1	1,226.1
1974:3	1,216.9	1,244.4	1,238.7
1974:4	1,199.7	1,240.4	1,237.9
1975:1	1,171.6	1,256.0	1,249.3
1975:2	1,189.9	1,265.4	1,258.5
1975:3	1,220.0	1,279.0	1,272.5
1975:4	1,227.9	1,283.6	1,275.9
1976:1	1,259.5	1,299.4	1,294.5
1976:2	1,267.4	1,306.2	1,302.0
1976:3	1,277.1	1,322.9	1,320.1
1976:4	1,288.1	1,325.1	1,324.3
1977:1	1,315.7	1,341.6	1,340.8
1977:2	1,331.2	1,357.6	1,356.6
1977:3	1,353.9	1,371.0	1,370.1
1977:4	1,361.3	1,379.3	1,374.1
1978:1	1,367.8	1,379.9	1,374.0
1978:2	1,395.2	1,400.2	1,392.4
1978:3	1,407.3	1,414.0	1,405.1
1978:4	1,426.6	1,429.3	1,418.9

Sources: See table 5

Our upper range estimate of potential output is denoted QPOT₁. It is well below the government's current measure of potential and it indicates that GNP was close to potential by the end of 1978. According to our lower range potential output estimate, the economy was overheating early in 1978. This pessimistic estimate of potential differs from QPOT₁, in part, by using U*₂ series instead of U*₁ to construct the potential labor series. This series, denoted QPOT₂, is provided on a quarterly basis in table 6 along with QPOT₁.

Given this view of inflation, what is the intermediate run outlook for this variable and what are the costs of ongoing inflation? The outlook is simply impossible to predict because it rests largely upon the future decisions of the monetary and fiscal authorities.

One of the major problems in the anti-inflation battle is that the appropriate unemployment rate target for stabilization policy is not known with certainty. How far can the monetary and fiscal authorities push down the unemployment rate without causing accelerating inflation? In the 1960's, it was argued that uncertainty about the length of the lagged response of economic activity to aggregate demand policies was the key problem in fine tuning the economy. That problem still exists, but we argue that it is small compared with the issues raised by the uncertainty over the level of the sustainable unemployment rate. Our equilibrium unemployment rate of 5.5 percent is a point estimate with a large standard deviation. The unemployment constraint could easily be over 6 percent.

In order to reduce the inflation rate, the evidence suggests the need for a long-run commitment to avoid overheating the economy. Within this context, however, it is not necessary to restrict monetary and fiscal policy to the point of encouraging a recession. An approach with a greater likelihood of success would focus on maintaining the unemployment rate close to 6 percent while the money supply growth rate was slowly contracted. This policy would require several years before the inflation rate would lower significantly, but the alternative seems to be a continuation of accelerating inflation combined with occasional recessions that would be precipitated in abortive and short-lived attempts to reduce the inflation rate.

A problem with using recessions to cure inflation is that they reduce the rate of capital accumulation and investment. The optimal monetary and fiscal policy to encourage maximum productivity and economic growth is a policy which minimizes the variance in GNP growth rates. The adoption of this approach also requires using reasonable targets for potential output and equilibrium unemployment.

IV. PRODUCTIVITY

From 1948 to 1965, average productivity of labor, as measured by the Bureau of Labor Statistics, rose by 2.7 percent per year. For the 1968 to 1978 period the rate of increase fell to 2 percent. The record since 1973 is even more disturbing, as for the past 5 years (1973 to 1978) productivity growth has averaged about 1 percent per year, and during 1973 and 1974, there was actually a decline in productivity of almost 5 percent.

A large number of hypotheses have been advanced to explain the decrease in the rate of productivity increase. Due to data limitations only some of these explanations have been examined empirically. The explanation which is consistent with our earlier discussion is based on the demographic overcrowding model. In this section we shall outline the relationship between productivity and the demographic swings and discuss some preliminary empirical results.

As long as the labor force is expanding in a manner which is largely unchanging over time, the demographic influences on productivity growth rates will be unimportant. The new entrants or reentrants into the labor market and the unemployed are always relatively young and unskilled.

The recent demographic swings, however, suggest that the current cohort of new workers for the 1965 to 1979 period have had a different

impact than the cohort that entered the labor market between 1950 and 1965. Whether both groups were of equal skill and education or not is relatively unimportant since more recent cohorts would probably have had lower marginal productivity simply because there were so many of them. With imperfect substitution between old and new workers, cohort overcrowding—as occurred between 1965 and 1979—should be expected to have caused a decline in the productivity of new workers.

The shift from the relatively small to the large entering cohort lowered the average productivity of the work force. As a consequence, the rate of change of productivity was reduced. These demographic factors partially explain the large drop in productivity from 1950, when a small cohort of males entered the labor force, to the late 1970's when a large cohort of males and females entered.

The impact of the demographic factors on the productivity slowdown is generally analyzed using the traditional average productivity series. For productivity analysis the more appropriate series is the marginal productivity series. But this variable cannot be calculated directly from published data. Using our translog production function we are able to calculate a marginal productivity series. (The translog estimation was used to calculate the potential output series $QPOT_1$ and $QPOT_2$ in tables 5 and 6.) See appendix 2 for a discussion of the underlying methodology.

Since our translog production function used a labor input variable which weighted workers by their (fixed) relative wages, the resulting average and marginal productivities are adjusted for the changing age-sex composition of the labor force. (Obviously, there are other ways of adjusting for the effects of the baby boom. In our current work we are experimenting with separate input measures for older and younger workers, rather than a single series obtained by aggregating with relative wage weights.) The changes in the average product (ΔAPL) and marginal product (ΔMPL) series over time are shown in table 7.

In table 8 the data for the 1956–78 period are subdivided into three subperiods, 1956–64, 1965–73 and 1974–78. The most striking finding is that, after the data are adjusted for the age and sex demographic changes, the rate of change in marginal productivity change actually shows an increase between 1955–64 and 1965–73. The demographic adjusted marginal productivity series increased at a 2.62 percent rate in the earlier period compared to a 2.78 rate in the later period. This positive differential growth rate between periods of 0.16 percent compares with a negative 0.4 percent differential in the unweighted series. Hence the swing due to the demographic adjustment is more than half a percent (0.56 percent).

This type of subperiod analysis however can be misleading. The data in tables 7 and 8 indicate the importance of the choice of years in dividing the period. For example, the years 1965 and 1966 have two of the three largest productivity gains over the past 25 years. Hence, changing the dating of the middle period from 1965–73 to 1967–73 makes a significant difference. The overall marginal productivity growth rate for 1967–73 is only 2.13 percent, down from 3 percent for 1956–66; the unexpected productivity speed-up becomes a more traditional slowdown.

TABLE 7.—PERCENTAGE CHANGES, AVERAGE AND MARGINAL, PRODUCTS FROM PRODUCTION FUNCTION

[Based on U^*]

	Average product (Δ APL)	Marginal product (Δ MPL)
1956.....	1.29	0.80
1957.....	2.51	2.37
1958.....	1.17	1.82
1959.....	4.23	3.88
1960.....	1.45	1.17
1961.....	2.27	1.93
1962.....	5.25	4.88
1963.....	3.45	3.09
1964.....	3.71	3.67
1965.....	4.53	4.78
1966.....	4.40	5.27
1967.....	2.02	2.28
1968.....	3.51	4.48
1969.....	1.46	2.17
1970.....	-.12	-3.48
1971.....	2.59	.82
1972.....	3.34	4.25
1973.....	2.60	4.41
1974.....	-2.52	-3.94
1975.....	1.17	-3.45
1976.....	2.90	3.87
1977.....	1.90	2.89
1978.....	.73	2.61

Sources: The average productivity figures are based on Government calculations. The marginal productivity series are derived in Jeffrey M. Perloff and Michael L. Wachter, "Alternative Approaches to Forecasting Potential Output, 1978-1980," Proceedings of the American Statistical Association, 1979, pp. 104-113. Also, "A Production Function—Nonaccelerating Inflation Approach to Potential Output: Is Measured Potential Too High?" Carnegie-Rochester Conference Series on Public Policy, K. Brunner and A. H. Meltzer, eds., vol. 10, 1979, pp. 113-163, "Reply," pp. 195-203.

TABLE 8.—PRODUCTIVITY GROWTH RATES

	Unweighted labor BLS Δ APL	Rate of change, average and marginal products	
		Δ APL	Δ MPL
1956-67.....	2.51	2.81	2.62
1965-73.....	2.12	2.70	2.78
1974-78.....	.84	.84	.40

Sources: See the references in table 7 and appendix 2.

It is, however, reasonable to start this period in 1965. Besides corresponding to a point in the business cycle where U was approximately equal to U^* (which is also true of 1956 and 1973), the year 1965 corresponds to a point in the demographic cycle when the first baby boom cohort entered the labor force in large numbers. (The oldest members of the baby boom cohort began to enter the labor market around 1960.)

Although a demographic adjustment for age and sex can explain the decline in productivity between 1965 and the early 1970's, this adjustment is not severe enough to explain the major slowdown that begins during the early 1970's. Indeed, the success of the demographic explanation in the early period compared with its lack of success in the latest period implies an even more pronounced slowdown after the early 1970's than is shown by an unadjusted productivity series. In other words, adjusting the labor input series for age and sex compositional shifts alters the timing but not the size of the productivity slowdown. The onset of any significant slowdown appears to be delayed until the early 1970's. The result is to change a gradual slowdown into a dramatic collapse of the productivity growth rate. As seen in table 8, the Δ MPL series, after increasing at a 2.62 rate from 1955

to 1964, and at a 2.78 rate from 1965 to 1973, grows at only a 0.40 rate from 1974 to 1978.

Several explanations have been offered for the early 1970's slowdown in productivity. Perhaps the most widely held view is that a shortfall in capital expenditures contributed to the productivity decline by reducing the trend growth in the capital-labor ratio. This conclusion arises most strongly in studies that use the growth accounting approach.

These studies, however, do not explain the slowdown so much as they attribute to the various inputs that part of the slowdown which parallels changes in input growth rates. As a result, the reduction in the growth of capital-labor ratios is viewed as the explanatory factor because both output and capital-labor ratios follow similar time paths between 1973 and 1979.

Although some authors argue that a fall-off in capital expenditures is the cause of the problem, the techniques used to determine that capital-labor ratios are growing more slowly than in earlier years are compatible (in a general equilibrium context) with either capital growing "too slowly" or labor growing "too quickly." To determine which is causing the productivity problem, one must study the firms dynamic adjustment behavior.

Research on the investment function has isolated several factors that might account for the investment of productivity slowdown. For example, papers presented in this JEC Special Study on Economic Change list increases in energy prices, change in government regulatory practices, increases in the acceptable or hurdle rate of return on new investments due to the additional uncertainty generated by the inflation, and the deep recession of 1974-75, as causes of the slowdown.

In our translog production function approach, the slowdown in productivity can be attributed to capital, labor, and energy growth patterns; Hicks neutral technological change; and cyclical factors. Although an investigation of these various factors is beyond the scope of this paper, our focus on the stagflation question makes it particularly relevant to explore the influence of the 1974-75 recession on the productivity slowdown.

Since our potential output series are calculated on the assumption that the economy has an unemployment rate equal to its equilibrium rate, the potential average and marginal productivity series, denoted ΔAPL^* and ΔMPL^* respectively, yield a cyclically corrected productivity series. These series are presented in table 9. The labor inputs in both the ΔAPL^* and ΔMPL^* series are adjusted for demographic as well as cyclical factors.

A comparison of the ΔMPL and ΔMPL^* series in tables 7 and 9 yields several striking results. First, if only a demographic correction is made (ΔMPL) productivity growth appears to increase between the 1956-64 and 1965-73 periods; while if both a demographic and cyclical adjustment (ΔMPL^*) based on U^* are made, productivity appears to decrease slightly. As indicated in table 10, the ΔMPL^* series averages 2.81 percent during the 1955-64 period and then slows to 2.47 percent in 1965-73.

TABLE 9.—PERCENTAGE CHANGES, POTENTIAL AVERAGE, AND MARGINAL PRODUCTS FROM PRODUCTION FUNCTION

[Based on U*₁]

	Potential average product (ΔAPL^*)	Potential marginal product (ΔPL^*)
1956	3.51	3.39
1957	3.33	3.15
1958	2.73	2.56
1959	2.85	2.87
1960	2.80	2.71
1961	2.71	2.57
1962	2.73	2.65
1963	2.79	2.68
1964	2.78	2.71
1965	3.05	2.95
1966	3.43	3.23
1967	3.24	3.01
1968	2.85	2.73
1969	2.77	2.65
1970	2.50	2.30
1971	1.63	1.54
1972	1.98	1.98
1973	1.87	1.86
1974	1.45	1.36
1975	1.08	.89
1976	1.41	1.45
1977	1.40	1.43
1978	.63	.74

Source: See table 7.

Second, the ΔMPL^* series is useful for analyzing turning points in the productivity growth rate. The timing of the productivity slowdown has been a focal point of the current debate. The recent years have been broadened into numerous different subdivisions in an attempt to isolate the onset of the recent slowdown: for example, the view that energy price increases are the major causal factor of the significant decrease in productivity which began after 1973. While the post 1973 ΔAPL^* and ΔMPL^* figures are below historical averages, these series peak in 1965 or 1966 and decrease thereafter. Substantial drops occurred in 1970 and other years. Thus, other factors besides energy must also affect productivity.

Indeed a case can be made that the major drop started in 1970 or 1971. Such a view is consistent with the theory that increasing rates of inflation, the uncertainty and misallocations created by the Nixon price controls program, and the expansion of government regulatory programs are all important parts of the productivity decline.

TABLE 10.—RATE OF CHANGE, AVERAGE AND MARGINAL POTENTIAL PRODUCTS

	Based on U* ₁		Based on U* ₂	
	ΔAPL^*	ΔMPL^*	ΔAPL^*	ΔMPL^*
1956-64	2.91	2.81	2.81	2.29
1965-73	2.59	2.47	2.60	2.33
1974-78	1.19	1.17	1.24	1.20

Source: See the references in table 7 and appendix 2.

Third, the cyclical adjustment correction results in a threefold increase in the productivity growth rate in the most recent period. While ΔMPL grows at 0.40 percent, ΔMPL^* grows at 1.17 percent between

1974 and 1978. Moreover, the ΔMPL^* series growth rate is also higher than that calculated by the BLS using its Q/L (average productivity) series. Although the cyclical correction yields a significant upward revision of the productivity growth rate, it is still the case that a productivity growth rate of 1.17 percent is very low by historical standards.

V. CONCLUSIONS

In order to determine which policies should be used to lower the inflation and unemployment rates and increase the rate of productivity growth, one must know which factors are responsible for the problems. Although these three problem areas have similar roots, they also have distinctive qualities.

If cyclical unemployment were a significant component of the overall unemployment rate, then monetary and fiscal policies could be used to decrease the unemployment rate and increase production. In this paper, we have argued that much of the increase in the unemployment rate over the past two to three decades can be traced to the changing composition of the labor force, which caused the equilibrium unemployment rate to increase from approximately four percent in the mid-1950's to almost six percent in 1979. Since most of the increase in the unemployment rate reflects an increase in the equilibrium unemployment rate, countercyclical monetary and fiscal policies cannot lower unemployment; except at the cost of accelerating inflation. Other policies, such as manpower training and employment tax credits, etc., could be used to lower the equilibrium unemployment rate.

It should be recognized, however, that real manpower policies, even if successful, will have only a negligible effect on productivity growth. The workers who are part of the unemployment pool at U^* are low-wage workers with little skills. Improving the skills and hence the employment ability and market wages of the workers would be extremely beneficial to the workers themselves and to society. But, because of their low skills, moving these workers from being unemployed to employed will have little impact on the level of production and productivity. Actually, the average product series generally used in the published data would probably decline because of the further compositional shift toward low-wage workers. Hence there is a tradeoff between programs that have their biggest impact on U^* and those that have their biggest impact on productivity growth. Moreover, calculations suggest a decline of approximately one percent in the equilibrium unemployment rate over the next decade. This gain will be due solely to the demographic factor. Government policy and external events can operate to either offset or further this projected decline in the equilibrium unemployment rate.

The major element in the stagflation picture is the slowdown in real economic growth. The current inflation and unemployment rates would be considerably less painful if the rate of real economic growth were increased. At present the rate of growth of potential output (using POT_1 and POT_2) is approximately three percent. In per capita terms, after adjusting for the growth in the labor force, this is a dismal record.

The general shape of policies to increase real GNP growth rates are well known. The basic requirement is a shift away from policies

which encourage consumption toward those which encourage investment. This would require a major overhaul in the tax structure as well as a change in priorities for government expenditure programs. Contrary to conventional wisdom, such policies need not increase the gap between high and low income families. Incentives for increased savings rates can be targeted at the middle class and government expenditure programs can be aimed at increasing the "human capital" of our lowest skilled workers. Obviously, describing the details of a high growth rate policy is beyond the scope of our report.

Over the long run the success of a high growth rate policy is improved if the inflation rate is reduced. A reduction in the level of inflation, given our economic institutions, also means a reduction in the variance of the inflation rate. Business and individuals can best make long run investment decisions in a noninflationary stable environment. The experience of some Western European countries and Japan, however, indicate that high inflation does not rule out high long-run growth rates for real income. Another theme that is a generally accepted part of a program to improve productivity is that the regulatory climate should be altered. Government regulatory agencies, including wage and price boards add to the cost and increase the risk of new investments. As stressed by the Council of Economic Advisors, in their latest report, more attention needs to be devoted to the economic costs as well as the benefits of regulation.

Important in improving the real growth rate is a commitment to terminate the incessant budget deficits. Keynesian economics, properly applied, argues for deficits during recessions and surpluses during expansions. The U.S. budget should be in balance when the unemployment rate falls to 6 percent. The current policy results in the "crowding out" of business investments by government consumption.

Finally, the evidence we presented above indicate that some of the slow-down in productivity was due to the unusually large cyclical fluctuations in the economy in the 1970's. This suggests that monetary and fiscal policies should be adopted to reduce the variance of output and unemployment in the economy. The increased uncertainty generated by the cyclical swings may be an important factor in dampening productivity growth. Although the Government's official policy is to dampen the business cycle, we believe that by adopting unrealistic unemployment and potential targets, the monetary and fiscal authorities may have accentuated the underlying swings in the economy over the recent past.

APPENDIX 1.—ALTERNATIVE METHODS OF CONSTRUCTING AN UNEMPLOYMENT RATE NORMALIZED FOR THE CHANGING CHARACTERISTICS OF THE LABOR MARKET

The central demographic reason why the unemployment rate has changed is the increasing numbers of young males and females in the population as a direct consequence of the baby boom of the late 1950's. Alternative methods have been suggested for computing an aggregate unemployment rate which is normalized for demographic changes in the labor force and population. George Perry was perhaps the first person to systematically consider the impact of the changing demographic composition of the unemployment pool on the usefulness of the traditional BLS unemployment rate as a measure of labor market tightness. He suggested the adoption of an adjusted unemployment rate that would account for the changing age-sex composition of the labor force. The essential element

in Perry's argument was that if a skilled worker earned \$8 an hour, he should count twice as much as a worker earning \$4 an hour. His adjusted unemployment rate measures workers in efficiency units in contrast to the BLS statistic which counts each worker equally. If over time the unemployment pool becomes dominated by lower-skilled workers, then the pool's potential deflationary impact lessens. One percentage point of lower skilled, teenage unemployment does not have the same economic meaning as one percentage point of prime-age male unemployment.

In the BLS count, all workers have the same weight and the aggregate unemployment rate is a simple summation of the unemployed workers in each of the 14 age-sex groups. In the Perry calculation, all workers are not the same, with each worker given a normalized weight equal to his relative wage, which is assumed to be an accurate proxy for relative productivity. These relative wages are assumed to be constant over time. Thus, the Perry unemployment correction normalizes solely for the changing composition of the labor force, using constant relative wages as weights.

A. THE METHODOLOGY FOR U^*

Source: Michael L. Wachter, "The Changing Cyclical Responsiveness of Wage Inflation Over the Postwar Period," *Brookings Papers on Economic Activity* (1:1976), pp. 115-159 and Jeffrey M. Perloff and Michael L. Wachter, "A Production Function-Nonaccelerating Inflation Approach to Potential Output: Is Measured Potential Output Too High," *Carnegie-Rochester Conference Series on Public Policy*, K. Brunner and A. H. Meltzer, eds. Vol. 10, 1979, pp. 113-163, "Reply," pp. 195-203.

It is probably a mistake to allow the weights used in forming an unemployment index to maintain constant over time. An important issue confronting macroeconomists who study unemployment is the relative worsening unemployment rates of young workers and to a lesser extent of females. That is, not only should U^* increase over time because the percent of young workers is increasing, it should also reflect the relative worsening of unemployment rates among these growing groups.

The groups that are becoming numerically more important are also becoming worse off. One explanation for this phenomenon is a "demographic crowding model" (Wachter 1976:1). Given certain maintained hypotheses about the manner in which the labor market has changed, one can isolate the demographic impact on the cyclical component of the unemployment rate and differentiate between U^* and U .

The basic assumption used in constructing U^* is that the structural changes in the labor market over the past two decades have had the smallest impact on prime-age males. Those workers show very little cyclical variation in their labor force behavior and are not significantly affected by changes in government transfer payments and minimum wage coverage. Using the prime-age male group (25-34 years of age) as a benchmark, it is possible to estimate the structural increases in unemployment of the standard age-sex categories in the labor force. The equation used in the earlier study is of the form:

$$(1) \quad U_i = a_0 + a_1 U_{PM} + a_2 RP_y$$

where U_i is the unemployment rate of the age-sex group, U_{PM} is the unemployment rate of prime-age males, and RP_y is the ratio of young people (age 16 through 24) to the adult population (age 16 and over). The variable RP_y is an indication of demographic twists in the age structure. To calculate the normalized unemployment rate for each age-sex group, we assume that 2.9 percent is the nonaccelerating-inflation unemployment rate, U_{PM} , for prime-age males: the 2.9 figure is a benchmark and the resulting U^* figures are indexed on this particular benchmark. If the 2.9 is changed, U^* will also change in the same direction. The choice of this number is based on one examination of inflation and U_{PM} data for the postwar period. Essentially, in the postwar period, U_{PM} has been below 2.9 percent during clear periods of excess demand, 1956:2, 1965:2-1970:2, and 1972:4-1974:3.

Substituting into (1) the estimated values for a_0 , a_1 , and a_2 in each age-sex equation and 2.9 percent for U_{PM} leads to estimates of the normalized unemployment rate for each age-sex group. They are shown in table 4 for 1955, 1965, 1975, and 1978. They vary over the period as RP_y changes. The demographic corrected U^* figure for the economy at any point in time is, then, a weighted average of the U^* , for each of the 14 age-sex groups. The weights are the percentage of each group in the labor force. The aggregate U^* or full employment rates for 1955 through 1978 are shown in table 3.

B. THE METHODOLOGY FOR U^*

Source: Jeffrey M. Perloff and Michael L. Wachter, "A Production Function-Nonaccelerating Inflation Approach to Potential Output. Is Measured Potential Output Too High?" Carnegie-Rochester Conference Series on Public Policy, K. Brunner and A. H. Meltzer, eds. Vol. 10, 1979, pp. 113-163, "Reply," pp. 195-203.

Potential output is that output which society could produce with the labor supply which is consistent with nonaccelerating rates of inflation. Thus, to provide estimates of potential output, we need, besides the aggregate production function, an equation which determines the natural rate U^* .

Three approaches have been adopted in the literature for dealing with the problem of estimating U^* . The first is to adjust the unemployment rate for demographic changes in the population and for changes in relative unemployment among the various age-sex groups. This approach is described in Wachter (1976) and was used to produce the series used in the previous section as parameters of the factor elasticities. This demographic normalization of the unemployment rate, denoted U^* , and plotted in figure 1, is developed outside of any wage or price equation and is thus only an indirect approximation to the U^* concept.

The technique of using a demographic adjustment to the unemployment rate in constructing potential output series is followed by Clark (1977), Rasche and Tatom (1977a, 1977b), and Perry (1977a, 1977b). The Clark and Rasche-Tatom series are similar in methodology to the Wachter (1976) series. The Perry construct, based on his 1970 work, differs theoretically in that it is based on a fixed weighting scheme using relative wage rates among demographic groups. Our series is based on a variable weighting scheme using relative unemployment rates among demographic groups. Empirically, the approaches differ from each other. The important distinction, for our purposes, is that in our series, U^* increases 1.5 percentage points between 1955 and 1977, while in the other series, U^* increases by only 1.1 percentage points.

The second approach to U^* is to confront the nonaccelerating inflation constraint directly; that is, a wage or price equation is estimated directly, with nonaccelerating inflation imposed in the form $\dot{w}_t = \dot{w}_{t-1} = \dots = \dot{w}_{t-n}$ or $\dot{p}_t = \dot{p}_{t-1} = \dots = \dot{p}_{t-n}$. The equation can then be inverted to solve for the equilibrium U^* . Numerous problems with this approach account for its lack of popularity. The primary disagreements center on how to specify the inflation equations, in terms of both functional form and explanatory variables.

For our purposes, it was better to experiment with a wage rather than a price equation. See Perloff-Wachter (1979a). Price inflation is more susceptible to exogenous shocks, which are very difficult to quantify. Wage inflation is less sensitive to weather, international trade, and oil price increases. A series of short-run shocks may be averaged out over the relatively long-term contracts which are important in the labor market. The result is that the wage series will vary more with longer-run influences, and the underlying U^* will be more stable and less subject to the vagaries of variables, which are difficult to quantify. To illustrate this method, we estimate a series of relatively simple Phillips curves of the general form.

$$\dot{w}_t = \alpha_0(\tau) + \alpha_1(\tau) \text{UGAP} + \Sigma \beta_1 \dot{w}_{t-1},$$

where U^* , is the normalized unemployment rate series discussed above, and the τ 's indicate that the coefficient on the constant and the unemployment term may vary over time. We allowed for several different schemes for the varying parameters and also introduced a variable to capture the Phase I through IV controls period. We imposed the assumption of nonaccelerating inflation by subtracting the lagged dependent variable that is in the form

$$\dot{w}_t - \Sigma \beta_1 \dot{w}_{t-1}.$$

The nonaccelerating inflation rate is imposed with reference not to the previous quarter, but to a weighted average of previous inflation rates. Allowing parameters to vary with time and imposing $\Sigma \beta_1 = 1$, we obtain the nonaccelerating inflation rate of unemployment

$$U^* = \frac{-\alpha_1(\tau) U^*_1}{\alpha_0(\tau)}$$

In virtually all of these equations, the resulting U^* series is above the demographic adjustment U^*_1 series. This result is anticipated by Wachter (1976) who finds that the nonaccelerating inflation rate of unemployment for 1975 is 6.04 (for a long-run productivity growth rate of 2.5 percent), compared to a U^*_1 of approximately 5.5 percent. As long as the coefficients in the wage equation are allowed to vary over time, the demographic U^*_1 series will, in general, not equal U^* which solves the equation. The average U^* calculated across alternative parameter schemes tends to be approximately 6.25 in 1977 and about 0.5 to 1.0 percent higher than the U^*_1 series.

APPENDIX 2.—POTENTIAL OUTPUT

Source: Jeffrey M. Perloff and Michael L. Wachter, "Alternative Approaches to Forecasting Potential Output, 1978-1980," Proceedings of the American Statistical Association, 1979.

Potential output may be defined as that level of output which is consistent with nonaccelerating inflation. There are two basic equations used in this approach, a production function

$$(1) Q = f(K, L, E),$$

and a Phillips curve,

$$(2) \dot{w} = g(U, \{\dot{w}_{t-1}\}, X),$$

where Q is output, K is capital, L is labor, E is energy, \dot{w} is the rate of wage inflation, $\{\dot{w}_{t-1}\}$ is a vector of lagged inflation rates which reflects an expectations formation process or the inertia in labor markets as a result of long-term contracts, and X is a vector of exogenous variables. Equation (2) may be solved for a U^* which is consistent with nonaccelerating inflation. This U^* can then be used to determine a potential labor series, L^* , which in turn is an argument of potential output through equation (1).

While it is possible to calculate and invert a Phillips curve for the historical period, there are several problems with such an approach. First, it is not possible to use this approach to project future U^* since the Phillips curve function is too unstable to be projected into the future. Second, even within the sample period, the U^* series is highly susceptible to the particular form adopted in (2). Although we experimented with alternative U^* series in our earlier paper, our preferred series was an approximation to U^* based on a technique developed by Wachter (1976). That approach is to construct a proxy for U^* which compensates for demographic changes in the population and for changes in relative unemployment among the various age-sex groups. The U^* obtained through this demographic adjustment should be viewed as an indirect approximation to the nonaccelerating-inflation rate of unemployment.¹ The normalized U^* ranges from 4 percent in 1955 to 5.5 percent in 1977.

In Perloff and Wachter (1979), equation (1) was replaced by a translog production function:

$$(3) \ln Q = \beta_0 + \beta_1 + \beta_2 t^2 = \beta_3 t^3 + \beta_4 I,$$

$$(4) I = \alpha_L \ln L + \alpha_K \ln K + \alpha_E \ln E + \frac{1}{2} \gamma_{LL} (\ln L)^2 + \gamma_{LK} \ln L \ln K + \gamma_{LE} \ln L \ln E \\ + \frac{1}{2} \gamma_{KK} (\ln K)^2 + \gamma_{KE} \ln K \ln E + \frac{1}{2} \gamma_{EE} (\ln E)^2,$$

where t represents a time trend (which is .625 in 1955 and grows by 1.00 each year), I is an index of inputs, and the Greek letters are technologically determined parameters (with symmetry conditions imposed: $\gamma_{ij} = \gamma_{ji}$, $i, j = K, L, E$). The time trend terms (t , t^2 , and t^3) were included in the production function to reflect Hicks neutral technological change.

Constant returns to scale were imposed on the production function by means of the following restrictions:

$$(5) \alpha_L + \alpha_K + \alpha_E = 1 \\ \gamma_{LL} + \gamma_{LK} + \gamma_{LE} = 0 \\ \gamma_{LK} + \gamma_{KK} + \gamma_{KE} = 0 \\ \gamma_{LE} + \gamma_{KE} + \gamma_{EE} = 0$$

If one ignores the log-quadratic terms (by setting $\gamma_{ij}=0, i,j=K,L,E$), the translog is simply a three-input Cobb-Douglas function, where $\alpha_L, \alpha_K, \alpha_E$ are the output elasticities. If, however, any of the log-quadratic terms are nonzero, the translog differs from the Cobb-Douglas.

Assuming that input and product markets are competitive (or subject to constant mark-ups), a necessary set of conditions for efficient production are the factor demand equations.

$$(6) \quad p_i = f_i = \frac{Q}{i} \left(\alpha_i + \sum_j \gamma_{ij} \ln j \right), \quad j = K, L, E,$$

where p_i is the factor price of the i^{th} input relative to the price of output, and f_i is the marginal product with respect to the i^{th} input, Equation (6) can be rewritten in terms of factor share equations,

$$(7) \quad M_i = \frac{P_i \cdot i}{Q} = \frac{i}{Q} f_i = \alpha_i + \sum_j \gamma_{ij} \ln j, \quad i, j = K, L, E,$$

where M_i is the relative share of total cost for the i^{th} input. Constant returns to scale and purely competitive markets assure that the sum of these shares exhausts total cost.

Disturbance terms were added to equations (7) to represent random errors in cost-minimizing behavior. Since the cost shares of the three equations in (7) always sum to one, any two of the equations will exactly identify all the parameters of the production function. The labor and capital share equations were estimated using an iterative Zellner approach.

In addition to estimating the standard translog production function, we also estimated what we call the cyclically sensitive translog. Since labor hoarding varies over the business cycle and Nadiri and Rosen (1969) have shown that the rates of adjustment of labor and capital differ, we allowed the production function parameters to vary with the business cycle. In particular, the production function parameters are written as:

$$(8) \quad \alpha_i = \alpha_i^0 + \alpha_i^1 \text{UGAP}, \quad i, j = K, L, E \quad \gamma_{ij} = \gamma_{ij}^0 + \gamma_{ij}^1 \text{UGAP},$$

where $\text{UGAP} = 0.25 \times (U^*/U)$ is a measure of the cycle.

The input measures used in estimation are division quantity indexes. The results described below differ slightly from those reported in our earlier paper since a modified labor index was used to facilitate projecting our results. The data are discussed in the appendix.

The estimated cyclically-sensitive input index (4) is

$$\begin{aligned} I = & [.7832 - .1430 \text{UGAP}] \ln L + [.4561 - .9331 \text{UGAP}] \ln K \\ & (.07295) (.3463) \quad (.1373) (.6008) \\ & + [-.1943 + 1.076 \text{UGAP}] \ln E + \frac{1}{2} [.2927 - 1.224 \text{UGAP}] (\ln L)^2 \\ & (.1778) (.7883) \quad (.0580) (.2719) \\ & + [-.1561 + .7068 \text{UGAP}] \ln L \ln K + [-.1366 + .4632 \text{UGAP}] \ln L \ln E \\ & (.04112) (.1923) \quad (.02707) (.1288) \\ & + \frac{1}{2} [.01655 - .1340 \text{UGAP}] (\ln K)^2 + [.1396 - .5728 \text{UGAP}] \ln K \ln E \\ & (.04127) (.1856) \quad (.04166) (.1840) \\ & + \frac{1}{2} [-.003043 + .1096 \text{UGAP}] (\ln E)^2 \\ & (.05449) (.2454) \end{aligned}$$

$$R^2 = .67.$$

For the translog production function to make sense, the fitted cost shares should be positive and the production function convex at every data point. Convexity of the production function guarantees that the necessary conditions for profit maximization, (7), are also sufficient. Both the positivity and convexity conditions are met at every data point.

Having estimated \hat{I} , it is straightforward to estimate equation (3). As it now stands, equation (3) has three time trend terms (t, t^2 , and t^3), to allow for decelerating Hick neutral technological progress. An alternative approach would

be to estimate (3) using only a single time trend term, t (by setting $\beta_2 = \beta_3 = 0$). This second specification assumes that technological progress is constant over time. We present both specifications since the implications for potential output are quite different *outside* the sample period.

Equation (3) may be rewritten as

$$(9) \quad \ln Q = \beta_0 + \beta_1 t + \beta_2 t^2 + \beta_3 t^3 + \beta_4 \bar{I} + \epsilon$$

where

$$\epsilon = I - \bar{I}.$$

The estimated equations are

$$\ln Q = 4.9918 + .02769 t + .0004068 t^2 - .00001177 t^3 + -.2459 \bar{I} \\ (.1877) (.005644) (.0006448) (.00001913) (.03742)$$

$R^2 = .996$, D.W. = 1.038, S.E.E. = .01614, and restricting $\beta_2 = \beta_3 = 0$,

$$\ln Q = 4.92143 + .03116 t + .2588 \bar{I}, \\ (.1262) (.0007505) (.02571)$$

$R^2 = .996$, D.W. = 1.020, S.E.E. = 0.01548

Given the production function estimates, potential output is calculated by setting $UGAP = 0.25$ (i.e., setting $U = U^*$) and by replacing the actual labor series with the potential labor series (see the appendix for details on the various series).

SELECTED REFERENCES

- Berndt, Ernst R. and Christensen, Lauritis R., "The Translog Function and the Substitution of Equipment, Structures, and Labor in U.S. Manufacturing, 1929-1968," *Journal of Econometrics*, 1, March 1973.
- and — "Testing for the Existence of a Consistent Aggregate Index of Labor Inputs," *American Economic Review*, June, 1974, pp. 391-404.
- and Khaled, Mohammed S., "Energy Prices, Economies of Scale and Biased Productivity Gains in U.S. Manufacturing, 1947-71," University of British Columbia Discussion Paper No. 77-23, August, 1977.
- and Wood, David O., "Technology, Prices, and the Derived Demand for Energy," *Review of Economics and Statistics*, 57, August, 1975, pp. 259-268.
- Brinner, R., *Technology, Labor and Economic Potential Data Resources Study*, 29, Lexington, Mass: Data Resources, Inc., 1978.
- Clark, Peter K., "Potential GNP in the United States, 1948-1980," *U.S. Productive Capacity: Estimating the Utilization Gap*, Center for the Study of American Business, St. Louis, 1977.
- "Capital Formation and the Recent Productivity Slowdown," *Journal of Finance*, June, 1978, pp. 965-975.
- Denison, E. F., "Some Major Issues in Productivity Analysis: An Examination of Estimates by Jorgenson and Griliches," *Survey of Current Business*, May, 1969 (Part II), pp. 1-27.
- *Accounting for United States Economic Growth, 1929-1969*, (Washington: Brookings Institution), 1974.
- "Effects of Changes in the Institutional and Human Environment upon Output per Unit of Input," *Survey of Current Business*, January, 1978, pp. 21-44.
- Easterlin, Richard A., *Population, Labor Force, and Long Swings in Economic Growth: The American Experience*, (New York: Columbia University Press for the National Bureau of Economic Research), 1968.
- Eckstein, Albert J. and Helen, Dale M., "Estimating Potential Output for the U.S. Economy in a Model Framework," *Achieving the Goals of the Employment Act of 1946—Thirtieth Anniversary Review*, U.S. Congress, Joint Economic Committee, 94th Congress, 2nd Session, December 3, 1976, pp. 1-25.
- Ehrenberg, Ronald G., "The Demographic Structure of Unemployment Rates and Labor Market Transition Probabilities," paper prepared for the National Commission for Manpower Policy, 1979.
- Eisner, Robert and Lawler, Patrick J., "Tax Policy and Investment: An Analysis of Survey Responses," *American Economic Review*, 65, March, 1975, pp. 206-212.

- Espenshade, Thomas J. and Serow, William J., *The Economic Consequence of Slowing Population Growth*, Academic Press, 1978.
- Feldstein, Martin S., "Lowering the Permanent Rate of Unemployment," a study prepared for the use of the Joint Economic Committee, 93rd Congress, 1st Session (1973).
- Flaim, Paul O., "The Effect of Demographic Changes on the Nation's Jobless Rate," *Monthly Labor Review*, March 1979, 13-23.
- Gollop, Frank M. and Jorgenson, Dale W., "U.S. Productivity Growth by Industry, 1947-1973," eds. J. W. Kendrick and B. N. Vaccara, *New Developments in Productivity Measurement*, National Bureau of Economic Research, forthcoming 1980.
- Gordon, Robert J., "Recent Developments in the Theory of Inflation and Unemployment," *Journal of Monetary Economics*, April 1976, pp. 185-219.
- Hall, Robert E., "The Rigidity of Wages and the Persistence of Unemployment," *Brookings Papers on Economic Activity* (2:1975), pp. 301-335.
- Hudson, Edward A. and Jorgenson, Dale W., "U.S. Energy Policy and Economic Growth, 1975-2000," *Bell Journal of Economics and Management Science*, 5, Autumn, 1974, pp. 461-514.
- Jorgenson, Dale W., "Econometric Studies of Investment Behavior: A Survey," *The Journal of Economic Literature*, 9, December, 1971, pp. 1111-1147.
- and Griliches, Z., "The Explanation of Productivity Change," *Review Economic Studies*, 34, July, 1967, pp. 249-283.
- Kendrick, J., *Productivity Trends in the United States*, (New York: National Bureau of Economic Research), 1961.
- Levitant, Sar A. and Robert Taggart III, *Employment and Earnings Inadequacy: A New Social Indicator* (Baltimore, Md.: Johns Hopkins University Press, 1974).
- Meltzer, Allan H., "Anticipated Inflation and Unanticipated Price Change," *Journal of Money, Credit and Banking*, April 1977, pp. 182-205.
- Nadiri, M.I. and Rosen, S., *A Disequilibrium Model of Demand for Factors of Production*, (New York: Columbia University Press for the National Bureau of Economic Research), 1974.
- Nordhaus, William D., "The Recent Productivity Slowdown," *Brookings Papers on Economic Activity*, 3:1972, pp. 493-545.
- Norsworthy, J.R., Michael J. Harper and Kent Kunze, "The Slowdown in Productivity Growth: Analysis of Some Contributing Factors," *Brookings Papers on Economic Activity*, forthcoming 1980.
- Okun, Arthur M., "Potential GNP: Its Measurement and Significance," American Statistical Association, *Proceedings of the Business and Economic Section*, 1962, pp. 98-104.
- "Upward Mobility in a High Pressure Economy," *Brookings Papers on Economic Activity*, 1:1973, pp. 207-261.
- Palmer, John L., ed., *Creating Jobs: Public Employment Programs and Wage Subsidies*, The Brookings Institution, 1978.
- Perloff, Jeffrey M., and Wachter, Michael L., "A Production Function-Non-accelerating Inflation Approach to Potential Output: Is Measured Potential Output Too High?" *Carnegie-Rochester Conference Series on Public Policy*, Vol. 10, pp. 113-163.
- and — "Alternative Approaches to Forecasting Potential Output, 1978-1980," *Proceedings of the American Statistical Association*, 1979, pp. 104-113.
- and — "Worksharing, Unemployment, and Economic Growth Rates," *Work Time and Employment*, National Commission for Manpower Policy, Special Report No. 28, October 1978, pp. 87-122.
- and — "The New Jobs Tax Credit: An Evaluation of the 1977-1978 Wage Subsidy Program," *Papers and Proceedings of the American Economic Association*, May 1979, pp. 173-179.
- Perry, George L., "Labor Force Structure, Potential Output, and Productivity," *Brookings Papers on Economic Activity*, 3:1971, pp. 533-578.
- "Unemployment Flows in the U.S. Labor Market," *Brookings Papers on Economic Activity*, 2:1972, pp. 245-278.
- "Potential Output and Productivity," *Brookings Papers on Economic Activity*, 1:1977, pp. 11-60.
- Rasche, Robert H. and Tatom, John A., "Energy Resources and Potential GNP," *Federal Reserve Bank of St. Louis Review*, 55:1977, pp. 10-23.

- "Potential Output and Its Growth Rate—The Dominance of Higher Energy Costs in the 1970's," in *U.S. Productive Capacity: Estimating the Utilization Gap*, Center for the Study of American Business, Washington University Working Paper 23, December, 1977, pp. 67–106.
- Wachter, Michael L., "The Changing Cyclical Responsiveness of Wage Inflation Over the Postwar Period," *Brookings Papers on Economic Activity* (1:1976), pp. 115–159.
- "The Demographic Impact on Unemployment: Past Experience and the Outlook for the Future," *Demographic Trends and Full Employment*, National Commission for Manpower Policy, Special Report No. 12, December 1976, pp. 27–99.
- "Intermediate Swings in Labor-Force Participation," *Brookings Papers on Economic Activity*, 2:1977, pp. 545–576.
- and Oliver E. Williamson, "Obligational Markets and the Mechanics of Inflation," *Bell Journal of Economics*, Autumn 1978, pp. 549–571.
- Welch, Finis, "Effects of Cohort Size on Earnings: The Baby Boom Babies' Financial Bust," *Journal of Political Economy*, October 1979, 65–98.

ACCELERATING INFLATION AND THE DISTRIBUTION OF HOUSEHOLD SAVINGS INCENTIVES

By Edward J. Kane¹

CONTENTS

	Page
Introduction.....	193
I. How accelerating inflation has hurt the small saver.....	195
Some preliminary definitions.....	195
How interest ceilings hurt small savers.....	196
Effect of accelerating inflation on financial incentives facing small savers.....	197
II. Behavior of inflation and interest rates during the 1960's.....	199
Post-1966 evolution of deposit-rate ceilings.....	200
Investment in real estate and consumer durables as opportuni- ties for escape.....	201
III. Limitations of our data base.....	202
IV. Consolidated balance sheets for households in different age and wealth classes.....	204
Testing the age hypothesis: Consolidated balance sheets for households classified by age.....	205
Evidence on the accuracy of the estimated value of owner- occupied housing.....	208
Testing the wealth hypothesis: Consolidated balance sheets for households ranked by their net transactable wealth.....	210
V. Estimated 1970 weighted average prospective rates of return for each age and wealth class.....	212
VI. Testing the minority hypothesis: Consolidated 1970 balance sheets and prospective portfolio yields for families in different demo- graphic circumstances.....	216
VII. Summary of findings.....	217
References.....	223

INTRODUCTION¹

Political rhetoric characterizes inflation as a high-ranking public enemy that society must band together to fight. But this view is exaggerated. Real-world inflation is never uniform in its effects. While some prices shoot up rapidly, other prices move hardly at all, and a few even decline. Uneven movements in prices cause inflation to affect

¹ The author, who is Everett D. Reese, Professor of Banking and Monetary Economics at The Ohio State University, wishes to thank Alexander J. Shumay for skillful and scrupulous research assistance and the Inter-University Consortium for Political and Social Research for furnishing *Survey of Consumer Finances* data. Data-processing took place mainly via IBM 370 programs written by Mr. Shumay. This paper extends and substantially refocuses an earlier study (Kane, 1980). For detailed criticism of the earlier drafts, the author is grateful to Phillip Cagan, Dennis Draper, Benjamin Friedman, John McConnell, Joseph Minarik, John Tuccillo, and George von Furstenberg and to seminar audiences at The Federal Reserve Bank of St. Louis, The Georgia Institute of Technology, Michigan State University, The National Bureau of Economic Research (Cambridge), The University of Washington, Western Michigan University, and The University of Wisconsin, Madison.

Finally, the author wishes to thank the American Council of Life Insurance, the National Bureau of Economic Research, The Ohio State University Center for Real Estate Education and Research, and the U.S. Department of Housing and Urban Development for supporting the several stages of research that underlie this paper.

the economic welfare of different people differently. The distribution of costs and benefits across the population works through the distribution of assets, debts, and labor skills. Just as some homes are protected against floods or earthquakes, some households possess skills and balance sheets whose net market values are protected against inflation.

Even when society as a whole is doing little to stop inflation, a venturesome household can neutralize inflation by suitably reallocating its wealth. It can do so by shifting its wealth (as far as transactions costs permit) into a collection of assets and liabilities whose overall rate of return promises to improve with anticipated and unanticipated increases in inflation. But most portfolios that protect against unanticipated inflation are speculative in that they threaten to develop substantial losses if unanticipated deflation should ensue instead.

This study describes how, in the middle and late 1960's, households in different economic and demographic classes reallocated their "transactable savings" to cope with accelerating inflation. We define transactable savings to mean essentially noncontractual savings: savings that are not administered for households by insurance companies, pension funds, or the U.S. Social Security System.

We use cross-section data from the 1962 and 1970 Surveys of Consumer Finances to estimate both the composition of household portfolios of transactable savings and prospective rates of return on these portfolios. Our purpose is to cast some light on how accelerating inflation affects the savings incentives of different households and to map out resulting differences in the distribution of opportunities for accumulating personal wealth.

Our data set neglects claims on pension funds and wealth accumulated in collectibles, food inventories, and consumer durables that are not built into homes. Aggregate Flow of Funds data for the household sector developed by Cagan and Lipsey (1978) suggest that these unmeasured asset categories captured about half the flow of net household saving between 1962 and 1970.² This proportion may be somewhat higher for younger and less-wealthy households.

As Cagan and Lipsey (1978) have shown, flow-of-funds data covering the household sector as a whole show virtually no change in balance-sheet ratios between 1962 and 1970. Moreover, although households' aggregate ratio of tangible to intangible assets rises sharply after 1972, Cagan and Lipsey argue that the increase can be attributed to capital appreciation on a relatively unchanging collection of assets, with no need to presume an active shift into inflation-protected assets. The research reported here indicates that the apparent passivity in aggregate household portfolio ration conceals some important shifts in asset-holding among wealth and age classes.

In the contemporary United States, the redistributive effects of accelerating inflation can be properly understood only in conjunction with longstanding Federal and State policies to promote homeownership and housing construction whose qualitative effects on savings incentives vary with the rate of inflation. These policies consist prin-

² Between 1962 and 1970, net acquisition of claims on pension funds averaged a fairly steady 22 percent of household asset acquisitions. Year by year, this proportion varied only between 20 and 24 percent. Net acquisitions of consumer durables averaged about 29 percent of household acquisitions, and the proportion ranged year by year between 21 and 36 percent.

cially of income-tax preferences available to homeowners and a grab-bag of programs and political forces that act to slow inflation-induced increases in the nominal rate of interest charged on mortgage funds.

Our analysis features the concept of regulation-constrained portfolio balance. We show that, both to hedge inflation risk inherent in their nontransactable savings and to eke out a positive net real after-tax rate of return on their transactable funds, all but the wealthiest U.S. households found it advantageous to substitute investments in housing and investment real estate (and presumably also in collectibles, food inventories, and consumer durables) for traditional financial vehicles for savings. Influenced by transactions-cost and tax differentials, the Nation's oldest and wealthiest households shifted their transactable wealth differently. They moved, on balance, out of home equity and traditional deposit accounts into certificates of deposit (CD's), marketable bonds, and equity in investment real estate.

Although both patterns of portfolio rebalancing make sense *ex ante*, the resulting balance sheets are noticeably riskier than the portfolios held by the corresponding sets of households in 1962. When in the 1970's bond prices declined and stock values failed to increase with unanticipated inflation, real returns earned by most wealthy households fared badly *ex post*. These developments have left our Nation's wealthiest households anxious and confused, particularly about the ability of common stocks to act as an inflation hedge. Conversely, trends in housing prices have rewarded and reassured those generally less-wealthy investors who shifted heavily into real estate, especially those who dared to leverage themselves to the hilt.

Disaggregating household behavior, particularly by wealth and age, helps to explain a number of puzzling special features of the 1975-79 macroeconomic recovery. Those special features include: The dominant role of consumer spending; unprecedented increases in household debt; changing patterns of financial intermediation; the improving quality of owner-occupied housing; and the growing speculative boom in residential real estate. Our analysis portrays each of these developments as a reasonable response to changes in the savings incentives facing households of different means.

I. HOW ACCELERATING INFLATION HAS HURT THE SMALL SAVER

Some Preliminary Definitions

It is convenient to begin with some definitions. By "small savers," we mean households of modest means: families whose accumulated net transactable wealth is less than \$10,000. Returns on these savings may be expressed in several ways. Nominal rates of return are ratios of capital income to invested principal that make no correction for either anticipated or observed changes in the purchasing power of the sums to be lent and repaid. So-called market yields are invariably stated in nominal terms. Real rates of return are nominal rates less the rate of inflation anticipated or observed over the period during which the financial contract is held.

Anticipated inflation clearly affects the terms of loan contracts. Lenders want to negotiate a nominal rate of interest that exceeds the

anticipated rate of inflation by what they take to be the "real" opportunity cost of their funds. In turn, borrowers can afford to pay nominal rates of interest that exceed the anticipated rate of inflation by the amount of the funds' perceived "real" productivity in the use they are going to serve. Hence, market interest rates tend to rise and fall with the level of anticipated inflation (Fisher, 1930). In addition, at any point in time, an asset's nominal yield tends to rise with its subsequent inflation risk. Other things equal, the less perfectly an asset's nominal yield promises to rise with unanticipated future increases in inflation, the higher the nominal yield it must offer today (Fama and Schwert, 1977).

Explicit interest consists of returns to capital (coupon interest plus capital gains) that are paid, or are at least receivable, in the coin of the realm. Implicit interest covers services and other in-kind concessions that are often embodied in debt contracts. An asset's total rate of return is the sum of its explicit and implicit yields. Finally, an asset's net yield is its total rate of return minus any transactions costs associated with buying and selling the asset.

How Interest Ceilings Hurt Small Savers

By raising expected rates of future inflation, observed accelerations in inflation tend to raise market rates of interest, although the response is not necessarily one-for-one and tends to be spread out in time. In nominal terms, rising market rates of interest mean improved new loan and investment opportunities for lenders. When deposit institutions are allowed to compete freely for deposit funds, pursuing these opportunities bids up deposit interest rates.

On the other hand, when deposit rates are held down by government-imposed ceilings, small savers cannot directly participate as fully in rising market rates as large savers can. This is because it is more costly per dollar for small savers to move their funds into securities markets. For small accumulations of wealth, the costs in yield equivalent of acquiring marketable securities are substantial. First, most small savers find it expensive simply to acquire sufficient financial sophistication to identify and track suitable investment opportunities. Second, the structure of dealer and broker transactions charges prevents low-value investments in open-market instruments from being economical. Third, because marketable instruments are seldom issued in small denominations, small portfolios of marketable instruments are almost always imperfectly diversified and subject therefore to excessive default and interest-rate risk.

In fully competitive markets, retail financial institutions (called financial intermediaries) develop to overcome these disadvantages by indirectly pooling household funds into amounts that can be invested economically (Gurley and Shaw, 1960). The pooling is indirect because these firms (commercial banks, thrift institutions, insurance companies, and mutual funds) sell their own debt to households and invest the proceeds for their own accounts. Intermediation occurs with respect both to denomination and portfolio risk and is typically coupled with provisions for delivering additional services (e.g., depository institutions offer liquidity and transactions services to their account-

holders). To the extent that the costs of providing nonpecuniary services are not recouped through fee income, these services may be treated as implicit interest payments. In competitive deposit markets, arrangements for paying implicit interest could in principle be sufficiently flexible to avoid efficiency losses. But this condition is unlikely to be met in practice, especially in view of the asymmetric tax treatment of implicit and explicit interest receipts by U.S. households. Because households (unlike business firms) cannot deduct service charges from taxable income, implicit interest is tax-advantaged.

In competitive equilibrium, the value of implicit and explicit interest payments to intermediary customers must at the margin equal the risk-adjusted yield that competing intermediaries expect to earn on market instruments after meeting expenses and paying normal returns on capital. If a depository intermediary were to pay less interest than this, competitors would bid its depositors away. If a depository intermediary incurred excessive expenses (perhaps in the process of subsidizing a disproportionate amount of nonpecuniary services), either explicit interest or returns on capital would slide below competitive norms. Either event would cause pressure on the intermediary's management to restore operating efficiency.

Effective ceilings on deposit interest rates undermine the efficiency of intermediation. They force depository institutions to compete exclusively in terms of implicit interest. They are led to expand their packages of subsidized customer services, often in imaginative ways. Such services include merchandise premiums, longer operating hours, superfluous branch offices or electronic teller machines, and "free" checking. Unfortunately, the aggregate value of these services to individual customers is often far less than their cost to the depository institution. As individual customers attempt to make the best of what is for many of them a "bad" bargain, their use of undervalued services wastes economic resources.

Compared to the unregulated case, the efficiency of financial intermediation is also reduced by so-called disintermediation, which occurs when developing interest-rate differentials drive depositors to unregulated institutions and instruments. Higher-cost, unregulated institutions (such as money-market mutual funds and credit unions) and unregulated instruments (such as repurchase agreements) are able to expand at the expense of traditional arrangements for intermediating household savings whenever inflation drives open-market yields above the ceiling rates on deposits.

Effect of Accelerating Inflation on Financial Incentives Facing Small Savers

Financial theory holds that wealthowners' demand for any asset varies directly with the net after-tax real rate of return it offers relative to returns available on other assets. It is also supposed that the level of household saving increases with the net after-tax real rate available on traditional savings vehicles, although the evidence for this is far from conclusive (Boskin, 1978; Wachtel, 1977; Howrey and Hymans, 1978). During the last 15 years, unfavorable movements have occurred in marginal tax rates (which were only partly offset by in-

creases in the standard deduction), in already-discriminatory dealer and broker transactions charges, and in the real (i.e., inflation-adjusted) values of interest-rate ceilings. Taken together, these changes have made it unrealistic for small savers to anticipate earning a positive net real rate of return on any collection of strictly financial assets. While financial instruments continue to offer implicit returns in the form of transactions, liquidity and diversification services, household savings invested in the types of financial assets available to nonwealthy households have shown reduced after-tax purchasing power with virtually every passing year.

To counterbalance the negative real after-tax rates of explicit return offered them by financial assets (and the roughly zero real returns accumulating on their nontransactable wealth), small savers have increased the weight of favorably taxed and inflation-protected real assets in their portfolios. To carry this off, they have had—as our survey data show—to supplement their accumulated savings with mortgage and installment debt and to redirect their current savings into downpayments and debt service. Ironically, usury ceilings enacted in many states to improve small savers' access to credit probably interfered with this process. Theoretical and empirical analysis (Nathan, 1978) suggests that families who receive credit when usury ceilings are effective generally have above-average incomes and wealth. This occurs not just because such individuals are perceived as more creditworthy, though perceived creditworthiness may seem to dominate rejections of loan applications from members of minority groups (Sowell, 1975). What is often more important is that economically advantaged households can more easily increase deposit balances or meet increases in such up-front costs as higher downpayments or loan closing fees when lenders choose to exact implicit interest in such ways.

Unfavorable movements in marginal tax rates.—Because progressive income taxes are levied on nominal incomes, accelerating inflation increases the effective tax rate that applies to every level of real income. However, legislated changes in the applicable tax structure provide some offset. As table 2 shows, effective marginal tax rates were raised only for middle-income households. For example, using the implicit price deflator for GNP, a taxable 1970 income of \$30,000 corresponds to \$23,173 in 1962 dollars. Using the tax schedule for joint returns with the same real (i.e., inflation-adjusted) taxable income at both dates, a taxpayer's marginal Federal tax rate would be 40 percent in 1970, but only 38 percent in 1962. On balance, this taxpayer's average Federal tax rate decreased from 28 percent in 1962 to 27 percent in 1970. Because ordinary income tax rates apply to all nominal interest received, these changes increased the attractiveness, for middle-income households, of assets that yield either-in-kind services that are not taxed at all or capital gains that are taxed preferentially.

In addition, the real value of dependent and standard deductions declined and, in many states, increases in state income taxes observed between survey dates further enlarged the wedge between before-tax and after-tax rates of return on nominal interest.

Unfavorable movements in transactions costs in securities markets. In the face of comprehensive interest-rate ceilings on traditional household savings instruments, secularly and cyclically accelerating

inflation causes disintermediation of household funds into potentially riskier, high-yielding, open-market instruments. Disintermediation implies a larger flow of small-denomination trades offered to securities dealers and brokers. During the late 1960s, the first waves of inflation-induced disintermediation created clearings logjams in the backrooms of securities firms. To reduce the volume of individual trades to be processed, securities firms repriced their services in ways designed to discourage small individual trades. They instituted posted "ticket fees" on transactions of less than 100,000. The practice of imposing a charge of \$10 to \$20 merely for writing up a small purchase or sale transaction spread through the industry. For many types of trades, securities firms also raised value-based odd-lot fees, transactions minima, and execution lags. Even though computerization of transactions and partial deregulation of the securities industry have lowered costs for large transactors, ticket fees on small trades have risen. Currently, they range between \$25 and \$40 per trade.

Discriminatory adjustments in deposit-rate ceilings.—The larger is a household's wealth, the more alternative financial investment outlets it can economically consider. Larger savers can reallocate their portfolios to escape much of the ex ante burden that inflation and deposit-rate regulation would otherwise place on them. In contrast, poor household's principal avenue of adjustment is to cut back on their savings, a response that spreads the burden onto their future standard of living.

Larger savers' differential ability to escape deposit-rate ceilings explains why regulators have over time adapted the ceilings to permit deposit institutions to offer differentially higher interest rates to larger savers who will not be put off by high minimum denominations or punitive penalties for early withdrawal of time-deposit funds. Restrictions on minimum denomination and early-withdrawal penalties have been the cutting edge of a regulatory strategy which enables deposit institutions to pay near-market interest rates to interest-sensitive depositors without raising yields offered to interest-insensitive customers.

II. BEHAVIOR OF INFLATION AND INTEREST RATES DURING THE 1960's

Table 1 shows that long term interest rates rose throughout the 1960's, with the rate of increase accelerating sharply (along with the rate of inflation) in the last half of the decade. For calendar-year holding periods, the last two columns report ex post returns on bonds and stock. From year to year, these ex post returns vary sharply.

Let us interpret the twin 1966 shocks of accelerating inflation and comprehensive deposit-rate ceilings as a joint experimental "treatment" and inquire how the treatment affected interest-rate spreads. Until 1966 when Federal deposit-rate ceilings were first extended to savings accounts at savings-and-loan associations (S&Ls) and mutual savings banks (MSB's), mean S&L deposit rates tended to fluctuate above the average level of yields on Treasury bills, roughly tracking the average yield on long term Treasuries.

Subsequently, Treasury yields averaged steadily higher than S&L deposit rates. Whether this benefited mortgage borrowers is debatable, since, even in the face of deposit-rate ceilings, mortgage rates regularly

TABLE 1.—INFLATION RATES AND MEAN ANNUAL RETURN ON SELECTED INSTRUMENTS, 1961 TO 1970
 (Stated in percent per annum)

Year	Interest rate on new issues of 3- mo U.S. Treasury bills	Yield on long term Treasury bonds	FHLBB ¹ series of effective mortgage interest rates on new homes	Yield on savings accounts in savings associations	Annual change in implicit price deflator for GNP	Ex post returns	
						On corpo- rate bonds	On common stocks
1961.....	2.38	3.90	-----	3.90	0.9	4.82	26.89
1962.....	2.78	3.95	-----	4.08	1.0	7.95	-8.73
1963.....	3.16	4.00	5.91	4.17	.8	2.19	22.80
1964.....	3.55	4.15	5.85	4.19	.8	4.77	16.48
1965.....	3.95	4.21	5.81	4.23	1.5	-.45	12.45
1966.....	4.88	4.65	6.25	4.45	2.6	-.20	-10.06
1967.....	4.33	4.85	6.46	4.67	2.6	-4.95	23.98
1968.....	5.34	5.26	6.97	4.68	3.9	2.57	11.06
1969.....	6.69	6.12	7.81	4.80	4.7	-8.09	-8.50
1970.....	6.44	6.58	8.45	5.06	4.5	18.37	4.01

¹ Federal Home Loan Bank Board.

² December figures.

Sources: Business Conditions Digest for U.S. Treasury interest rates and changes in the GNP deflator. U.S. League of Savings Associations, Savings and Loan Fact Book (annual) for mortgage rates and savings-account yields. Ibbotson and Sinquefeld (1976) for returns on common stocks and corporate bonds.

exceeded yields on long term Treasuries, with the spread fluctuating within the same bounds that applied in the early 1960's.

From 1966 forward, high interest rates on new mortgages offered unusually good earnings spreads for mortgage lenders. However, federal officials feared that open competition for savings funds would bankrupt older S&L's and MSB's that had to carry lots of low-rate mortgages on their books. With free competition, higher deposit rates would have to be paid on all accounts, while competitive mortgage rates could be earned only on current loans. Institutions holding substantial proportions of older low-rate mortgages would experience negative overall cash flows. Alternatively, one could say that higher current interest rates reduced the market value of many thrifts' seasoned long term assets enough to exhaust their previously accumulated net worth. Restrictions on S&L and MSB deposit interest were introduced to prevent newer firms from ruining the older ones. To keep commercial banks at a disadvantage, ceilings for thrifts were initially set 50 basis points above those that applied to commercial banks. (This "differential" has since narrowed to 25 basic points.) Federal authorities conceived the system of ceilings as a temporary stopgap measure, intended to avert an immediate threat of financial panic and to avoid temporarily destabilizing the flow of mortgage credit and homebuilding activity. They sought to assure specialized mortgage-lending institutions a positive net cash flow by locking in an above-market profit margin on new lending to offset the slim (or negative) spread on old lending; presumably only until interest rates turned down again cyclically.

Post-1966 Evolution of Deposit-Rate Ceilings

Once the ceilings were in place, their justification broadened. In repeated battles over proposed legislation, a coalition of the thrift, labor, and construction lobbies has been able to defeat subsequent attempts to remove the ceilings. Since 1966, the large and cyclically fluctuating

spread between open-market yields and passbook rates has accentuated cyclical disintermediation and reduced the flow of savings to these institutions during most of the cycle. To minimize the disruption, authorities have undertaken a series of additional actions. Regulatory officials adopted a strategy of restructuring deposit-interest ceilings in ways that promised to lessen the disintermediation without greatly increasing costs on interest-insensitive funds. Repeated restructurings have developed a series of deposit instruments that—by making the maximum interest payable on any type of deposit account vary directly with its maturity and/or minimum denomination—allow depository institutions to offer higher interest rates to interest-sensitive customers without extending higher payouts to interest-insensitive ones. Although large certificates of deposit (CD's) are now completely exempt from regulation, between 1966 and early 1970, even large CD's (though treated preferentially) were subject to ceilings. After January 21, 1970, interest was unfettered for CD accounts of less than 90-days maturity and at least \$100,000 in minimum denomination.

To make its own securities less competitive with thrift deposits, the Treasury held interest rates on U.S. Savings Bonds well below those on marketable securities of similar maturity: at 4.25 percent until December 1969, when they were raised to only 5 percent. The Treasury also acted in February 1970 to raise the minimum denomination of Treasury Bills from \$1,000 to \$10,000. Knowledgeable small savers had increasingly placed noncompetitive bids in \$1,000 and \$5,000 units, winning a larger and larger proportion of the total amounts awarded in the Treasury's weekly bill auction (Mullineaux, 1973).

Investment in Real Estate and Consumer Durables as Opportunities for Escape

During the post-1966 era, for households of modest means, the inflation-adjusted after-tax rate of return has been negative on the few financial assets their transactable wealth permits them to buy. Even in the 20-percent tax bracket, a 5.25-percent return on passbook savings yields only 4.20 percent after taxes. In the 30-percent bracket, the after-tax yield falls to 3.68 percent. It is hard to remember when the rate of inflation in product prices did not exceed these low rates of return. This means that savings invested in these assets have less real value with each passing year.

In the absence of government-enforced ceilings on deposit interest rates, market forces would have pushed financial-institution deposit rates up at least enough to promise low-bracket depositors a small anticipated net yield. With deposit-rate ceilings in place and transactions costs keeping small savers out of bond and stock markets, many households have found that real-estate assets offer their transactable savings the best available protection against inflation-induced erosions in purchasing power. Real estate ownership has been a traditional goal for Americans and returns on real property have been taxed much more favorably than returns on financial assets. Federal tax treatment of a property's capital income is especially generous for owner-occupants. Real estate gained attractiveness under comprehensive deposit-rate ceilings because well-developed mortgage markets provided a convenient vehicle for small savers to leverage their modest saving enough

TABLE 2.—EFFECTIVE FEDERAL TAX RATES ON EQUIVALENT REAL TAXABLE INCOMES FOR HOUSEHOLDS FILING JOINT RETURNS IN 1962 AND 1970

Taxable income in 1970 dollars	Equivalent taxable income in 1962 dollars	1962 marginal tax rate on 1962 equivalent income	1970 marginal tax rate (includes 2.5 percent surtax)	1962 average tax rate	1970 average tax rate
\$1,000.....	772	0.20	0.15	0.20	0.14
\$5,000.....	3,862	.20	.195	.20	.17
\$10,000.....	7,724	.22	.226	.21	.19
\$20,000.....	15,448	.30	.328	.24	.22
\$30,000.....	23,173	.38	.400	.28	.27
\$50,000.....	38,621	.53	.513	.36	.35
\$100,000.....	77,243	.69	.636	.49	.46
\$500,000.....	386,214	.90	.718	.78	.66

Source: Equivalent 1962 real incomes are calculated using the Implicit Price Deflator. Joint-Return tax schedules are taken from Federal Tax Handbook, 1963, Englewood Cliffs: Prentice-Hall, 1962 and 1971 U.S. Master Tax Guide, Chicago: Commerce Clearinghouse, 1970.

to cover the purchase price of a residence or rental property. Institutional arrangements do not exist to let them borrow so easily to purchase stock shares or fixed-interest securities. Households dealing with dealers and brokers must maintain margin accounts and pay one or two points over the broker-dealer interest rate for margin credit.

Ironically, restrictions on deposit interest have driven small savers increasingly into debt. Lacking enough wealth to invest directly in diversified round lots of marketable bonds and stocks and prevented by law from enjoying the full fruits of indirect investments in securities markets made by means of deposit accounts, they have turned to investing in real assets, supplementing their savings as necessary *via* mortgages and installment loan contracts. With interest expense tax-deductible, real after-tax rates on loans made to support tax-favored investments, seem unusually low.

Although this explanation is still not widely appreciated, small savers' efforts to protect their transactable wealth from being eaten away by artificially low deposit rates provide the motive force both for declines in recorded ratios of deposit-institution inflows to personal income and for an ongoing speculative boom in housing. In this way, deposit-rate ceilings have reinforced the secular inflation in housing costs and, by discouraging the flow of middle-income households' savings into strictly financial instruments, have reduced the pool of savings available for new business investment. Even though deposit-rate ceilings were intended to promote housing activity, authorities by no means meant to push it so assiduously or at such a high cost in macroeconomic destabilization.

III. LIMITATIONS OF OUR DATA BASE

Although the University of Michigan's Survey Research Center surveyed consumer finances throughout the 1960's, only the 1962 and 1970 survey questionnaires develop detailed information on household balance sheets.³ Fortunately, the two years lie symmetrically four years

³ Katona *et al.* (1963 and 1971) reproduce copies of the survey instruments. As explained by Hansmire (1976) the SCF was discontinued after 1970. Her essay includes a summary statement of just what variables were measured in each year. Under the sponsorship of the three Federal banking agencies, the Survey Research Center conducted a partly similar *Consumer Credit Survey* in 1977. In future research, I plan to compare changes in household balance sheets across the three survey dates.

before and four years after what we can call the twin economic-policy "crimes of '66." As we did with interest-rate spreads, we propose to interpret the twin economic-policy shocks of accelerating inflation and the spread of deposit-interest ceilings to thrift institutions as an experimental "treatment," and to view survey data collected in the two years as representative samples of pretreatment and posttreatment values of household income and balance-sheet variables.

Table 3 lists the particular survey variables investigated in our study. Unfortunately, assets are not valued on a consistent basis. Respondent family units were requested to furnish face values for bonds but to estimate market values for stocks and investment real estate. They were asked to estimate the "present value" of owner-occupied real estate (which we call homes) if they had resided there during the second calendar year preceding the year of the survey; otherwise they were asked merely to supply the home's purchase price. No matter how accurately they may be able to value their assets, secretive people or families whose members had reason to conceal assets from each other would have an incentive to underreport their holdings. Forgetfulness would cause underreporting, too. On the other hand, a desire to impress interviewers might tempt some respondents toward boastful overstatement.

Clearly, as compared to contemporaneous transactions values, estimates gathered in this way should have some systematic biases and should be more accurate for some asset categories than for others. For example, information needed to estimate the value of a household's stock portfolio is more readily accessible than that needed to appraise real estate. When housing prices are rising especially quickly, household estimates may tend to lag market values. As discount instruments,

TABLE 3.—LIST OF VARIABLES GENERATED FROM THE 1962 AND 1970 SURVEYS OF CONSUMER FINANCES FOR USE IN THIS STUDY

Variable name	Variable symbol	Available in 1962?	Available in 1970?
A. Financial assets	FA	Calculated	Calculated.
1. Regulated assets	RA	Calculated	Calculated.
a. Checking accounts		Yes	Yes.
b. Savings accounts		Yes	Calculated.
i. Certificates of deposit		No	Yes.
ii. Other savings accounts		No	Yes.
c. U.S. savings bonds (face value)		Yes	Yes.
2. Unregulated assets	UA	Calculated	Calculated.
a. Stocks and mutual funds (market value)		Yes	Yes.
b. Bonds other than U.S. savings bonds (face value)		Calculated	Yes.
i. U.S. Government bonds		Yes	No.
ii. Municipal bonds		Yes	No.
iii. Corporate bonds		Yes	No.
B. Real estate assets	REA	Calculated	Calculated.
1. Home, farm, or mobile home:			
a. Equity	HE	Yes	Yes.
b. Market value	HV	Yes	Yes.
2. Investment real estate (including land contracts):			
a. Equity	IRE	Yes	Yes.
b. Estimated market value	IRV	Yes	Yes.
C. Real estate debt	RED	Calculated	Calculated.
1. Value of mortgages on home, farm, or mobile home		Yes	Yes.
2. Value of mortgages on investment real estate		Yes	Yes.
D. Explicit income in the previous calendar year:			
1. Total household income (dividends, interest, trust funds, royalties, and rent)	Y	Yes	Yes.
2. Capital	YC		
a. Of whole household	YCWH	Yes	No.
b. Of head only	YCH	No	Yes.
E. Age of head	AGE	Yes	Yes.

the values of unmatured U.S. savings bonds or Treasury bills would be consistently overstated. Similarly, the generally upward trend of interest rates in the 1960's leads us to suspect that the market value of other bonds would on average fall short of face value. The reader should keep these difficulties in mind in interpreting our results.

Even in our two focal years, values for most types of debts and what we call "nontransactable" assets were not reported at all. A few variables were reported in one year only. As table 3 indicates, across the two year some variables are defined differently or are available in different detail.

Whatever one does to correct for these conceptual difficulties, one should also recognize that (precisely because high-income sample cells are small in absolute size) surveys of consumer finances (SCF) samples deliberately overrepresent high-income families and that SCF data tapes required careful editing to adapt them to our use. A few observations appear more than once on SCF data tapes. Occasional overflows occur in capital income and in individual assets, while in the 1970 survey partially incomplete reports pose some difficult problems.⁴ In particular, differences in the accuracy and completeness of respondent reports across conventional income and age classes change the representativeness of our samples relative to the population of U.S. households. Omissions and overflows should occur predominantly for households whose incomes and wealth are high, and result in an understatement of assets held by these groups. This measurement bias partly offsets the sampling bias that Survey Research Center personnel created by oversampling high-income households.

IV. CONSOLIDATED BALANCE SHEETS FOR HOUSEHOLDS IN DIFFERENT AGE AND WEALTH CLASSES

In analyzing SCF data, we seek to identify how average asset-holding patterns differ with household income, transactable wealth, and the age, sex and race of the household head. Our principal focus is to determine the extent to which households in different economic and demographic circumstances shifted their transactable wealth among three classes of assets for which survey measurements exist:

- (1) Equity in real estate: defined as the difference between the value of investment real estate and owner-occupied housing (i.e., "homes") and the dollar amount of household debt secured by these properties;
- (2) Regulated financial assets: deposits and U.S. savings bonds; and
- (3) Unregulated financial assets: stocks, marketable bonds, and mutual funds.

The purpose of the exercise is to investigate how the combined burdens of inflation and interest-rate ceilings are distributed across the population of U.S. households. We are concerned particularly with determining how these burdens are distributed across different types of families and how they have affected the mix of debt and equity assets in household portfolios.

⁴ Because incomplete records often show substantial values for one or more specific categories of assets, in compiling portfolio distribution, we chose to treat missing values as true zeroes.

Given the structure of income taxes, transactions costs and interest-rate ceilings, a household's ability to take advantage of regulation-exempt and tax-avoiding savings opportunities may be expected to increase with its income (the "income hypothesis") and its transactable wealth (the "wealth hypothesis"), and to be influenced by its place in the life cycle (the "age hypothesis") and possible membership in minority groups (the "minority hypothesis"). By analyzing cross-section data on earnings, assets, debt and demographic characteristics collected in the 1962 and 1970 Surveys of Consumer Finances, the rest of this paper develops evidence consistent with a more precise formulation of each of these hypotheses.

Looking backward from 1979, it should be clear that, ex post, the big losers from accelerating inflation have been family units possessing large amounts of stock or "regulated assets" (deposits and U.S. savings bonds) and those who did not own any real-estate assets at all. While wealthy households tend to be heaviest in stock, households that fit the rest of this profile are drawn disproportionately from the ranks of the old, the black, the female, the poor, and the young. Particularly in competing for mortgage loans, these groups are traditionally disadvantaged (Sowell, 1975). Moreover, with accelerating inflation, deposit-interest ceilings heighten that disadvantage by driving up both the cost of housing and the demand for mortgages by other groups, while reducing the disadvantaged families' ability to accumulate the financial wherewithal to make an acceptable downpayment.

Testing the Age Hypothesis: Consolidated Balance Sheets for Households Classified by Age

Survey data depicting the composition of household assets indicate that between 1962 and 1970 the combination of accelerating inflation and deposit-rate ceilings has markedly changed the age distribution of real-estate ownership. This is shown in Table 4. Even as early as 1970, households whose heads were less than 55 years in age had sharply increased the proportion of their accumulated savings held as equity in real estate, while older households had shifted their funds out of both real estate equity⁵ and "regulated financial assets" (deposits and U.S. savings bonds) into "unregulated financial assets" (stocks, marketable bonds, and mutual funds). Moreover, within their holdings of regulated assets, older households moved funds from other categories into certificates of deposit (CD's). In 1970, survey households whose heads were 55 or older owned approximately 55 percent of reported net transactable wealth, but 75 percent of total CD's, deposits, and stockmarket investments and 85 percent of marketable bonds. In 1962, this age group owned approximately 40 percent of respondents' net transactable wealth, and (except that they held only 15 percent of marketable bonds) allocated their funds fairly evenly across individual asset categories.

⁵ It is interesting to note that in 1978 Federal tax law was changed to increase the special tax forgiveness for capital gains on sales of personal residences by older taxpayers from \$35,000 to \$100,000 and the minimum age for qualifying for this benefit was lowered from 65 to 55. To secure this change, older households (especially those in the 55-to-64 age class) must have complained bitterly about the Government's growing tax take on these transactions.

TABLE 4.—PERCENTAGE BREAKDOWN OF HOUSEHOLDS' PORTFOLIOS OF TRANSACTABLE FINANCIAL ASSETS AND REAL ESTATE EQUITY BY AGE CLASS IN 1962 AND 1970

[Proportions stated in percentage points]

Age of household head (in years)	Financial assets			Real estate equity			Percent sample of respondents
	Regulated	Un-regulated	Total	Total	Equity in home	Equity in investment real estate	
1962 DATA SET							
Under 25.....	19.5	57.4	76.9	23.2	8.8	14.4	9.1
Under 25 deleting wealthy outlier.....	(29.0)	(33.7)	(62.7)	(37.2)	(14.1)	(23.1)	(9.1)
25 to 34.....	18.9	12.2	31.1	68.9	48.1	20.8	19.5
35 to 44.....	13.1	20.1	33.2	66.8	50.2	16.6	23.4
45 to 54.....	14.6	20.0	34.6	65.4	51.0	14.4	19.5
55 to 64.....	17.6	17.7	35.3	64.7	47.1	17.6	13.3
65 and over.....	27.0	12.8	39.8	60.2	42.0	18.2	15.3
2,117 respondents.....	18.1	17.9	36.0	64.0	47.1	16.9	100.1
1970 DATA SET							
Under 25.....	44.8	8.7	53.5	46.5	36.1	10.4	10.0
25 to 34.....	19.9	8.1	28.0	72.1	53.2	18.9	18.3
35 to 44.....	14.4	14.7	29.1	71.0	47.7	23.3	18.9
45 to 54.....	15.7	10.4	26.1	73.8	55.0	18.8	20.0
55 to 64.....	16.9	27.5	44.4	55.7	37.3	18.4	16.5
65 and over.....	21.2	25.9	47.1	52.8	32.6	20.2	16.3
2,576 respondents.....	17.8	20.2	38.1	61.9	42.1	19.8	100.0

Note: Components of totals shown may not add to 100 because of rounding.

Source: Calculated from "Survey of Consumer Finances" data tapes. (For a description of these surveys, see G. Katona, L. Mandell, and J. Schmiedeskamp, "1970 Survey of Consumer Finances," Ann Arbor: Survey Research Center, Institute of Social Research, 1971.)

Presumably, older households find the in-kind return on housing less valuable as their children grow up and set up households of their own. However, they could afford economically to undertake these reallocations because they are on average large savers. Also at issue are the development of experience and efficient patterns for accumulating and decumulating wealth to smooth consumption over the life cycle. Our interpretation of these data implicitly attributes observed changes in portfolio distributions between 1962 and 1970 to differences in the ability of households of different ages to protect themselves both against increases in inflation and inflation risk and against unfavorable regulatory developments in financial markets. We simply presume that 1962 portfolio patterns are determined predominantly by life-cycle considerations. However, since the 1962 survey was taken about a year into a cyclical recovery and the 1970 survey at the beginning of an economic decline, cyclical influences probably affect the results, too. During the months of the 1962 survey, unemployment was cyclically high but falling. In 1970, unemployment was low but rising. Although aggregate unemployment rates were not greatly different, unemployment among males aged 20 to 24 averaged 11.2 percent in the 1962 survey months and only 7.7 percent during the 1970 interview period. The cyclically poorer labor-market outlook in 1962 may well have made some young households temporarily hesitant to undertake the responsibilities of homeownership.

However, young households' dramatic increase in the proportions of their transactable wealth placed in regulated assets and real-estate equity seems far too large to attribute to this small difference in age-

class unemployment rates. In 1962, only 6.2 percent of households whose heads were under age 25 owned their own residences, but by 1970, 20.3 percent of households in the counterpart age class were homeowners. In 1970, the youngest age class quadrupled the portfolio weight carried by its 1962 counterpart. (Even if we eliminate as an outlier the wealthiest household in the 1962 age-class sample, the 1970 portfolio weight for home equity is still 2.5 times its 1962 value.) Because households in the youngest age class had generally smaller families in 1970 than in 1962 (so that they presumably found the continuing services of a given living space less productive), they must have anticipated substantial future appreciation in housing prices to justify this allocational pattern. It is possible that this inflation-spawned increase in the propensity of young families to undertake leveraged homeownership reflects, as well, a generational difference in both borrowers' and lenders' attitudes toward risk bearing. The young have to live with the consequences of accelerating inflation over a longer economic horizon than anyone else. In the face of contemporary inflation, table 5 indicates that modern lending officers and would be young borrowers have proved less inhibited psychologically by conventional attitudes about the alleged "prudence" of "staying out of debt." But, adopting plausible assumptions about prospective yields on alternative assets, section V shows that even these massive portfolio shifts were insufficient to bring the prospective 1970 portfolio ratio of return for this age class up to the level earned by older households.

Table 5 indicates that, whatever assets are ultimately supported by real-estate debt (Arcelus and Meltzer, 1973), most age classes (especially the youngest) carry in 1970 a larger proportion of this debt in their portfolios. Even more important, the observed reallocation of the housing stock among age groups has shifted ownership, on balance, from families who traditionally carry low debt ratios to younger households who show much higher ratios of mortgage debt to home

TABLE 5.—RATIOS OF HOUSEHOLD REAL ESTATE DEBT TO VARIOUS ASSET TOTALS AND TO FAMILY INCOME BY AGE CLASS IN 1962 AND 1970

[Proportions stated in percentage points]

Age of household head (in years)	Home mortgage debt to home value	Total real estate debt to—		
		Total value of real estate	Total value of assets held	Total family income
1962 data set:				
Under 25.....	67.0	46.9	17.0	11.8
25 to 34.....	57.2	52.3	43.0	60.0
35 to 44.....	42.1	37.6	28.7	66.2
45 to 54.....	25.7	25.2	18.0	45.3
55 to 64.....	17.0	14.7	10.1	30.9
65 and over.....	4.0	4.5	2.8	17.7
2,117 respondents.....	30.4	27.3	19.4	48.3
1970 data set:				
Under 25.....	73.6	68.8	50.7	25.0
25 to 34.....	59.4	54.2	46.0	54.0
35 to 44.....	42.7	38.2	30.5	70.2
45 to 54.....	27.4	28.1	22.4	49.6
55 to 64.....	11.7	13.8	8.2	33.2
65 and over.....	7.2	5.6	3.1	21.1
2,576 respondents.....	29.3	26.4	18.2	48.5

Source: Calculated from "Survey of Consumer Finances" data tapes.

equity and transactable wealth. This explains how the aggregate proportion of home equity to net transactable wealth can actually decline between the survey dates.

To show that our results measure a true generational difference, we can reclassify the data to emphasize that the cohorts of households belonging to each age group differ substantially between survey dates. Table 6 resets the boundaries of the 1962 age classes to let us compare portfolio weights for the same age cohorts at each survey date. This table makes it clear that household heads who are less than 25 years old in 1970 were not even sampled in 1962. Otherwise, it confirms the age-class and generational patterns of asset accumulation and decumulation inferred from table 4. Further analysis (not reproduced here) indicates that allowing for the effects of housing-price appreciation on each age cohort's 1962 investment in housing does not change the qualitative pattern of age-class portfolio reallocation.

TABLE 6.—PERCENTAGE BREAKDOWN OF HOUSEHOLDS' PORTFOLIOS OF TRANSACTABLE FINANCIAL ASSETS AND REAL ESTATE EQUITY BY NORMALIZED AGE CLASS IN 1962

[Proportions stated in percentage points]

Age of household head (in years)	Financial assets			Real estate equity			Percent sample of respondents
	Regulated	Un-regulated	Total	Total	Equity in home	Equity in investment real estate	
1962 DATA SET							
Under 17.....	0	0	0	0	0	0	0
17 to 26.....	19.1	47.0	66.1	33.9	13.2	20.7	12.2
17 to 26 deleting wealthy outlier.....	(25.2)	(27.2)	(52.4)	(47.5)	(18.5)	(29.0)	(12.2)
27 to 36.....	16.1	22.9	39.0	61.0	41.1	19.9	21.3
37 to 46.....	13.0	12.8	25.8	74.3	58.8	15.5	21.8
47 to 56.....	15.0	21.4	36.4	63.5	50.5	13.0	19.5
57 and over.....	23.9	14.3	38.2	61.9	42.8	19.1	25.2
2,117 respondents.....	18.1	17.9	36.0	64.0	47.1	16.9	100.0

Notes—Same as table 4.

Evidence on the Accuracy of the Estimated Value of Owner-Occupied Housing

In valuing household real-estate investments, the two main sources of measurement error are: (1) Reliance on self-assessment; and (2) the neglect of price appreciation on homes purchased in the year preceding the survey date. These errors are worrisome because they threaten to prove reinforcing. Taken together, they might cause a serious underestimation of home equity.

Bias due to neglecting depreciation on recently purchased homes.—Turning to the second issue first, table 7 develops information on the 4 percent of 1970 survey respondents who had purchased their homes in 1969. The U.S. Commerce Department estimates that the average sales price of houses sold in 1969 increased 4.9 percent, with the rate of price increase greater in the first half of the year than in the second. In the first half of 1970, prices increased another 0.7 percent. Since the survey instrument did not ascertain precisely when in 1969 individual homes were acquired, our calculations assume that by the survey date each of these homes had experienced six-months' appreciation in 1969 (2.5 percent) plus a further 0.7 percent in 1970. Except in the youngest age

TABLE 7.—EFFECTS OF UNREPORTED APPRECIATION IN VALUE OF HOMES ACQUIRED IN 1969 ON PORTFOLIO WEIGHTS, 1970 AGE CLASS

[Dollar amounts in millions, others in percent]

Age of household head (In years)	Percentage of respon- dents in the age class that acquired homes in 1969	Reported value of homes acquired in 1969	Value of 1969 ac- quisitions as a percentage of home value re- ported by the full age class	Calculated increase in value of homes acquired in 1969	Reported equity in homes acquired in 1969	Calculated survey-date in homes acquired in 1969	Additional home equity in 1969 acquisitions relative to survey reports
1970 DATA SET							
Under 25.....	5	\$0.21	39	\$0.01	\$0.04	\$0.05	7.1
25 to 34.....	8	.65	15	.02	.17	.19	1.1
35 to 44.....	7	.91	11	.03	.37	.40	.6
45 to 54.....	3	.24	3	.01	.11	.12	.2
55 to 64.....	2	.17	2	.01	.09	.10	.2
65 and over.....	1	.12	3	0	.08	.08	0
2,576 Respondents....	4	2.31	7	.07	.85	.92	.3

Notes—Same as table 4.

class, the effect of accounting for this appreciation is negligible. Even for this class, when raw data are employed, the portfolio weight for home equity rises only by 1.2 percentage points.

Assessment bias.—Respondents' self-assessments of the value of their homes may be inaccurate because homeowners who do not actively participate in housing markets have a poor idea of trends in house prices. In table 8, we develop evidence by which to investigate whether,

TABLE 8.—CONSTRUCTING HOUSING-VALUE PROJECTIONS THAT CAST LIGHT ON AGGREGATE ASSESSMENT BIAS

[Dollar amounts in thousands]

Year in which homeowner moved into current home	Aggregate estimated value of homes occupied in designated years	Households moving in during the designated years	Average estimated value of designated homes	High projection of value in 1970	Low projection of value in 1970
1962 DATA SET					
1939 or earlier.....	\$2,386	163	\$14.64	\$21.96	\$19.47
1940-49.....	3,120	229	13.62	20.43	18.11
1949 or earlier ¹	5,506	392	14.05	21.08	18.69
1950-54.....	3,575	258	13.86	20.78	18.43
1955-60.....	6,972	455	15.32	22.98	20.38
1960 or earlier ¹	16,053	1,105	14.53	21.80	19.32
1961.....	1,153	79	14.59	21.89	19.40
1962.....	64	4	16.00	24.00	21.28
1970 DATA SET					
1945 or earlier.....	4,474	229	19.54	.....	.....
1946-55.....	6,666	333	20.02	.....	.....
1956-60.....	5,474	238	23.00	.....	.....
1960 or earlier ¹	16,614	800	20.77	.....	.....
1961-65.....	8,283	373	22.21	.....	.....

¹ Indicates observations constructed by summing aggregate values in the preceding categories.

Source: Same as table 4.

Notes: Projections for 1970 employ a cumulative growth factor generated by multiplying year-to-year changes in 2 "extended" indices of housing prices (U.S. Department of Commerce, 1977). The high projection combines the rate of increase in the GNP price deflator for 1962 and 1963 with the Commerce Department's series of changes in the average sales price of new houses actually sold in each of the years 1964 through mid-1970. The estimated cumulative inflation factor is 50 percent. The low projection replaces year-to-year changes in the prices of houses sold in each year with changes in the average sales price of the kinds of houses sold in 1974. This produces a cumulative inflation factor of only 33 percent.

given the inflationary surge in house prices during the 1960's, homeowners who had occupied the same residence for various periods of time consistently undervalued their property in 1970.

To do this, we report data on housing values at each survey date by the year in which homeowners first occupied their homes. We then extrapolate the values estimated in 1962 forward to 1970, using cumulative rates of increase observed in average housing prices. These projections are meant to be compared with roughly parallel assessments quoted by respondents in 1970.

Unfortunately, the data do not permit precise comparisons. First, 1962 and 1970 SCF data tapes aggregate reported years of occupation into largely nonconformable intervals. Hence, the two data sets place different boundaries on the date-of-occupation variable. Second, since indices of average housing prices are available only from 1963, the first observations on year-to-year changes in housing prices date from 1964. To fill in the gap for 1962 and 1963, we used movements in the GNP Price Deflator to proxy the rate of housing-price inflation. Finally, since data published on housing prices cover only new houses, we need to consider whether, on average, homeowners upgrade older houses to incorporate most of the comforts being built routinely into newer structures.⁶ What we call our "low projections" track changes in the value of a hypothetical house whose attributes are fixed. Our "high projections" track changes in the value of the specific types of houses constructed and sold each year.

Since the assessments made by respondents in 1970 average near the high projections of comparable 1962 estimates, our data suggest that (at least in the aggregate) self-assessment is not a serious source of downward bias.

Testing the Wealth Hypothesis: Consolidated Balance Sheets for Households Ranked by Their Net Transactable Wealth

For both survey dates, table 9 reports consolidated portfolio weights for households grouped by their decile of net transactable wealth. The observed changes in portfolio patterns by wealth class confirm earlier analyses (Kane, 1970 and 1977) of post-1966 disintermediation. Sophisticated households with sizeable amounts of savings can and do shop among a variety of assets. By 1970, they could rearrange their financial-asset portfolios to lessen the burden that deposit-interest ceilings would otherwise have placed on them. Moreover, the longer the ceilings remained in force, the more fully financial markets and institutions could adapt to help them. The rapid growth of money-market mutual funds and credit unions—and the development of small-denomination bonds by large municipal and corporate issuers—provide examples of this adaptation. Relaxing the ceilings on minimum-denomination and longer-maturity certificates of deposits allows the Nation's wealthier households to earn higher explicit deposit rates at

⁶ To communicate the types of quality improvements that are occurring, Harter (1979) reports that between 1970 and 1977 new one-family houses increased in size and amenities. The median square footage increased from 1510 square feet to 1720 square feet, while the percentage of homes that included each of the following features increased as follows: a dishwasher (from 42 percent to 82 percent); two or more bathrooms (from 48 to 70 percent); one or more fireplaces (from 35 to 61 percent); and a garage (from 58 to 68 percent).

banks and thrift institutions than ordinary families can. For small savers, possibilities for adapting their financial portfolios are severely limited and have been further compressed by government action to reduce disintermediation, notably the 1970 increase in the minimum denomination of U.S. Treasury bills. Providing they can obtain debt financing, small savers lessen the burden of low ceiling rates of interest on regulated financial assets principally by investing directly in homes, investment real estate, and consumer durables.

Hence, in table 9, between 1962 and 1970 we see that, through the sixth decile, portfolio weights for regulated financial assets fall, while the weights for real-estate equity rise. Although households in the seventh decile of wealth show much the same portfolio weights at both dates, between 1962 and 1970 savers in the eighth and ninth deciles undertook some market shifts in the allocation of their transactable wealth. Looking simultaneously at table 10, which develops more detailed data on financial assets, we see that these households moved funds proportionately out of investment real estate, common stocks, checking accounts and savings bonds into high-rate CD's and (to a lesser extent) into other savings accounts.

Families in the highest-wealth decile (whose actions loom very large in aggregate figures) reduced their home equity and moved out of every type of regulated asset except CD's. Unlike middle-wealth house-

TABLE 9.—PERCENTAGE BREAKDOWN OF HOUSEHOLDS' PORTFOLIOS OF TRANSACTABLE FINANCIAL ASSETS AND REAL ESTATE EQUITY BY DECILE OF NET TRANSACTABLE WEALTH, 1962 AND 1970

[Proportions stated in percentage points]

Wealth decile	Financial assets			Real estate equity			Upper boundary of decile
	Regulated	Unregulated	Total	Total	Equity in home	Equity in investment real estate	
1962 DATA SET							
1.....	0	0	0	0	0	0	0
2.....	100.0	0	100.0	0	0	0	\$100
3.....	88.2	1.3	89.5	10.5	10.5	0	741
4.....	50.0	5.3	55.3	44.7	41.9	2.8	2,250
5.....	29.1	3.5	32.6	67.5	60.5	7.0	4,900
6.....	18.1	4.9	23.0	77.0	70.9	6.1	7,700
7.....	14.6	4.6	19.2	80.7	73.6	7.1	10,838
8.....	16.5	5.6	22.1	78.0	64.8	13.2	16,800
9.....	17.6	9.2	26.8	73.2	57.3	15.9	28,901
10.....	17.3	27.7	45.0	55.0	33.6	21.4	874,000
2,117 respondents.....	18.1	17.9	36.0	64.0	47.1	16.9	.....
1970 DATA SET							
1.....	0	0	0	0	0	0	0
2.....	92.0	4.0	96.0	4.0	4.0	0	290
3.....	76.7	2.9	79.6	20.4	17.0	3.4	1,525
4.....	36.6	5.5	42.1	57.9	50.9	7.0	4,660
5.....	19.9	3.4	23.3	76.7	68.7	8.0	8,800
6.....	14.8	3.4	18.2	76.7	76.0	5.7	13,101
7.....	15.5	3.1	18.6	81.4	74.6	6.8	18,600
8.....	20.5	5.6	26.1	73.9	65.0	8.9	27,750
9.....	23.6	7.3	30.9	69.1	57.0	12.1	50,300
10.....	15.3	31.1	46.4	53.5	25.9	27.6	1,654,997
2,576 respondents.....	17.8	20.2	38.0	62.0	42.1	19.8	.....

Notes: Sums of components of totals shown may not add to 100 because of rounding. Zeros are recorded in every column for the lowest wealth decile because members of this decile report no assets or real estate equity. Because we chose not to split identical wealth values across neighboring deciles, this 1st "decile" actually represents 15.7 percent of the sample in 1962 and 11.1 percent in 1970. To balance out these overflows, corresponding 2d deciles contain 4.6 percent and 8.7 percent respectively. No other wealth decile in our samples contains less than 9.9 percent or more than 10.1 percent of the cases.

TABLE 10.—PERCENTAGE BREAKDOWN OF HOUSEHOLDS' PORTFOLIOS OF TRANSACTABLE FINANCIAL ASSETS BY DECILE OF NET TRANSACTABLE WEALTH, 1962 AND 1970

[Proportions stated in percentage points]

Wealth decile	Checking accounts	Savings accounts	CD's	U.S. savings bonds	Other bonds	Stocks and mutual funds	Total financial assets
1962 DATA SET							
1.....	0	0	-----	0	0	0	0
2.....	66.7	33.3	-----	0	0	0	100.0
3.....	38.2	47.1	-----	13.2	0	1.5	100.0
4.....	15.7	61.8	-----	12.9	0	9.6	100.0
5.....	14.4	60.5	-----	14.4	0	10.7	100.0
6.....	17.3	49.5	-----	12.1	.3	20.8	100.0
7.....	13.5	50.7	-----	11.9	0	24.0	100.1
8.....	15.3	46.4	-----	13.0	.2	25.1	100.0
9.....	9.2	47.0	-----	9.5	.4	34.0	100.1
10.....	4.9	24.5	-----	9.1	1.6	59.9	100.0
2,117 respondents.....	7.6	32.7	-----	9.9	1.1	48.6	100.0
1970 DATA SET							
1.....	0	0	0	0	0	0	0
2.....	58.3	29.2	0	8.3	0	4.2	100.0
3.....	31.1	56.7	1.2	7.3	.6	3.0	99.9
4.....	20.5	57.6	1.2	7.7	0	13.1	100.1
5.....	19.2	58.5	2.5	5.2	0	14.5	99.9
6.....	14.1	58.8	2.5	6.0	0	18.6	100.0
7.....	11.7	58.0	4.0	9.7	.1	16.5	100.0
8.....	9.5	51.9	7.8	9.4	.1	21.3	100.0
9.....	7.1	52.4	10.5	6.3	1.8	21.9	100.0
10.....	2.9	16.4	9.6	4.0	7.3	59.7	99.9
2,576 respondents.....	5.3	27.6	8.9	5.0	5.4	47.8	100.0

Notes—Same as table 9.

holds who decreased the portfolio weight for common stock or low-wealth households who increased it, the highest wealth households held steady. They increased their portfolio weights for only three asset categories: CD's, marketable bonds, and investment real estate.

For each survey date, table 11 reports real-estate debt ratios by wealth decile. For all deciles but the third, ratios of real-estate debt to various asset values decline between 1962 and 1970. However, debt-to-income ratios behave quite differently for households in different places in the wealth distribution. For small savers, the ratio increases sharply between survey dates. For households in the sixth through ninth wealth deciles, the ratio falls. The pattern of debt-to-income ratios observed supports the hypothesis that in 1970 low-wealth households found it necessary to leverage more of their human capital to support expansion in real-estate equity and other assets.

V. ESTIMATED 1970 WEIGHTED AVERAGE PROSPECTIVE RATES OF RETURN FOR EACH AGE AND WEALTH CLASS

Our explanation of the changing distribution of household savings across assets presumes that households reallocate their funds as far as possible to escape the costs that accelerating inflation and deposit-rate regulation would otherwise impose upon them. To clarify how this process affects ex ante portfolio returns, table 12 uses proxies for prospective 1970 asset yields to translate the portfolio proportions underlying tables 4 and 9 into weighted-average prospective rates of return for each age and wealth class. Because these calculations neglect discriminatory variation across wealth classes in the rates of return earned

TABLE 11.—RATIOS OF HOUSEHOLD REAL ESTATE DEBT TO VARIOUS ASSET TOTALS AND TO FAMILY INCOME BY DECILE OF NET TRANSACTABLE WEALTH IN 1962 AND 1970

[Proportions stated in percentage points]

Wealth decile	Home mortgage debt to home value	Total real estate debt to—			Upper boundary of decile
		Total value of real estate	Total value of assets held	Total family income	
1962 DATA SET					
1.....	100.0	100.0	100.0	4.1	0
2.....	100.0	100.0	89.7	6.5	\$100
3.....	91.8	91.8	54.2	9.2	741
4.....	80.1	79.3	63.2	47.5	2,250
5.....	63.3	61.9	52.3	66.2	4,900
6.....	45.4	44.6	38.2	67.2	7,700
7.....	34.0	33.7	29.1	64.5	10,838
8.....	29.0	29.4	24.5	64.4	16,800
9.....	19.9	20.9	16.2	56.0	28,901
10.....	15.7	13.8	8.1	47.3	874,060
2,117 respondents.....	30.4	27.4	19.4	48.4	.....
1970 DATA SET					
1.....	100.0	100.0	100.0	13.8	0
2.....	99.5	99.5	89.1	13.7	290
3.....	92.9	91.9	69.9	23.2	1,525
4.....	75.1	74.2	62.5	58.5	4,660
5.....	56.9	58.1	51.5	74.5	8,800
6.....	39.7	40.0	35.3	59.1	13,101
7.....	32.8	32.2	27.8	56.7	18,600
8.....	27.3	27.9	22.2	54.3	27,750
9.....	16.1	17.4	12.7	41.9	50,300
10.....	13.0	13.6	7.8	52.3	1,654,997
2,576 respondents.....	29.3	26.4	18.2	48.5	.....

Notes: Sums of components of totals shown may not add to 100 because of rounding. Zeroes are recorded in every column for the lowest wealth decile because members of this decile report no assets or real estate equity. Because we chose not to split identical wealth values across neighboring deciles, this 1st "decile" actually represents 15.7 percent of the sample in 1962 and 11.1 percent in 1970. To balance out these overflows, corresponding 2d deciles contain 4.6 percent and 8.7 percent respectively. No other wealth decile in our samples contains less than 9.9 percent or more than 10.1 percent of the cases.

on deposits, they provide conservative estimates of the degree to which returns on financial assets differ with a household's transactable wealth and position in the life cycle. On the other hand, reporting bond values on a face-value basis systematically overweights yields on the bond portion of household portfolios. Since bond holdings tend to rise with wealth and age, at least the two biases are offsetting in direction.

Specifically, the calculations reported in table 12 employ the following estimates of the annual average yield that might have been anticipated on individual assets in 1970:

- (1) Yield on Demand Deposits = 6.36 percent (Stevens, 1976).⁷
- (2) Yield on Savings Deposits = 5.06 percent (table 1).
- (3) Yield on U.S. Savings Bonds: 5.00 percent (Yield set on new U.S. savings bonds in December 1969).
- (4) Yield on Other bonds: 6.58 percent (table 1, Long Term Treasury Bond Yields).
- (5) Yield on Stocks and Mutual Funds: 8.5 percent [Mean Annual Return on Common Stocks, 1926-1974 (Ibbotson and Sinquefeld, 1976)].
- (6) Yield on Equity in Home: 8.45 percent (table 1, Federal Home Loan Bank Board (FHLBB) Mortgage Interest-Rate Series).

⁷ Of the four financial yields we estimate, this is the only one that features an implicit component. We treat this series asymmetrically because implicit returns dominate competition for demand deposits.

TABLE 12.—ESTIMATES OF PROSPECTIVE 1970 PORTFOLIO RATE OF RETURN FOR EACH AGE CLASS AND WEALTH DECILE

[Stated in percent per annum]

	Yield on financial assets only	Combined yield on financial assets and real estate equity
Decile ranking of households' net transactable wealth:		
1.....		
2.....	5.96	6.06
3.....	5.57	6.21
4.....	5.77	7.42
5.....	5.81	7.95
6.....	5.88	8.06
7.....	5.78	8.05
8.....	5.91	7.91
9.....	5.93	7.84
10.....	7.26	8.29
2,576 respondents.....	6.85	8.12
Age of household head (in years):		
Under 25.....	5.81	7.18
25 to 34.....	6.20	8.09
35 to 44.....	6.86	8.32
45 to 54.....	6.46	8.19
55 to 64.....	7.10	8.11
65 and over.....	6.88	8.00
All respondents.....	6.85	8.12

Source: Calculated from portfolio weights underlying tables 4 and 9, using yield assumptions stated in the text.

(7) Yield on Equity in Investment Real Estate: 9.86 percent [Average Interest Rates on Income Property Mortgages, American Life Insurance Association, cited in Gettel (1976, p. 108)].

Our proxies for the last four yields are chosen conservatively, especially on a before-tax basis. Yields on shorter term instruments, taxable-equivalent yields on municipals, and yields on corporate bonds averaged much higher than yields on long term U.S. government bonds. Moreover, although the ex post yield on stocks was only 4.01 percent in 1970, prospective yields on common stocks almost certainly exceeded the rate of inflation. For two-year and three-year holding periods, realized per annum yields on common-stock investments made in 1970 averaged 9.0 and 12.2 percent respectively. Over 1901-71, Friend and Blume (1975) estimate mean per annum yields on stocks of 9.0 percent.

Most importantly, while yields on both forms of real-estate equity should equal corresponding mortgage interest rates at the margin, prospective returns figures to be higher on average. Our estimates of prospective real-estate yields may be excessively conservative. Although a telephone survey of trade associations in St. Louis, Chicago, and Washington, D.C. could uncover no direct data on real estate returns, information in the files of the General Services Administration's Appraisal Staff supports using an ex ante, per annum return of just over 12.00 percent in 1970. Diamond (1979) estimates (net of anticipated price appreciation) a before-tax "user cost of capital" of 12.49 percent for owner-occupied housing in 1970. Hendershott and Hu (1979) report estimates of this cost in 1964, 1972, and 1978, for households in three different tax brackets and under two alternative models for forming expectations of future price appreciation. Hendershott

and Hu's estimates range between 12 and 13 percent for households in their lowest tax bracket.

Alternatively, a 10-percent basic rate of prospective return on housing in 1970 can be constructed as the sum of an imputed rental rate of return and an anticipated rate of housing-price appreciation. Drawing on the national-income accounts, Larry Kotlikoff of the National Bureau of Economic Research estimates (in private correspondence) that the imputed rental rate exceeded 4 percent in every year between 1962 and 1970. Over the three years preceding 1970, Commerce Department indices of housing prices increased roughly 6 percent. Factoring in the benefits of leverage easily supports a rate of return on equity of 12 percent or more.

Table 13 develops alternative, less conservative estimates of portfolio rates of return for households in our 10 wealth and 6 age classes. These estimates assume higher anticipated returns on other bonds (8 percent) and on both forms of real-estate equity (12 percent).

Under either set of assumptions, prospective 1970 yields on regulated financial assets average less than 6.00 percent. Even without formal calculations, it is obvious that overall rates of return will be highest for classes with low percentages of their transactable wealth in these assets and high percentages in unregulated assets and real-estate equity. Because deposit-rate regulation artificially restricts the explicit rewards offered on low-risk assets, households have been encouraged to occupy riskier and less-than-perfectly-diversified balance-sheet positions.

Tables 12 and 13 develop two remarkable results. First, while households in the lowest deciles have simply been shortchanged, households

TABLE 13.—LESS CONSERVATIVE ESTIMATES OF PROSPECTIVE 1970 PORTFOLIO RATE OF RETURN FOR EACH AGE CLASS AND WEALTH DECILE

[Stated in percent per annum]

	Yield on financial assets only	Combined yield on financial assets and real estate equity
Decile ranking of households' net transactable wealth:		
1.....		
2.....	5.96	6.20
3.....	5.58	6.89
4.....	5.77	9.38
5.....	5.81	10.56
6.....	5.88	10.88
7.....	5.78	10.84
8.....	5.91	10.41
9.....	5.95	10.13
10.....	7.37	9.85
2,576 respondents.....	6.93	10.07
Age of household head (in years):		
Under 25.....	5.82	8.69
25 to 34.....	6.23	10.38
35 to 44.....	6.88	10.51
45 to 54.....	6.51	10.56
55 to 64.....	7.20	9.87
65 and over.....	6.97	9.63
All respondents.....	6.93	10.07

Note: As compared to the estimates reported in table 12, these calculations assume higher anticipated rates of return on other bonds (8 percent), homeowner equity (12 percent), and equity in investment real estate (12 percent).

Source: Calculated from portfolio weights underlying tables 4 and 9, using yield assumptions stated in the text.

in the middle wealth deciles used investments in real estate to offset a good portion of the discrimination effect of deposit-rate ceilings on the yields they could earn on strictly financial assets. Although differences in marginal tax rates importantly affect the desirable breakdown between prospective in-kind running yield and price appreciation, combined portfolio yields differ much less by wealth than financial yields do. Second, along with the very poor, young households (those whose head is under 25 years of age) emerge as the group most severely burdened by the double whammy of accelerating inflation and interest-rate ceilings. This may occur because these households realize a lower in-kind running yield from a given living space or because they have a hard time competing for mortgage funds, especially when state usury ceilings are binding on mortgage interest rates. Whatever the reason, unlike other age classes in 1970, young families were able to use real-estate investments to eliminate only about half of the gap between the yield on their portfolio and that earned by members of the modal class.

Even the conservative estimates in table 12 indicate that, on a before-tax basis, households in the middle and upper wealth classes were able in 1970—by taking on additional portfolio risk—to anticipate earning a positive real estate of return even on their financial assets. Whether after-tax real yields are positive as well depends on the breakdown of these returns between explicit running yields, implicit yields, and price appreciation. However, households in the various wealth classes reached out for this yield along different effective risk-return loci and took on quite distinct risks. Unanticipated developments over the decade of the 1970's (particularly, unanticipated inflation) made shifts into real-estate equity look even wiser, *ex post*, and movements into unregulated assets look fatuous.

VI. TESTING THE MINORITY HYPOTHESIS: CONSOLIDATED 1970 BALANCE SHEETS AND PROSPECTIVE PORTFOLIO YIELDS FOR FAMILIES IN DIFFERENT DEMOGRAPHIC CIRCUMSTANCES

Accelerating inflation and deposit-rate ceilings tax the poor to finance "welfare" for the rest of us. In their distributional effect, they are equivalent to a confiscatory Federal tax that falls on the financial wealth of small savers only and whose proceeds are designated to subsidize homebuilders, homeowners, and managers and/or stockholders of inefficient depository institutions.⁸

Besides stock-market investors, after-the-fact losers in the game of accelerating inflation cum deposit regulation have been families of modest means who concentrate their saving in regulated assets and/or do not own any real estate at all. Compared to other respondents, these families are drawn disproportionately from the ranks of the black, the female, the poor, and the young. In competing for mortgages, these groups are traditionally portrayed as disadvantaged. However, deposit-interest ceilings aggravate that disadvantage by driving up both the cost of housing and demands for mortgages among other groups, while reducing the disadvantaged sectors' ability to accumulate an acceptable downpayment.

⁸ In the case of mutual institutions, availability of these subsidies may have intensified managerial incentives for converting to a stock charter.

For four different demographic groups, table 14 shows how household asset allocations and anticipated portfolio returns varied with net transactable wealth in 1970.⁹ Less than 10 percent of the lowest wealth households were able to participate in real-estate ownership. They placed the bulk of their wealth in regulated assets (deposits and U.S. savings bonds). Within each group, wealthier households proved increasingly able to use *both* real-estate and securities investments to secure an anticipated positive net real rate of return on their overall portfolios. Interestingly, controlling for wealth and sex of head, black households show a higher propensity for real-estate investment than white families.

Distinguishing between real-property owners and nonowners in the same four demographic groups, table 15 shows how 1970 portfolio weights and anticipated yields varied by age class. In each demographic group, the proportion of young families that own real property is low. However, because of differences in the distribution of wealth, it is almost uniformly lower for female-headed families than for male-headed families and for black families than for white ones. Controlling for the age and sex of household heads, black families show a lesser participation in real-estate ownership than white families. This occurs despite black families' greater propensity for real-estate ownership as shown in table 14, because the families have disproportionately less wealth and income than white households.

For the same groups that are featured in table 15, table 16 presents 1970 portfolio weights and anticipated yields by household income. Households with less than \$7500 in 1970 income are about evenly divided between real-property owners and nonowners, but within this category black and female-headed families prove less likely to own real estate.

VII. SUMMARY OF FINDINGS

Evidence developed in this paper clarifies how in the face of comprehensive deposit-rate ceilings real estate has served as the ordinary citizen's chief hope against accelerating inflation. By expanding their proportionate holdings of real estate, households with below-average wealth were able in the late 1960's to anticipate positive real after-tax rates of portfolio return despite painful interest-rate ceilings on the deposits and savings bonds in which their transactable wealth had traditionally been concentrated. By discriminatorily reducing the efficiency of financial intermediation, interest-rate ceilings have biased investments by small savers toward tangible assets (especially real estate) and investments by very large savers toward unregulated financial assets.

Although these reconstituted portfolios made sense in 1970, they appear unnecessarily risky *ex ante* for both groups. With real-estate investments protected against unanticipated inflation and stocks and bonds proving surprisingly vulnerable to it, so far the Nation's wealthiest households have fared less well, *ex post*, than the average homeowner. However, precisely because homeowners' portfolios of transactable wealth are protected against unanticipated inflation, they

⁹ Our analysis of minority portfolios ignores a relatively small number of disparate non-white respondents who are nonblack.

TABLE 14.—AVERAGE PORTFOLIO PATTERNS AND YIELDS BY RACE AND NET TRANSACTABLE WEALTH, FOR MALE-HEADED FAMILY UNITS IN 1970

[Except where indicated, all figures in percent]

	Dollar value of wealth for male-headed white households								Dollar value of wealth for male-headed black households							
	Less than 1,000	1,000 to 4,999	5,000 to 9,999	10,000 to 24,999	25,000 to 49,999	50,000 to 99,999	100,000 to 249,999	250,000 or more	Less than 1,000	1,000 to 4,999	5,000 to 9,999	10,000 to 24,999	25,000 to 49,999	50,000 to 99,999	100,000 to 249,999	250,000 or more
Panel A: All family units in the survey:																
Percentage of portfolio placed in regulated financial assets.....	88	40	20	17	23	24	18	4	89	23	7	8	8	16	14	6
Percentage in unregulated financial assets.....	5	5	5	4	7	13	26	49	0	3	4	7	0	61	0	0
Percentage in real estate equity.....	7	55	75	79	70	63	56	46	11	74	89	86	92	23	86	94
Estimated mean per annum portfolio yield.....	6.02	7.32	7.95	8.02	7.85	7.93	8.24	8.67	5.72	7.91	8.29	8.34	8.60	7.97	9.05	8.24
Number of survey respondents.....	393	255	236	519	254	140	67	20	82	37	27	26	7	1	2	1
Aggregate value of family portfolios (in millions).....	\$0.08	\$0.70	\$1.73	\$8.49	\$8.73	\$9.37	\$9.71	\$11.47	\$0.01	\$0.11	\$0.19	\$0.35	\$0.24	\$0.06	\$0.21	\$0.25
Panel B: Family units without real property:																
Percentage of portfolio placed in regulated financial assets.....	96	88	82	79	77	97	50	-----	100	83	22	-----	-----	-----	-----	-----
Percentage in unregulated financial assets.....	4	12	18	21	23	3	50	-----	0	17	78	-----	-----	-----	-----	-----
Percentage in real estate equity.....	0	0	0	0	0	0	0	-----	0	0	0	-----	-----	-----	-----	-----
Estimated mean per annum portfolio yield.....	5.78	5.69	5.83	5.84	5.88	5.17	6.78	-----	5.38	5.85	7.74	-----	-----	-----	-----	-----
Number of survey respondents.....	367	104	25	20	8	6	3	-----	78	5	1	-----	-----	-----	-----	-----
Aggregate value of family portfolios (in millions).....	\$0.07	\$0.22	\$0.17	\$0.32	\$0.26	\$0.37	\$0.44	-----	\$0.01	\$0.01	\$0.01	-----	-----	-----	-----	-----

	Dollar value of wealth for female-headed white households								Dollar value of wealth for female-headed black households					
Panel A: All family units in the survey:														
Percentage of portfolio placed in regulated financial assets.....	86	51	32	23	29	29	17	11	71	20	8	5	0	-----
Percentage in unregulated financial assets.....	5	6	0	4	7	29	43	80	0	0	0	0	0	-----
Percentage in real estate equity.....	10	42	68	74	65	42	40	9	29	80	92	95	100	-----
Estimated mean per annum portfolio yield.....	5.98	6.79	7.50	7.81	7.64	7.66	8.23	8.23	6.41	8.05	8.34	8.43	8.45	-----
Number of survey respondents.....	116	54	36	76	56	20	7	1	67	9	9	10	1	-----
Aggregate value of family portfolios (in millions).....	\$0.02	\$0.14	\$0.26	\$1.20	\$1.89	\$1.45	\$1.04	\$0.32	\$0.01	\$0.03	\$0.06	\$0.14	\$0.04	-----
Panel B: Family units without real property:														
Percentage of portfolio placed in regulated financial assets.....	94	88	100	77	89	64	2	-----	100	100	-----	-----	-----	-----
Percentage in unregulated financial assets.....	6	12	0	23	11	36	98	-----	0	0	-----	-----	-----	-----
Percentage in real estate equity.....	0	0	0	0	0	0	0	-----	0	0	-----	-----	-----	-----
Estimated mean per annum portfolio yield.....	5.72	5.55	5.12	5.84	5.48	6.31	8.42	-----	5.37	5.37	-----	-----	-----	-----
Number of survey respondents.....	109	33	6	7	4	2	1	-----	61	3	-----	-----	-----	-----
Aggregate value of family portfolios (in millions).....	\$0.02	\$0.08	\$0.04	\$0.12	\$0.13	\$0.17	\$0.21	-----	\$0.004	\$0.004	-----	-----	-----	-----

Notes: Detail may not add to totals because of rounding error and classification problems. Each family in the stratified sample represents about 25,000 demographically similar households. Interest

rate assumptions used to calculate portfolio yields are explained in the text.

Source: Calculated from 1970 "Survey of Consumer Finances" data tapes.

TABLE 15.—AVERAGE PORTFOLIO PATTERNS AND YIELD BY RACE, SEX, AND AGE OF HEADS OF HOUSEHOLD, FOR FAMILY UNITS WITH AND WITHOUT REAL PROPERTY IN 1970

[Except where indicated, all figures in percent]

	Age of white male head in years						Age of black male head in years					
	Less than 25	25 to 34	35 to 44	35 to 54	55 to 64	65 or more	Less than 25	25 to 34	35 to 44	45 to 54	55 to 64	65 or more
Panel A: Family units with some real property:												
Percentage of portfolio placed in regulated financial assets.....	20	15	12	14	14	19	67	18	10	6	5	13
Percentage in unregulated financial assets.....	5	8	15	11	29	26	0	5	25	0	0	0
Percentage in real estate equity.....	75	77	73	75	57	55	33	77	65	94	95	87
Estimated mean per annum portfolio yield.....	8.09	8.27	8.41	8.29	8.23	8.08	6.62	8.27	8.16	8.37	8.86	8.67
Number of survey respondents.....	38	222	304	324	252	209	2	17	23	30	13	13
Aggregate value of family portfolios (in millions).....	\$0.22	\$2.84	\$9.28	\$9.76	\$13.12	\$13.16	0	\$0.14	\$0.20	\$0.58	\$0.21	\$0.23
Panel B: Family units without real property:												
Percentage of portfolio placed in regulated financial assets.....	83	84	84	83	78	68	100	100	57	100	0	0
Percentage in unregulated financial assets.....	17	16	16	17	22	32	0	0	43	0	0	0
Percentage in real estate equity.....	0	0	0	0	0	0	0	0	0	0	0	0
Estimated mean per annum portfolio yield.....	5.85	5.79	5.78	5.77	5.82	6.20	5.03	5.58	6.65	5.06	0	0
Number of survey respondents.....	156	148	68	70	44	47	9	22	16	16	12	9
Aggregate value of family portfolios (in millions).....	\$0.12	\$0.18	\$0.23	\$0.25	\$0.56	\$0.51	0	\$0.01	\$0.02	0	0	0
	Age of white female head in years						Age of black female head in years					
	Less than 25	25 to 34	35 to 44	35 to 54	55 to 64	65 or more	Less than 25	25 to 34	35 to 44	45 to 54	55 to 64	65 or more
Panel A: Family units with some real property:												
Percentage of portfolio placed in regulated financial assets.....	23	20	26	24	21	20	0	4	7	3	7	7
Percentage in unregulated financial assets.....	0	3	2	4	20	22	0	0	0	0	0	0
Percentage in real estate equity.....	77	77	72	72	59	58	100	96	93	97	93	93
Estimated mean per annum portfolio yield.....	7.87	7.84	7.72	7.78	7.93	8.03	8.45	8.37	8.46	8.47	8.30	8.30
Number of survey respondents.....	2	8	21	30	64	78	4	6	9	5	8	8
Aggregate value of family portfolios (in millions).....	\$0.02	\$0.11	\$0.27	\$0.63	\$2.07	\$2.47	\$0.01	\$0.05	\$0.08	\$0.07	\$0.07	\$0.07
Panel B: Family units without real property:												
Percentage of portfolio placed in regulated financial assets.....	94	97	100	81	84	46	100	100	100	100	100	0
Percentage in unregulated financial assets.....	6	3	0	19	16	54	0	0	0	0	0	0
Percentage in real estate equity.....	0	0	0	0	0	0	0	0	0	0	0	0
Estimated mean per annum portfolio yield.....	5.39	5.22	5.14	5.73	5.70	6.92	5.47	5.06	5.06	5.03	5.06	0
Number of survey respondents.....	33	22	21	20	19	47	10	17	17	7	8	5
Aggregate value of family portfolios (in millions).....	\$0.02	\$0.03	\$0.03	\$0.09	\$0.06	\$0.53	0	0	0	0	0	0

Note: Detail may not add to totals because of rounding error and classification problems.

Source: Calculated from 1970 "Survey of Consumer Finances" data tapes.

TABLE 16.—AVERAGE PORTFOLIO PATTERNS AND YIELD BY RACE AND INCOME, FOR MALE-HEADED FAMILY UNITS WITH AND WITHOUT REAL PROPERTY IN 1970

[Except where indicated, all figures in percent]

	Dollar income of male-headed white households								Dollar income of male-headed black households							
	Less than 3,000	3,000 to 4,999	5,000 to 7,499	7,500 to 9,999	10,000 to 14,999	15,000 to 24,999	25,000 to 49,999	50,000 or more	Less than 3,000	3,000 to 4,999	5,000 to 7,499	7,500 to 9,999	10,000 to 14,999	15,000 to 24,999	25,000 to 49,999	50,000 or more
Panel A: Family units with some real property:																
Percentage of portfolio placed in regulated financial assets	14	20	22	13	18	18	10	5	2	5	4	10	12	6	19	-----
Percentage in unregulated financial assets	5	4	3	5	11	18	40	61	0	0	0	2	4	6	20	-----
Percentage in real estate equity	81	76	75	82	71	64	50	34	98	95	96	88	84	88	61	-----
Estimated mean per annum portfolio yield	8.28	8.25	8.10	8.53	8.12	8.08	8.44	8.33	8.46	8.30	8.44	8.71	8.36	8.74	8.41	-----
Number of survey respondents	75	91	158	217	425	296	70	17	13	14	14	18	27	9	3	-----
Aggregate value of family portfolios (in millions)	\$1.59	\$2.71	\$4.41	\$5.83	\$9.84	\$11.65	\$6.37	\$5.96	\$0.12	\$0.36	\$0.14	\$0.18	\$0.36	\$0.17	\$0.08	-----
Panel B: Family units without real property:																
Percentage of portfolio placed in regulated financial assets	96	56	96	96	76	74	62	-----	0	0	100	100	100	47	-----	
Percentage in unregulated financial assets	4	44	4	4	24	26	38	-----	0	0	0	0	0	53	-----	
Percentage in real estate equity	0	0	0	0	0	0	0	-----	0	0	0	0	0	0	0	-----
Estimated mean per annum portfolio yield	5.31	6.68	5.37	5.33	5.92	5.98	6.49	-----	0	0	5.49	5.47	5.21	7.03	-----	
Number of survey respondents	71	79	110	106	117	42	8	-----	20	13	16	14	17	4	-----	
Aggregate value of family portfolios (in millions)	\$0.11	\$0.21	\$0.17	\$0.17	\$0.72	\$0.39	\$0.09	-----	0	0	0	0	\$0.01	\$0.02	-----	

TABLE 16.—AVERAGE PORTFOLIO PATTERNS AND YIELD BY RACE AND INCOME, FOR MALE-HEADED FAMILY UNITS WITH AND WITHOUT REAL PROPERTY IN 1970—Continued

[Except where indicated, all figures in percent]

	Dollar income of female-headed white households								Dollar income of female-headed black households							
	Less than 3,000	3,000 to 4,999	5,000 to 7,499	7,500 to 9,999	10,000 to 14,999	15,000 to 24,999	25,000 to 49,999	50,000 or more	Less than 3,000	3,000 to 4,999	5,000 to 7,499	7,500 to 9,999	10,000 to 14,999	15,000 to 24,999	25,000 to 49,999	50,000 or more
Panel A: Family units with some real property:																
Percentage of portfolio placed in regulated financial assets.....	21	23	21	18	23	21	17	11	5	9	7	7	0	-----	-----	-----
Percentage in unregulated financial assets.....	8	15	11	8	27	36	0	48	0	0	0	0	0	-----	-----	-----
Percentage in real estate equity.....	71	62	68	74	50	42	83	41	95	91	93	93	100	-----	-----	-----
Estimated mean per annum portfolio yield.....	7.87	7.89	8.01	8.16	7.74	7.97	7.92	8.23	8.36	8.20	8.48	8.47	8.48	-----	-----	-----
Number of survey respondents.....	61	42	40	30	17	10	2	1	10	5	7	6	4	-----	-----	-----
Aggregate value of family portfolio (in millions).....	\$0.97	\$1.38	\$0.82	\$0.67	\$0.57	\$0.98	\$0.08	\$0.11	\$0.08	\$0.02	\$0.04	\$0.07	\$0.06	-----	-----	-----
Panel B: Family units without real property:																
Percentage of portfolio placed in regulated financial assets.....	97	92	56	79	79	2	-----	-----	100	100	100	0	0	100	-----	-----
Percentage in unregulated financial assets.....	3	8	44	21	21	98	-----	-----	0	0	0	0	0	0	-----	-----
Percentage in real estate equity.....	0	0	0	0	0	0	-----	-----	0	0	0	0	0	0	-----	-----
Estimated mean per annum portfolio yield.....	5.20	5.37	6.63	5.83	5.85	8.42	-----	-----	6.36	5.06	5.03	0	0	5.03	-----	-----
Number of survey respondents.....	67	32	37	15	10	1	-----	-----	31	18	11	1	2	1	-----	-----
Aggregate value of family portfolios (in millions).....	\$0.16	\$0.12	\$0.17	\$0.08	\$0.03	\$0.21	-----	-----	0	0	0	0	0	0	-----	-----

Note: Detail may not add to totals because of rounding error and classification problems.

Source: Calculated from 1970 "Survey of Consumer Finances" data tapes.

remain exposed to substantial deflation risk. As they come to realize this, homeowners may begin to function politically as an explicit constituency for inflation.

Other remarkable findings concern the increased emphasis on leveraged housing investment among the very young. Between 1962 and 1970, households headed by persons under 25 years of age greatly expanded equity in homes, although not enough to lift estimated yields on their savings up to the level achieved by older groups. Since the implicit yield on a given home tends to increase with family size, contemporary young families along with older households may be disadvantaged in the running yields that they can earn on equity invested in homes. In addition, binding ceilings on mortgage interest rates tend to restrict young persons' ability to finance desired purchases of homes.

Our data also show that, between 1962 and 1970, direct holdings of marketable bonds and stock have become more tightly concentrated in the hands of wealthy investors. This development supports the hypothesis that at least in 1970 only wealthy households could economically engage in strictly financial-market disintermediation. This explains why Federal banking and S&L regulators settled on the strategy of relaxing deposit-rate ceilings only on minimum-denomination and longer-maturity accounts. This approach conserves depository-institution profits by allowing them to increase the yields offered to interest-sensitive customers without simultaneously raising yields on interest-insensitive funds. However, regulators must recognize that even among small savers interest sensitivity tends to increase with the length of time that sizable interest-rate differentials remain in force.

Finally, our analysis provides a more balanced perspective on the supposedly unfavorable trends of falling funds flows to traditional savings institutions and rising ratios of household debt to income. These developments reflect not profligacy but households' willingness to expose themselves to deflation risk in hopes of enhancing the real value of their accumulated savings. Aggregate household saving is alive and well, but it is taking some unconventional and risky forms. More and more, prudent households are focusing on building up a speculative investment portfolio of inflation-protected tangible assets to supplement their holdings of strictly financial assets.

REFERENCES

1. Aaron, Henry. "Income Taxes and Housing," *American Economic Review*, Dec. 1970, 60 (5), pp. 789-806.
2. Arcelus, Francisco, and Meltzer, Allan H. "The Markets for Housing and Housing Services," *Journal of Money, Credit and Banking*, 5 (February 1973), pp. 78-99.
3. Boskin, Michael J. "Taxation, Saving, and the Rate of Interest," *Journal of Political Economy*, April 1978, Part 2, 86 (2), pp. S3-S27.
4. Cagan, Phillip, and Lipsey, Robert E., "The Financial Effects of Inflation," Cambridge: Ballinger Publishing Company for The National Bureau of Economic Research, 1978.
5. Diamond, Douglas B., Jr., "Taxes, Inflation, Speculation and the Cost of Ownership: 1963-1978," paper presented before the American Real Estate and Urban Economics Association, May 23, 1979.
6. Fama, Eugene F., and Schwert, G. William. "Asset Returns and Inflation," *Journal of Financial Economics*, 5 (November 1977), pp. 115-146.
7. Fisher, Irving. "The Theory of Interest." New York: Macmillan, 1930.
8. Friend, Irwin and Blumme, Marshall E. "Short Run Asset Effects on Household Saving and Consumption: The Cross-Section Evidence," *American Economic Review*, Sept. 1975, 65 (4), pp. 624-33.

9. Gettel, Ronald E. "Real Estate Guidelines and Rules of Thumb." New York: McGraw-Hill, 1976.
10. Gurley, John G. and Shaw, Edward S. "Money in a Theory of Finance." Washington: Brookings Institution, 1960.
11. Hansmire, Evelyn. "Survey Data Available from the Economic Behavior Archive," in "Surveys of Consumers," 1974-1975. Edited by Richard T. Curtin. Ann Arbor: University of Michigan Institute for Social Research, 1976, pp. 285-312.
12. Harter, Thomas R. "Housing Outlook 1979," New York: Mortgage Bankers Association of America (mimeographed, 1979).
13. Hendershott, Patric, and Hu, Sheng Cheng, "Inflation and the Benefits from Owner-Occupied Housing," paper presented before the American Real Estate and Urban Economics Association, May 23, 1979.
14. Howrey, E. Phillip and Hymans, Saul H. "The Measurement and Determination of Loanable Funds Saving," Brookings Papers on Economic Activity, 1978, (3), pp. 655-705.
15. Ibbotson, Roger G. and Sinquefeld, Rex A. "Stocks, Bonds, Bills, and Inflation: Year-by-Year Historical Returns (1926-1974)," Journal of Business, Jan. 1976, 49 (21), pp. 11-47.
16. Kane, Edward J. "Short-Changing the Small Saver," Journal of Money, Credit, and Banking, Nov. 1970, 2 (4), pp. 513-522.
17. ——— "Good Intentions and Unintended Evil: The Case Against Selective Credit Allocation," Journal of Money, Credit, and Banking, Feb. 1977, 9 (1), pp. 55-69.
18. ——— "Consequences of Contemporary Ceilings on Mortgage and Deposit Interest Rates for Households in Different Economic Circumstances," in "The Government and Capital Formation." Edited by George M. von Furstenberg. Cambridge, MA: Ballinger, 1980 (forthcoming).
19. Katona, George; Lininger, Charles A., and Kosobud, Richard F. "1962 Survey of Consumer Finances." Ann Arbor: University of Michigan Institute for Social Research, 1963.
20. Katona, George; Mandel, Lewis, and Schmiedeskamp, Jay, 1970 "Survey of Consumer Finances." Ann Arbor: University of Michigan Institute for Social Research, 1971.
21. Mullineaux, Donald J. "Deposit-Rate Ceilings and Noncompetitive Bidding for U.S. Treasury Bills," Journal of Money, Credit and Banking, 5 (February 1973), pp. 201-212.
22. Nathan, Harold C. "Economic Analysis of Usury Laws: A Survey," Washington: Federal Deposit Insurance Corporation Working Paper No. 78-7 (mimeographed, 1978).
23. Sowell, Thomas. Race and Economics. New York: David McKay Company, Inc., 1975.
24. Stevens, Edward J. "Measuring the Service Return on Demand Deposits, Federal Reserve Bank of Cleveland Working Paper No. 7601, (Mimeographed, 1976).
25. U.S. Department of Commerce, Bureau of the Census, "Constructive Report: Price Indexed of New One-Family Houses Sold," Quarterly, December 1977.
26. Wachtel, Paul. "Inflation, Uncertainty, and Savings Behavior Since the Mid-1950's," Explorations in Economic Research, Fall 1977, 4 (4), pp. 558-78.

THE DISTRIBUTIONAL EFFECTS OF INFLATION AND THEIR IMPLICATIONS

By Joseph J. Minarik*

CONTENTS

	Page
1. Introduction and summary	225
The distributional effects of inflation	226
Implications for policy	229
Anti-inflation policy	230
2. Inflation, economic well-being, and policy	231
Low-income households	231
Middle-income households	235
Upper-income households	237
The elderly	238
3. Inflation, incentives, and efficiency	243
Low- and middle-income households	243
Upper-income households	251
Summary	257
4. Conclusions	259
5. Simulations of the distributional effects of inflation	261
Methodology	262
Simulation results	270

1. INTRODUCTION AND SUMMARY

This paper is written to provide a basic understanding of the distributional effects of inflation and their implications for current economic policy. Detailed computer simulations will be used to estimate inflation's effects on various population groups. While the results would probably attract majority agreement among economists, they may seem quite surprising to laymen. Also, this research provides richer information with which all segments of the political spectrum can press their policy proposals; it does not settle the issue in favor of any particular group. The author's own view of the policy implications of this research will be presented, but this view has no more inherent validity than anyone else's.

Before the distributional effects of inflation can be understood, three principles must be firmly established. Indeed, it is a failure to understand these principles that leads many non-economists (and even

* Research associate, Economic Studies Program, the Brookings Institution. Edward M. Gramlich, Robinson G. Hollister, Daniel J. B. Mitchell, John L. Palmer, Joseph A. Pechman, Emil M. Sunley, and the staff of and participants in the Special Study provided many useful comments. Todd E. Easton provided diligent and careful research assistance; Richard Booth, Mary Bell Hevener, Richard Marney, James G. McClave, Jr., and Laurent R. Ross also provided helpful research assistance for short periods. This paper incorporates and builds upon "The Size Distribution of Income During Inflation," Review of Income and Wealth, December 1979. Opinions expressed herein are those of the author and should not be attributed to the Brookings Institution, its officers, trustees or other staff members, or to the Special Study participants or staff. Any and all errors are the responsibility of the author.

a few economists) to react to this interpretation with something between surprise and shock. The principles are:

First, to evaluate inflation's impact we must consider its effect not only on prices but also on incomes, taxes and wealth. The worker who considers an 8-percent increase in the price of peanut butter to be the thievery of inflation, but thinks his 10-percent wage increase is his earned right, is kidding himself. The same is true of those who jump to conclusions about inflation without considering its effects on taxes, stocks, bonds, or savings accounts.

Second, the effect of inflation in *changing* the real income of a household is not necessarily related to the preexisting *level* of real incomes of that household. Put another way, inflation might have a very small impact on the real income of a low income household, but a much larger impact (in absolute *and* percentage terms) on the real income of a high income household. In this example, inflation has not appreciably hurt the poorer household, but has hurt the richer household even though the latter remains substantially better off than the former.

Third, inflation was not the cause of everything that happened over the past 10 years. Much of the public dissatisfaction can be traced to high unemployment and slow economic growth, which were not the direct results of inflation. Blaming all of our ills on inflation would divert our attentions from our other very important tasks.

With these principles in mind, let us now summarize the distributional effects of inflation, which are described in detail in section 5. A summary of the policy implications will follow.

The Distributional Effects of Inflation

LOW-INCOME GROUPS

Rather than any precise "low income" boundary line in dollars, let us consider here households that rely primarily on government transfer payments for their support. Wage earners, property income recipients and the elderly are considered later.

Over a short period, low-income households are indeed the most adversely affected when prices increase, simply because they have the least maneuvering room in their budgets. But over longer periods their incomes tend to catch up with prices. Two important cash transfer programs—social security and supplemental security income—are indexed annually for inflation. Federal employee retirement programs are indexed semiannually. The in-kind transfer programs either increase their bonus values for inflation (food stamps, indexed semiannual) or cover the cost of obtaining certain services, and thus are implicitly indexed (public housing, medicaid, and to a lesser extent, medicare). Other programs administered by the states are either explicitly indexed or have kept roughly in step with prices through discretionary action (unemployment compensation, aid to families with dependent children [AFDC]).

Thus the adverse effects of inflation on low income households must be significantly qualified: First, many if not most low-income house-

holds are protected by explicit or implicit indexing of their incomes; and second, most such households suffer only for short periods, less than six months or one year, before their incomes jump to catch up with prices. Low-income households' problems with respect to inflation are therefore not so much general problems as they are problems of pockets of the population that are not protected by indexation—in particular, households not covered by medicaid or from states that have not increased their AFDC (or local welfare) benefits. This problem must realistically be described as limited, and subject to minor policy revisions.

MIDDLE-INCOME HOUSEHOLDS

The second class of households considered here is the group with middle incomes. Again the definition is not expressed in dollars, but rather in terms of the primary source of income—in this case, labor (wages, salaries, self employment or partnership income). The effects of inflation on lower and higher income households relying on labor income are similar.

Middle-income households benefit from the well-documented tendency of labor earnings in the U.S. economy to keep pace with prices (if not exceeding them). This is to be expected, because the price of any good is someone's receipt, and that receipt obviously keeps pace with the corresponding price. While aggregate wages keep pace with prices, any given contractually fixed wage or salary will lag behind prices for a time until it jumps to catch up (and usually pass) the price level. Also some workers with market power may obtain wage increases larger than the average, while others with limited skills may get less. This is a phenomenon that would persist with or without inflation, and inflation's effect on the process is small or nil.

Unlike low-income households, those with earned incomes tend to own some assets, predominantly homes. Home ownership has proven to be the main hedge against inflation for the household sector. Household benefit from home ownership during inflation for three main reasons: First, while the services of the home are fixed in real terms, the mortgage payments for principal and interest are fixed in money terms—meaning that even in a rapid inflation, a substantial part of the middle income household's budget does not inflate at all; second, houses have tended to appreciate at least as fast as the inflation rate, leaving the household with an asset it can sell or use as security for a loan at a later date; and third, the household's mortgage debt depreciates in value with each increment to the price level. The benefits of home ownership to middle-income households have proven substantial over recent years. Households have demonstrated that they understand these benefits by paying higher home prices at higher (tax deductible) interest rates, in anticipation of fixed out of pocket housing costs and future asset appreciation.

Households with confidence that their real incomes will rise have used the same technique of borrowing to accelerate their consumption of other goods. Such households understand that their debt will depreciate as the price level rises, and their fixed repayment schedule will become less onerous as inflation drives up their nominal incomes. This trend is evident in the rapidly increasing amount of outstanding consumer debt.

On the other side of the coin, the progressive Federal income tax imposes a higher burden on workers as prices and incomes rise. This is because any increase in earnings, even if only sufficient to keep real pretax income constant, is taxed not at the worker's average effective tax rate, but rather at his highest marginal rate. This effect is real but comparatively modest in importance, especially because the Congress has reduced the taxes of middle income households on numerous occasions to compensate for inflation.

The net effect of all of these factors is that the average middle income homeowner is the big winner in inflation. His labor income keeps up with prices, his home appreciates in real terms, and his home mortgage payment does not increase at all. The Federal income tax becomes somewhat more onerous, but this effect is far outweighed by the benefits of homeownership. The average middle income home renter does not fare as well, but overall he nearly keeps up with inflation.

Thus, middle income households generally profit from inflation or stay nearly even. Workers with low skills and slowly increasing wages may have lost some ground, but here again the root problem is not inflation but a shortage of earning power. Policy choices that focus on the minor impact of inflation rather than the real problem may leave low wage workers worse off than before.

UPPER-INCOME HOUSEHOLDS

Upper-income households are defined here as those with significant amounts of property income—interest, dividends, or rents. Many upper income households have considerable earned incomes, while some lower income households (especially retirees, who will be discussed in a separate section) receive all or most of their income from property.

The financial affairs of the well-to-do are much more complex than those of the average family, and so it is not surprising that the effects of inflation on the wealthy are more complex also. As income and wealth increase, the relative importance of labor earnings and homes tends to decrease, and other income and asset types tend to become more prominent. No other assets or income forms retain their value as well as housing in inflation, however, and as a result the upper income groups are left substantially worse off.

Corporate stock, for example, is not the inflation hedge it once was thought to be. Corporation income taxes tend to increase in real terms during inflation, largely because depreciation allowances do not keep up with the cost of capital goods. As a result, the real value of corporate stock can be expected to fall, as it has since the mid-1960's. Bonds and other debt instruments are equally unattractive, because inflation depreciates the value of the principal. Interest rates do rise as a result of inflation, but the increase has been insufficient to compensate fully for the depreciation of the principal, and even that insufficient compensation is subject to the Federal income tax. Thus, the bondholder in an inflationary environment typically finds himself earning low if not negative real after tax yields. The well-to-do benefit from the depreciation of their debts the same as middle income households, but

the amount of debt of wealthy households is typically insignificant relative to their net worth.

Thus, the wealthy have no safe and profitable store of value in times of inflation. All the alternatives to conventional forms of saving have some significant drawbacks: Real estate speculation is risky, entails significant management responsibilities, and (depending on the choice of investment) may have no current yield; gold is likewise risky, has no current yield, and may entail storage costs; and antiques and other collectibles are also risky, pay no current yield, and involve substantial storage costs. The fact that many upper-income investors are driven into such offbeat forms of saving is an indication of how drastically inflation limits their prospects (though the speculation game has winners as well as losers), and how costly inflation can be in terms of the diversion of saving from socially productive to socially unproductive channels.

THE ELDERLY

A special case in terms of inflation's impact on the distribution of income is the elderly. Their lot is unique because even those at comparatively modest income levels receive substantial shares of their income from property, which (as was just discussed) does not keep pace with inflation. Income from private pension rights lags prices even more than that from stocks and bonds, with many private pensions permanently fixed in money terms.

The elderly hurt most by inflation are those who rely most heavily on private pensions or on their own savings. The notion of the social security recipient as the chief loser in inflation is largely incorrect; the social security benefit keeps up with inflation. If there is hardship it is mostly because the benefit is too small in the first place.

One aspect of the current inflation which has hurt almost all elderly is the rapidly rising cost of medical care. Retirees find that medical care consumes a rising fraction of their budgets—medicare does not absorb all costs nor are all elderly covered.

Implications for Policy

The policy summary that follows is a distillation of sections 2 and 3.

As was mentioned earlier, inflation is not the major problem of low income households. For those whose transfer payments are already indexed, any remaining need indicates only that benefits are inadequate even without inflation—an issue that should be addressed, but not here. To alleviate any remaining inflationary burden, the Federal Government should mandate inflation indexing of AFDC and unemployment insurance benefits in states where such action has not already been taken.

Middle-income households are doing well now, and need little further protection. Those working at the low end of the wage scale recently received a substantial increase in the minimum wage, which should more than suffice for purposes of offsetting inflation; any remaining hardship is caused not by inflation but by poor job opportunities and skills, which must be dealt with on their own terms. Federal income taxes should be reduced periodically—not automatically—to offset inflation's tendency to increase real effective tax rates, if fiscal policy

considerations permit; Congress has already shown sensitivity on this issue.

Despite their losses of real income, upper income households cannot be considered burdened by inflation, simply because their resources are sufficient to cope; policy action should be directed not toward any burden, but rather toward economic efficiency. Inflation's incentives toward unproductive saving in gold and other collectibles should be counteracted by targeted incentives toward productive saving, such as business investment. Tax cuts for capital gains are not targeted investment incentives, but rather blanket largesse that rewards, among other things, investment in gold, Persian rugs, and antiques.

Automatic indexing of the Federal income tax should be avoided because it weakens a built-in stabilizer against inflationary excess demand, and because it would be extraordinarily complex, if not impossible, to do correctly and completely. Indexing of capital gains taxes in isolation would be inequitable to the average American with small cash savings in the bank; indexing of interest receipts but not of interest paid (debt) would permit an orgy of tax sheltering; indexing of debt would be political suicide, requiring as it would the payment of tax by homeowners on the depreciation of their mortgage balances. Thus partial indexing of the income tax would fail on grounds of equity, while complete indexing would complicate the tax law, hamstring fiscal policy, and revolutionize tax practice in a manner to rival the Boston Tea Party—from the point of view of a tea drinker.

The elderly are most in need of policy action. Retirees should be permitted to put their savings (up to some limit) into government-financed purchasing power bonds, paying interest that is indexed to the inflation rate. This would give the elderly some protection against their great fear today: Outliving their savings. It would also give today's workers a greater incentive to save, in the knowledge that once they retire, their wealth will be protected from inflation.

Social security and supplemental security income could be indexed semiannually rather than annually if cost and administrative impediments could be overcome. Medicare coverage, if extended to more of the elderly and expanded in scope, could reduce the burdens on the elderly; unfortunately, the costs would be quite large.

Anti-Inflation Policy

The introduction included the argument that the greatest reductions of real income due to inflation were those of the rich, and that in contrast the losses of the poor were quite limited. This is not to say that inflation is desirable as an equalizer of the distribution of income or as a de facto wealth tax. The wealthy who lose most from inflation are those who save in socially desirable forms, such as corporate stock. Inflation encourages them to shift their resources to unproductive investments such as gold or collectibles. Those with more modest incomes are discouraged from saving at all. And inasmuch as rapid inflation encourages ever higher wage and price demands to "get ahead", there may be a strong tendency for inflation to accelerate in a socially destructive zero-sum contest.

The results presented here do suggest that a policy-induced recession does not "save the poor from inflation"; rather it amputates the hand

to relieve the hangnail. Surely prudent fiscal and monetary policy is essential. But instead of extreme restraint, we should carefully examine all of the tools that do not reduce real output, including regulatory simplification, appropriate antitrust enforcement, and tax and moral suasion incentives for socially responsible wage and price behavior.

2. INFLATION, ECONOMIC WELL-BEING, AND POLICY

This section will focus on the policy implications of the distributional effects of inflation on different income classes. It will emphasize the distinctions between cash and comprehensive income, and between households of average circumstances for their income classes and those in unusual circumstances. The elderly will be the topic of a final, separate subsection. The approach to be taken in the policy discussions is to consider separately macroeconomic restraint, which would eliminate inflation's redistributive effects but reduce real output, and other policies that would reduce the redistributive effect without any explicit effect on either inflation or output. Household behavior will be assumed fixed; incentives to change behavior will be discussed in the next section.

Much of the discussion is based on simulations of the distributional effects of inflation. Some references are made to the simulations. A detailed exposition of the simulations is postponed to the final section, to spare the noneconomist any unnecessary complexity. The technically minded reader may wish to skip to that section before proceeding with this discussion of policy.

Low-Income Households

For purposes of this discussion, low income households are those with incomes below approximately \$9,000 in 1978 dollars. This a particularly diverse group. Apart from the low income elderly, who will be discussed elsewhere, there are at least three types of low-income households. The first is households supported by low wage workers, with or without some supplementation through government cash (particularly unemployment compensation) or in-kind (particularly food stamps) transfers. The second group is the dependent population, whose major source of income is government transfers (particularly aid to families with dependent children [AFDC], supplemental security income [SSI] and food stamps) with smaller amounts of labor income in some cases. The third group is households with larger amounts of positive income offset by business losses. Each of these groups will be discussed in turn.

HOUSEHOLDS WITH LABOR INCOME

The low-income working household is on average and over the long run relatively well protected from inflation. Because wages tend to keep up with prices, the main source of income is largely unaffected in real terms. Unemployment compensation benefits are usually a percentage of wages for low paid workers, and thus are implicitly indexed to wages and the price level. Food stamps are explicitly indexed.

Households which are subject to the Federal income tax will suffer real tax increases proportionately greater than the increase in their real incomes. The absolute tax liabilities in this income range, however, are generally so small that the effect on well-being is modest. Further, periodic reductions have tended to lighten even this modest burden. Figure 5, in section 5, illustrates the effect of taxes by showing the ratios of real before and after tax income with and without inflation. At low incomes, the change in before tax real income due to inflation is quite like that for after tax income, indicating that the tax system itself plays only a modest role.¹

Low income working households with children can be affected somewhat capriciously by the interaction of inflation and the earned income tax credit. Under 1979 law, those with earnings below \$5,000 would have their credit increased in proportion to inflation if prices and wages increased. Those with earnings between \$6,000 and \$10,000, however, would have their nominal tax credit reduced by \$12.50 for every \$100.00 increase in earnings, whether real or due only to inflation.

To the extent that low income working households have preexisting debts, they benefit from the depreciation of the principal amounts.² If they choose to and can borrow, they will find that inflation makes the repayment burden less onerous.

A further benefit to some low-income working families is home ownership. As was noted earlier, home ownership can reduce the discomfort of inflation in three separate ways: The market value of the home tends to increase along with the price level (if not faster—see the next section); the real value of the home's services is constant; and the principal and interest payments (if any) remain fixed in money terms. Because the value of an owner-occupied home is usually several times the amount of annual income (except at much higher income levels), home ownership often dominates all other factors in determining the redistributive impact of inflation. Figure 6 in section 5 shows the result of a simulated 2-percent inflation increase for homeowners and nonhomeowners respectively, using the accrued comprehensive measure. For relatively low income households, home ownership is clearly the difference between staying ahead and falling behind during inflation. (The impact on other income classes will be discussed later.) Further, the difference between the outcomes for homeowners and nonhomeowners taken as groups is far greater than the net impact of inflation on the entire income class (as seen in figure 1, section 5), indicating that home ownership is a powerful influence.

The simulation results discussed thus far are subject to certain qualifications. First, the results are averages and do not represent the outcomes for all individual households. The most important deviations from the average are likely to occur in wage adjustment. Even if the wages received by low-income working households keep up with inflation on average and over the long run, deviations will occur.³ In the short run, some workers who keep up with prices over the long haul

¹ The effects for households with greater incomes will be discussed later in this section.

² Of course, this is not to say that households in debt are better off than others in absolute terms, all else being equal.

³ As is explained in section 5, this analysis deals with the impact of inflation only; unemployment, trend growth of real wages and career advancement are ignored.

will lag because of random factors such as durations of contracts and customary dates for wage adjustments. Others with better fortune will jump ahead of prices for a time. Apart from chance, there will be systematic variations as well. Some marginal low wage workers probably are paid at (or below) the legal minimum for extended periods, with only a tenuous hold on their jobs and no hope of increased wages; others may benefit if employers increase low wages more rapidly than higher ones explicitly to protect their more vulnerable employees from inflation.⁴ Weak firms may grant nominal wage increases during inflation little greater than they would without inflation; strong firms may grant much larger nominal wage increases to improve morale, expecting inflation to cut the real cost. Thus low income workers will clearly have varying wage adjustments during inflation.

A further consideration is the pattern of price increases; if necessity items increase in price faster than average, households with modest incomes will suffer greater losses in real purchasing power than under a uniform inflation. Much has been made of the rapid inflation in food, fuel, housing and medical care prices over the past five years, but the case is often overstated. First, apart from the outburst in 1973-74 and a renewal in recent months, prices of food and fuel have not inflated at faster than average rates. Second, increases in housing costs have generally been concentrated in home purchase, rather than rent or operating costs of a previously purchased home, and thus do not affect low income households so much as others. Third, some low income households are shielded from medical care costs by medicaid and medicare; the problems that remain are sectoral in nature and are not dependent upon the behavior of the aggregate economy in any event. Finally, the difference in the effect of a food and fuel concentrated and a uniform inflation, as is shown in section 5, is not great.

A second limitation of the simulation results is that either cash income or accrued comprehensive income can be the more relevant measure of well-being under different circumstances. The key factor is the appreciation of owner occupied homes. Low-income households are better off on the balance sheet when their houses appreciate, but that may be a mixed blessing. Home appreciation would cause reassessments and higher property taxes in a correctly administered system, assuming that tax rates are not reduced. This could be a problem for households whose cash income, such as wages, did not keep up with prices. While credit-worthy households could borrow against their house appreciation to meet current cash needs, lower-income households would be less likely to have that option. The credit worthiness question is relevant even without house appreciation; any debtor is better off as inflation depreciates the principal amount of his debt, but those who cannot attract lenders cannot take advantage.

In summary, the low-income working household tends to keep up with inflation, although there can be considerable variation from household to household. Individual wage rates may rise faster than or lag behind prices due to random or systematic factors; households may or may not benefit from home ownership, and they may or may not be able to take advantage of inflation's transfers from debtor to creditor.

⁴ Many union cost of living adjustment formulas are so designed; the recent increase in the minimum wage has the same effect.

The costs to households that fail to keep up with prices could be great. Some observers argue that an equal percentage reduction of income inflicts greater hardship upon a low income household than one of greater means.

The potential for public policy on behalf of low-income working households is limited. On average, protection is already effective in that food stamps and unemployment compensation are indexed (implicitly or explicitly). What actions remain to benefit such households would really be directed at altering the distribution of income rather than giving protection from inflation. Sectoral policies with respect to food, energy and medical care may help to protect those households most affected by concentrated price increases in necessities, and not protected by medicaid or food stamps. Automatic indexing or regular discretionary tax cuts would prevent the tax burden from increasing. The earned income tax credit phaseout limits should be increased in line with prices, lest the capricious reduction in the credit due to inflation have a confusing and demoralizing effect on recipients.

HOUSEHOLDS WITH TRANSFER INCOME

Low-income dependent households are subject to similar variations of response, particularly in transfer income. While SSI and food stamp bonuses are explicitly indexed, benefits from AFDC (in most states) are not. Analysis indicates that benefits in most states have kept up with prices, but mostly because of informal, inexact adjustments. Further, some benefits surely are not increased and lag behind prices. Thus, some households that are neither homeowners nor "credit worthy" lose ground during inflation. Again, these households suffer more if necessities increase in price faster than the average rate of inflation, apart from the protection afforded by medicaid and food stamps.

Public policy to protect dependent low income households could begin with mandatory indexation of AFDC benefits. While, on balance, the record over recent years appears satisfactory, variation in benefit adjustments from one State to the next could be great, and the losers could be hard pressed. These households are protected from both food and medical cost increases through the indexation of food stamps and the comprehensive coverage of medicaid.

HOUSEHOLDS WITH BUSINESS LOSSES

The well-being of the third group of households, those with sizable business losses, is much harder to analyze. Business losses can be either real diminutions in well-being or temporary accounting devices for purposes of tax sheltering.⁵ The positive and negative income flows that net to small positive totals may be of any size, and may represent any amount of wealth. Thus little can be said with certainty of this small subgroup of households.

In summary, nonaged low-income households stay very nearly even with prices on average. There are clearly some households that do not keep up, and in those cases there is hardship. However, the reduction

⁵ The tax return data used for the simulations show only the net amount of business income, with no detail as to its character.

of real income in such cases is small, simply because wages and transfers are not reduced as much as income from property. Policy analysis must come to grips with the hardship in certain low income households, but must also consider other influences on well-being. For example, if a poor household would suffer serious hardship in a world without inflation, and inflation makes the situation painfully but marginally worse, what should be the public policy response? Should government pursue fiscal and monetary stringency, perhaps costing many hard-pressed workers their jobs and reducing real output by tens or even hundreds of billions of dollars? Or should it focus on the greater part of that hardship, which would continue even without inflation, and is primarily a lack of earning power and employment opportunities? These findings suggest that the burden of proof should be on those who advocate slow economic growth or recession in order to "save" low income households from inflation.

Middle-Income Households

Middle-income households are those with incomes between about \$9,000 and \$37,500 in 1978 dollars. The simulations in section 5 showed that inflation has no significant effect on these households by either income measure. This result for Census income is caused by the tendency of wages and salaries to keep up with inflation; most of these households receive virtually all of their income from labor. For accrued comprehensive income, the net effect is the result of several offsetting influences.

Middle-income households stay even with prices if their wages and salaries keep up with the price level.⁶ They lag behind to the extent that their income is derived from property (usually a small influence). They lag further through increased real income tax liabilities due to inflation—as additional wage or salary income, intended to keep the household even with inflation, is taxed at the highest applicable marginal tax rate. Figure 5, in section 5, illustrates this effect; it can be seen that the negative impact of the tax system on real incomes during inflation increases as incomes increase from the low through the middle range.

Middle-income households benefit from inflation, however, to the extent that they own homes and are in debt. Their debts, including mortgages, depreciate as the price level rises. Further, their homes tend to appreciate with the price level. Their mortgage payments are fixed in money terms, and so they would gain if their incomes merely keep up with inflation because their mortgage payments do not. While figure 1, in section 5, shows that middle-income households were on average unaffected by inflation, figure 6 shows that middle-income homeowners in fact profit from inflation, while middle-income renters are somewhat worse off. As will be explained in more detail in the next section, middle-income households can gain still further if they choose to increase their investment in housing and their use of credit in response to inflation.

⁶ While unemployment compensation is normally a fraction of wage or salary income and thus is implicitly indexed, some middle income households would be constrained by state benefit maxima if they were to experience unemployment. They thus would receive lower real benefits with inflation than if there had been no inflation.

The results for middle incomes, like those for lower incomes, are subject to certain qualifications. First, wages of middle-income workers can lead and lag the price level like those of lower-income workers, even though they generally keep up. Individual home values might increase faster or slower than the price level. Thus, again, the simulation results are averages, while individual households might do better or worse.⁷

There is also the distinction between cash and accrued income. Households living in appreciating homes have an accrued gain in the house value, but an increased current liability in higher property taxes. For most middle income households this would not be a problem, but for those whose cash incomes lag behind prices the higher property tax bill could cause discomfort.⁸ In general, however, middle-income households would be credit worthy, and thus could borrow against home appreciation to meet current cash needs and profit from the depreciation of debt.

Finally, middle-income households would be hurt by rising real tax burdens during inflation if there were no compensating tax cuts. For households whose income was entirely from earnings and who claimed the standard deduction, the remedy would be quite simple: The Congress need only increase the standard deduction, personal exemption and tax rate bracket boundaries by the rate of inflation. In fact, Congress has returned all of the so-called "inflation tax" to the taxpayers through tax cuts since the early 1950's.⁹ However, Congress has skewed those tax cuts to benefit some groups more than others—so, any particular household may be better or worse off than it otherwise would have been with a precise inflation adjustment under the tax law of any particular previous year.

One factor leading to diverse effects on individual taxpayers has been Congress' treatment of the standard deduction. Since the 1950s, the standard deduction has been increased from a small fraction of income to a relatively large fixed amount.¹⁰ Itemizers have had no such implicit indexing of their deductions, and so have faced increasing real tax burdens in some cases. Nonetheless, because personal deductions should exempt from taxation only specified types of expenses actually paid, this increase in real taxes of itemizers is not really a reduction in well-being. Rather, it is a tax on a higher real income due to the failure of the exempt expenses to increase as fast as prices in general. Of course, the simulations indicate that, on average, middle-income households keep up with prices even if the tax laws are not altered.

Middle-income households, all things considered, are neither hurt nor helped by inflation. Their incomes, mostly from wages and salaries, tend to keep up with prices; what they lose through higher real income taxes and depreciating financial assets, they gain back through

⁷ And still again, it is necessary to distinguish the effects of inflation from other influences that make people relatively better or worse off during inflation, such as the market power of some unions or the weakness of ailing firms.

⁸ An extreme case of this problem arose in California, where home values rose much more rapidly than prices in general (at least in part for reasons other than inflation) and property tax rates were not reduced to compensate.

⁹ Emil M. Sunley and Joseph A. Pechman, "Inflation Adjustment for the Individual Income Tax," in Henry J. Aaron, editor, *Inflation and the Income Tax* (Brookings 1976), pp. 153-166.

¹⁰ This is in part to influence the distribution of the tax burden and in part to save taxpayers the recordkeeping burden of itemizing, as well as to compensate for inflation.

home ownership and the depreciation of debt. Because they are better credit risks than low-income households, they can more readily borrow to take advantage of the inflation.

Public policy has little role to play in behalf of middle-income households. While indexing or annual revision of the tax code might reduce real income losses in some cases, the net effect is small even without it. The dispersion of inflation rates among different commodities is not an important factor. Households with average incomes tend to have average expenditure patterns, and if their incomes keep up with the average inflation rate their total budgets are unaffected whatever the dispersion of inflation rates of various individual commodities.

Upper-Income Households

Households with higher incomes, or approximately \$37,500 and above in 1978 dollars, receive more of their income from property than do households with lower incomes. As a result, they tend to fare worse in inflation.

As is explained in section 5, creditors lose ground in inflation. The principal value of debt securities depreciates as prices increase, interest rates of most assets can be adjusted only upon their maturity, and even at that time the additional interest flow is subject to taxation in its entirety.¹¹ Corporate stock is not a perfect alternative, because business tax burdens increase due to the inadequacy of depreciation allowances based on historical cost.¹² Only real estate and other real assets offer protection from inflation. Home ownership confers the same benefits as for other income groups, but often the home is a smaller share of total net worth for upper than for lower-income households. Figure 6, in section 5, shows that home ownership is a benefit to upper income households, but that its relative importance is not as great as at lower incomes.

Again, the simulation results are averages. Because portfolio composition of upper-income households can be quite diverse, the range of possible results can be great.¹³ The more that wealth is stored in the form of real as opposed to financial assets, or the more that is invested in firms with a high-debt financial structure, the less affected real income will be. There are limits to the household's ability to save in the form of real assets, however, as will be discussed in the following section.

¹¹ A corollary of this factor is that future tax burdens will be lower because government debt is depreciated by inflation.

¹² One criticism of this conclusion is that upper-income households will be left unharmed after share prices fall in a one-time adjustment due to the inflation. The present results reflect, rather, an ongoing reduction in share prices, relative to what they would otherwise be, due to the shortfall of depreciation allowances for each new investment by the firm. If all such losses were collapsed into their discounted value for a one-time capital loss, the effect on upper-income households would be timed differently but would be no less real. Another criticism is that this is an effect of the tax system and not of inflation alone, and thus could be easily eliminated. It is included in the simulations, however, because it obtains and is likely to persist.

¹³ The point here, to clarify further, is not that every upper-income household loses ground during inflation, but rather that the average outcome for upper-income households will be reduced relative to what it would otherwise be due to inflation. After the empirical work for this paper was completed, the Federal Reserve authorized the issuance, by banks and savings institutions, of money market certificates, with interest rates above the previous ceilings. If these savings instruments had been included in the simulations, they would have modestly reduced, but not nearly eliminated, the losses to upper-income households.

The distinction between cash and accrued income is of little importance to upper-income households. Such households have access to credit markets and can easily convert assets into cash. For this reason, the deterioration of balance sheets is clearly felt in the current position of the household.

To sum up, upper income households are strongly and unfavorably affected by inflation, as will be demonstrated below in the simulations including taxes and asset values. Financial assets fail to keep their owners in step with prices; and real assets, though less affected by inflation, are of limited application on the household balance sheet. While it is clear that the real income of the well-to-do is the most adversely affected by inflation, many would argue that well-being considerations are of minimal importance in dealing with the upper tail of the income distribution. Clearly it is a matter for personal value judgment whether a great loss to a rich person is of lesser or greater concern than a smaller loss to one less well off.

If relief of the inflation losses of upper-income households were sought, the only real path would be indexation of the tax code, but tax indexation would be extremely complex. Though adjustment of the exemptions and rate brackets would be easy, determination of the correct amounts of taxable income from property would be quite difficult. For example, interest income on financial assets would need to be reduced to account for depreciation of principal. If this were done, however, inflationary gains of debtors would need to be taxed to avoid lucrative sheltering activities; this would be extremely difficult politically and practically, because those gains are not received in cash from which the tax could be paid. (Indexation will be discussed in more detail in the next section.) Also, as figure 5, in section 5, shows, the tax system is responsible for just over half the inflationary losses to upper-income households; the rest would remain even with a perfectly indexed tax code. The balance of these losses is due to basic debtor-creditor transfers that would be even harder to correct. It seems quite unlikely that public policy could significantly reduce the inflation losses of upper-income households.

The Elderly

Households with heads 65 years old or over are truly the disaster area of inflation. The costs to this group are complex.

The single most important factor in the well-being of the elderly is the change in their sources of income. While younger households participate in the labor market and keep up with prices through increases in nominal wages, the elderly do not. Many of the elderly receive social security or supplemental security income, both of which are indexed with only a slight lag, but most of the balance of their income is derived from property. The elderly receive the usual interest, dividends and rents, which lag behind prices as described earlier. The private pensions also receive by the elderly are typically permanently fixed in money terms; they represent actuarial claims on a fixed accumulation of nominally denominated assets, with formal or even informal indexing for only a small minority. As is shown in figure 7 of section 5, the income of the elderly lags significantly behind prices because of

the predominance of property and the small amount of labor income. Unlike the incomes of younger households, which lag only at the highest levels, those of the elderly lag up and down the scale.

The elderly benefit from homeownership, and at any given income level are more likely to own their own homes than any other age group.^{13a} However, they benefit less from home ownership than do other households for three reasons. First, the elderly own their homes outright in many cases, and thus do not benefit from having a portion of their household budgets contractually fixed.¹⁴ Second, the elderly are often assumed to be poor credit risks (in part because of their vulnerability to inflation) and thus cannot as readily borrow against the appreciation brings with it higher property taxes, which the elderly can be hard pressed to pay given the lags in their cash income from other sources.

The pattern of price increases can also pose problems. The low income elderly face the same problems as similar younger families if prices of necessities increase faster than other goods. The particular pattern of recent inflation, with above average increases in medical care, is troublesome for those of the elderly who find their need for medical services increasing. Medicare and medicaid cover many of the elderly and provide an implicit indexing, but some services are not completely covered by medicare and thus can impinge on the household's budget.

The shape of figure 7 in section 5 shows significant diversity from one income class to the next in the effects of inflation on the elderly. The poorest are significantly hurt. Those with 1970-level incomes from about \$1,000 to \$4,000 receive predominantly social security and supplemental security income, and because of the indexing in those laws the losses are more modest. From about \$4,000 to \$100,000, property income is increasingly important, and thus real income losses are substantial and also greater than those for younger households. Above about \$100,000, the sources of income for young and old alike are virtually identical, and so there is little difference in their outcomes; real income losses are significant.

The stereotyped elderly household badly hurt by inflation is dependent on social security, but these results show that such households are among the least affected. In contrast, those with income from their own savings or accumulated pension right are harder hit. This yields a counterintuitive result: The elderly with higher incomes are more adversely affected by inflation. Put in other words, the low income elderly dependent on social security are better able to maintain their low standard of living than the higher income elderly can maintain their higher one. Over time, the elderly living on their accumulated savings and pensions, either alone or with social security, find that their own resources are progressively depleted. Unless they cut back on their standard of living, they could outlive their money. Social security recipients eventually would consumer all their private savings and then rely totally on social security; those who do not receive social security

^{13a} U.S. Bureau of the Census, "Census of Housing: 1970," Subject Reports, Final Report HC(7)-1, Housing Characteristics by Household Composition, U.S. Government Printing Office, 1973, Table B-3.

¹⁴ This is not to say that a household that owns its home outright is worse off than an otherwise identical household purchasing its home; rather, the latter is less adversely affected by inflation than the former.

would exhaust their savings and come to depend on supplemental security income.

SOME POSSIBLE REMEDIES

These results have interesting policy implications. First, if the goal is to reduce the redistribution losses due to inflation, policy should deal primarily with recipients of property income rather than public transfers. The problem is that nominally denominated assets, including pensions, depreciate as the price level increases.

A policy that has been suggested in other contexts but may help to solve this problem is the issuance of purchasing power bonds. A purchasing power bond is a security with a fixed real return, and thus a nominal return that varies with the rate of inflation. Some observers have proposed that the Federal Government issue purchasing power bonds to the general public to provide a government commitment to stop inflation and to give savers a guaranteed real rate of return. This proposal has been criticized because the bonds would drain savings on a large scale from private institutions and firms into the public sector, with a corresponding administrative burden on the Federal Government. An alternative would be to restrict ownership of the bonds to the elderly, with some maximum holding per person to limit the potential benefit to any individual. Bonds could be purchased with cash savings or with accumulated pension wealth at the time of retirement. Provision could be made for the elderly to receive only the interest as it was earned or to draw down the total value of their saving over a period of years. A final variation would be a purchasing power pension fund, in which benefits would be paid until death. The benefits of those who lived beyond their life expectancy could be financed by the contributions of those who died before achieving their life expectancy, as in current pension plans.

The guaranteed return on the purchasing power instruments could exceed the interest rate the Federal Government would have paid on alternative financing of the national debt in any given time period. In that case, government outlays would of course be increased—an increase one could view as an obligation the government has to ease the inflationary burden on the elderly. This view would be reinforced, and the cost kept reasonable, if a strict limit were imposed on purchases by any one elderly individual. The nature of the program might even defray part of the cost. If such purchasing power programs were continued into the long run, current benefits could be supported by capital contributions of current retirees, in a fashion analogous to the social security program. This would make the programs at least partially self financing.

Such a program has one obvious limitation. If it were voluntary, it would be attractive only as long as inflation were expected or at least feared. Retirees would invest in purchasing power instruments only as long as the expected return on conventional bonds or pensions were lower (though retirees would likely attach some "insurance" value to an asset that would pay a constant real return if there were a rapid inflation, even without such an inflation at the time of their retirement). Thus, if expectations of inflation were sharply reduced and investments in purchasing power instruments by the newly retired were to decrease, there would be less new capital to pay the inflation pre-

mium on the outstanding instruments. Of course, if reduced expectations followed a reduction in the current inflation rate, the inflation premium on the outstanding instruments would itself be reduced. There remains the issue of retiree reaction to a reduced nominal return on savings in the event of deflation; the reaction of younger households to the inflation-insured bonds for the elderly only; and the risk of trafficking in rights to the bonds from the elderly to the young.

Purchasing power bonds or pensions for the elderly deserve consideration as a partial answer to some of the redistributive problems of inflation. They would protect the elderly from some of the deterioration in their living standards that otherwise appears inevitable in inflation. The availability of that protection would encourage younger persons to save during their working lives, because they would know that their savings would buy a guaranteed real standard of living when they retired. The incentive to save could be a crucial element in public policy during inflation, as will be discussed in the following section.

As was stated at the outset, purchasing power assets are designed to protect those among the elderly who rely on income from property; these persons are the most adversely affected by inflation, though they are not the worst off in an absolute sense. Aid for the elderly who are dependent on public transfers and social security would most likely require more timely indexation of social security and supplemental security income. Benefits under these two programs are currently indexed in July of each year according to the rate of inflation between the first quarter of that year and the first quarter of the year preceding. The indexation could be made somewhat more effective if benefits could be increased every six months or every quarter, or if the lag between the measurement period and the increase in benefits could be reduced, or both. With these adjustments, the incomes of the elderly would stay closer to the price level.

There are two drawbacks to such a course. The first is administrative complexity; social security already has a multitude of programs and benefit structures, and more frequent adjustment of benefit levels would clearly be difficult. A complete assessment of the administrative costs of such a change would be necessary to match an analysis of the benefits.

The second problem with more timely indexation is the budgetary cost. There is no question that benefits would be higher than under the current system for at least part of each year,¹⁵ and someone would have to foot the bill. One could argue that such social security inflation protection should be financed through higher payroll taxes, but that argument would likely fail politically in light of the recent substantial increases. A second option would be the tax reformers' proposal of many years: Subjecting a portion of social security benefits to the Federal income tax. Half of each individual's social security benefit was earned through the untaxed employer's contribution. (Assuming that he was an employee rather than self-employed; in the latter case the question is more complex.) Revenue from taxing half of benefits could be assigned to the trust funds to finance more timely indexation.

¹⁵ For example, a shift to indexation in July and January from indexation in July only would result in higher benefits from January through June and the same benefits in July through December.

Even with that step, social security would be taxed more favorably than private pensions; not only the employer contribution and its implicit earnings, but also the implicit earnings of the previously taxed employee contributions are taxed when distributed.

Taxing social security benefits to finance higher benefits might appear to be merely sleight of hand, but that is not the case. Even if each dollar of additional tax were distributed so that aggregate net benefits were constant, the distributional result would be changed. Many of the elderly would pay no income taxes even if half of their benefits were taxed. With the standard deduction now \$2,300 and with two \$1,000 personal exemptions (taxpayers over 65 years of age receive two personal exemptions under the Federal income tax) an elderly individual with no other income would have to receive annual benefits of over \$8,600 before he would be subject to tax; this is unlikely if not impossible. Thus taxation of half of social security benefits would affect only those with considerable income from other sources, but the poorest of the elderly would gain from greater benefits through more timely indexation. This course does not reduce the cost of higher benefits under supplemental security income, of course, which is funded through general revenues.

More timely indexation of social security benefits is one way of precisely reducing those costs to the elderly that are caused by rapid inflation. There are other ways of improving the lot of the elderly that are not dependent on the rate of inflation or inflation's consequences: Higher social security benefits, social security credits for housewives based on their husbands' contributions, and higher supplemental security income benefits. Any of those alternative steps could be financed through partial taxation of social security benefits or any other means. The public policy choice of whether any action is necessary, or whether that action should be more timely inflation indexing or some non-inflation-related policy, must be made on a more comprehensive basis than the present inquiry. The focus here is explicitly restricted to inflation.

A further concern of the elderly, related to prices rather than incomes, is the cost of medical care. The elderly are vulnerable to rapid inflation of medical costs because their use of medical services is greater than average and increases as they age, thus cutting ever more deeply into their budgets. Medical cost inflation is not responsive to macroeconomic policy, and is exceedingly complex. The best that government can offer is short-run controls or long-run medical cost containment, both of which are as complex as the problem itself. Medicare could be made more comprehensive or national health insurance could be adopted in a comprehensive form, but both of these options require management of runaway health care costs and a new source of financing.

Some State governments have already introduced "circuit breaker" laws to assist elderly homeowners who are burdened by rising property tax bills due to inflation. The typical circuit breaker forgives property tax liabilities in excess of some fraction of income. This formula would certainly assist many of the hard-pressed elderly homeowners, but it also has a perverse distributional effect: At any given income level, the greatest assistance goes to those with the greatest wealth in the form of

their homes. It would be more equitable to defer property tax increases due to home appreciation until death, when the deferral could be collected with reasonable interest as a lien on the estate. This policy would not have the perverse distributional effects of the conventional circuit breaker, and the deferral would hardly constitute a burden on the heirs because it would be only the tax on the appreciation of the home. The major problem with such a policy is the reluctance of many of the elderly to incur liens on their estates even under the most favorable circumstances.

Finally, some mention must be made of the role of macroeconomic policy. Monetary and fiscal restraint are not favorable policies for low-income households, as was discussed earlier, because these policies have only questionable impacts on the modest costs due to inflation, but can have considerable costs of their own in terms of job loss and reduced real wage growth. The elderly would reap the benefits of restrictive policy in terms of reduced inflation, but would be little subject to the costs because they generally do not work. It remains to choose whether this uncertain benefit for the elderly is worth the more certain costs upon nonaged low-income households.

3. INFLATION, INCENTIVES, AND EFFICIENCY

The preceding section discussed the effects of inflation on the distribution of income and absolute levels of economic well-being—concepts that could be grouped under a loosely defined heading of “equality.” This final section will discuss the influence of inflation on economic incentives for individual behavior, and the resultant effects on the composition and level of economic output—considerations that might be classified under the term “efficiency.” Again, the discussion will be organized by income classes, first covering the incentive effects and then their policy implications.

Low- and Middle-Income Households

Inflation incentives have little effect on low-income households, because most or all available cash is used to meet current needs. However, if income (in these income groups, mainly labor earnings) is high enough that there is some discretionary cash, inflation can have powerful effects on incentives.

CONSUMPTION VERSUS SAVING

One common element among most lower and middle-income working households is small or moderate amounts of discretionary income with modest previous accumulation. As was explained earlier, inflation alters the returns to various assets tremendously. Ordinary bank savings accounts currently pay interest at rates below the rate of inflation, and so depositors lose purchasing power in the first round. If households are subject to the Federal income tax (as virtually all middle-income households are), the loss is even greater. Corporate stock is not an attractive alternative because of the inflation induced depreciation problems, as well as risk and transactions costs. Lower- and middle-

income households would clearly find saving in financial assets less attractive during a rapid inflation. Achieving appreciable accumulation with small amounts of discretionary cash at negative real after tax rates of return must seem quite unlikely to the would-be saver. Thus, it would not be surprising to find increased consumption and decreased cash saving during inflation. Indeed, as was discussed in the preceding section, some middle-income households might go beyond consuming all of their income to dissaving. Their debts would be paid in cheaper dollars and the interest costs are partially subsidized through tax deductibility.

A contrary motivation sometimes uncovered by surveys has been a fear of increased future cash needs due to rising prices and possible recession. This would encourage greater saving even at a low or negative real after tax interest rate. The deciding factor between these two contrary incentives would seem to be anticipations of future real income; the more confident the individual, the more likely he would be to reduce his savings and even go into debt.

The one form of saving that is attractive to households with moderate incomes is investment in housing. Houses, like some other real assets, tend to maintain their real value during inflation. Owner-occupied housing has in fact been the only investment accessible to middle-income households to show consistent positive real returns after taxes over the last 15 years.

Recent behavior indicates that these incentives are widely perceived, and that households expect future income growth. The home purchase market recovered quite strongly from the 1974-75 recession and achieved boom levels. When the Federal Reserve tightened credit in 1978, home demand remained quite firm over a long period. Few buyers were deterred by the higher interest rates except those completely priced out of the market.

The continued rapid inflation of the 1970's may have significantly changed consumer perception of borrowing. Households seem to feel that they can overextend themselves in the short run because inflation will help them meet the payments. As was noted earlier, a homeowner with a sizable mortgage is better off with a rapid inflation even if his earnings only keep up with prices. The part of his budget representing home purchase does not inflate at all, and his increased money wage enables him to buy more of other goods. Middle-income households are responding to this incentive by buying more homes, and more expensive homes relative to their income, than in the past. This inflation-induced shift in demand toward housing from other goods has driven home prices up even faster than the inflation rate for all other goods. This simply increases the incentive to stretch the family budget to the limit to invest in housing. Housing even becomes a substitute for, as well as an alternative to, saving in financial assets. Families can borrow against their houses' appreciation as soon as inflation increases their cash income enough to cover the mortgage payment comfortably; the proceeds of the second mortgage loan are used to pay for consumer durables or the children's education. Later, the home can be traded for a smaller unit for the parents only, with the capital gain used to finance retirement. Thus, investing more in housing is not a

trade-off for fewer other goods, it is a way to get more of both. As long as inflation proceeds and this potential is recognized, there will be upward pressure on housing prices beyond the market conditions that would otherwise obtain.

The same factors encourage buying consumer durables on installment credit. Again, households are responding to the incentives and anticipating further increases in their money (if not real) wages and salaries, perhaps because they expect continued inflation. Rather than saving to buy an expensive durable item, with the interest subject to tax, households can buy the item on credit with the interest tax deductible. If inflation increases the household's money income, the payment schedule becomes less burdensome, and with consumer credit interest rates fixed by state usury laws the payment schedule will not increase. Thus the additional after tax cost of buying on credit can be small, especially if the price of the good rises while the household saves to buy with cash. Further, the household can have the item sooner by buying on credit. Households are responding to the incentives, and consumer debt has increased at unprecedented rates.

When all of these factors are considered, a middle-income household whose wages keep up with prices is at least potentially benefited by inflation. At little additional cost, it can obtain items sooner, on credit, than it could waiting, while saving, to buy with cash. Most likely, however, even middle-income households who do choose to go into debt do not perceive this effect of inflation as a "benefit." Observers in the popular press report that many American households feel pressured to purchase expensive automobiles and other nonhousing durables by advertising, by the purchases of their neighbors, or by their expectations of their own future prosperity nurtured by years of economic growth.¹⁶ Consumers seem to feel frustrated at the current level of prices, relative to past prices, because the increase reduces their current potential standard of living. They do not seem to understand that their incomes have generally kept up with prices, and yielded some further real growth besides.¹⁷ Further, they see the installment payments and high interest rates on their consumer loans as a burden, not understanding that continued inflation and nominal income growth after the purchase help them meet the payments. Thus, while inflation does benefit the middle class by giving an option of increased consumption, and even though increasing numbers of families are taking that option, it is unlikely that many middle-income families are grateful for inflation.

While households can take advantage of inflation by borrowing, they do run certain risks. If their nominal incomes do not increase as rapidly as they expect, or if the cost of living outpaces those incomes, they might not be able to meet the payment schedules they set for themselves. The risk of accelerating consumption through inflation should trouble policymakers who observe the present record levels of consumer debt and the widely held anticipations of an economic downturn.

¹⁶ For example, see William Greider, "The Buying Binge," *The Washington Post*, Sunday, December 17, 1978, pp. D1 ff., and Boris Weintraub, "Inflation," *The Washington Star*, January 10, 1979, pp. C1 ff., and January 11, 1979, pp. C1 ff.

¹⁷ Consumers would like to spend their 1979 incomes at 1972 prices, not realizing that if there had been no inflation from 1972 to 1979, their 1979 nominal incomes would be much lower.

POSSIBLE POLICY REMEDIES

Thus, with regard to the middle class, policy must be ambivalent. Inflation can in fact help the middle class, and so policymakers who perceive this may be reluctant to undo that redistributive effect. Surely, public policy has gone to great lengths—and expense—to promote home ownership. Though inflation has increased home prices, it has also encouraged home purchase, made home ownership more profitable, and enabled households to purchase homes of a given dollar value earlier and more easily over time. Further, while inflation might have encouraged some households to shift from cash saving to investment in housing, it might also encourage a shift from consumption to housing investment. This might be considered socially desirable rather than undesirable. The investment in housing does become available to meet future needs through borrowing or realizing capital gains. The public may wish to stop inflation because of its adverse effects other than redistribution, and to undo some of its other redistributive effects; but, much of inflation's effect on home ownership would be either impossible or undesirable to reverse.

The present boom in housing demand may lead to a later collapse, but that will not necessarily occur. The nature of the additional demand is still uncertain; it could be more or earlier first purchases of homes, more frequent changes of homes over the life cycle, or continued demand for still larger homes later in the life cycle. A final possible cause would be unexpectedly high rates of family formation. Until the nature of the demand is better understood, the outlook will be uncertain. Demand for housing, in terms of current cash expenditure, must eventually stabilize as a fraction of current cash income; it cannot continuously rise and reach 100 percent. The trend of consumer preferences toward housing could actually be reversed, leading to a period of slack housing demand (and slower or negative real growth of prices). Or construction could overshoot the need for houses in certain markets, leading to excess supply. Alternatively, demand and supply could adjust more smoothly, without any sharp reversal in the markets. Policy designed to slow the current market and prevent any serious overshooting, and to divert funds from home purchase to cash saving, could follow several lines.

Some may feel that inflation has so encouraged home ownership that existing incentives should be cut back or eliminated. Tax reformers have for some time advocated the abolition of tax preferences for housing, such as the deduction for mortgage interest and property taxes.¹⁸ These steps have been opposed on the grounds that incentives for home ownership are more desirable than tax neutrality, and that these preferences are capitalized in home values. Thus, the termination of tax preferences for homeowners would wipe out large amounts of wealth, and throw lending markets into disorder as homeowners faced payment schedules in excess of both the current values of their homes and

¹⁸ The theoretically correct treatment of owner-occupiers would in fact involve far more complex steps than simply abolishing those two deductions. See William F. Hellmuth, "Homeowner Preferences," in Joseph A. Pechman, editor, *Comprehensive Income Taxation* (Brookings, 1977), pp. 163-197.

their ability to pay in after tax dollars.¹⁹ If the Congress and the public found these reforms unappetizing under stable prices, they would surely find them even more so in the present environment, with many households extended to the limit to purchase their homes.

Further the Federal Government has supported the housing market by authorizing the issuance of money market savings certificates. Banks and savings institutions now can pay certificate depositors yields high enough to keep funds from fleeing to marketable instruments. Mortgage money became nearly unavailable when before the certificates, monetary policy was used to restrain the economy, as it is presently being used. The Federal Reserve might choose to eliminate or restrict the yields of the certificates to achieve a slowdown in housing, unless the high mortgage rates forced by the certificates and tight monetary policy slow the market themselves. Of course, the Fed authorized the certificates because the boom and bust pattern of the housing market caused by withdrawal of funds from savings institutions was thought to be undesirable from a public policy point of view; and, that pattern may be less desirable than the current distress.

Indexing the tax system with respect to liabilities would remove the particular inflation payoff to mortgage debtors. As will be argued later in this section, however, complete and correct indexing would greatly complicate the tax code. Further, those who must pay tax on the income they implicitly receive through the depreciation of the outstanding principal of their mortgages would not have a corresponding cash receipt from which to pay the tax.

The unpleasant side of inflation and homeownership is that the large increases in home prices and the high interest rates have priced many moderate-income families out of the home market. Interest rates are typically set according to macroeconomic criteria that are unlikely to yield to more parochial concerns. Part of the upward pressure on home prices is due to increased construction costs, and much of that increase is simply due to high shortrun demand. There may be some room for improvement in the efficiency of home construction, however, through standardization of building codes and techniques and mass production of components. Governments' records in these areas have been less than charmed, but in light of the current difficulties further and greater effort may be warranted. The development of cheaper housing construction techniques would spread the benefits of home ownership to many households now excluded, and might ease the present housing market out of high gear before it overshoots its longrun price growth path.

Other policies could be adopted to help the lower-income homebuyer on the demand side, but they would not ease supply cost pressures and thus might contribute to, rather than forestall, an overshooting of the market. One possibility is to influence the terms under which houses of a given price can be purchased. Direct subsidization of mortgages beyond current practice would not be desirable. On the other hand, if continuing inflation is anticipated, mortgages with increasing payment schedules could be helpful. Payments early in the term could merely service the debt, with higher payments later after nominal

¹⁹ The revenue gained through the elimination of the tax preferences would have to be given back several times over in general tax cuts to leave heavily leveraged homeowners with the same after tax income.

incomes have had a chance to rise. Of course, if inflation and/or real growth were to slow suddenly, the increasing payments could prove burdensome. Another step would be to lengthen the term of mortgages beyond the current standard 30 years. Both of these steps require careful examination from all angles, not only from the present one.

The boom market in housing may soon be choked off by tight monetary policy and very high interest rates, rather than by sectoral programs designed to ease the dislocations of an ongoing inflation. If inflation should suddenly abate, many households which stretched to purchase expensive homes (anticipating that inflation would rapidly increase their nominal incomes) would find their mortgages extremely burdensome for extended periods.

Macroeconomic restraint, whether through monetary or fiscal policy, would discourage investment in housing. High interest rates would increase the monthly payment for any given price of home, and thus make home purchase impossible or unattractive for some buyers. Slow growth would cause unemployment and reduce real incomes, thus forestalling much investment in housing. However, it is uncertain whether the outcome would be desirable. Households with reduced incomes would likely reduce their cash savings, though other households might save more as a precaution against possible income loss. Households discouraged from home purchase by high interest rates would likely save to buy a home later, but they would also probably increase their current consumption. The loss of real income and the demoralizing effect of high interest rates would seem a high price to pay for a possible increase in cash saving by some households.

In contrast to inflation and housing, benefits to households through inflation and consumer borrowing seem unattractive. While borrowing substantial sums in a mortgage does not violate the old American virtues of thrift and sacrifice, going into debt for consumer durables does. Sacrificing for a home does not seem quite the same as sacrificing for a Videobeam. Nor should it. A home will provide bread and butter services over a long period in the future, while a large screen color television is the whipped cream on top of the mousse. Policy might encourage saving and discourage consumer borrowing for at least four reasons. First, saving and thrift are considered to be valuable virtues. Second, saving can help households to meet future needs, including retirement. Third, saving makes funds available for business investment, which provides future output and may add to productivity. Finally, consumer borrowing can commit households to future liabilities that they cannot meet if their income growth is slower than expected. Encouraging cash saving is one way to divert what might be considered an undesirably rapid flow of cash into home purchase.

If public policy sought to discourage consumer borrowing through relatively minor steps, there would be two immediate possibilities. One would be the abolition of interest rate ceilings by the states. This would raise the cost of consumer borrowing, and thus discourage it. However, it would also increase the burdens of those forced to borrow in emergencies, and would thus be widely perceived as permissive of gouging. A more moderate and feasible step would be eliminating the deductibility of consumer credit interest on Federal income tax returns. While interest paid for business investment is a cost of earning

income and thus properly deductible, interest paid to buy consumer goods is not.

Eliminating the deductibility of consumer credit interest would raise the problem of differentiating between that type of interest and others that are tax deductible. For example, a consumer could take cash which he would otherwise use to voluntarily retire part of the principal of his mortgage, and spend it instead. Thus he would have a large outstanding balance on his mortgage, whose interest is deductible, rather than a smaller mortgage balance and an offsetting loan, whose interest is not deductible. However, the potential for this kind of manipulation is very limited in scope—much more limited than in the current law's distinction between investment interest and other borrowing. This is a step that tax reformers have recommended for years, and with the current concern about inflation and excessive consumer borrowing and spending, its time may be at hand.

A saving incentive from the other side of the balance sheet would be a higher rate of return for small savers. Banks and saving institutions have been authorized to offer money market savings certificates, at rates slightly above short term U.S. Treasury securities, to deposits of \$10,000 or more for periods of 6 months. Small savers, however, have been limited to conventional passbook accounts and long term savings certificates, which at present pay much lower yields. The Federal Reserve is presently studying the issuance of facsimile money market certificates for small savers. If such instruments were available, with a minimum interest reduction for the greater costs of smaller individual transactions, they would help reduce the savings disincentives of inflation. They would have equity advantages as well, giving the same savings opportunities to small savers as are now open to large savers. Negative considerations, such as the additions upward pressure on lending interest rates, must also enter into the policy decision. Nonetheless, because small savers contribute only a small fraction of total loanable bank deposits, that upward pressure should be limited.

There are other policies which would encourage saving and discourage consumption in a general way; the most pertinent of these would be to change the income tax into a consumption tax. Conceptually, this involves allowing a full deduction for saving in the present tax. While the basic outlines of such a tax seem simple, the detail can be extraordinarily complex, and no discussion in this context could do the subject justice.²⁰ Notwithstanding, a brief summary of the considerations involved would be in order. A consumption tax may result in greater personal saving than an income tax of equal yield, though the difference would likely not be great. The distributional effects of an expenditure tax are hard to predict. Though theoretically the tax rate schedule could be drawn to yield any desired distribution, the information needed to do so is unavailable even if present taxpayer behavior is assumed not to change; if behavior should change due to the new tax, the distributional effects would be even more unpredictable. In any event, some economists argue that consumption is the best current indicator of long term well-being, and thus is the most equitable tax base; others would counter that a tax deduction for saving, when

²⁰ The Brookings Institution will release a conference volume on the personal expenditure tax as an alternative or supplement to income taxation, to be edited by Joseph A. Pechman, editor, *What Should Be Taxed: Income or Expenditure* (Brookings, 1980).

many taxpaying households can hardly meet their current needs and thus cannot save, is inherently inequitable.

On administrative grounds, it is clear that the problems inherent in an expenditure tax are quite different from those of an income tax, though perhaps no less manageable; the one clear advantage of the income tax is that it is in force now, while an expenditure tax could only be had through a complex and costly transition with many uncertainties. Some economists argue that an expenditure tax is conceptually less amenable to preferences and loopholes than the current income tax; others counter that the interest groups would have their way regardless, and that a real world expenditure tax would be more ridden with loopholes than the income tax. In sum, it should not be blithely assumed that an expenditure tax would be better for savings (or for that matter, any purpose) than the present income tax. The road from here to there may be difficult indeed.

Finally, personal cash saving should not be considered in isolation. Recent trends indicate that households have been more likely to borrow for current consumption and less likely to save. However, saving in the form of employer contributions to pension funds has grown rapidly over a longer period. Such pension saving meets most of the objectives for cash saving. The existence of these plans is evidence of workers' choosing to save, because they could have bargained for higher wages instead. If workers prefer pension coverage to higher wages because the funds cannot be squandered, that is at least some concession to personal thrift. Inasmuch as employer contributions to pension and insurance funds in 1975 were half again as large as personal cash savings, and 25 percent larger than consumer borrowing at 1978 levels, it is clear that any reduction in personal saving due to inflation incentives is offset in a macroeconomic sense.²¹ Finally, pension wealth will enable covered workers to meet their needs in retirement.

Tax policy is already highly supportive of pension saving. Employer pension contributions are deductible to the firm and not taxable to employees until distributed. Benefits not previously taxed are subject to the lower marginal rates often paid during retirement. Workers not covered by employer plans may make their own tax-deferred deposits. If the growth of pension plans is any indication, public policy has been quite successful at stimulating private saving, despite the disincentive effects of inflation. The role for new policy would be merely to continue the current success in expanding coverage and saving.

Thus for lower and middle-income households, the major efficiency concern about inflation is that it encourages consumption and discourages saving. In addition, inflation provides a powerful incentive to investment in homes; inasmuch as public policy has long encouraged homeownership, it is not clear whether the additional incentive provided by inflation is desirable or too strong. Ameliorative steps include raising the rate of return to saving, ending the tax subsidy to borrowing, expanding pension coverage, and encouraging the sup-

²¹ Cash and pension saving data from E. Philip Howrey and Saul H. Hymans, "The Measurement and Determination of Loanable Funds Savings," *Brookings Papers on Economic Activity* (3:1978), Tables 1 and 3; consumer borrowing data from the U.S. Council of Economic Advisers, *Economic Report of the President, January 1979*, Table B-66.

ply of moderately priced housing for owner occupation. None of these steps, however, will fully correct the problem.

Restrictive macroeconomic policies will act to increase cash saving and decrease consumption as the households able to maintain their incomes respond by taking precautionary measures. However, other households which experience job loss or reduced real incomes will reduce their savings to try to maintain their living standards. Longrun savings habits may be improved by the increased fear of further downturns, but the reduction or real output seems to be a higher price to pay.

Some economists look at restrictive policies more favorably. They see the inflationary process as the result of excessive wage and price behavior encouraged by years of growth and permissive policy. The only solution, they maintain, is an extended period of macroeconomic restraint to break the "bad habits" formed over this period.²² The research presented here is not directed towards a refutation of this thesis. Yet, given the failure of fiscal and monetary restraint in dealing with the major costs of inflation (as opposed to inflation itself), the results suggest that the burden of proof should be upon those who advocate recession as an anti-inflation policy of anything but the last resort.

Upper-Income Households

In comparison to the efficiency issues relating to middle-income households, the problems of upper income households are much more complex. This is largely a function of the number of their available options. Middle-income households can choose to consume their discretionary income, to save it in bank or savings accounts or small blocks of financial assets, or to invest in housing. Upper-income households have a much broader array of financial and real assets available, and also possess a disproportionate share of the discretionary income in the household population. For these reasons, inflation's incentives for upper-income households can strongly affect both those households and the economy as a whole.

PRODUCTIVE VERSUS UNPRODUCTIVE SAVINGS

As was noted earlier, comprehensively defined real income from interest bearing assets falls during inflation. Market interest rates adjust to higher inflation rates only with a lag, and realized yields (of long term instruments especially) lag even further. Finally, the increased interest flows that are realized to compensate for depreciation of principal are taxed.²³

Corporate stock, though traditionally considered a hedge against inflation, does not keep up with prices. Depreciation allowances based on historical cost do not allow for tax free replacement of assets after their useful lives. As a result, taxed income must be taken either from retentions or dividends to replace existing capital. On average share prices tend to increase in nominal terms but decrease in real terms.

²² See William J. Fellner, *Towards a Reconstruction of Macroeconomics: Problems of Theory and Policy* (American Enterprise Institute, 1976).

²³ The widely recognized "bracket creep," whereby households are pushed into higher marginal tax rate brackets, encourages households to invest in public sector tax exempt rather than private sector taxable securities.

These nominal gains are taxed under the individual (or corporate) income taxes when realized, as though they were real.²⁴

Thus stocks and bonds, the conventional savings vehicles of the well-to-do, are less attractive during inflation. We would thus expect the savings patterns of upper income groups to change. Alternative savings forms that are less attractive under stable prices may be used more during inflation. Various real assets are likely candidates, the most common being real estate. Households with large amounts of discretionary income can either invest more in housing for themselves, purchase additional housing units for rental, purchase commercial real estate for rental, or speculate in undeveloped land. All of these investments can be undertaken individually or through consortia of various kinds.

Such investments are attractive for the wealthy just as they would be for households of middle incomes; real assets tend to hold their real value in inflation, and the trend toward greater investment in housing has driven house values up in real terms. Economic and commercial growth, together with the substitution of new structures in growing locations for old structures in declining locations, increase the value of undeveloped land. As a result, there is little doubt that interest in real estate as an investment has broadened significantly.

While real estate can be an attractive investment for the wealthy, its application is surely limited. More expensive homes for owner occupation tie up capital in the production of more housing services than the household might need. The homeowner must wait for the house to appreciate before he can borrow usable capital, and realizing the capital gain through sale incurs considerable transactions costs. Investment in a home for rental or in commercial property involves management and transactions costs, while undeveloped land earns no rent while involving costs of buying and selling. Risks due to changes in zoning laws and surrounding development, coupled with the loss of liquidity, prevent a wholesale portfolio conversion from financial assets to real estate. Investment consortia can reduce these costs (at a price) but not eliminate them.

There are other real assets often touted as hedges against inflation, including art, antiques, oriental rugs, diamonds, and jewelry. These might be called unproductive real assets, because they do not add to the economy's capacity to produce. These investments have indeed shown a tendency to maintain their real value. Further, as more and more investors become frustrated by the return to financial assets during inflation, interest in these unorthodox investments may increase, bolstering demand and the rate of return. There are limitations on these investment avenues, however, just as there are on real estate. Art and like

²⁴ Firms might respond to inflation by reducing investment and thereby increasing the after tax rate of return with inflation to the equilibrium level without inflation. If firms invest until the marginal return after taxes is zero, and if depreciation allowances are less favorable in inflation, then investment should be reduced and the marginal rate of return after taxes unchanged on a smaller capital stock. On the other hand, if firms make investment decisions on a nonmarginal basis (such as payback periods requiring positive real after tax rates of return) then the effect of inflation on investment is uncertain. Anticipation of future inflation of the final product price and the availability of depreciation on an unrealistically short life with an investment tax credit might mean that the level of investment would not fall significantly. The level of interest rates would also be an important determinant.

investments earn no rent, and in fact incur storage cost. Liquidity is less than in financial assets, though with increased interest in these investments better markets may develop. Even with the best advice there are risks of erroneous valuation of many objects. Clearly art will be used as an investment during inflation, but it will never supplant stocks and bonds over the long haul. Given the risk involved, it is likely that such assets will be viewed as speculative, and might thus displace consumption as well as saving in financial assets.

Finally, inflation has led to an unparalleled interest in gold as an investment. While gold has appreciated admirably over recent years, it is not an ideal general purpose investment. Like objects such as art, it pays no rent, incurs storage costs, and involves valuation risks—though trading in gold futures contracts avoids the storage costs and valuation risks. Beyond those considerations, its role as an international reserve leads to price fluctuations both up and down. The investor who needs to liquidate his holdings when gold is sold to stabilize the dollar could take a substantial loss. Thus, gold will attract interest but will not supplant traditional forms of saving.

In addition to alternative forms of saving, consumption also competes with financial assets for the upper income household's discretionary dollar. If the real after tax rate of return on saving (accounting for risk and liquidity) falls, the price of future consumption in terms of current consumption rises, and we might expect more consumption in the present.²⁵ Social objectives might easily be better served by greater saving, which would generate future streams of income, than by greater consumption by households already far above an adequate standard of living.

Again the importance of these considerations depends on how great the response to the incentive is. The incentives themselves seem quite strong: figures 1 and 4 shows dramatic effects on comprehensively defined real after tax income. Yet the responses to the incentives are not so clear. Consumer debt is at all time highs, indicating high consumption and low saving rates, but upper income households are not likely in debt on consumer loans. Information on allocation of savings among financial and real assets is sketchy, but there is no evidence of any massive shifting of holdings. If corporate investment is an index of the size of the effect of inflation on savings, the outlook must be fairly sanguine. Investment after a slow recovery from the 1974-75 recession is at least for the moment quite strong.

POSSIBLE POLICY REMEDIES

The effect of inflation on incentives must remain a concern, whatever the short term indicators. Deeply ingrained saving habits might be worn away gradually by a continuing inflation. If inflation becomes a dominant element in the savings decisions of upper income households, preventive actions that do not impose significant costs on the economy will be necessary.

Among the costs likely to be imposed by some prosavings policies are reductions in fairness. The replacement of the current income tax

²⁵ There can be a contrary result, whereby households would consume less to achieve a planned level of future consumption even at the lower rate of return. Households would likely behave differently according to their income and stock of wealth.

by an expenditure tax was discussed earlier as a stimulus to saving. Another argument against the expenditure tax is that it would allow a deduction for saving, which only upper income households could use on a significant scale. Of course, the fairness of an expenditure tax would depend on the tax rate schedule used, but twisting the rates to far toward low income households might negate the savings objectives.

Besides fairness, the allocation of saving among different forms is an important consideration in prosavings policy for upper income households. Households with modest incomes are for the most part restricted to saving in bank accounts or investing in homes, but upper income households have more options. Some of these options, including saving in the form of unproductive assets, are hardly more socially desirable than consumption. Policy should target saving as much as possible to productive uses. An expenditure tax that defined unproductive assets as saving would thus fail to address some of the major concerns about inflation and incentives.

Indexing the tax code would deal directly with the effects of inflation on rates of return. Indexing for middle-income households is quite simple, involving only the personal exemptions, standard deductions and rate bracket boundaries. Indexing is much more complex for upper-income households with receipts from property. Much of the inflation problem for property income is mismeasurement of the true amounts of income, not merely the correct mathematical formulas by which to tax that income. Interest income is taxed in full under present law even though the capital that yielded that interest is depreciating. Nominal capital gains are taxed although the real gains are smaller. Corporate income is overstated for tax purposes due to the limitation of depreciation allowances to historical cost.²⁶ Correction of these measurement errors could be extraordinarily complex.

Inflation indexing of capital gains has been proposed by itself as appropriate during inflation. The technique would increase the cost basis of the asset by the rate of inflation between the time of purchase and the time of sale, and compute the gain as the difference between the inflated basis and the selling price. However, indexing only for capital gains could meet significant political opposition: How could the tax code provide relief for the capital gains of the wealthy but not for the small saver's interest, which is subject to the same measurement distortions? Even apart from the political problems indexing of capital gains would be quite complex. As just one example of the complexity, consider the capital gain on a home purchased with a mortgage loan. The correct inflation adjustment would not use the change in the price level between the purchase and the sale, because the home was not owned in its entirety upon purchase. Allowing a full inflation adjustment under such circumstances would provide a windfall to the taxpayer. The correct inflation adjustment would involve a complex indexing of portions of the equity as it was purchased over time. Taxpayer compliance would be quite difficult.

²⁶ As is noted in the section on methodology, corporate income is also subject to debtor-creditor and inventory distortions. However, the debtor-creditor issue nearly cancelled out for the corporate sector taken as a whole in the simulations, and inventory can be measured reasonably accurately with last-in-first-out accounting. For individual firms' tax computations, however, these issues would need to be addressed.

Capital gains already receive preferential treatment through the exclusion of 60 percent of the amount of the gain from adjusted gross income. While it is impossible to determine congressional intent with certainty, one of the most commonly cited motivations for the exclusion is compensation for inflation (though the compensation is clearly inexact). If gains were both indexed and allowed a 60 percent exclusion, there would be overcompensation for inflation and the preference would be excessive. If the exclusion were cut back or eliminated as part of indexation, there would be protests from those who supported the original exclusion as a stimulus to entrepreneurship or as protection of capital. Clearly, indexation of only capital gains would raise grave questions of a distorting incentive toward realizing income in the form of gains and inordinate preferences for gains recipients.

Corporate depreciation allowances would also require careful handling. The historical cost of assets might be indexed according to changes in their own replacement values, but that would disproportionately reduce the costs of processes that the market made more expensive. A better approach would be to increase all depreciation allowances (computed according to historical cost) by a single average deflator for capital goods, or at most separate deflators for equipment and structures. Again, however, all depreciation policy should be considered in an indexing decision. Depreciation is presently accelerated through use of double declining balance and sum of years digits formulas as alternatives to straight-line depreciation, and by the use of shorter than average service lives through the asset depreciation range system. The cost of certain types of investment assets is further reduced by the investment tax credit. These provisions all have several purposes, including the subsidization of investment (or certain types of investment) as well as compensation for inflation. If depreciation allowances were to be indexed, therefore, it would be essential to consider whether the existing tax preferences for investment should be continued in full, in part, or not at all.

Complete indexation would require considerable modifications to the present treatment of interest income receipts. The depreciation of the principal amount of bonds and interest bearing accounts would be deducted from cash interest receipts to determine real interest income. In many cases, at current interest and inflation rates, real income would be negative. The demand for debt securities would surely shift dramatically, both in terms of total demand and relative demand for risk-free as opposed to risky securities.

The implications of such a step would be far reaching. It would be impossible to index interest bearing assets without also indexing interest bearing liabilities. If only assets were indexed, the opportunities for tax sheltering would be enormous. A taxpayer borrowing at 10 percent and lending at 5 percent interest during a 5 percent inflation would have no real taxable income, but a 10 percent interest deduction that would shelter income from other sources. A taxpayer in a tax rate bracket over 50 percent would make money through such an uneconomic transaction.

Indexing debt would entail adding to adjusted gross income the depreciation in the principal value of liabilities. It would require that tax be paid even though those gains were not realized in cash. Indexing

debt would touch virtually every household in the country, but would be particularly onerous upon homeowners with large mortgages.

Indexing the tax base is thus an extremely complex undertaking. Partial indexation, involving only certain types of assets, is subject to political attack and introduces distortions through unequal treatment of indexed and unindexed assets. Indexing for all assets would fundamentally change the basis upon which our entire economy functions. It would dramatically alter asset values and the distribution of wealth; even with the most careful transition procedures, it could alter the distribution of income as well. While indexing could be undertaken to undo the effects of inflation on the incentives of the well-to-do, it would only partially accomplish that task—while having drastic effects on homeowners with modest incomes. Indexation should be avoided unless it is clear that rapid inflation in the future is inevitable.

Another policy sometimes proposed to increase work and savings incentives is a large reduction in marginal income tax rates, such as the Roth-Kemp bills of the preceding and the current Congresses. These proposals would cut marginal income tax rates across the board by approximately 30 percent. Such tax rate cuts, the sponsors claim, would undo the “bracket creep” caused by inflation. Further, they would increase the after-tax payoff for each additional dollar of income earned, and thus encourage additional work and savings. Finally, the lower tax rates would reduce the payoff to tax avoidance and tax shelters, thus redirecting resources to productive pursuits.

Roth-Kemp encompasses certain implicit (this year, explicit) judgments about the appropriate size of the public sector which are unrelated to the subject of this paper. But for any desired amount of tax collections, income tax rates can be high or low according to the size of the tax base, and the amount of deductions from that base for tax preferences. Income tax rates could be even lower than those proposed under Roth-Kemp with no loss of tax revenue if only the many loopholes in the income tax code were closed.²⁷ If desired revenue were less than that under current law, the tax rates could be lower still. Thus, if the objective were to reduce tax rates across the board in order to increase incentives, the best way would be to close the tax loopholes and then set tax rates as low as possible to achieve the desired tax revenue.

The Roth-Kemp claim that lower tax rates will reduce the use of unproductive tax shelter investments is also questionable. It is unlikely that those who have learned to avoid taxes at 70 percent rates will forget their trade just because tax rates have been reduced to 50 percent. More likely, they will continue their work at a slightly lower wage. The only way to stop tax sheltering is to repeal the provisions that make it possible. Those who advocate sharp reductions in marginal tax rates, without any compensating reductions in the many tax preferences in the current law, are ultimately spokesmen for wealthy tax avoiders who want to have their loopholes and eat them too. Further, capital gains on oriental rugs and antique jewelry would be just as favored by Roth-Kemp as would profits on the sale of corporate stock.

²⁷ Joseph J. Minarik, “The Yield of a Comprehensive Income Tax,” in Joseph A. Pechman, editor, *Comprehensive Income Taxation* (Brookings, 1977), pp. 277–298.

It is possible that policies either to stop inflation or act directly on its symptoms would not be chosen. If policies unrelated to inflation are needed to encourage saving and investment, they should be targeted specifically toward productive investment. Reductions in the corporate tax rate, increases in the investment tax credit and liberalizations of depreciation allowances increase the after-tax rate of return to businesses, and thus encourage greater saving in the form of corporate stock and greater investment. Integration of the corporate and personal income taxes could also increase saving and investment incentives, although it would be exceedingly complex and could have unfortunate equity consequences.

The other side of targeting policies toward productive investment would be avoiding any encouragement of unproductive investment. Some purchase's of jewelry or like items might anticipate that they could liquidate their investments for capital gains without paying any tax. It is important that the tax laws be enforced in every case, but particularly here where the prospect of simple tax evasion might lead funds out of productive uses.

Macroeconomic restraint would be of dubious value in dealing with the inflation incentives for upper income households. The "contractionary" policies are intended to choke off investment, in the first round, to slow inflation; while the first concern about inflation's incentives is the reduction of investment. Incomes from corporate stock, both in the form of dividends and accrued capital gains, would be lower due to reduced profits. The incentive to invest will be reduced until demand recovers sufficiently to restore capital utilization to higher levels. Thus, the main incentive concern of inflation, productive investment, will be set back by this remedy for inflation.

If the 1974-75 experience is any guide, the reduction in investment from economic downturns is substantial. Business fixed investment (in 1972 dollars) fell from about \$130 billion in 1973 to about \$110 billion in 1975. The recession's impact on inflation was limited and short-lived. In contrast, the impact of inflation on investment, independent of the effect of monetary policy through interest rates, is surely more modest. Clearly, it would take a large reduction in inflation over a long period to justify the immediate investment cost of recession. Given the uncertainty of the anti-inflation effectiveness of macroeconomic policy, and the residual effects of low capacity utilization rates during a long recovery and high interest rates used to choke off inflation, the investment cost of recession could be even greater over time. Thus, restrictive policies seem to have little favorable effect on inflation incentives, and would appear quite unattractive unless inflation were out of control and other policy remedies had failed.

Summary

Ultimately, the incentive effects of inflation must be evaluated empirically, in a manner beyond the scope of this paper. However, a qualitative examination of the question does yield some tentative conclusions. Inflation definitely encourages middle income households to spend more, borrow more and buy more housing, and to save less in the form of time and savings deposits. Data indicate that households

have increased their consumer borrowing, consumption and home purchases. The urgency of concern for these phenomena is debatable, however. The cash savings of middle income households are only a small part of total savings, and so the macroeconomic consequences are limited. Further, these cash savings are increasingly supplemented by employers' pension contributions, which fulfill the macroeconomic role and contribute to welfare during retirement. Fears of future hardship are still less urgent given the important role to be played by social security. While there might appropriately be concern at the erosion of the virtue of personal thrift, this institutionalized thrift will likely meet our material needs.

The acceleration of investment in housing may represent a reduction in cash saving, but it also has beneficial side effects. First, investment in housing may displace current consumption as well as saving, and to that extent may be socially desirable. Second, investment in housing does reduce future cash expenditures on housing relative to renting, and thus may make future cash saving easier for some households. Third, the investment return to homes can be realized upon retirement to finance those needs.

Macroeconomic restraint would not be a desirable course to remedy the incentive effects of inflation. A modest increase in the cash saving rate may require a substantial reduction in current income and thus in the amount of saving. Recession may also prevent future investment in housing and thus indirectly increase cash consumption. Clearly any policy that could slow inflation without reducing output would be more desirable than recession. In the interim, policy should encourage saving and discourage borrowing directly, and facilitate home purchase by those now priced out of the market by inflation and high interest rates.

For upper income households, the incentives are similar. The return to productive investment (such as plant and equipment) is reduced by inflation, while many unproductive investments (including gold, art, and jewelry) become relatively more attractive. The saving of upper-income households is a more urgent macroeconomic concern than that of middle-income households, simply because it is a much greater amount of money; for an individual's well-being, of course, it is less important.

While unproductive investments have become more popular, there are limits to their use. Such investments are generally risky, illiquid, and yield no current return. While consumption is also relatively more attractive during inflation, there are surely also limits to the capacity of the well-to-do to consume. Productive investments will remain the most important savings vehicle of the wealthy.

Stopping inflation through macroeconomic restraint will bring an end to the perverse incentives, but the cost would be great. It would cost large amounts of productive investment now to achieve modest increases in such investment later. Any noncontractionary anti-inflation policy would be more attractive. Large general tax cuts would increase returns to both productive and unproductive investment, but could have highly undesirable equity consequences. Indexing the tax code for inflation would be exceedingly complex, would have cataclysmic distributional effects, and would fundamentally change the

basic operation of the economy. It would only partially undo the incentive effects of inflation. The best policy would seem to be targeted incentives to productive investment, thus directly acting on our chief social concerns.

The discussion here is based on qualitative and only rudimentary quantitative analysis. Future empirical research may negate these conclusions. At least for the moment, however, the results seem fairly clear cut.

4. CONCLUSIONS

The purpose of this paper is to determine how inflation affects the distribution of income, how households respond to inflation, and what these factors imply for the future of the economy. A comprehensive view of this topic yields results somewhat different from the popular conceptions, for several reasons.

First, inflation is a process that affects incomes as well as prices. Most workers seem to feel that they earn large wage increases and then have them stolen away by inflation. In fact, rising prices either cause or are caused by rapid increases in wages, and without the large price increases wages would be far more stable. The only correct way to evaluate inflation's redistributive effects is to analyze its effects on both prices and wages.

As a corollary to this consideration, the objective of the simulations was to measure the change in real income due to inflation. An upper-income household is thus said to be hurt by inflation if its real income is reduced, while a lower income household is said to be unaffected if its real income is constant. Clearly these statements say nothing about the level of well-being of the two households, but only about the change in well-being.

Second, it is necessary to consider inflation's effects on both current income flows and the values of assets. Inflation may increase the interest income of creditors, but this is little comfort to them if the principal value of those loans is decreasing faster. From another viewpoint, the appreciation of a home's value increases the well-being of a household, but the resultant increase in property tax liabilities imposes a cash burden on the household. Both cash and accrued incomes must be evaluated to arrive at a complete result.

Finally, taxes must be taken into account. Any increased money income flow will compensate for inflation only if taxes do not increase faster. Taxes may increase faster or slower than inflation in any individual case, and the absolute amount of a tax increase may be significant or too small to affect well-being materially.

The simulations in this paper attempt to meet those three requirements through quantitative techniques described in the fifth section. The results, discussed in section two, are quite different from the popular conception of the redistributive effects of inflation. On a comprehensive basis, low-income groups are only slightly hurt by inflation, and middle-income groups not at all. Upper-income households are hurt dramatically by inflation, with percentage reductions in real income often far in excess of the percentage increase in the price level. The elderly are also badly hurt by inflation, at almost every income level.

These results depend on the degree to which individual income items respond to changes in the price level. Transfer payments, an important source of support for low-income households, lag behind prices slightly but tend to keep up over the long run. Some transfers, including social security, are explicitly indexed to inflation. Labor earnings, the major source for the middle class, also tend to keep up with prices. But property income, which is most important for upper income households and the elderly at all income levels, lags behind prices due to long-term contracts and increased real income tax liabilities.

Debt is another important factor. Debtors gain ground during inflation because their liabilities do not increase in money terms while inflation increases their nominal incomes. The chief gainers through debt are middle income households with large mortgages, and some low income households.

Given these distributional effects, inflation provides households with clear incentives. The reward for saving and the penalty for borrowing are both reduced, encouraging less thrift and more borrowing and consumption. Housing and unproductive real assets such as jewelry and art are favored over productive assets as stores of value. Such incentives would have undesirable effects on the economy if they were maintained and strengthened. Evidence to date suggests that households recognize and respond to those incentives, though not yet to a dangerous degree.

Among the available policy remedies for these incentive problems, macroeconomic restraint would seem one of the least attractive. While restrictive monetary and fiscal policies might reduce inflation and thereby its incentives, they would certainly reduce incomes, employment, saving and investment. This would directly negate the objective of eliminating inflation's incentives, at least in the short run, and it would harm the lowest income households. Unless there were a significant probability that inflation would rage out of control or that inflation's incentives were having a broad and powerful effect, use of restrictive policies should be most judicious.

A better route against inflation's incentives would seem to be policies targeted to the end results desired: Higher returns for household saving; abolished tax deductibility for consumer credit interest; more liberal tax treatment of business investment and depreciation; and lower corporate tax rates. Tax indexation should be considered only if inflation is expected to be rapid over the long run.

While the redistributive effects of inflation are mild for the great majority of the population, policies should be considered to help those who have been left behind. Indexation of AFDC benefits might be required by the Federal Government. In particular, the elderly are in need of assistance: More effective indexation of social security benefits, purchasing power bonds and protection from rising medical costs should be considered.

These findings could be interpreted in several different ways, according to the particular values of the observer. Some might argue that upper income households deserve relief from the costs of inflation, because they are the most adversely affected. Others could contend that there is no need to be concerned about inflation at all, because only those with high living standards are significantly hurt. The

author steers a course somewhere between these two extremes. Inflation is a concern because it does harm some households that are vulnerable, particularly the elderly and other low income households without indexation. There must also be concern about inflation's incentives for those with discretionary income, but not as much concern on well-being as on keeping savings and investment in productive channels.

Finally, we should try to stop inflation. But from the perspective of redistribution and incentives, significant macroeconomic restraint is called for only if inflation is rapid and accelerating and only after every other available remedy has been tried, including presidential influence, tax based incomes policies, and careful handling of specific markets. Federal cost-raising policies should be avoided. Fiscal and monetary policies during this time should certainly be prudent, but they should not be heavyhanded.

Over the past 10 years, inflation has been a continuous, significant policy concern. Now the tensions may be worse than ever. This paper was written to help in better understanding what inflation really does to the economy. If it serves its purpose, it will help us to live a bit easier with inflation, so that we can focus our energies more effectively and, someday soon, vanquish it.

5. SIMULATIONS OF THE DISTRIBUTIONAL EFFECTS OF INFLATION ²⁸

The purpose of this section is to explain in technical terms how inflation affects the distribution of income, using a large scale computer simulation. The simulation follows earlier efforts by Nordhaus, and Budd and Seiders ²⁹, but extends the more customary analysis in several dimensions: (1) It uses a large sample microdata set, the Brookings 1970 MERGE file, that accurately represents the entire population and exhausts national income ³⁰; (2) tax liabilities are included in the analysis; (3) the adjustment of transfer payments to inflation is modeled ³¹ (4) inflation-induced changes in the corporate sector, including tax effects, are passed through to equity owners in the household sector; and (5) uniform and food and fuel concentrated inflations, and short and long-term inflations are all simulated.

²⁸ This section reproduces "The Size Distribution of Income During Inflation," Review of Income and Wealth, December 1979.

²⁹ Edward C. Budd and David F. Seiders, "The Impact of Inflation on the Distribution of Income and Wealth," American Economic Review Papers and Proceedings, May 1971; William D. Nordhaus, "The Effects of Inflation on the Distribution of Economic Welfare," Journal of Money, Credit and Banking, February 1973, Part 2.

³⁰ The MERGE file is a statistical match of responses from the U.S. Census Bureau's March 1971 Current Population Survey, a uniform sample of about 50,000 American households; and the U.S. Internal Revenue Service's 1970 Individual Income Tax Model File, a stratified sample of 100,000 U.S. personal income tax returns, including a 100-percent sample of returns with adjusted gross income over \$200,000. (Both samples are without individual identifying information, of course.) The MERGE file thus has detailed demographic information together with complete income and income tax data, permitting precise computation of income taxes and accurate estimation of all other taxes. See Joseph A. Pechman and Benjamin A. Okner, "Who Bears the Tax Burden?" (Brookings, 1974). App. A, for a complete description of the MERGE file; detailed working papers are available from the present author. The data file used for the earlier studies, the Federal Reserve Board's Survey of Financial Characteristics of Consumers, had some wealth data but was deficient in reporting of both wealth and income. See Projector and Weiss, "Survey of Financial Characteristics of Consumers" (Washington: Board of Governors of the Federal Reserve, 1966), p. 2.

³¹ The earlier studies were completed before social security benefits were automatically indexed, and assumed that other transfers were fixed in money terms. See, for example, Budd and Seiders, p. 132.

Part 1 explains the methodology used in this study, and part 2 presents the results.

There are many diverse views of inflation, and so the approach in this paper should be clearly explained. The traditional cost-push and demand-pull theories of inflation are really hypotheses of how inflation begins, and this paper will be agnostic on that question. The inflation of today is a phenomenon of momentum, with price increases continuing at roughly the same rapid rate until something happens to make them accelerate or decelerate. It is the effects of this kind of inflation that this paper will analyze.

Further, the focus will be restricted to the immediate effects of inflation only. The simulations assume that inflation accelerates by a given number of percentage points per year, while the real utilization of the economy is constant. The simulations measure changes in the distribution due to this higher rate of inflation at constant utilization. This approach does not square with the often heard opinion that inflation causes political or economic stresses and strains that make recession inevitable; some may wish to take issue on this point.

Methodology

The simulations described in this paper were performed by analyzing the effect of inflation upon an income and expenditure statement for each household. The response of each item on the statement to changes in the general price level was estimated, tax liabilities for all taxes affecting the household sector were computed, and the changes in the individual items were summed to find the total effect of inflation.

The first part of this section will explain the two income concepts used; the second and third will deal with income and expenditure items respectively; and the fourth will explain the types of inflations simulated. At the conclusion of that section is a table showing, in summary, how each income and expenditure item changes under each alternative simulated inflation. (A detailed appendix on the methods used is available from the author.)

INCOME CONCEPTS

Two different income definitions are used in each of the simulated inflations. The first is the money income concept used by the U.S. Census Bureau in its surveys and published income distribution and poverty data. "Census income" includes cash income from wages, salaries and self-employment; interest, dividends, rents and royalties; cash government transfers from social security, welfare, unemployment compensation, workmen's compensation, supplemental security income and general assistance; private and government pensions; and regular cash receipts from any other private sources.

The second income concept, developed for this study, is called Accrued Comprehensive Income (ACI). ACI is conceptually based on the traditional Haig-Simons definition of income as consumption plus the change in net worth,³² and operationally follows the Adjusted

³² Robert Murray Haig, "The Concept of Income—Economic and Legal Aspects," in Haig, ed., *The Federal Income Tax* (Columbia University Press, 1921); Henry C. Simons, *Personal Income Taxation; The Definition of Income as a Problem of Fiscal Policy* (University of Chicago Press, 1938).

Family Income measure used by Pechman and Okner.³³ ACI includes all of Census income, plus many sources of accrued income,³⁴ in-kind income,³⁵ and certain tax amounts necessary to comply with the national income accounts tax incidence assumptions.³⁶ ACI is net of all taxes paid by the household sector using those assumptions. The result is a measure approximating national income (at market prices) received in the household sector. The treatment of inflation-induced changes in the accruals, in keeping with the Haig-Simons definition, is to include them in income currently.

INCOME ITEMS

The dominant income item in the United States is labor earnings.³⁷ An analysis of the behavior of labor earnings during inflation must abstract from all other influences; the method chosen for the current analysis was a time series regression on the share of labor in the corporate sector, controlling for the level and rate of change of the utilization of the economy and the rate of change in the price level on a quarterly basis, corrected for autocorrelation. The results of the regression indicate no independent influence of price behavior upon the labor share:

$$\begin{aligned} \ln(W/y) = & -0.446 + 0.003U \\ & (2.269) \\ & -0.346DLnGNPF - 0.136DLnP - 0.090DDLnP \\ & (6.850) \quad (0.694) \quad (0.744) \end{aligned}$$

$$RHO=0.936 \quad R^{-2}=0.900 \quad F(4,101)=238.043 \quad SE=0.007 \quad DW=1.806$$

(*t* statistics in parentheses)

$\ln(W/y)$ is the natural logarithm of earnings divided by gross corporate product;

U is the unemployment rate;

$DLnGNPF$ is the change in the ratio of actual to potential gross national product;

$DLnP$ is the change in the natural logarithm of the GNP deflator; and

$DDLnP$ is the second difference of the natural logarithm of the deflator.

Data period 1948 through 1974.

Given this evidence, the simulations were performed under the assumption that wages are perfectly indexed to the price level. This

³³ Pechman and Okner, *op. cit.*

³⁴ These fall into two classes. The first is employer contributions into public programs or private trust funds for future benefit to the worker: social security, unemployment insurance, workmen's compensation, government retirement, and private pension and welfare programs. The second class is accruals to the value of property: interest on life insurance; and the change in the value of corporate shares, farm assets, nonfarm real estate, corporate and noncorporate inventories, debt, and debt securities.

³⁵ These are the insurance value of medicare and medicaid benefits, the bonus value of food stamps, and imputed net rent on owner occupied homes.

³⁶ These are the Federal, State and local corporate income taxes on shareholders' firms, and the real property tax on land. See Pechman and Okner, *op. cit.*

³⁷ Because of a complete lack of data on relative factor returns in small and unincorporated business, such income is considered here as entirely returns to labor, and to behave in the same fashion as labor earnings in the corporate sector.

assumption explicitly ignores the possibility that inflation may cause policy decisions that would affect the real economy and thereby the labor share. Because such policies would be taken at the discretion of government, in part perhaps because of inflation's assumed redistributive effects, it would be more useful to determine inflation's impact independent of those decisions.

Clearly the distribution of wages among various groups has not been constant over the past 10 years, but the purpose of this paper is to isolate only those changes that occurred because of inflation and thus would not have occurred otherwise. Some large unions, in particular, have achieved wage increases in excess of inflation. A recent study of the responsiveness of wage rates to economic conditions by Daniel J. B. Mitchell shows that these phenomena are extremely difficult to interpret in the present context.³⁸

One technique by which union wages keep up with inflation in non-contract years is the cost of living adjustment (COLA). While the use of COLA's increases and decreases as inflation accelerates and decelerates, they are generally applied most often in contracts of large unions. This gives those large unions a certain measure of protection that smaller unions do not have. However, the most common COLA formulas do not themselves give complete protection against inflation, with lower wage workers generally faring better than the higher paid. Exact terms vary from contract to contract. How any individual worker fares thus depends on his wage level, the precise escalator in his contract, and whatever unconditional deferred increases, if any, his union negotiated in addition to the escalator.

On the other hand, smaller unions are not totally without protection. Mitchell found that deferred wage increases under smaller contracts were more significantly related to the inflation rate at the time the contract was signed than were those of larger contracts. Thus, an ongoing inflation would be reflected in large contracts through current COLA's, and in smaller contracts through deferred adjustments. A final element of protection for smaller union contracts is their generally shorter duration. Small contracts are thus more frequently negotiated, and the evidence indicates that the inflation responsiveness of first year wage rates under large and small contracts is quite similar.

Nonunion wages show the same first-year responsiveness to inflation as union wages. Because nonunion workers are rarely subject to long term wage agreements, this indicates that inflation cannot be assigned a causal role in widening union-nonunion wage differentials.

Thus, any difference in the response of large union, small union and nonunion wages to inflation is only the subtlest matter of timing. Even if such a distinction could be identified, it would be dangerous to assign it to inflation in a broader sense. The major difference between large unions and other workers is the greater market power of the highly organized groups. Under current circumstances, the unions express that market power in part through inflation protection in their contract. If inflation were less of a problem, it is highly likely that the unions would channel their market power into other avenues, and achieve higher compensation through straight wage increases.

³⁸ Daniel J. B. Mitchell, "Union Wage Determination: Policy Implications and Outlook," *Brookings Papers on Economic Activity* (3:1978), especially pp. 537-549.

The regressions are based on data from the corporate sector only, and thus do not reflect the behavior of wages in the unincorporated private or public sectors. For the simulations it was judgmentally assumed that the rest of the economy would follow the wage behavior in the corporate sector. It seems likely that capital is allocated between the corporate and noncorporate private sectors so that returns are equalized, and that the behavior of wages will be similar. Federal, State and local public sector wages are for the most part based on formulas designed to achieve comparability with private sector wages. If these formulas do not in fact produce comparable wages, it seems unlikely that the error is in any sense a function of the rate of inflation.³⁹ Finally, wages in the nonprofit sector have tended to lag behind other wages, primarily because of slow real economic growth and particular problems in the nonprofit sector—not because of inflation.

Employers contributions to workmen's compensation, pension and welfare programs were assumed to be a fixed percentage of wages.

Interest income is received from a number of different sources in the United States, and so its simulation is complex. The general methodology used was to assume that long term interest rates will increase by an amount equal to an additional increment of inflation through an exponential decay process over a period of five years, and that short term rates will make the same adjustment over one year.⁴⁰ Regulatory ceilings constrained bank interest rates. Data were then examined on the holdings and maturity structures of different types of debt instruments in the household sector (whenever possible by income class). Each household was then assumed to hold a portfolio of all the types of instruments it was found likely to hold; this restricted low-income households to time deposits in banks, and government short term bonds and tax-free state and local bonds to upper income households. The yields were assumed to remain fixed until the instrument matured, and the maturation of the stock of each instrument was assumed to follow the time structure of the outstanding debt of that form. The result was that the adjustment of interest income receipts lagged behind that of market interest rates; receipts still far outpaced the price level, however.⁴¹ Interest on life insurance policies was assumed fixed in money terms. The market value of debt securities was assumed to fall according to the increase in interest rates, and the change was added to ACI.

³⁹ President Carter recently decided to reduce the calculated Federal civil service pay increases for fiscal 1979 explicitly to reduce inflation. However, in the current context, this is a policy decision which the President and the Congress chose to take at their option, and should not be considered as an inevitable effect of inflation.

⁴⁰ This involves two implicit assumptions. First, the assumed rate of adjustment is a middle ground estimate on the basis of earlier studies cited by Nordhaus, op. cit., Table D1. Since the Nordhaus compilation, William E. Gibson, "Interest Rates and Inflation Expectations," *American Economic Review*, December 1972, pp. 854-865, obtained estimates of a faster adjustment of interest rates.

Second, it is assumed that interest rates, in order to provide the same after tax cost or income to borrower or lender, do not increase by an amount greater than the increment to inflation. This assumption is made because interest rates are not observed to rise by sufficient amounts to justify a greater adjustment, and because the diversity of tax rates paid by borrowers and lenders (including governments, which pay no tax) makes such overadjustment unlikely. See Jack Carr, James E. Pesando and Lawrence B. Smith, "Tax Effects, Price Expectations and the Nominal Rate of Interest," *Economic Inquiry*, June 1976, pp. 259-269, for an empirical examination of this question.

⁴¹ This is so because a 2-percentage point increase in an interest rate from 5 to 7 percent, for example, to compensate for a 2-percentage point increase in inflation, would increase interest income flows by 40 percent. Thus interest from instruments with lower yields increases faster in percentage terms during inflation, as does interest from instruments with a shorter average maturation time.

Likewise, the reduction in the real value of household debt was added to ACI.

Corporate dividends have most successfully been estimated in the United States as a function of past dividends and corporate cash flow.⁴² Accordingly, the simulations use that technique. Corporate sales and production costs were assumed to increase with the price level; net interest payments were assumed to increase in the same fashion as household interest receipts from corporate debt.⁴³ Tax free depreciation allowances were inferred from the actual figure, with an adjustment based on the assumptions that new capital goods purchased during the year increased in price at the average rate of inflation,⁴⁴ and that corporations used the double declining balance method with the average lifetime of new investments equal to the average lifetime of the existing stock. The Federal corporate tax was then computed on new money profits at the pre-inflation average rate. (This allows implicitly and inexactly for the investment tax credit and corporate profits taxed below the surtax rate.) State and local corporate taxes, which are both income and property taxes, were assumed to increase at the rate of inflation. Aggregate dividends were then estimated from the usual equation :

$$D - D_{-1} = 0.358 + 0.123C - 0.489D_{-1}$$

(7.232) (6.713)

$$R^2 = 0.726 \quad F(2,21) = 31.518 \quad SE = 0.326 \quad DW = 1.950$$

(*t* statistics in parentheses)

Annual data, 1947-1970, where *D* is aggregate dividends (later years are omitted because of dividend controls instituted in the U.S. in 1971); *D*₋₁ is aggregate dividends lagged one period; and *C* is corporate cash flow. On this basis, an additional dollar of inflationary

⁴² John Lintner, "Distribution of Income of Corporations Among Dividends, Retained Earnings and Taxes," *American Economic Review*, May 1956; and John A. Brittain, *Corporate Dividend Policy* (Brookings: 1966).

⁴³ The gains of debtor corporations and losses of creditor corporations are ignored here because corporate net interest is usually near zero in aggregate in most years, indicating that the corporate sector neither gains or loses appreciably in aggregate. There are systematic tendencies for financial corporations to be relatively more in debt than nonfinancial corporations, and thus to fare better during inflation. With any class of firms there are variations in debt positions, with some firms relatively better off to the extent that the inflation rate is higher. The stock market should take these variations into account in its valuation of equities. Unfortunately, it is unknown to what extent different classes of households hold different equity in different types of firms.

Losses due to the taxation of inventory profits are also ignored because the use of last-in first-out accounting provides approximate indexation in that regard; and, because, for the economy as a whole, a certain level of inventories is a necessary input to productive activity and is thus unconsumable. At any particular time, however, one firm may profit more than another due to its particular level of inventories; a perfectly neutral tax policy would compensate for this uneven impact.

While changes in the market values of household assets are included in income, appreciation of corporate assets is not included in corporate income. This judgmental decision is based on the mortality of the individual and the "immortality" of the firm. Some individuals will someday no longer need their homes, and so can leave it to their heirs (for their occupancy or liquidation) or borrow against its value during life. A corporation (barring liquidation) will need its land in perpetuity, and will consume all the value of its equipment in the long run. Thus the appreciation of a home is consumable income to its owner, while the appreciation of corporate property is not. Note, however, that any existing firm is made relatively better off than any potential competitor as the market price of land and other productive property increases; this is a valid question for tax policy.

⁴⁴ It is implicitly assumed that corporations will not change their investment plans because of inflation. In the long run, given the increase in corporate tax liabilities due to inflation, firms may reduce their investment to raise the marginal rate of return after taxes to the pre-inflation level.

cash flow would add \$0.123 to dividends; for the simulation year that yields an underadjustment of dividends to inflation.

Corporate retained earnings are assumed to directly increase equity prices and are included in the comprehensive definition of income. Retentions are the residual of revenues after dividends, interest, taxes and costs, but with an adjustment, presumed to be made by the equity market, for the shortfall of post-inflation depreciation allowances relative to actual capital consumption. Actual depreciation is assumed to be equal to pre-inflation depreciation allowances increased by the increment to inflation; retained earnings in comprehensive income are reduced by the shortfall of post-inflation depreciation allowances, as described above, relative to actual capital consumption.

Realized capital gains are not included in either of the income concepts, but their adjustment is necessary for tax computation purposes. The prices of assets are assumed to increase at the rate of inflation this assumption is also used for farm assets, nonfarm real estate, and corporate and noncorporate inventories; the cost bases as a fraction of sale prices are derived by income class, from the most recent (none-theless dated) capital gains study by the U.S. Internal Revenue Service.⁴⁵ Proportional adjustments of gains and losses are estimated by income class from the relationship of prices to cost bases. For assets purchased during the simulated inflation, the bases as well as the prices were adjusted.

Rental income is adjusted on the basis of a regression equation similar to that for labor earnings:

$$\begin{aligned} \ln(R/y) = & -3.621 + 0.021U - 0.344DLnGNPF \\ & (5.787) \quad (2.889) \quad -0.594DLnP + 0.463DDLnP \\ & (1.263) \quad (1.610) \end{aligned}$$

$$RHO=0.988 \quad R^{-2}=0.954 \quad F(4,101)=548.231 \quad SE=0.016 \quad DW=1.971$$

(*t* statistics in parentheses)

Quarterly data, 1948 through 1974, where:

$\ln(R/y)$ is the natural logarithm of the rent share of GNP;

U is the unemployment rate;

$DLnGNPF$ is the change in the natural logarithm of the ratio of actual to potential GNP;

$DLnP$ is the change in the natural logarithm of the GNP deflator;

$DDLnP$ is the second difference of the natural logarithm of the GNP deflator.

This equation reveals a reduction in the rent share of total income in inflation at the 20 percent significant level, probably due to the setting of rental prices in part according to historical capital costs.

The various government transfer payments were treated in different ways. Three programs—social security, supplemental security in-

⁴⁵ "Statistics of Income, 1962. Supplemental Report: Sales of Capital Assets Reported on Individual Income Tax Returns." U.S. Treasury Department, 1966.

come and food stamps—are automatically indexed and are adjusted according to the statutory formula.⁴⁶ Benefits under aid to families with dependent children are adjusted according to published figures on benefits per household, taking account of the fact that household size has been falling substantially in the program.⁴⁷ Medicare and medicaid benefits increase at the average inflation rate. Unemployment and workmen's compensation benefits increase according to the actual increases in maximum allowable benefits under the state programs from 1967 to 1975 (1974 for unemployment compensation. For the most part these programs are indexed to real wages, and benefits grew faster than prices. Benefits under the small state programs of general assistance and emergency relief are assumed fixed in money terms for want of sufficient data to derive other estimates.

Benefits from private pension plans are largely fixed in money terms, and are so treated in the simulations.

Income from estates and trusts was assumed to be divided between interest and dividends in the same proportion as the remainder of aggregate household income, and is adjusted accordingly.

EXPENDITURE ITEMS

Prices of goods and services are generally assumed to increase at the average rate of inflation.⁴⁸ However, not all of a household's income should be deflated by the average increase in the price index. Home mortgage or rental payments are contractually committed and do not increase at the average rate of inflation. Home mortgage payments are fixed, and home rental payments increase at a rate somewhat slower than the average. To account for these contractual arrangements, the amount of homeowners' mortgage payments is not deflated, and the amount of home rental payments is deflated by a separate price index for rent.⁴⁹

Taxes are recomputed after inflation. The facilities of the Brookings MERGE file permit precise computation of the Federal income and payroll taxes; the tax laws in effect in 1975 are used. Federal, State and local excise and sales taxes are separated into those usually specific and those usually ad valorem, with the ad valorem taxes assumed to increase at the rate of inflation and the specific taxes fixed. Local property taxes are also assumed to be perfectly indexed, as they would be if assessments were kept current or rates are increased to maintain the real yield of the tax, or a combination of both. State income taxes were increased in proportion to the increase in adjusted gross income on the Federal income tax return.

⁴⁶ The supplemental security income program was introduced in 1975; for the simulations, incomes received under the three predecessor programs—aid to the blind, aid to the permanently and totally disabled, and old age assistance—are adjusted according to the supplemental security income formula.

⁴⁷ AFDC benefits are computed on the basis of family size. While benefits per household have been nearly constant, the falling household size in the program indicates that benefits for households of any given size are rising.

⁴⁸ For the sake of simplicity, the effects of housing costs on the overall rate of inflation is ignored; that is, the overall rate of inflation is assumed and applied to all goods other than housing, and then the housing rates are computed and used without a recomputation of the overall rate.

⁴⁹ Mortgages judged to have been written during the simulation year (due to a high ratio of debt to equity) are recomputed at higher interest rates because of inflation.

TYPES OF INFLATIONS

The standard simulation presented here assumes a 2-percent increase in the annual inflation rate. In addition to this base case, three other inflations are simulated; each required certain alternations in the basic methodology.

A 5-percent uniform inflation requires a greater increase in prices, incomes and interest rates, and a recomputation of taxes.

A 2-percent food and fuel concentrated inflation is designed by increasing the prices of food and fuel products by 4-percent, and all other prices by an amount sufficiently lower that the average for all consumer prices would be 2-percent. Real household income after inflation is then derived from the new income and price structure under the assumption that real food and fuel consumption remained fixed; thus, the result is a lower bound on real household income.

The effects of the base case is also estimated for the sixth year of inflation. This requires greater adjustment of income and expenditure amounts. Home mortgages written over a six-year period are adjusted for changes in market interest rates and prices of homes. Corporate depreciation allowances are increased to account for greater capital outlays over the six years; dividends therefore change over the entire period. The cost bases of realized long term capital gains are increased.

A summary of the effects of inflation on individual income and expenditure items under each of the simulated inflations is presented in table 1.

TABLE 1.—PRICE AND INCOME ADJUSTMENT COEFFICIENTS FOR INFLATION¹

Price or income item	Adjustment coefficient			
	2 percent uniform (current)	5 percent uniform (current)	2 percent food and fuel (current)	2 percent uniform (after 5 yr)
1. Prices (all) (full adjustment).....	1.010	1.025	1.010	1.115
2. Food and fuel prices.....	1.010	1.025	1.020	1.115
3. Other prices.....	1.010	1.025	1.006	1.115
4. Wages, salaries, self-employment income, royalties.....	1.010	1.025	1.010	1.115
5. Rent.....	1.008	1.020	1.008	1.072
Interest on: ²				
6. U.S. bills.....	1.163	1.408	1.163	1.296
7. U.S. bonds.....	1.012	1.030	1.023	1.287
8. U.S. savings bonds ³	1.000	1.000	1.000	1.000
9. Corporate and foreign bonds.....	1.012	1.030	1.012	1.163
10. Loans and mortgages.....	1.002	1.006	1.002	1.074
Savings and time deposits: ⁴				
11. Less than \$100,000.....	1.008	1.008	1.008	1.008
12. \$100,000 and greater.....	1.094	1.096	1.904	1.096
13. State and local bonds.....	1.003	1.008	1.003	1.124
14. Dividends.....	1.004	1.009	1.004	1.079
15. Corporate retained earnings.....	1.006	1.014	1.006	1.083
Corporate taxes:				
16. Federal.....	1.016	1.039	1.016	1.165
17. State and local.....	1.010	1.025	1.010	1.115
18. Income from estates and trusts.....	1.036	1.067	1.036	1.157
19. Social security.....	1.002	1.004	1.002	1.087
20. Workmen's compensation.....	⁵ 1.008	⁵ 1.022	⁵ 1.008	⁵ 1.096
21. Unemployment compensation.....	⁵ 1.008	⁵ 1.021	⁵ 1.008	⁵ 1.094
22. Aid to families with dependent children.....	⁵ 1.009	⁵ 1.022	⁵ 1.009	⁵ 1.102
23. Supplemental security income.....	1.002	1.004	1.002	1.097
24. Food stamp bonuses.....	1.002	1.004	1.004	1.103
25. Private pensions.....	1.000	1.000	1.000	1.000

¹ Coefficients are derived according to assumptions and methodology described in the text and appendix.

² Interest coefficients do not include losses due to depreciation of principal; were such losses included, adjustment would be full (i.e., equal to price coefficient) in the long run (except for short-term assets, which adjust in 1 yr).

³ Government action to raise U.S. savings bond interest rates assumed not to occur.

⁴ Interest rate ceilings assumed to remain unchanged.

⁵ Weighted average of individual State factors which are available from the author.

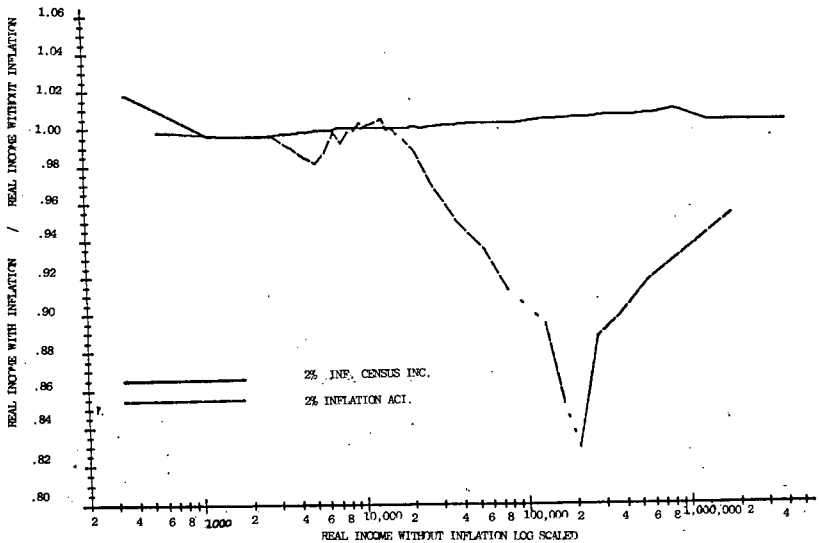
Simulation Results

This section is a presentation of the simulated inflations described in section 1. The results are presented graphically, as the ratio of real income with inflation to real income without, by income class. Real income with inflation was computed by deflating money income with inflation by the increment to inflation—with the adjustments to home mortgage payments and home or apartment rental payments, and (in the food and fuel inflation case) food and fuel expenditures, as described in section 1.

BASE CASE

The first simulation is the uniform 2-percent inflation, measured in the current year. The effect of this inflation is shown in figure 1.

FIGURE 1.—2-percent uniform inflation.



SOURCE.—Brookings 1970 MERGE file. Results are in 1970 dollars. Population percentile rankings are as follows. Census income: \$2,000, 8.6; \$4,000, 21.2; \$5,000, 27.1; \$7,000, 39.3; \$9,000, 51.6; \$10,000, 57.4; \$12,000, 68.1; \$15,000, 79.9; \$19,000, 89.4; \$25,000, 95.3; \$40,000, 98.7; \$100,000, 99.9. Accrued comprehensive income: \$3,000, 7.9; \$5,000, 18.3; \$8,000, 32.2; \$10,000, 41.1; \$12,000, 50.4; \$14,000, 59.5; \$17,000, 71.1; \$20,000, 80.2; \$25,000, 89.4; \$30,000, 93.8; \$75,000, 99.3; \$200,000, 99.9.

The curve for Census income shows that below about \$10,000 real incomes are reduced, with the greatest reduction about 0.5 percent; this is because transfer income, some of which lags prices, is highly concentrated at low incomes. From about \$10,000 to about \$25,000 real incomes are virtually unaffected because of the predominance of earnings in that range. Above that level real incomes are increased by increasing proportions until \$1,000,000, where the increase is about 1 percent; from that point the increase falls off to less than 0.5 percent. The increase in the \$25,000–\$1,000,000 range is due to a high concentration of interest income; above that level the reduced gains are due to increased relative amounts of dividend income.

The second curve shows changes in real ACI by income level in the 2-percent inflation. At the lowest incomes, the ACI curve is higher (due to home value increases swamping very small incomes), but above that level Census income shows modest gains while accrued comprehensive income shows sizeable losses—as great as 17 percent from \$200,000 to \$500,000 of income. The ACI result is almost diametrically opposite to that of Census income.

The difference between these two income measures produces these results. While Census income includes the increased interest income of the upper-income households, it does not include the decline in market values which these higher interest receipts imply for those holding long term assets,⁵⁰ or transfers from creditors to debtors. Accrued comprehensive income, as applied here, includes these losses. Census income includes dividends, which are underadjusted for inflation, but ACI also includes corporate retained earnings which are similarly underadjusted and thus further reduce measured after inflation receipts of high income households. Low income households suffer to the extent that transfer payments are underadjusted, but gain because increases in home value swamp the small (in dollar terms) losses from other sources.

The simulations on the accrued comprehensive income basis have some important implications. While a narrow income concept such as Census income may suggest that inflation redistributes income to those at the top of the distribution, a broader income concept reveals just the reverse. This contrast sheds some light on recent movements of Census income distribution statistics. With the recent burst of inflation, the distribution of Census income has generally become less equal.⁵¹ This kind of effect has been ascribed to inflation.⁵² The simulations here show that inflation may have caused these movements, but that the Census income measure includes the benefits but little of the costs of inflation to high income groups. It should be clear that accrued comprehensive income is a better measure of economic well-being for the purposes of these simulations, and that the "hidden" costs of inflation to high income groups far outweigh the visible benefits.

FASTER INFLATION

The second simulation, illustrated in figure 2, replicates a 5-percent inflation. At the low end of the income scale, the afterinflation census income changes are about two and a half times the changes in the 2-percent inflation. Above about \$25,000, although the shape of the 2-percent and 5-percent curves is much the same, the deviation of the curve from 1.0 is damped by a greater lag of dividend receipts. Thus the real income gains of upper incomes in the 5-percent case are less than two and a half times the gains in the 2-percent case. In general the ACI results show greater losses at the income extremes, with middle incomes largely maintaining their real levels. The general out-

⁵⁰ These losses are one-time only decreases in net worth. Later simulations will abstract from these transient elements by measuring distribution effects in long-term inflation, after the rise in interest rates has worked its way through the securities markets.

⁵¹ In particular, the income share of the highest quintile of households increased from 43.4 to 44.8 percent between 1967 and 1972, while the shares of the second and third quintiles fell from 10.6 and 17.5 to 10.0 and 16.9 percent respectively. These are rather dramatic changes compared to the normally glacial movements of income shares. U.S. Census Bureau, "Current Population Reports," Series P-60, No. 105, Table 13.

⁵² "There can be little doubt that poor people, or people of modest means generally, are the chief sufferers from inflation." Arthur Burns, "The Perils of Inflation," *Tax Review*, May 1968, p. 21.

come of the 2-percent simulation, that upper incomes are by far the most adversely affected, is not altered.

FIGURE 2.—2- and 5-percent uniform inflations.

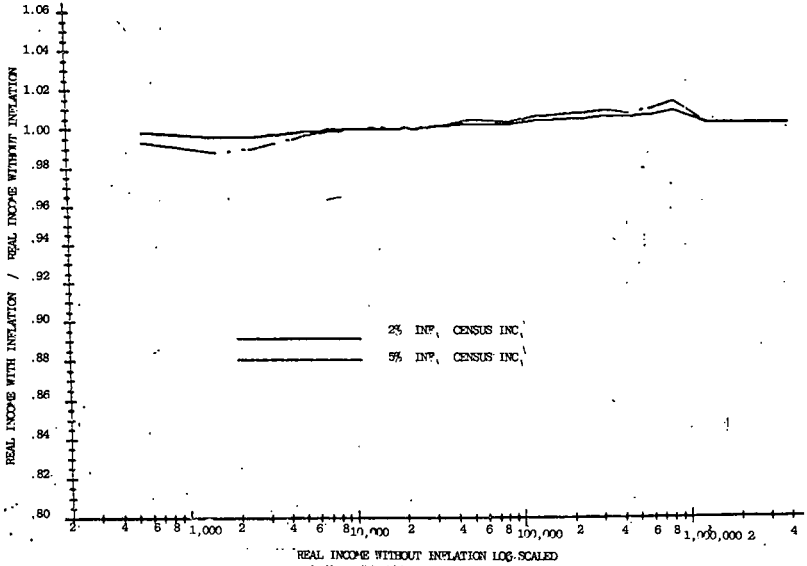
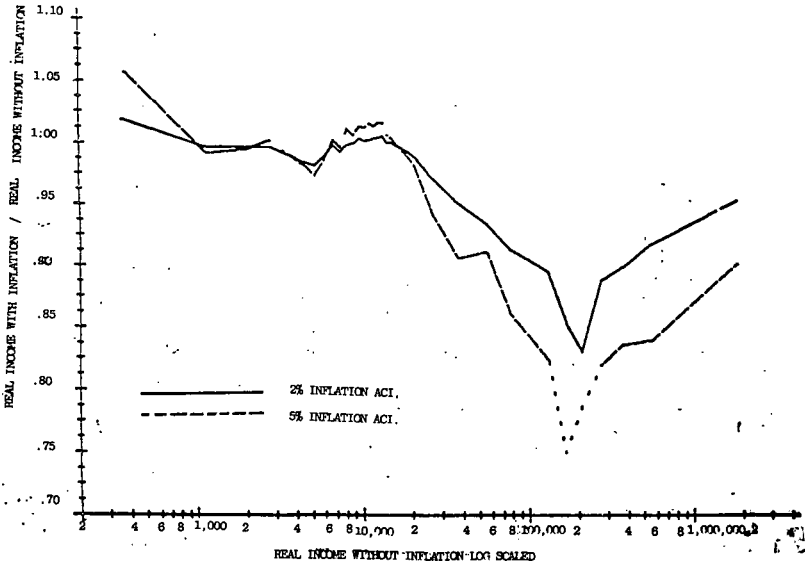


FIGURE 2.—Continued.



SOURCE.—Brookings 1970 MERGE file. Results are in 1970 dollars. Population percentile rankings are as follows. Census income: \$2,000, 8.6; \$4,000, 21.2; \$5,000, 27.1; \$7,000, 39.3; \$9,000, 51.6; \$10,000, 57.4; \$12,000, 68.1; \$15,000, 79.9; \$19,000, 89.4; \$25,000, 95.3; \$40,000, 98.7; \$100,000, 99.9. Accrued comprehensive income: \$3,000, 7.9; \$5,000, 18.3; \$8,000, 32.2; \$10,000, 41.1; \$12,000, 50.4; \$14,000, 59.5; \$17,000, 71.1; \$20,000, 80.2; \$25,000, 89.4; \$30,000, 93.8; \$75,000, 99.3; \$200,000, 99.9.

FOOD AND FUEL INFLATION

The next simulation assumes that all food and fuel-based products (including food consumed both at and away from home, gasoline and utilities) inflate at twice the average rate (i.e., 4 percent) and all other prices increase at a lower rate which maintains the 2-percent average (i.e., approximately 1.2 percent using CPI consumption weights).⁵³

Figure 3 shows the changes in real income due to food and fuel inflation together with the results from the uniform 2-percent inflation. The margin between these curves is about 0.5 percent at the lowest incomes; households at about \$4,000 of income are equally well off under either inflation, while the highest incomes are about 1 percent better off under food and fuel inflation. The pattern of these curves should not be surprising; low income households are intensive food and fuel consumers and will be worse off under food and fuel inflation; higher income households are better off with a lower inflation rate for all other goods.⁵⁴

LONG-TERM INFLATION

The final simulations show the effects of inflation which began 5 years prior to the income measurement year (i.e., inflation continuing from 1965 through 1970). After 5 years and by assumption, market interest rates have fully adjusted to the higher rate of inflation, although some long term instruments still have not matured since the acceleration. Income flows during the final year (not accumulating the effects of the 5 earlier years) are measured relative to incomes in the same year without inflation.

Figure 4 shows the curves for 5-year inflations in Census and accrued comprehensive income, together with the curves when the inflation and the measurement year began at the same time. Upper incomes under the Census concept show marked reductions after 5 years of inflation, in contrast to the gains in the current inflation case; this is due to the continued lag in real dividends and rent, and the interest rate ceilings on large bank deposits. Incomes from \$10,000 to \$20,000 again show little change. Below \$10,000 there are real income losses, but these are only slightly greater than they were in the first year of inflation; the worst case is at about \$3,000 of income, where the real income loss is 1.3 percent.

The accrued comprehensive income results are similar. Real incomes up to about \$20,000 are much the same after 5 years of inflation as they were without inflation. From about \$20,000 to about \$500,000 real incomes are higher than in the first year of inflation but still below noninflation levels; this is because interest receipts which are important in this income range are progressively recovering to their pre-inflation real levels, and market values of debt securities have reached their new equilibrium. Above \$500,000, real incomes are lower after 5 years because of the continuing lag of dividends. The superad-

⁵³ Under Census income the postinflation money income receipts of households are no different with food and fuel than with a uniform inflation; the only difference in measured real income is the individual household deflator, which calculates an additional real income loss for intensive food and fuel consumers. Accrued comprehensive income increases slightly for recipients of food stamps, because the semi-annual cost-of-living adjustments in food stamp bonuses are based on the price index for food.

⁵⁴ The point of equal "well-offness" at \$4,000 is lower than might be expected; because the consumption amounts were imputed from the 1960 Survey of Consumer Expenditures, still the latest data available, it is possible that they do not reflect 1970 consumption patterns adequately.

FIGURE 3.—2-percent food and fuel concentrated and uniform inflation.

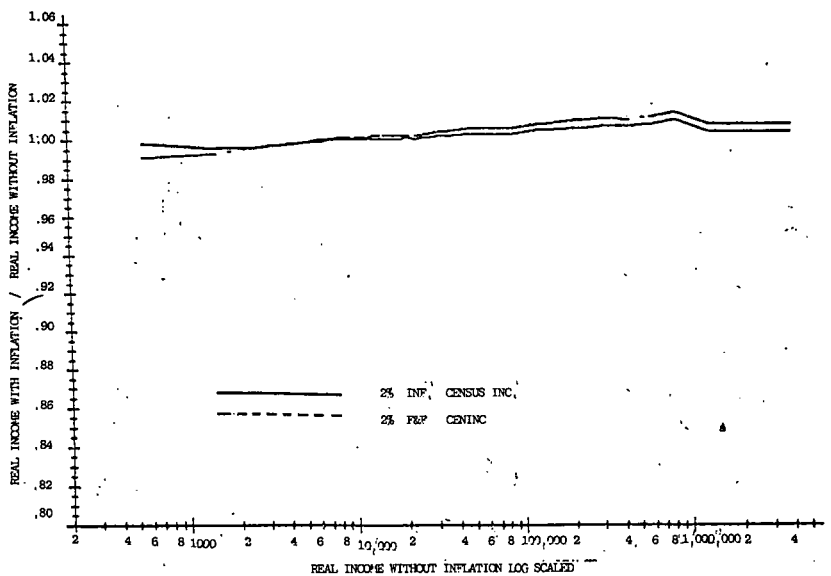
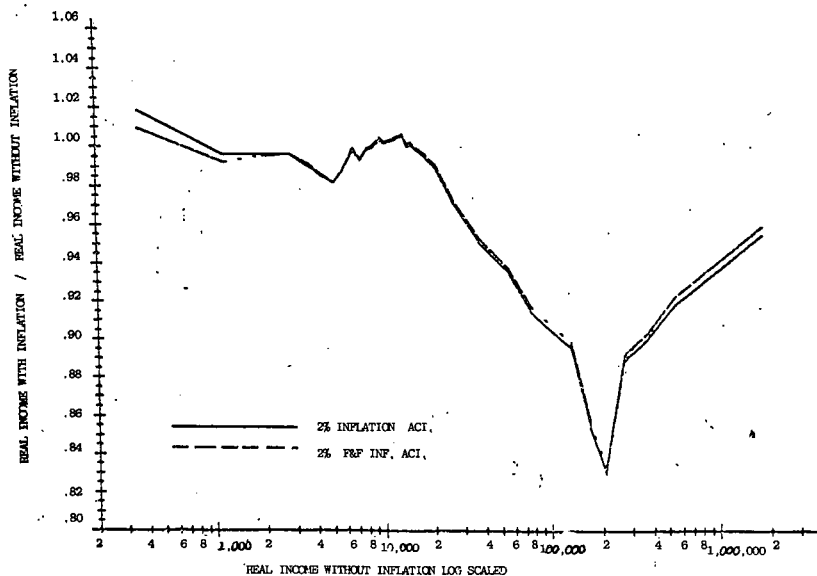


FIGURE 3.—Continued.



SOURCE.—Brookings 1970 MERGE file. Results are in 1970 dollars. Population percentile rankings are as follows. Census income: \$2,000, 8.6; \$4,000, 21.2; \$5,000, 27.1; \$7,000, 39.3; \$9,000, 51.6; \$10,000, 57.4; \$12,000, 68.1; \$15,000, 79.9; \$19,000, 89.4; \$25,000, 95.3; \$40,000, 98.7; \$100,000, 99.9. Accrued comprehensive income: \$3,000, 7.9; \$5,000, 18.3; \$8,000, 32.2; \$10,000, 41.1; \$12,000, 50.4; \$14,000, 59.5; \$17,000, 71.1; \$20,000, 80.2; \$25,000, 89.4; \$30,000, 93.8; \$75,000, 99.3; \$200,000, 99.9.

FIGURE 4.—2-percent uniform inflation after 5 years and currently.

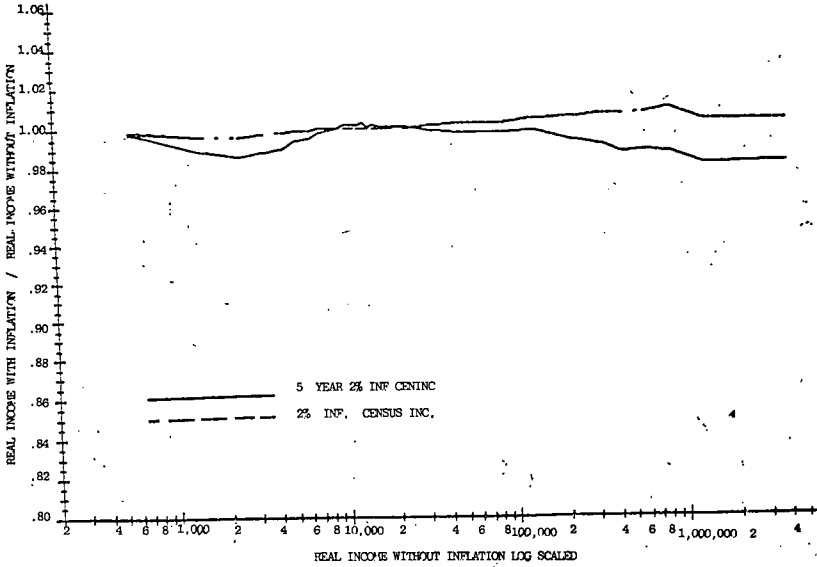
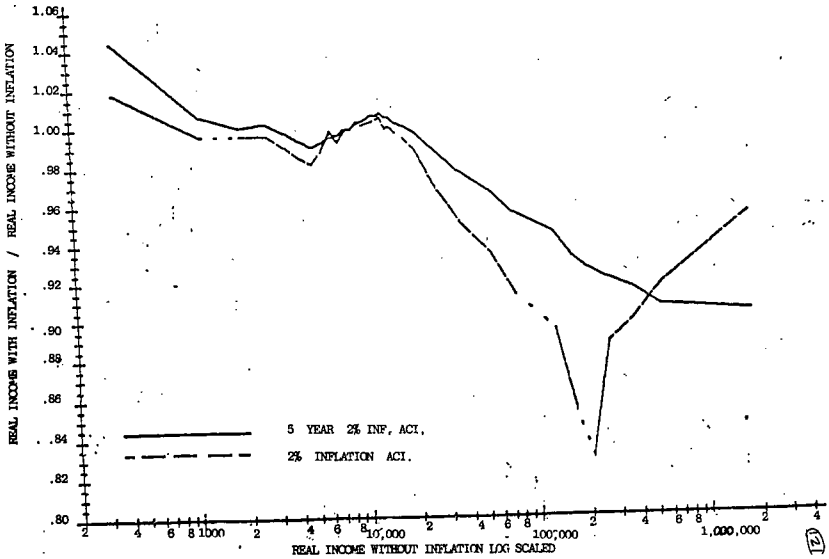


FIGURE 4.—Continued.



SOURCE.—Brookings 1970 MERGE file. Results are in 1970 dollars. Population percentile rankings are as follows. Census income: \$2,000, 8.6; \$4,000, 21.2; \$5,000, 27.1; \$7,000, 39.3; \$9,000, 51.6; \$10,000, 57.4; \$12,000, 68.1; \$15,000, 79.9; \$19,000, 89.4; \$25,000, 95.3; \$40,000, 98.7; \$100,000, 99.9. Accrued comprehensive income: \$3,000, 7.9; \$5,000, 18.3; \$8,000, 32.2; \$10,000, 41.1; \$12,000, 50.4; \$14,000, 59.5; \$17,000, 71.1; \$20,000, 80.2; \$25,000, 89.4; \$30,000, 93.8; \$75,000, 99.3; \$200,000, 99.9.

justment of Federal income taxes is also reducing real incomes for the upper income groups; results for intermediate durations of inflation (not presented in figure 5) indicate that real accrued comprehensive income for households over the \$20,000 level will decline relative to pre-inflation income in the sixth and succeeding years of inflation because of increased real personal income taxes.

TAX EFFECTS

Figure 5 shows the effects of the tax system in the 2-percent inflation using the comprehensive income measure. The tax effect is small at low incomes, but at upper incomes the tax system exaggerates the effects on pretax incomes. Therefore tax indexation would not eliminate, but only reduce, the redistributive effects of inflation.

HOMEOWNERSHIP

Figure 6 compares the effects of inflation on homeowners and renters. For low- and moderate-income households, homeowners fare significantly better, for reasons described earlier. At upper incomes, owner-occupied homes are a less significant element in household wealth, and the difference between homeowners and renters is reduced.

THE ELDERLY

Retired persons are likely to be adversely affected by inflation because they receive relatively more income from property and less income from labor, and because their debt is relative low. Figure 7 shows that the elderly, even at low and moderate incomes, are significantly hurt by inflation. At upper incomes, the income sources and debt position of the aged and nonaged are alike, and so the effect of inflation is also similar.

FIGURE 5.—Effect of taxes on distribution of income.

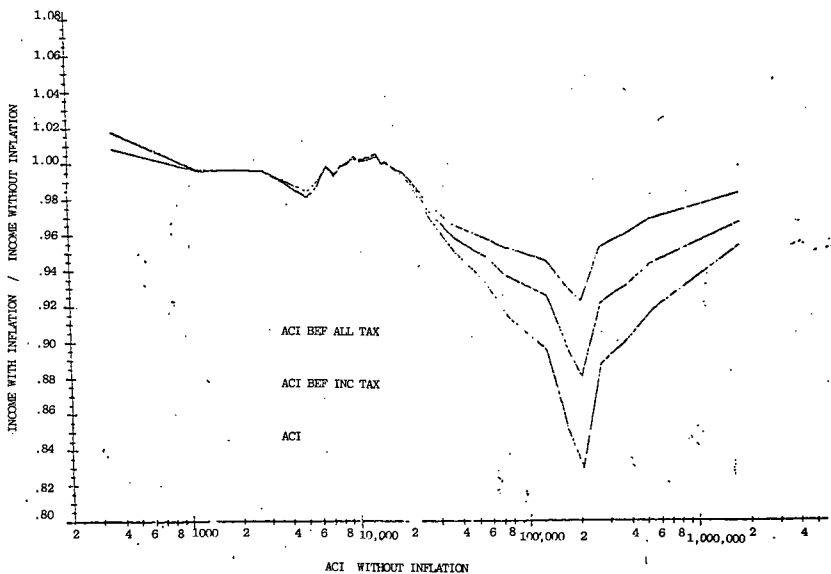


FIGURE 6.—Effect of inflation on homeowners and renters.

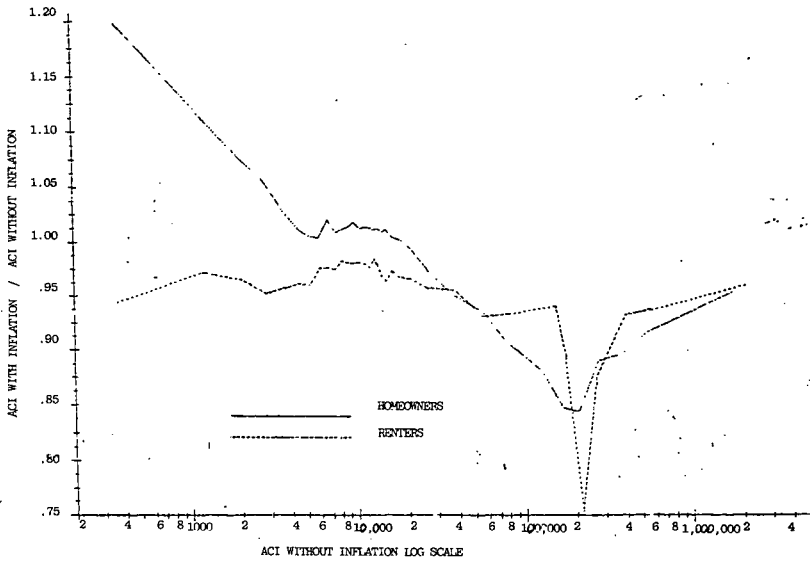
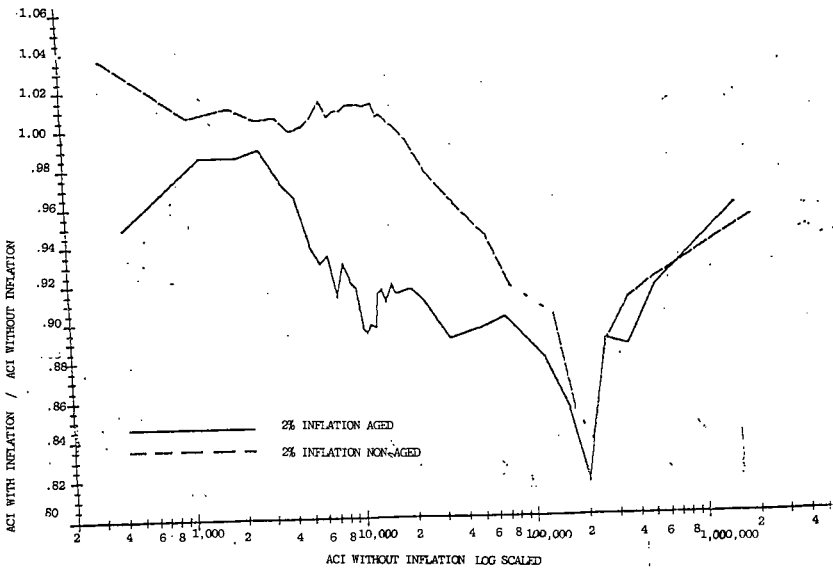


FIGURE 7.—Effect of inflation on aged and nonaged households.



IS THERE A SHORTAGE OF SAVINGS IN THE UNITED STATES? THE ROLE OF FINANCIAL INSTITUTIONS, MONETARY AND FISCAL POLICY IN CAPITAL ACCUMULATION DURING PERIODS OF STAGFLATION

By Paul Davidson*

CONTENTS

	Page
I. Introduction and Summary	278
II. A Clarification of Concepts.....	279
1. Saving, Contracts, Money, and Liquidity.....	279
2. Entrepreneurs, Investment Spending, and Finance.....	283
3. Finance and Financial Institutions.....	285
III. A Summary View of the Relationship Among These Concepts.....	286
IV. Insufficient Private Saving: Cause or Effect of Stagflation?.....	287
V. How Would a Shortage-of-Saving Policy Affect Private Investment? ..	289
VI. What Would a Value Added Tax Do?.....	292
VII. Should We Reduce Consumption or Ease Finance and Encourage Consumption?.....	294
VIII. Output Concepts Elaborated.....	295
IX. Finance and the Role of Financial Markets.....	299
X. Rules and Monetary Policy.....	302
XI. Public Policy and Inflation.....	303
Bibliography.....	306
Appendixes.....	307

I. INTRODUCTION AND SUMMARY

It has been argued by a number of economists that the recent poor performance of the United States economy is due to a policy bias against saving by the private sector of the economy. Government policy, it is claimed, which taxes income and capital gains while distributing social welfare benefits discourages private saving and therefore leads to economic stagnation. Unfortunately, this argument confuses the role of private saving with the role played by finance in a modern, capitalist, market-oriented production economy. If the United States has been hobbled on the "supply side" in recent years, it is because of *a shortage of finance and not because of a shortage of saving*. In point of fact, to the extent that government policy did directly inhibit the private sector's tendency to save out of income during the 1970's, the greater has been the actual growth of GNP.

The primary purpose of this paper is to clarify the economic relationship between finance, private sector saving and capital accumulation so that intelligent policy proposals can be developed. This involves examining the role of financial institutions in the saving-finance-investment nexus. Section II presents a clarification of the various concepts involved in this analysis while III provides a brief summary

*Rutgers, the State University of New Jersey.

of the relationships analyzed in the body of this paper. Section IV demonstrates that the low rates of private saving observed during the 1970's are an effect and not a cause of the Stagflation tendencies of the U.S. economy. Section V explains why current proposals to tilt government policy toward encouraging more private saving will reduce capital accumulation plans of business firms. Section VI analyzes why adoption of a Value Added Tax will exacerbate Stagflation. Section VII suggests that the basic cause for the poor performance of the U.S. economy during the 1970's has been a shortage of finance due to the use of tight monetary policies in an unsuccessful attempt to stem rising prices of goods and services.

Sections VIII and IX develop additional concepts which are necessary to a more thorough understanding of the role of finance and financial markets in the investment process. Section X indicates why simple rules for controlling money supply growth can never be a substitute for intelligent discretionary monetary policy. Section XI concludes with a discussion of how monetary policy must be coordinated with an intelligent, psychologically and politically acceptable incomes policy if inflation in the price level of the newly produced goods is to be avoided.

Appendixes A, B, and C (which the nonprofessional economist reader may wish to skip) are in the nature of a technical discussion of the relationship among corporate needs for external finance, organized security market institutions and household saving and liquidity needs.

II. A CLARIFICATION OF CONCEPTS

Before attempting to answer the question in the title of this paper, it is necessary to discover precisely what query is being posed. The question about a possible shortage of private saving, as often debated in public forums, is unfortunately essentially vague, for the underlying notions of savings, investment, etc. are surprisingly obscure. Clear thinking, which must *precede* good policy decisions can only be obtained by using precise language and formulating exact questions. Thus the foundation of this study involves a method of discovery via the use of an unambiguous set of definitions of the fundamental economic concepts and their logical relationships. Often what appears to be disagreements among economists about the role of saving, etc. really involve semantic confusions which are the result of opponents using the same words to convey different meanings. To the extent we can get agreement on modes of action, it is desirable that all utilize the same language to formulate policy.

1. SAVING, CONTRACTS, MONEY, AND LIQUIDITY

In a capitalist economy where market-oriented entrepreneurs organize the production process on a forward-money contract basis (i.e. hiring inputs and purchasing raw materials by entering into contractual agreements to pay money sums for delivery at specified future dates), the earning of income in the private sector is directly associated with the existence of the money contracts which "control" the inputs into production activities. In other words, the *income* which a household or firm obtains in a monetary economy comes primarily

from the money payments which are made to it by the discharge of some buyer's contractual commitment. These contractual money payments give the recipient claims on the products of industry.¹ *Consumption* is defined as spending by households of a portion of these monetary claims on the current products (or resources) of industry. *Saving* then can be defined as *not* exercising a portion of current money income claims on current products (or resources) of industry.

Since consumption is (by definition) restricted to households how are we to define saving by business firms? The gross income of businesses is defined as the excess of the value of their finished products sold during the period over their contractual payments for labor, material supplies, and contractual interest payments. A portion of this business income may be transferred during the period to household via dividends. The remaining income is equal to retained profits and capital consumption allowances and this is defined as *gross business saving* since it is not immediately or *necessarily* spent on the current products (or resources) of industry.

But what, one might inquire, if in the same period firms purchased newly produced capital goods equal to (or more than, or less than) the value of gross business saving? Analytically this should be looked upon as two separate and independent decisions; namely:

(1) A decision to not spend all corporate revenues on production—labor, raw materials, interest and/or dividends—and (2) a decision to purchase (invest in) newly produced plant and equipment. If the current purchases of capital goods by business firms are equal to gross savings, these saving can be used to finance internally those investment expenditures. If investment exceeds business savings, external debt and/or equity finance will be required; if investment spending is less than business saving, unless households consume more than their income, unemployment and recession may result.

In a modern economy with a well developed financial and banking system there is no necessary fixed relation in the aggregate involving (a) the level of business saving and business planned investment and/or (b) decisions to change the level of business saving or planned investment. Thus, it is essential to separate analytically these different decisions to save and invest by firms to clarify thinking and analysis.

In sum, gross business saving is equal to retained profits plus capital consumption allowances; and an increase in either of these components of gross business saving will not automatically increase current expenditure on plant and equipment. Consequently, it follows that the private sector's decisions to save are in themselves decisions not to purchase the current products of industry.

While this saving concept is not the same as adopted by some other economists (e.g. Professor Friedman), our definition has two distinct advantages. (1) The concept is unambiguous—any decision to increase saving must always mean a decision to buy less of the pro-

¹ Since the term "income" is associated (in common usage) with contributions to the production of current output in the economy, aggregate household income should be limited to receipts by households arising from the contractual sale of current services of the factors of production (land, labor, and capital). Income-in-kind payments therefore should be conceived of as the combination of two separate contractual transactions. (a) money income payments to factor owners from the employer, with (b) a simultaneous purchase commitment by the factor owner to the employer.

ducts of industry out of any level of income. (2) This saving concept conforms to what the intelligent layman means when he describes savings, namely spending less of his income receipts.²

An act of saving in the private sector means in essence a decision not to have dinner today; it does *not* however require the saver to make a decision to consume (purchase) a specific product of industry in lieu of dinner at a specific time either today or at any future date. What the saver desires is a "time machine" for transferring this saved purchasing power to an unspecified date in the future when he may wish to exercise a claim on production. At the moment of saving the typical saver need not be certain what resource (or product) he will want delivered to him at what specific time and place in the future; and, hence, the saver may be currently unwilling to enter into a forward contractual commitment for the purchase *and* delivery of any resource-using product at a specific future date. Thus, as long as the money-contracts law is expected to determine future resource commitments and allocation, either (1) money or (2) any liquid (readily resaleable) durable with low carrying cost are eligible time machines worthy of the savers' consideration. The income recipient who decides not to exercise all his current claims out of today's income, must also necessarily decide in which form of time machine to embody today's saving. Such time machines are called liquid assets.

Time is a device which prevents everything from happening at once. Production takes time. Thus a capitalist system which attempts to organize (as well as the exchange of goods and services) via the market place requires the human institutions of money and time—specific money contracts. These money contracts are of two types: (a) *Spot contracts* which require *immediate* delivery and money payment; and (b) forward contracts which specify future date(s) of delivery and money payment.

As long as production and exchange are primarily organized on a money contract basis, claims on the resources available for production (or on the products of these resources) will always be in the form of money. *Money*, therefore, is defined in terms of its function, namely, *money is the means of contractual settlement.*

In a capitalist, market-oriented economy, although exchange can occur under spot or forward contractual agreements, most production

² Milton Friedman, on the other hand, has in developing his analytical position used strange (to the layman) definitions of consumption and savings. Friedman designates consumption as "the value of services" consumed (i.e., destroyed) during the period. Thus, for Friedman consumption is equal to depreciation (or wearing out) of existing durables each year plus the purchase of nondurables [Friedman, 1957, p. 11]. Savings, then in Friedman's analysis, is any part of income not so consumed; thus, a layman might be shocked to discover that the purchase of a gas-guzzling sports car is, in Friedman's analytical system, a form of private saving in the year of its purchase (except for the portion of the car which depreciates in that year). Friedman prides himself on *not* defining the purchase of such durables as consumption. Instead Professor Friedman boast that his definitions are superior to others (including the ones used in this paper) because "much that one classified as consumption is reclassified as savings" [Friedman, 1957, p. 28]. Thus, for example when windfall (unplanned) income are received in Friedman's permanent income model, Friedman asks rhetorically "Is not the windfall likely to be used for the purchase of durable goods?" [1957, p. 28]. Hence, almost by definition, Friedman has demonstrated that current windfall (or transitory) income receipts will always be "saved" since how many additional nondurables can a household purchase in the current period? The average layman would be surprised to learn that if a household won the Irish Sweepstakes and spent the receipts on yachts, fast cars, mink coats, etc., that such purchases are not, in Monetarist theory, conspicuous consumption but are instead private savings!

Such uncommon use of language can be highly misleading for the unwary. For example, does anyone truly believe that a policy which stimulates private savings in the form of say mink coats, etc. improve productivity in the U.S.?

transactions between firms must involve forward contracts (e.g., labor hire, raw material purchases) if production is to be planned efficiently.

Since resource owners in a capitalist economy are willing to enter freely into forward money contracts, money will not only be the means of contractual settlement but it will also possess the capability of acting as a vehicle for moving generalized (nonspecific) purchasing power for resources over time; i.e., *money is also a one-way* (present to future) *time vehicle or time machine*. As long as the economy organizes its production on a forward money-contract basis, money will be the thing in which future liabilities (e.g., the money cost of future production, the future cost of living, etc.) will fall due. Hence, today's money can always be held to pay for these future purchases, as long as the carrying cost in the shape of storage, wastage, etc. of today's money is low. Money is, as far as the private sector is concerned, a time machine *par excellence*.

Of course, other durables can possess this time machine function which we call *liquidity* in various degrees, depending on their carrying costs and their resaleability.³ Since any durable besides money, *however, cannot* (by definition) be used as settlement of future contractual obligations, in order for any other durable to be a liquid asset (time vehicle) for moving generalized purchasing power, it must be readily resaleable at any time in a well-organized, orderly *spot* market. The degree of liquidity associated with any durable therefore depends on the degree of organization of its spot market. If a spot market for a specific durable is thin or nonexistent, then the purchase of such a durable is "permanent and indissoluble, like marriage, except by reason of death or other grave cause" (Keynes, 1936, p. 160).⁴

³ Durables with high carrying costs are "expensive" modes of time transportation, just as "gas-guzzlers" are for space transport. All other things being equal, savers will attempt to find time machines with the lowest carrying cost among those available, just as automobile buyers might, *ceteris paribus* choose the lowest "gas guzzler" even if only guzzlers are available.

Milton Friedman on the other hand would permit (by definition) the saver to store his current claims in consumer durables such as clothing and household appliances (1974, p. 28): i.e., durables which, in the real world, have large carrying costs and which are normally not readily resaleable and hence are very illiquid.

⁴ The attribute of liquidity requires that money (and other financial assets) possess certain "essential properties" namely a zero (or negligible) elasticity of production and a zero (or negligible) elasticity of substitution. Since I have developed the rationale for these salient properties for liquidity at great length elsewhere (Davidson, 1978), let me merely summarize the implications of these properties:

(1) To denote that the elasticity of production is zero is merely to recognize, in the language of economists, the veracity of the old folk adage that "money does not grow on trees" and hence money can not be harvested (produced) by the use of labor. Since the elasticity of production is zero, if households, for example, decide to buy less autos (space vehicles) and buy more time vehicles for liquidity purposes out of current income—while no one else concurrently spends more on the producible goods of our industries—then employment will decline in the auto industry while the unemployed resources *cannot* be reabsorbed into the production of time machines. Moreover since the unemployed auto workers will buy less goods, additional or secondary unemployment (the multiplier) will occur in other industries which ordinarily sell goods to auto workers.

(2) Since the elasticity of substitution is also zero as the hypothesized increase demand for money (or similar financial assets) increase and these liquid time machines become more scarce, households will not substitute *other producible items* for these desired machines. Accordingly, the demand for liquidity can become a bottomless sink. For example, if the private sector should increase its demand for liquid assets (such as money and/or securities) at the expense of the products of industry (whether the latter are durable or non-durable)—i.e., if in the aggregate the private sector increases its savings out of income, while the foreign and government sectors do not increase their spending out of their income on the products of industry—then unemployment must develop. In Friedman's model, on the other hand, when household savings increase at the expense of consumption—while the money supply is unchanged—there is no unemployment since consumers buy more durables to offset their reduced purchases of nondurables. Why then should investment spending by business increase in the face of a rise in private sector savings propensities?

2. *Entrepreneurs, Investment Spending, and Finance*

Entrepreneurs are economic agents who as managers of business firms are willing to invest; i.e., to contractually commit themselves today to the purchase of working and/or fixed capital goods in order to provide an expected flow of produced goods at specific dates in the future. Production takes time, and in order to organize the production process efficiently, contractual commitments must be entered into at the start of the production process, so that delivery of components, etc. can be made as the good-in-process (working capital) is fabricated from basis raw material to finished product by the use of instruments of production and labor.⁵

Fixed capital are very durable instruments of production which are expected to yield money revenues from the future sales of products over a very long time. *Working capital* is goods-in-process, durables which are partly fabricated towards their ultimate form; such goods will provide their expected yield in the course of a single production period (e.g., a bushel of wheat). This paper, like most discussions regarding investment expenditures for capital accumulation and increasing productivity, focuses on the demand of fixed capital goods. Accordingly, *gross investment* in this paper describes the gross output of industries producing fixed-capital goods over time, and *net investment* (or new capital formation) is gross investment less replacement of fixed capital goods that actually "wear out" during the period.⁶

Entrepreneurial investors must undertake contractual commitments to hire resources to increase the stock of instruments of production far in advance of actual consumer purchases of the prospective output. Since today's saver is unwilling or unable to make specific forward contractual commitments today (designating which future products he will buy with his current savings and at what future dates he will make these purchases) there is no market mechanism that can coordinate today's investment plans of investors to make facilities available to produce specific goods in the future to meet the future consumption demands of today's savers. Consequently, in a market economy investors must take "positions" in fixed capital goods a long time before they have received forward contractual commitments by the ultimate buyers (consumers) for the products produced by utilizing these fixed capital goods.

The *finance of capital goods* is critical for investment decisions because capital goods require considerable time to produce, to put into place, and to wear out. This is especially true for fixed capital items such as plant and equipment. Therefore, fixed capital goods are typically financed twice during their lives: The first financing can be termed *construction funds finance*; the second is *investment funds finance*.

⁵ As the *Economist* (March 10-16, 1979 issue, p. 12) noted, the Japanese auto industry became an important world force when Toyota "... implemented its radical production control system, known as the 'just in time' method. This process was quickly copied by the rest of Japan's motor industry. It likens each manufacturing stage to a customer. . . . The customer collects his goods in the precise quantity and at the exact time he needs them. The component producer, which may be part of the same company, thus has an orderly market and so can adjust its production (using the same approach) accordingly."

⁶ Nevertheless, it should be recognized that the holding of both fixed and working capital goods—which are necessary for production to occur—require financing.

In the construction funds finance stage, while fixed capital goods are being fabricated they are considered working capital for the capital-goods-producing industries. These capital goods-in-process are often financed via short-term construction or working capital loans obtained by their producers from the banking system. Entrepreneurs use these construction funds to pay their workers and suppliers during this construction period.

When the capital goods are finished, delivery is made and full payment by the buyer on the forward contract ordering the fixed capital goods is required. These purchase payments cannot usually be made entirely out of the current income receipts of the buyer. Rather they are viewed as capital account purchases. The buyer-investor must finance the purchase price of these capital goods via some investment funds financing arrangement which will span most, if not all, of the future period when these long-lived goods are in place and producing final goods. Thus at the date that the investor in fixed capital goods takes delivery of these items from the producer, the investor is typically required to make a money payment to the producer. This payment is used to pay off the short-term loan from the banking system and yield a profit to the producer of the investment goods. (The short-term loan remember was used to pay for the resources—labor, raw materials—that were required to produce the capital goods.) Of course, once the short-term construction loan is paid off, it is available from the banking system to finance another capital goods-in-process commitment. Thus the funds for construction fund finance become a “revolving fund” which can maintain the existing rate of construction (in value terms). If construction rates are to increase, however, it requires that the bank finance for additional construction must *pari passu* expand.

The investor in fixed capital is required to finance his delivery day payment via either equity or debt “funding.” These capital account financial arrangements will have been made prior to the delivery date. Because most fixed-capital goods are *illiquid assets* (that is durables whose spot market is poorly organized, thin or even notional) investors recognize that profitable resaleability of fixed assets during their useful lives is virtually impossible. Hence, unlike the relatively short-term financing arrangement which was used to undertake the position in these assets while they were being built,⁷ a longer term “funding” of the position via equity or debt must be arranged before delivery can be accepted. Of course, over the useful life of the capital goods, the investor expects (a) that goods produced from these facilities will be sold at definite dates in the future and (b) that the revenues remaining from these sales (after paying for labor and raw materials) will be sufficient to liquidate the long-term equity or debt position in plant and equipment, plus earn a rate of return which will have made the taking of this position worthwhile. It is the expectations of profitable future sales which induce entrepreneurs to invest currently in new plant and equipment, as long as there is no difficulty in financing this increased

⁷ Since the fabrication of fixed capital goods is normally undertaken after the buyer-investor has entered into a forward contractual commitment to accept delivery and make payment at a specified (near) future date, the fixed capital goods producer can use this purchase order as the basis for obtaining short-term construction fund finance from the banking system.

“position” in fixed capital goods. If in the aggregate, investors “positions” in fixed capital are increasing, capital accumulation must be occurring.

In the case of equity finance the buyer has at the purchase date already amassed sufficient purchasing power via money *savings* out of previous or current income and/or the sale of other assets (including new issues of equities)⁸ to pay the entire money purchase price upon delivery. In the case of debt financing the buyer must borrow all (or some) of the purchase price via a *debt contract* (i.e., a contract for forward delivery of interest payments and the return of principal) in order to meet the delivery payment obligation.

(a) *Equity financing*.—If equity financing is used, the asset holder is operating as an Equity Fund which, in essence, is a body to which a certain amount of funds has been entrusted without any specific contractual obligation for the return of these funds. There is only a hope that the return on these funds will be made as large as possible, and that some time over the useful life, the equity funds will be, if desired, returned (the position liquidated). The equity fund works solely on the asset side of its balance sheet—in a manner of speaking, “its liabilities are asleep” (Hicks, 1967, p. 47).

(b) *Debt financing*.—In the case of debt financing, the investors liabilities are not asleep. Most businessmen use debt financing to hold some, if not all, of their illiquid assets. Working capital goods are typically debt financed via short-term bank loans (the duration of which is normally related to the gestation period of production). Investment in fixed capital assets are often financed by long-term debts. Hence, the production flow of goods and services which make up the GNP of any economy depend in large part on the ability of entrepreneurs initially to finance via debt their production commitments and then to maintain sufficient liquidity to meet the resulting debt liabilities as they fall due. Meanwhile, entrepreneurs utilize the illiquid real assets so financed to produce the goods which make up the standard of living of the economy. In any capitalist economy which uses long-lived capital goods to produce (via lengthy and technologically complex processes), financial institutions e.g., organized securities markets, investment bankers, and the banking system play an involved and unique role.

3. Finance and Financial Institutions

Financial institutions, when functioning properly, permit the installation of additional illiquid capacity and the attendant expansion of output while simultaneously caring for the liquidity desires and needs of the private sector via creating various liquid assets (time machines) and organizing (“making”) continuous markets for the purchase and resale of these time machines. It is the existence of these financial institutional arrangements which rupture any direct link between the saving desires of the private sector (and its accompanying liquidity demands) and the investment demands (and related liquidity needs)

⁸ Although it may appear that the floatation of new issues ties investment directly to private sector savings, section IX and appendixes A, B, and C demonstrate that the existence of financial markets and a modern banking system rupture this direct connection.

of entrepreneurs. In fact, in a simple two-sector (consumption and investment goods) model of the economy, where the major form of money is bank deposits (liabilities), the increase in the quantity of money is the way in which the financial community looks after that portion of the increase in the real wealth (fixed capital) of the economy which wealth-owning households do not desire to hold legal title to (equity-own) or even directly lend investment funds for (i.e. hold evidence of debt claims against investors). Thus, even if aggregate planned saving by households and firms equals planned aggregate investment by entrepreneurs, if firms in the aggregate plan to spend on investment in excess of what they can internally finance from gross business saving, while households wish to allocate their planned saving to new issues of bonds and/or corporate stock *and* money or other liquid assets as a store of value, then unless the banking system increases the supply of money, the actual level of GNP will fall short of the level of GNP planned for (and expected by) firms and households. This decline in expected GNP will be due to a shortage of liquidity and finance and *not* due to a shortage of saving!

III. A SUMMARY VIEW OF THE RELATIONSHIP AMONG THESE CONCEPTS

Before developing these financial aspects in further detail, however, a summing up of the saving-investment analysis developed so far is in order to fix these relations firmly in readers' minds.

Today's investors contractually order⁹ long-lived capital goods because of the *expected* dated stream of future *money* receipts net of operating costs which the investors believe will accrue to them by exercising managerial control over these real capital goods. Investors, therefore, are not motivated by the same desires as savers. Investors are not primarily interested in obtaining a time machine to move generalized purchasing power to the indefinite future. Investors (by definition) desire to acquire the future services of real fixed capital assets as inputs in a time-consuming technical production process for they believe they possess the skill, knowledge, and time required to (i) foresee future market demands (even before the buyers in these markets) and (ii) coordinate efficiently production decisions in their pursuit of an expected future dated stream of cash inflows; i.e., "The prospective yield of the marginal new investment depends on the expectation of a demand for a specific article at a specific date." (Keynes, 1936, p. 212).

Investors recognize that in taking a position in real capital goods they are purchasing essentially *illiquid assets*—durables whose spot markets are poorly organized and discontinuous or even practically nonexistent. Illiquid assets are not readily resaleable (liquidated) at

⁹ In general, fixed capital goods are produced "to order" rather than "to market." In other words, because of the specificity of the production process, its geographical location and other factors, producers of plant and equipment generally produce goods only when buyers have executed orders (forward contracts) for the purchase of these goods to be delivered at a specified future time and place. Purchasers of fixed capital goods (investors) are willing to enter into these forward commitments because they believe they possess the expertise to utilize this equipment to earn an expected series of annuities (dated money income flows) over a period of years which will be sufficient to pay off ("realize") the illiquid position taken in fixed capital and yield a *monetary* return which will make it worthwhile to take on the risks of illiquidity and incorrect forecasts of the future.

short notice. Consequently, investors realize that if the future differs from their expectations, they may have to take large capital losses, particularly if they are forced to liquidate when they can not meet their contractual obligations. Investors believe, however, that the liquidation of their positions will essentially occur at planned dates of expected net cash sales inflows over the useful life of the equipment. Thus, fixed capital goods will not be purchased for use as liquidity time machines, as long as other assets exist with lower carrying costs and greater liquidity; i.e., money and financial assets.¹⁰

Since fixed capital goods are illiquid, entrepreneurial investors do not necessarily want legal title to the stock of capital. What they want is possession or control. What is relevant is expected sales revenue in the future from the output produced by capital and labor relative to the costs involved in obtaining control of the services of these factors.

Organized security markets have developed as the institution in advanced economies which provide liquid time machines for individual savers, while the underlying position in fixed capital is illiquid and irrevocable for the community as a whole. Spot markets enable transactions in legal titles to capital goods, although the possession of title does not require delivery of the capital goods owned.

It is the flexibility of security prices in organized spot markets which permits each household unit to hold as many titles to real capital as it desires as liquid time machines and to alter its portfolio of securities as often as it desires. In the aggregate the public holds exactly the quantity of securities and money which the financial system makes available to the public.

The existence of well-organized spot markets in securities has not only created liquidity for savers out of basically illiquid fixed capital goods, but in so doing has severed the link between ownership and control. This schism, and its potential for conflict and antisocial behavior, has long been recognized by some economists (e.g., Berle, Keynes, Galbraith) while others have assumed a confluence of interest between owners (savers) and managers (investors).

IV. INSUFFICIENT PRIVATE SAVING: CAUSE OR EFFECT OF STAGFLATION?

A recent article in *Business Week* (December 11, 1978 pp. 90-98) provides a useful vehicle for focusing our discussion involving the claimed cause and effect relationship between a shortage of saving (hereafter SOS) and stagflation. The fundamental conclusion of the SOS thesis is that the current economic ills of the American economy can be ameliorated, if not completely eliminated, by reversing U.S. fiscal policy which, it is claimed, is currently biased against private sector (mainly household) savings. SOS advocates propose: (1) Reductions in income tax rates for the upper income classes (who tend to save the most); (2) reductions in capital gains rates (to channel more after-tax purchasing power to investment); (3) substitution of a general expenditure tax such as VAT (value added tax) for a por-

¹⁰ Thus the existence of an organized securities market where sale of title does not require delivery of fixed assets assures that the spot market for titles (corporate equities) is used for liquidity purposes, while the spot market for purchase (and delivery) of fixed capital goods is not (for a more complete discussion, see Davidson, 1978, Ch. 4 and Section IX *infra*.)

tion of the income or payroll taxes (thereby discouraging spending and providing tax relief to higher income classes); and (4) reductions in welfare transfer payments to the elderly and the poor (who tend to save less). The latter, according to SOS advocates, provides economic incentives to the poor to spend less and save more, and to rely less on governments to finance their consumption.

Business Week, noting that higher rates of investment is the key to greater growth in the economy, quotes Professor Modigliani of MIT as stating "To some extent high growth produces high savings but high savings also creates growth. In the long run, it is savings which limits investment and not visa versa." (p. 91). And Professor Feldstein of Harvard and President of the National Bureau of Economic Research is quoted: "Over the long term, the real problem is savings and how to simulate a high rate of saving (p. 91) . . . The system should be tilted towards taxing spending and not income" (p. 92). Professor Solow of MIT is even more specific when he states "you need to sacrifice current consumption to create the productive capacity to gain further consumption" (p. 91). Thus these SOS advocates appear to argue that if the U.S. Government would only create additional tax incentives to discourage consumption and increase saving out of current income, all other things being equal, aggregate real investment in the U.S. must increase and the tendency for the economy to stagnate will disappear. Nevertheless, *Business Week* notes a caveat in the SOS advocates position:

No one is advocating that government policy move headlong into pushing the private savings rate up sharply overnight. . . . If that were to happen, the economy would surely go spinning into a recession. Rather, what seems to be called for is a reversal of a system of incentives that has pushed the public toward spending and away from savings (p. 92).

Thus, it seems, in the short run if the government significantly raises private saving out of current income the economy will tumble into a recession. Apparently, however, in the long run, a higher private saving rate (*i.e.*, less consumption out of current income) is desirable and even necessary, according to the SOS view, if the GNP is to grow more rapidly.

The apparent conflict between the short run and long run conclusions of this SOS thesis is due in large part to a lack of precision in the language and analysis of SOS advocates. This semantic muddle in which the long run effects of a change in policy is claimed to be desirable while the short run results are clearly disastrous makes Keynes's gibe that "in the long run we'll all be dead" particularly appropriate for the implications of the SOS doctrine.

Taken at face value, the SOS hypothesis suggests that Congress should drastically alter fiscal policy. Before making such a fundamental change in a policy direction which during the past 40 years has provided the citizens of this nation with an unprecedented growth in prosperity and personal security, a fundamental logical assessment of the validity and applicability of this SOS hypothesis to current economic conditions is in order. If such an analysis demonstrates that much of the current stagnation is *not* directly due to a tendency of the private sector to undersave, then the SOS hypothesis and its policy implications should be abandoned.

SOS advocates have based their analysis on a confusion between the role of finance and that of saving in stimulating capital accumulation by the private sector. To a large extent it is the misdirection of monetary policy in a vain attempt to prevent inflation in the last decade which has led to a shortage of finance and consequent lower investment activity which has ultimately discouraged saving. A market-oriented economy based on a forward money contract method of organizing production can grow rapidly *only* when entrepreneurs are willing and eager to expand their contractual liabilities over time and the banking system provides them with the finance to do so.

The ready availability of finance permits, in essence without involving significant real costs, private entrepreneurs to marshal all the resources they desire to expand capacity. The lack of finance may prevent capital plans from becoming operational and hence cause the idling of resources in the capital goods industries and thereby limit the economy's ability to provide for growth in future consumption. Financial constraints which prevent spending not only limit entrepreneurs' ability to provide for future consumption by engaging in capital formation now; but by destroying potential effective demand for current goods and services, tight money policies also squelch the very profit opportunities and cash flows which are necessary to validate past entrepreneurial plans. Hence, after a period of tight money which results in recession or at least a slowing of growth, entrepreneurial-investors are likely to be more cautious and less willing to undertake additional capital-expansion commitments when finance again becomes available. Thus monetary policies designed to limit spending (encourage private saving) in any given expansionary phase of the business cycle will create a conservative psychology among investors which will, *ceteris paribus*, cause the next expansionary phase to be more sluggish than otherwise. In such an environment, a change to permanent policies specifically designed solely to encourage additional saving out of income will exacerbate any tendency in a market economy towards stagnation by creating an atmosphere which destroys the "animal spirits" of private investors.

V. HOW WOULD A SHORTAGE-OF-SAVING POLICY AFFECT PRIVATE INVESTMENT?

If the SOS thesis is correct, then the Federal Government should deliberately adopt policies geared solely to reduce the private sector's consumption spending out of current income.¹¹ Specifically this means that the Government must encourage the private sector to cancel some orders (which would otherwise be forthcoming) for today's production of consumer goods (without encouraging any substitution by the private sector to place additional forward orders today for specific additional consumer goods to be delivered at a specific future date). Accordingly, to the extent that "free enterprise" business firms gear their decision to hire workers today to their current (and prospective) near

¹¹ Of course if all the SOS advocates wish to accomplish is the stimulation of investment spending, they should come out explicitly for policies which directly accomplish this objective—e.g., making easy financing available. In an economy which is stagnating with excess capacity and unemployed labor it is unnecessary to cut consumption (or government spending) in order to free resources!

term orders for goods, a deliberate government policy to lower consumption spending *must* decrease employment today in the consumer goods industries without providing any direction to investors as to where to increase their orders for specific pieces of *additional* plant and equipment so that this prospective increment in the capital stock will be on-stream when, at some unspecified date in the future, savers decide to increase their orders (*more than otherwise*) for consumer goods.

A government policy which deliberately seeks *only* to reduce private expenditures on new goods and services (which is, by definition, private saving), merely reduces the total orders for the products of industry as long as the policy is in force. In a capitalist market-oriented economy, however, it is the volume of actual orders and the expectation of *near* future orders which is the "invisible hand" which directs businessmen's decisions into the quantity of resource-hiring contractual commitments to be undertaken to produce consumption *and* investment goods (where the latter depends on the expected volume of orders for consumer goods in the further future). If consumer demands decline today as a result of deliberate government policy *and* no specific orders are deliberately and simultaneously placed to offset the consumer decline, why should businessmen expect sales in the future (as long as the policy remains) to increase *more rapidly* than their expectations of sales before the policy to reduce consumer spending was inaugurated? Yet it is just such expectations of even greater (near) future orders which are necessary (*but not sufficient*) to induce businessmen to expand their contractual orders for capital goods today. With a deliberate government policy to lower spending and therefore reduce consumption (i.e. increase saving) however, some already existing plant and equipment is immediately made less scarce (or even redundant) and hence it can be conserved for future consumer demand when, *and if*, the latter arrives. Consequently there is permanently less need for entrepreneurs to place orders for *additional* capital equipment for *two reasons* if the government adopts a *permanent* policy whose sole objective is to favor reducing consumption spending out of any level of GNP! First, such a policy if successful immutably reduces sales to consumers out of any level of GNP. Secondly, at the time the policy is initiated it will make the existing stock of capital facilities more redundant than otherwise and hence more readily available if demand expands in the future; expansion or even replacement of existing fixed capital is postponed. If a government policy which encourages private saving is effective, not only will it release resources in the consumer goods industry, but simultaneously it will *lower employment* in the investment goods industry and thereby reduce the rate of capital accumulation and economic growth.

In other words, to the extent that a deliberate government policy against current consumption is successful, it will encourage the private sector to spend less on such things as autos which are produced *today* by labor and capital and to put these private savings into liquid assets which can not be produced by labor and existing capital facilities. Of course, if only the demand for real capital were to increase concomitantly with the increased demand for liquid forms of saving

stimulated by the SOS policy, then the labor and facilities released in the consumption goods industries could be reemployed in the capital goods industry. This, of course, is the wish (assumption) underlying the SOS hypothesis (see footnote #11), but in a modern market-oriented economy, no direct mechanism exists (except via a possible lowering of interest rates and improving financial conditions) for stimulating capital accumulation. Unfortunately, with the development of a modern monetary and financial system, savers (e.g., households) do not desire (or need) to store their "temporary" generalized purchasing power into readily producible durable things (i.e., real wealth or capital) which are produced by the use of labor and equipment, because the essential properties of liquid assets preclude the use of *easily reproducible durables*.¹²

Yet, the only logical sense that can be made out of the SOS hypothesis is that any policy which creates direct incentives for increasing private saving must simultaneously cause "savers" to desire to hold their additional savings directly in the form of additional capital goods. Otherwise the financial system will intervene between the savers and the investment goods buyers, and, as section IX and appendixes A, B, and C demonstrate the financial system is not merely a "veil" on the real activities of the economy. Instead the financial system can alter investment spending independently of the saving plans of decision makers in the private sector and vice versa.

Any government policy which successfully increases private saving propensities out of income must reduce private enterprises' incentive to produce consumer goods today. This renders a portion of existing plant, equipment and labor force as unnecessary, and therefore causes entrepreneurs to lower their current purchases of capital goods. To the extent this decline in orders today causes entrepreneurs to lower their expectations of future sales, an even greater decline in the demand for capital will occur thereby exacerbating the stagnation problem. The inevitable logical conclusion of a government policy to reduce current consumption out of income when the economy is already stagnating is that in the long run we'll all be dead!

But the SOS advocates might parry, will not the private saving be put to use via the purchase of securities thereby reducing the cost of finance (i.e., lowering the rate of interest) and hence stimulate additional investment expenditures? It should be noted, that such a question implies *it is ultimately the ability to lower interest rates and provide additional finance* which is the slender reed upon which the SOS hypothesis is relying on to bring about more rapid expansion. (For a complete response to this query, see the development of the analysis of finance and the role of financial institutions in section IX and appendixes A, B, and C.) Simultaneously SOS advocates are implicitly assuming that the concurrent reduction in consumer sales and in-

¹² In the analytical model of Professor Friedman, on the other hand, if households initially demand additional money in order to hold some of their increased savings and if the supply of money is limited, the price of money will rise and savers will substitute "cheaper" durables as "temporary abodes of purchasing power." These "cheaper" durables include easily producible durables such as appliances and clothing (Friedman, 1974, pp. 27-29, 107-10), and hence unemployment is avoided and real wealth is accumulated as the increased desire to save by purchasing "temporary abodes of purchasing power" spills over into the purchase of household durables. But does even the nonprofessional economist believe that appliances and clothes are really efficient "temporary abodes of purchasing power," i.e., do households buy such durables for resale?

creased excess capacity will not depress entrepreneurial expectations of *future* profitable sales and thereby lower the demand for real capital. If the goal of the SOS advocates is to improve financial conditions why not state this specifically and advocate "easy financing" policies directly? Then, at least, the discussion can focus on the crux of the problem, namely, the shortage of finance, rather than debating the results of the stagnation problem namely the shortage of saving.

To stimulate capital expansion during a period of stagflation, it is necessary to (i) increase the availability of finance at reasonable terms rather than reduce consumption out of income, and (ii) assure that the aggregate resulting demand for goods is sufficient to encourage entrepreneurs to employ all who are willing and able to work. This second necessary condition implies that it may actually be necessary to increase private consumption (or social investment) in order to encourage entrepreneurs to increase their rate of capital accumulation. As long as there is idle capacity and unemployed workers, increasing the availability of finance need not create inflationary pressures.¹³

Only if the economy were already at full employment and orders for additional capital goods were increasing at a rate which led to long (and increasing) queues of buyers and lengthy delays in promised delivery dates could there be some justification temporarily to tilt government policy towards private saving. Even in this case, however, financial arrangements (as discussed below) rather than the lack of private saving can be the basic constraint. Hence, financial policy must be the centerpiece of any policy to increase the rate of capital accumulation.

VI. WHAT WILL A VALUE ADDED TAX DO?

It should be obvious from the preceding analysis that the institution of a tax on spending (e.g., a value added tax) as a substitute for a tax on income or capital gains or to finance welfare payments will not in itself stimulate additional expenditure on real capital goods. VAT cannot be justified on the basis that it will per se increase capital accumulation. Nevertheless, since Congressional committees are considering the possibility of instituting such a tax, it is useful to discuss the effects which VAT could have on the U.S. economy.

Almost two decades ago, I demonstrated that the *ceteris paribus* effects of the imposition of a general excise tax such as VAT (Davidson, 1960) would be: (1) If money wages are sticky, to increase the general price level of producible goods at any level of employment while simultaneously reducing employment and output by driving a tax wedge between market prices and the costs of production and by encouraging (domestic and foreign¹⁴) buyers to avoid tax payments by attempting to reduce consumption of domestically produced goods (save); and (ii) if it is assumed that the incidence of VAT falls entirely on the price of inputs (so that money wages and other costs of production fall proportionately to the tax rate, and hence there will

¹³ The analysis of the role of monetary policy in an anti-inflation program is developed in appendix C.

¹⁴ Unless exports are excluded from VAT. As a practical matter, however, a complete exclusion is not possible; e.g., invisible exports via purchase of tourist services cannot be readily excluded.

be no change in the price level at any output flow), employment of labor and capital will still be reduced to the extent savings out of current incomes is stimulated. In either case, to the extent that VAT is perceived to be a *permanent* tax which reduces spending out of income, entrepreneurs should expect, *ceteris paribus*, consumer demand in the future to be permanently lower than it would be in the absence of VAT. Since in a capitalist society increases are expected in consumer spending (which is the ultimate determinant of the entrepreneurial desire for capital accumulation), entrepreneurs should order less plant and equipment than otherwise; i.e. the institution of VAT, *ceteris paribus*, will tend to aggravate rather than ameliorate stagflation tendencies. If, government policy is instituted which deliberately discourages current consumption via VAT, entrepreneurs will not want to order additional equipment today and incur the high carrying costs of holding these facilities idle. On the contrary, entrepreneurs are likely to lower current capital expenditures as VAT makes some portion of existing plant less scarce than otherwise.

Of course, if VAT were to be announced as only a temporary tax with a specific termination date *and* a government guarantee to reverse policy and stimulate consumption to an even larger extent than if VAT had not been installed, then some additional investment spending could be induced currently. In this case, however, it will be the guarantee of larger consumption spending at a future date and not the discouragement of consumer expenditures today that is the stimulus to more present investment; VAT is an unnecessary adjunct. At some date between today and the announced date of government stimulation of additional consumer demand, entrepreneurs will increase the orders for capital goods provided the credit conditions for financing of an expanded position in fixed capital is appropriate.

Thus, whether the nation was in a period of stagnation or one of full employment, tilting policy toward saving might, *ceteris paribus*, stimulate additional investment *only* if:

(a) The government restrictions on consumption were specifically limited as to duration; while

(b) Entrepreneurs believed the government could "fine tune" private sector consumption expenditures *and* that, at the announced termination date, of the tilt towards having policy, consumers would expand their spending on domestically produced goods at a rate which would greatly *exceed* what they would have spent in the absence of tilt towards savings policy in the interim;

(c) The termination date on such policy was close enough in the future so that entrepreneurs would have to place orders almost immediately in order to have the new facilities on stream by the termination date so that the expected increase in future consumer demand could be met;

(d) Entrepreneurs do not go bankrupt or suffer severe financial losses during the period when government deliberately discourages consumption sales; and

(e) Financial facilities are readily available.

Conditions (a) through (e) are all necessary to achieve higher investment rates today, if the government tilts policy toward encouraging private saving. Explicit recognition of these conditions expose the

logical weakness of the SOS hypothesis. Ultimately in a market-oriented production economy, it is the entrepreneurs' expectations of greater consumer sales in the near future, and not the constraint on consumption purchases today, which lead to greater rates of capital accumulation by capitalists.

VII. SHOULD WE REDUCE CONSUMPTION OR EASE FINANCE AND ENCOURAGE CONSUMPTION?

A *long-run* policy of reducing consumption out of current income each year is antithetical to the only justification for economic activity in a capitalist economy—namely to ultimately satisfy the consumer. Those who advocate stimulating a higher rate of saving by sacrificing “current consumption” are arguing on the basis of a variant of the old butter vs. guns analogy (substitute capital goods for guns) which they believe is applicable to the current state of stagnating Western capitalist countries such as the United States. Since it is admitted even by economists of the SOS persuasion that the butter vs. capital goods analogy is only applicable to a fully employed economy, those advocating SOS policy must claim that the United States is either at or very close to full employment and hence expanding capital goods output requires reducing consumer production. In a money economy, however, simply reducing the employment of resources in the consumer sector will *not* automatically increase output in the capital goods sector. Even at full employment, such a reallocation requires: (1) expectations of higher rather than lower consumption out of current income in the near future (if not today); and (2) finance arrangements which provide entrepreneurs and savers with sufficient liquidity so that the banking system will take title (indirectly) for that portion of the capital stock that the households do not wish to hold at the current rate of interest. If these conditions are met, entrepreneurs can go ahead with their plans to enhance the stock of capital independent of the saving plans of households while the actual volume of private saving will always be brought up to the requisite sum.

As long as we rely primarily on private entrepreneurial decisions to accumulate real capital, the most important factor increasing the demand for real capital is the infusion of decision makers with the expectations of higher (not lower) consumer demand. (Keynes called such expectations—“animal spirits”—“the desire for action rather than inaction.”) If animal spirits can be created and if sufficient construction and investment fund finance is provided by the banking system, then by the tried and true rules of the capitalist game, entrepreneurs will increase their positions in long-lived capital goods *today*. In a capitalist monetary economy, *however*, demand means want *plus* the ability to pay. Therefore, entrepreneurs can not demand more plant and equipment unless they can pay more. This increased ability to pay, however, involves primarily the availability of finance via the banking system. If such finance is created and provided to entrepreneurs-investors, then private households will—and must—adjust their aggregate saving accordingly. Conversely, *even* if private saving plans of households are coincidentally equal to the needs for externally financing larger investment positions by firms, the increased

investment plans of entrepreneurs may be aborted if the banking system is not accommodating.

The essential role of a modern banking system and the financial institutions which permit and encourage (or discourage) debt and/or equity financing of "positions" in long-lived real capital goods is ignored in the logical analysis of the SOS hypothesis. Because there is no important role for these financial institutions and money in the SOS analysis, its advocates have confused the existence of a shortage of finance which can constrain the rates of capital accumulation with an apparent shortage of private saving in the U.S. economy. But the perceived saving shortage is a *result* of the finance-shortage policy of the Federal Reserve in an attempt to induce lower demand for capital goods and thereby fight inflation!

VIII. OUTPUT CONCEPTS ELABORATED

Before turning to financial considerations, several output concepts must be developed in order to provide clarity in the ensuing exposition. Most readers are familiar with the national income accounts which define the Gross National Income of the economy as equal to the Gross National Product (GNP); i.e., the value of the gross production or output of industry during a specified period of time. Although the GNP consists of literally millions of different goods and services, it is desirable to categorize all these goods as belong to two groups: (1) *Available Output* (AO); and (2) *Nonavailable Output* (NAO). (cf. Keynes 1930 a, p. 127). AO is defined as currently produced goods which are fabricated into a form available for immediate purchase by households. Thus AO equals all household purchases in the period net of the change in inventories of consumer goods held by industry at the retail level; nevertheless as a first approximation we can associate AO with current consumption spending by households. NAO, on the other hand, is currently produced goods which by their very nature are in a form not available for purchase by households. In a simple two-sector model, NAO is the gross-investment output of the economy.¹⁵

In a market-oriented, capitalist economy where production precedes sales, the quantities of AO and NAO respectively which are already produced and ready for delivery today are the result of yesterday's entrepreneurial decisions regarding the desired size of their positions in fixed (plant and equipment) and/or working (goods-in-process) capital. In general in a mass production economy (as opposed to a produced-to-order only system), these illiquid entrepreneurial positions have to be financed for a significant period of time before consumers are willing to commit themselves contractually to purchase either today's AO or tomorrow's AO which will be produced, in part, by utilizing today's NAO. Thus in order to induce increased gross investment by the private sector (NAO today *and* tomorrow), government policies must encourage "position" taking in NAO by: (a) stimulating optimistic expectations of future specific consumer demands; and (b) permitting ready financing of such entrepreneurial

¹⁵ For simplicity, we are ignoring the fact that many government expenditures are on NAO (and some may even be AO; e.g., food purchases for the Armed Services, etc.)

positions. Given entrepreneurial views of the future, it is the lack of adequate finance and not a profusion of orders for goods which is the prime constraint on expanding capital accumulation by the private sector.

The SOS advocates are implicitly and incorrectly postulating that, in a modern bank-money economy, *before* investors can order new plant and equipment, savers must give up liquidity by transferring their money claims on resources (earned from current income) directly to the investors. In other words, SOS theorists assert that additional capital goods production merely requires the transfer of claims on resources from economic units which spend less than their income (savers) to units which wish to spend in excess of their current income (investors). The existence of a modern financial system, however, permits but does not require such specific claim transfers between savers and investors in order to facilitate an expansion in capital goods production.

Moreover, if savers decide (or are encouraged) to execute less claims on current AO, then investors may be discouraged by the decline in sales (recession) from exercising even the current level of orders for plant and equipment, *even if savers are eager to transfer their unused claims to investors*. (Why should an entrepreneur increase spending on plant and equipment when he can not sell everything that he can produce via current capacity?)

Finally, even if investment demand is assumed to be unchanged by the increase in private savings and the resulting decline in potential sales, unless the financial system not only expedites claims transfers but simultaneously *creates* additional claims, the economy will be unable to increase its GNP—even though there exists idle resources which could be employed to *expand* the current level of total output.

It follows that no volume of GNP which is directed by entrepreneurs into NAO (capital formation) can exhaust or exceed the supply of savings out of current income. In a capitalist economy where inputs in the production process are hired on a forward money contract basis, when entrepreneurs are given the financial facilities to “command” resources to produce capital goods, then the private sector has no choice but to limit its spending out of current income on consumption to that portion of GNP which is AO. Only when the demand for AO *plus* the demand for NAO currently exceeds, and is expected to continue to exceed, the potential total output of the economy, should the government consider a temporary tilt towards private saving—as long as such a tilt does not cause the demand for NAO to come crashing down with that for AO! (*This latter caveat is ignored at one’s peril.*) Even if the government would not adopt a policy tilt towards saving in a full employment situation, however, the greater rate of investment and productivity growth *will be maintained* as long as the banking system does not limit credit availability.

Such financing would lead to a windfall *profits inflation* for those who are holding inventories of NAO which can be readily converted into AO; but such a profits inflation *if expected to continue* will in itself (a) encourage an increased demand for a more NAO (capital goods) and (b) provide additional internal finance by tilting the in-

come distribution toward entrepreneurs.¹⁶ As long as the profits inflation does not spill over into an *incomes inflation* (i.e., higher money wages relative to productivity and/or higher expected "normal" profits) then the windfall profits inflation will be temporary. A windfall profits inflation is the way a market system brings about the higher rate of capital accumulation (*at full employment*) and higher private saving without any specific government policy to stimulate saving.

It is "Enterprise which builds and improves the world's possessions If Enterprise is afoot, wealth accumulates whatever may be happening to Thrift; and, if Enterprise is asleep, wealth decays whatever Thrift may be doing" [Keynes, 1930 b, pp. 149-50]. Hence the role of government in an economy which relies on the private sector to accumulate capital is:

(a) To provide ground rules for the capitalists' game which permit entrepreneurial income to increase permanently *only* if output expands (i.e. large permanent profits are associated with greater output not larger profit margins) and labor income to permanently increase only with productivity gains;

(b) To encourage household purchases of industry output as quickly as industry can expand; and

(c) To have the banking system provide all the finance for entrepreneurs to put their planned investment projects into execution (the real bills doctrine) and to provide all the liquidity the private sector desires.

If the government plays such a role, then when idle plant and unemployed workers are present, any increased demands for NAO will not only create jobs and additional income which induces further increases in consumption spending, but any resulting price increases will be relatively small and will only reflect rising real costs (if any) of increased production flows.

It is the lack of financial facilities due to deliberate policy decisions to limit the growth of the money supply, and/or deliberate policy constraints on the growth of demand for output which can limit capital accumulation either by hobbling the most optimistic entrepreneur's ability to finance additional investment and/or by creating inadequate demand which can quickly turn optimism to pessimism.

From the entrepreneurial view point, any potentially profitable project will be undertaken if: (1) there is sufficient short-term construction finance (bank loans) available to finance the production of the real capital during its period of gestation; and (2) sufficient investment fund finance when the capital goods are installed so they can be funded via a long-term issue of debt or equity finance. Since the fabrication of all capital projects must precede (in time) the in-

¹⁶ Even if the initial position is full employment, the availability of finance will permit an expansion of NAO. If the market for goods is unfettered, then some windfall profits will be made in the AO industries, thereby causing an income redistribution towards groups with higher than average savings ratios. This redistribution raises aggregate private-savings-out-of-income into line (without a deliberate government policy) with higher proportion of GNP produced in the form of capital (or NAO). If, for social and political reasons, this redistribution is considered undesirable, a deliberate explicit incomes policy (see appendix C) and fiscal policy must be put in place to meet the objective of higher investment *at full employment*. In any case, a tight monetary policy can not be utilized to prevent the resulting incomes inflation, for monetary policy to the extent it is successful in fighting inflation will do so by *reducing* actual investment activity.

stallation and use of the equipment as an input in the production process, the short-term financing over the gestation period of long-lived capital must be forthcoming before any funding (and savings availability) problem can even be considered. The supply of finance for planned (*ex ante*) investment projects depends on the banking system (given the liquidity propensities of the public). If investors are to increase their orders for fixed capital goods today they (or their suppliers) must obtain an increased supply of liquidity (finance) *before* they can hire additional workers and generate new income, no matter how thrifty the private sector may plan (*ex ante*) out of the additional income when it eventually comes (*ex post*). The entrepreneur needing additional finance today can not borrow the additional future planned savings of the private sector, for "the *ex ante* saver has no cash [today] but it is cash [today] which the *ex ante* investor requires" [Keynes, 1973 XIV, p. 219].

If the saver is forced to increase his saving today in order to transfer claims to the *ex ante* investor, some AO which otherwise would be bought today will go unsold (or be sold at a loss). The resulting loss of sales will make the *ex ante* investor immediately more cautious than otherwise. In the face of increasing slackness in today's markets for AO, *ex ante* investors are likely to be less willing (even if finance is readily available) to commit themselves contractually to ordering capital goods whose additional output will have to find profitable market outlets tomorrow.

A heavy demand for capital goods NAO can be held up by a lack of financial facilities on reasonable terms. This is especially likely to occur if the government relies on monetary policy rather than an incomes policy to fight domestic inflation. It is the limitation of available finance by government policy rather than any bias against private saving out of current income which has restricted the rate of investment in the United States in recent years. As long as the banking system makes all the finance available at reasonable terms that entrepreneurs desire, investment will be at the greatest rate that private investors desire. If this is still deemed too slow a rate of investment, then as long as businessmen are motivated by the profit system to respond to consumer demands, *the cure for the slow rate of accumulation is to stimulate current and near future consumption out of income, not to stifle it by tilting the system towards additional saving.*

The great capital accumulations of history—the building of the pyramids in Ancient Egypt, the cathedrals of the Middle Ages, the discovery and exploration of the New World, the railroads and the development of the American West—were never constrained by the desired personal saving ratios of households. It was the ability of the entrepreneurs of these magnificent ventures to obtain ready finance (often by questionable financial manipulation) which permitted these vast capital accumulations of their time!

The preceding analysis highlights the importance of finance and not private saving for increasing the rate of accumulation and GNP growth. For those who still find difficulty in accepting that it is a shortage of finance and not a shortage of saving which threatens capital accumulation, the following query is presented:

Given the stagflation conditions throughout the 1970's, what motivation would there have been for domestic corporations to install even more capacity than they did during the past decade *if* planned consumption spending out of any level of GNP had been significantly lower during the period *and if* government expenditures had also been lower during the period?

IX. FINANCE AND THE ROLE OF FINANCIAL MARKETS

In a modern, market-oriented money economy, financial intermediaries and the banking system play an involved and unique role which can permit the installation of productive capacity and the expansion of output at a rate which would undoubtedly be impossible in a nonmonetary world. A modern banking system and associated financial institutions contribute significantly to economic growth. Through the operation of financial intermediaries and their preferential relationship to the banking system (e.g., the discount window, repurchase agreements, etc.). Enterprise may often be encouraged to accumulate real wealth at a rate which otherwise might be incompatible with either normal savings (time preference) and/or portfolio (liquidity preference) desires by household. At times of general insecurity, however, these institutions may magnify the rush to liquidity and thereby accentuate slumps.

The business of the daily exchanging of existing titles to wealth via organized security markets absorbs some resources and human energy, and considerable public attention. Organized security markets also provide the institutional link between the desire to accumulate fixed capital by firms and the desire to store wealth in liquid assets by households. The existence of continuous, well-organized spot markets in titles to, or debt claims against, fixed capital makes the investment decision even more independent of the decision to save than it might be otherwise. In the absence of spot securities markets:

Decisions to invest in private business were. . . largely irrevocable, not only for the community as a whole, but also for the individual. With the separation between ownership and management which prevails today . . . a new factor of great importance has entered in, which sometimes facilitates investment but sometimes adds greatly to the instability of the system . . . the daily revaluations of the Stock Exchange, though they are primarily made to facilitate transfers of old investments between one individual and another, inevitably exert a decisive influence on the rate of current investment (Keynes, 1936, pp. 150-1).

Nevertheless, organized security exchanges are not insurance markets—nor do middlemen between savers and investors operate on actuarial principles. Instead, some of these financial intermediaries have developed semi-privileged arrangements with the banking system which have provided a degree of liquidity to the possession of securities utilized and traded by these financial institutions which cannot be associated with, in an uncertain world, the holding of real capital goods—thereby creating a potentially discordant schism between ownership and control of real assets. Moreover, the existence of these liquidity-creating arrangements between financial market intermediaries and the Monetary Authority either directly or indirectly (via commercial banks) has meant that, under certain conditions, *the money supply will respond endogenously to changes in the needs of trade* or even changes

in the needs of the financial circulation. Accordingly, we now turn our attention to the factors gearing the money supply to real factors, and possible behavioral decisions that can cause slippage. To describe such interrelationships will, however, require a more technical level of analysis than has been prevented so far. The interested reader is referred to appendixes A and B; the following briefly summarizes the conclusions from that technical analysis.

Conclusions from technical analysis.—As long as financial institutions act as residual buyers and sellers in a well-organized securities market, securities will be very good substitutes for money (and other liquid assets) as a store of value. If the public's (households plus firms) planned saving ratio out of current income exceeds that which is necessary to maintain effective demand at the current level of employment, it does not matter whether households desire money or securities as a vehicle for transferring purchasing power to the future. Entrepreneurial sales expectations must be disappointed. Realized profits and cash flows will be lower than expected and entrepreneurs will be encouraged to retrench.¹⁷ Thus, any policy whose *sole goal* is to increase household saving out of income always runs the danger of creating market conditions which, *ceteris paribus*, induce entrepreneurs to reduce their capital formation plans.

An adequate money supply to meet the needs of industry and finance at full employment is a necessary, but not a sufficient condition to assure rapid accumulation of real capital and the maintenance of full employment growth. If households' desires for liquidity in the form of money, for example, are sufficiently large so that households will not absorb all the new issues floated at the current security prices and interest rates (technically speaking there is a negative excess flow-demand for securities), then unless the Monetary Authority provides for additional finance via open market operations and prevents interest rates from increasing, financial conditions will limit accumulation *even if* the planned aggregate saving and investment spending would be equal at the full employment level of output. On the other hand if real spending plans are not sufficient to bring about their rapid capital accumulation (or in other words, planned saving out of current income is excessive and therefore entrepreneurs can not sell all they plan to produce at profitable prices), then easier financial conditions will *not*, even in the presence of these big saving propensities by income recipients, induce entrepreneurs to expand their rate of capital formation.

Harrod has succinctly summarized this central theme of the relationship of saving, investment and security purchases in a monetary economy when he noted:

It was Keynes's contention, which was both a novelty and source of endless confusion among commentators that a tendency for savings to exceed investment had nothing whatsoever to do with people putting money into a stocking or even with their leaving it idle in a banking account. Savings might exceed investment even if all savers immediately invested their money in industrial securities, and investment might exceed saving even if a great many savers were putting their money into stockings. (1951, pp. 404-5.)

¹⁷ To the extent firms are making out-of-pocket losses, they may partly finance these by additional borrowings from the banks (who, however, are unlikely to be willing to make such loans even if they have excess reserves). Even if firms finance losses by borrowing, they will be under financial pressure to cut costs and therefore production and hiring in the future.

It is the existence of financial institutions which operate as "market makers" (i.e., institutions which organize markets for financial assets and act as residual buyers and sellers in such markets) which creates the public's belief in the liquidity of the assets traded. These assets have the same elasticity properties as money. In the absence of such "market makers" and the resulting well organized markets, money alone might possess these elasticity attributes. It is these elasticity conditions which break the Say's Law proposition that the supply of goods creates its own demand and its corollary (upon which SOS hypothesis is based)—namely, that any policy which encourages increased saving out of income (by dampening consumption spending) must *pari passu* increase investment spending.

The existence of such financial intermediaries who "make" well-organized markets in securities, however, assure that not only money but also securities have significantly greater liquidity than real fixed capital. As long as savers can employ their saving in either hoarding money or the purchase of liquid assets, the alternative of actually purchasing real fixed capital will never be sufficiently attractive. This means that the decision to invest is independent of the decision to save and policies that encourage the latter will not, *by themselves*, increase the former.

The preferential access which financial institutions have to the banking system and therefore to the Monetary Authority (who is ultimately the lender of last resort supporting financial markets) is the institutional *coup de grace* to the shortage of saving thesis that a tilt toward encouraging higher saving ratios by households will, *ceteris paribus*: (a) Increase the rate of capital formation; (b) improve productivity; and (c) reduce stagflation tendencies.

The financial arrangements between firms, investment underwriters, stock specialists and commercial banks provide a mechanism both for communicating the financial needs of industry, and a way for the Monetary Authority to respond to these current and anticipated needs of businesses. Unfortunately, the various financial institutions operating on this two-way street are often guided in their actions by principles of conventional wisdom which are oriented towards goals that often are, in an uncertain world, antithetical to the commonweal. Accordingly, it is not surprising that these human creations have not only at times constrained the rate of accumulation while resources were idle, but have also permitted a decision-making procedure to develop in which the services of the productive resources of society are utilized in ways which are adverse to social interests.¹⁸

There is an asymmetry about money matters. If excess flow-demand for securities is negative, more rapid expansion of the money supply can maintain growth while the banking system looks after the portion of the real wealth of society that the public does not wish to own currently. While if excess flow-demand (out of household savings) is positive, monetary policy may be powerless to encourage an expansion. This is the analysis which ultimately lies beyond the old monetary theory adage "You can't push on a string."

¹⁸ It is the separation of ownership from control which is due to the growth of organized, continuous security markets and not the lack of perfect competition in the traditional microeconomic sense which leads to Galbraith's scathing indictment of the misallocation of resources in a growing economy. See J. K. Galbraith (1967).

X. RULES AND MONETARY POLICY

Since for wealth-holding households the portfolio balance decision as to what proportion of their store of value to hold in the form of uncertain deferred claims (securities) and what proportion to hold as immediate claims (money) relate to their whole block of wealth at each moment, and not to their current increment, specific guidelines for monetary policy involving business needs for external finance vis-a-vis the private sector's propensity to use corporate securities as a liquidity time machine will be much too complex to be incorporated in any simple rule for money supply growth.

In the real world, the supply of new issues and the flow-demand for securities associated with current household saving are trifling components of total supply and demand in the daily transactions of the large, well-organized, securities markets. Changes in speculative and precautionary demand for money and securities (out of previously accumulated portfolios) which are the result of changes in the public's confidence and opinion regarding future spot securities prices can, especially in times of uncertainty, dominate fluctuations in security market prices. Any discrepancy between external financial needs and planned purchases of securities out of household savings can, at any time, be swamped by the eddies of speculative movements by the whole body of wealth-holders who are constantly sifting and shifting their portfolio composition. Consequently, in an uncertain world, where financial market expectations are especially volatile and unpredictable, the relationship between increases in the quantity of money and the needs of the financial circulation are too complex and capricious to be handled by any simple rule, even if growth in the real factors underlying the needs of the industrial circulation could be accurately forecast. The solution lies:

. . . in letting Finance and Industry have all the money they want, but at a rate of interest which in its effect on the rate of new [externally financed] investment . . . exactly balances the effect of bullish sentiment. To diagnose the position precisely at every stage and to achieve this exact balance may sometimes be, however, beyond the wits of man. (Keynes, 1930 (a) pp. 254-5).

Any rule for expanding the money supply at the same rate as the growth in output will only fortuitously promote a steady rate of accumulation since the demand for securities out of households' savings and/or the public's liquidity preference proper may be changing at a different rate than the supply of securities.

The Monetary Authority in most capitalist economies believes that, as the ultimate creator of the medium of contractual settlement, it is solely responsible for maintaining the purchasing power of money used in the settlement of production contracts. Unfortunately however, the Monetary Authority has no direct control over the money flow-supply prices which are agreed upon in forward production contracts between entrepreneurs and owners of the factors of production. These flow-supply prices relative to the productivity of these factors form the money costs of production of the goods and service which make up the GNP. Business firms who produce this GNP must cover these money costs of production via market prices charged consumers if private enterprise is to be encouraged to maintain production flows.

Hence, if the Monetary Authority wishes to reduce the inflationary pressures generated by increasing forward factor-price contracts (rising faster than productivity increases) on GNP, it will use the only instrument available to it—a restrictive monetary policy. Such a tight money policy, by creating weak or slack markets will, it is hoped, prevent factor supply prices from rising.

In a period of restrictive monetary policy, however, it will be impossible to expand the revolving fund of finance even to meet the needs of a growing industrial circulation, and accumulation will be retarded even though households and entrepreneurs propose to behave in a manner consistent with maintaining a steady rate of growth. Moreover, if there are strong social and political forces causing spontaneous rises in flow-supply prices of reproducible goods, “then the control of the price-level may pass beyond the power of the banking system” (Keynes, 1930b, p. 351) even if the Monetary Authority holds the rate of growth of the money supply far below the growth in potential output.

A monetary policy which is compatible with a socially desirable stable rate of growth and a relatively stable price level, must be coordinated with a fiscal policy which assures the proper balance of the real forces underlying aggregate demand and potential supply and a government policy on incomes oriented towards stabilizing the flow-supply price of reproducible goods over time. For prices of new goods are always someones's income; therefore, when prices in general are rising, some people's money incomes are being inflated.

In the next section we shall develop this theme of stabilizing the purchasing power of money via a coordinated permanent incomes and monetary policies.

XI. PUBLIC POLICY AND INFLATION

Inflation can be simply defined as rising money prices of goods (as opposed to financial assets). For policy purposes, however, we distinguish among: (a) The money (spot) price of nonreproducible goods (e.g., old masters, land) and goods inherited from past production; (b) the money price of new, domestically produced, readily reproducible goods (e.g. haircuts, food, clothing, new autos) (i.e., most of the goods in the GNP); and (c) the domestic money price of foreign produced goods (i.e., imports).

[Obviously for producible durable goods categories (a) and (b) can overlap. The more durable and the longer the gestation period of production, the more a commodity can be treated as in category (a) rather than (b).]

Policies for fighting inflation in each category can differ. For example inflation in pure category (a) goods can be dealt with via a buffer stock policy and/or a tax policy which alters the carrying cost of holding durables; while category (b) requires a Permanent Incomes Policy (PIP). Anti-inflation policy for category (c) goods depends on whether the good belongs to either (a) or (b) and to the government's exchange rate policy.

For economies which consume primarily domestic goods (e.g. the U.S.) inflation in category (b) goods is the most serious policy prob-

lem; and, hence, in the limited space below only this aspect will be developed at length.

There are three basic reasons why the money price of reproducible goods can increase: (i) Diminishing returns; i.e., when the productivity per worker declines as the rate of flow of output increases in response to an increase in demand. (ii) Increasing profit margins; i.e., when the wedge between market price and production costs rise. (iii) Increasing money wages relative to productivity.

For more than a century economists have taught that every expansion in the flow of output will normally involve diminishing returns as some input such as land or managerial talent becomes increasingly scarce. Moreover, similar results can occur if expansion involves employing less efficient inputs; i.e., *hiring path diminishing returns*. [Davidson, 1978, p. 341]. Inflation, if it is due to diminishing returns, involves a once-only rise in prices for any increased production flow and cannot be avoided in the short run. No society has a vested interest in low prices by maintaining low output merely to avoid diminishing returns. (Policies to mitigate this type of inflation include paying piece rate rather than time rates—which shifts the entire burden of diminishing returns onto the labor force in industries exhibiting diminishing returns, and/or government sponsored training and research programs to upgrade skills and enhance productivity.)

Increasing profit margins and excessive money wage increases involve Incomes Inflation as various groups attempt to obtain more of the national product for themselves. These uncoordinated, inconsistent and competing claims for rising income put us all on a treadmill where we must all run faster—demand more money income—merely to keep in the race. For modern production market-oriented economies, Incomes Inflation is the Second Great Crisis for Capitalism in the 20th Century.

Two competing anti-Incomes Inflation are currently advocated. Each suggests a different means to the same end, namely to create an economic environment where powerful subgroups in our economy will not attempt to extort money incomes increases from the rest of society. The traditional remedy for Incomes Inflation is a restrictive monetary and fiscal policy (what Professor Friedman calls “bullet biting”) so that the economy becomes so impoverished it can not be held up for economic blackmail by powerful subgroups.

The alternative is a National Policy to Coordinate Incomes Claims (NPCIC), that is, some form of a Permanent Incomes Policy (PIP). A properly designed PIP will involve an equality of sacrifice when economic events are unfavorable and an equality of sharing of gain in prosperous times. On the other hand any restrictive policy which is based on inflexible rules which limit the growth of the money supply and/or government expenditures to pre-specified rates must involve an inequality of sacrifice as Peter’s pay raise may bankrupt Paul’s employer—efficient or inefficient—when the banks are forced to turn off the taps and the government can not offset the resulting weak markets for goods.

Why, then, do most politicians and businessmen appear to support restrictive policies in public, rather than PIP? First, they are never

told that the object of such restrictive policies is to involve business firms in losses and the factors of production increased unemployment. If they were told this and still chose restrictive policies, they would have forfeited their right to complain when these results ensue and they would lose their positions as either the impoverished electorate or the bankruptcy courts removes them from office. Instead, restrictive policies are always presented as if only others—more greedy than your own group—will suffer! Second, and more important, with the development of industrial markets and the percolation of the democratic ethos through society, each group believes it can, and has the right to, insulate itself against the market forces unleashed by restrictive policies and thereby shift the burden to others. As Galbraith (1978) has forcefully argued, with the growth of industrial society and democracy, people have learned that they can, *and should*, attempt to control their own destiny. If one can gain control of one's income, then one's fate is largely in one's own hands. Galbraith indicates that there are three alternative ways people attempt to control their own income:

(1) Develop a unique marketable qualification, i.e., establish a monopoly position.

(2) Organize with others who have similar market capacities in order to exercise some joint monopoly control; and finally if market power still eludes such groups.

(3) Organize and employ political activities to tilt government policy towards augmenting your income. (Thus poor farmers, poor people, senior citizens, rich and poor corporations, educational institutions, labor unions, etc. each in turn march on Washington, and a lobbying industry grows and enriches itself.)

These developments are permanent; we cannot return to the 19th century when the common person accepted his income as part of his kismet and beyond his control and believed that poverty on earth could be redressed by heavenly rewards. Today we must employ the democratic processes to work out a social contract which permits the equitable sharing of an economic pie which is growing at its maximum potential.

In an economy where strong social and political forces have already gained control of the ever rising money costs of production, the control of the domestic price level has passed beyond the power of the Central Bank. The Monetary Authority can attempt to unleash recessionary forces to put "labor" back in its place; i.e. to induce future inflationary process. Even if such oppressive measures are ultimately successful, the Fed can not control the pace or the route of the journey to the new era of "noninflationary expectations." The path will be a long and dreary one and our economy, even if it survives, will be the poorer for the experience.

Monetary policy is singularly ill adapted for preventing domestic Inflation for it can not directly influence the major costs of production of reproducible goods.

In truth, there is no choice for any modern capitalist society which relies upon cooperation among the factors of production for its national production. As the private law of long-duration money contracts breaks down, and each group demands more rapid income increases, and we leap frog over each other on our treadmill to higher

money incomes, our society must either collapse or enter into a social contract to reestablish the "rules of the capitalist game"—a game in which sticky money wages and price contracts over time are at the core.

In keeping with the game analogy, it should be noted that President Carter has likened the current incomes inflation problem to a crowd at a sporting event—all standing on tip toes to get a better view. The result is no better view, instead aching leg muscles for all, with survival for the tallest. All would be better off, if only there was a permanent rule, equitably enforced, requiring all to sit down. Any temporary rule or any restrictive policy which reduced the tempo of the game might provide temporary relief as the crowd relaxed, but the throngs would be on their feet again at the next flurry of activity.

Why is a PIP feared? For three reasons: (1) The uncertainty associated with anything new; (2) PIP may subsidize inefficiency (in others) by penalizing the productive and the skilled (i.e. me); and (3) By permanently freezing relative prices, resource misallocation may create greater economic losses than would otherwise occur.

Reason No. 3 is, however, not well founded because restrictive monetary and fiscal policies have already created tremendous economic losses and social conflicts in the last decade without eliminating or even reducing the problems of inflation; conversely, incomes policies can be designed to permit relative price changes and market determined resource reallocations if these are desired (e.g., the Wallich-Weintraub scheme of tax-based incomes policy known as TIP).

Fears Nos. 1 and 2 are, of course, real and experimentation with any new policy will be necessary to develop an operational form which achieves its objective while minimizing uncertainties and social conflict. Thus, as was indicated earlier, policy solutions must not only be good (i.e., developed upon correct economic logical analysis) but such policies must also be clever, (i.e., designed in a form that is politically acceptable and encourages compliance by the public). It is hoped that the preceding discussion has developed the principles for providing good policies for stimulating accumulation and reducing stagflation. If so, then the discussion can move forward to how to design clever policies to achieve these objectives.

BIBLIOGRAPHY

- K. J. Arrow and F. H. Hahn, *General Competitive Analysis* (Holden-Day, Inc., San Francisco, 1971).
- A. A. Berle and G. C. Means, *The Modern Corporation and Private Property* (Macmillan, New York, 1934).
- F. P. R. Brechling "A Note on Bond-Holding and the Liquidity Preference Theory of Interest". *Review of Economic Studies*, 24, (1957).
- Business Week Editors "The U.S. Bias Against Savings Leads to High Inflation. Weak Dollar, Slow Growth, Declining Productivity" *Business week*, December 11, 1978.
- Paul Davidson, "Money and General Equilibrium" *Economic Appliquee* 30, 1977, ——— *Money and the Real World and edition*, (Macmillan; London, 1978).
- "Rolph on the Aggregate Effect of A General Excise Tax" *Southern Economic Journal*, 27, 1960.
- The Economist Staff, "Motoring in the 1980's—A Survey" *The Economist*, March 10-16, 1979.
- M. Friedman et al, *Milton Friedmans' Monetary Framework A Debate with His Critics* (Univ. of Chicago Press, Chicago, 1974).

- *The Theory of Permanent Income* (Princeton University Press, Princeton) 1957.
- J. K. Galbraith, "On Post Keynesian Economics" *Journal of Post Keynesian Economics*, 1, 1978.
- *The Affluent Society* (Houghton Mifflin, Boston 1958).
- *The New Industrial State* (Houghton, Mifflin, Boston, 1967).
- R. F. Harrod, *The Life of John Maynard Keynes* (Macmillan, London, 1951).
- J. R. Hicks, *Critical Essays in Monetary Theory* (Clarendon Press, Oxford 1967).
- R. F. Kahn, "Some Notes on Liquidity Preference", *Manchester School* 1952.
- J. M. Keynes, *A Treatise in Money* (Macmillan, London) Vol. 1-1930a; Vol. 11-1930b.
- *The Collected Works of John Maynard Keynes*, Vol. XIV (Macmillan, London, 1973).
- *The General Theory of Employment, Interest and Money* (Harcourt, Brace, New York 1936).
- A. Smith, *The Wealth of Nations* (Modern Library Edition, New York, 1937).
- Securities Exchange Commission, *Report of Special Study of Securities Markets of the Securities Exchange Commission, Part II* (U.S. Government Printing Office, Washington, 1963).

APPENDIX A

TECHNICAL ANALYSIS: EXTERNAL FINANCE AND HOUSEHOLD SAVINGS

In a stationary economy where sales expectations are being met, it is true that firms could replace fixed and working capital per period from sales receipts over time. Of course, even in a stationary economy, as long as production takes time, firms may be required to make payments to resource owners before sales revenues are received. The financing of these factor payments could be accomplished by short-term loans from banks. When, at the end of the production period, sales expectations are met, then sales revenues will be sufficient to repay the firms' short-term obligations to the banks and to yield a 'normal' profit. Under these conditions, the volume of available short-term credit facilities is a "revolving fund" of a more or less constant amount available to finance the working capital expenditures of the next period. In equilibrium in a stationary economy, there will be neither a flow-supply of securities (new issues) nor a flow-demand for securities by the public out of household savings, since net savings and net investment are (by definition) zero.

In a growing economy, on the other hand, there will be a flow-supply of new securities if firms choose to fund externally a portion of net investment, and a flow-demand for securities if households wish to purchase securities out of current savings. For simplicity let us assume that all retained profits are *immediately* used to finance a portion of net investment of the corporate sector. Accordingly, the financing of net investment spending plans in excess of retained profits will require that the flow of new issues by business be taken up either by households or the banking system. The flow demand for securities by household can be, for purpose of exposition, associated with a marginal propensity to buy securities out of household savings (m). Moreover, unless otherwise noted, the following analysis assumes (a) no open-market operations by the banking system (i.e., banks do not absorb any additional corporate securities in their portfolios), and (b) no changes in the private sector's liquidity preference (i.e., no changes in household's precautionary and speculative demands for liquid assets).

The flow demand for securities is therefore the increase in the private (household) sector's demand for securities at any price over the period. Given household savers' expectations of future security prices vis-a-vis current prices, this flow demand for securities is positively related to—but not necessarily equal to—total household savings over the period. In other words, it is assumed that households wish to put some but not necessarily all of their savings each period into the purchase of securities as vehicles for transferring purchasing power into the future. The marginal propensity to purchase securities out of household savings measures this net flow demand for securities; i.e.,

$$d_s = S_h = m s_h y_h$$

where d_s is the flow demand for securities, S_h is aggregate household savings, y_h is household income, s_h is the marginal propensity to save out of household in-

come, m is the marginal propensity to purchase securities out of household savings, while both m and s_h are both fractions between zero and unity. Equation (1) is properly specified for any given level of security prices (or rates of interest).¹⁹

In this simplified model, the only alternative to corporate securities as a liquid time machine is money; hence $(1-m)$ is equal to households' propensity to demand money out of current savings as a store of value. In the real world, of course, philatelic material, old masters, titles to "rare" metals, foreign currencies and other durables are potential store of value if their carrying costs over time are low *and* they are traded on well organized, orderly spot markets. Hence, in an expanded model $(1-m)$ is equal to the private sector's propensity to utilize *any* liquid asset besides corporate securities as a temporary abode of purchasing power. The existence of any such assets—and money is the most obvious one—breaks any direct gearing between increases in savings propensities and increases in investment plans.

For simplicity of exposition however we limit the discussion to the choice of money vs. securities and we assume that only households can buy new issues and only businesses can issue new securities.

It should be noted that the value of m is independent of the existence of expectations of inflation (as long as such expectations are homogeneous throughout the population). Expectations of inflation can affect the *composition* of liquid assets held as time machines as households search for assets which are expected to be "good hedges against inflation"; i.e., those basically *nonproducible* assets whose supply increments are very limited and whose spot resale price is expected, *ceteris paribus*, to rise faster than the prices of newly produced goods. In a closed economy model, it is usually assumed that corporate securities are the only alternatives to money as liquid assets. Moreover, if the general public all have identical inflationary expectation then for any chance therein, the current spot price of securities will be forthwith adjusted so there is no relative advantage of holding securities vis-a-vis money as a store of value.

Hence as long as the economy continues to organize production on a money contract basis, homogeneous expectations of inflation should not, as a first approximation, affect the value of m . Of course if under the threat of hyperinflation the money-contract-production system should break down, there will be a flight from all domestic liquid assets; i.e., "a flight from currency".

Accordingly for the purpose of analytically separating "independent" economic factors, the following analysis emphasizes household decisions about current increments in wealth and corporate decisions on increments of securities as the major forces determining the excess-flow demand for securities, even though these current increments per period are only a trifling proportion of the existing blocks of wealth and indebtedness. In section X, additional prospectives are developed involving preexisting holdings of securities by households (i.e., the total portfolio holdings of households) as well as the increase in this portfolio each period as the result of each period's household savings.

If there are continuous well-organized spot markets for securities, households will be continuously reevaluating their entire wealth-holdings of securities, and changing the combinations of securities and/or money holdings they desire to possess. Hence the problem of matching the flow-supply of new issues over time with the flow-demand out of current savings of households over time is complicated by possible simultaneous changes in the households' desires to hold (second-hand) securities at any given price relative to the existing stock of "old" corporate securities available to the public; i.e., by simultaneous changes in what can be called the excess stock-demand function of households for securities.²⁰ However, in order to make progress in analyzing this complicated problem of the role of securities markets vis-a-vis household portfolio holdings, it is necessary at least initially to focus on the decisions of households to increase their security

¹⁹ See footnote 23.

²⁰ The existing excess stock-demand function for securities is developed in detail in Davidson (1973, Ch. 10). Essentially, at any part of time excess stock-demand equals the difference between the public's demand for securities out of their previously accumulated savings minus the existing stock of (previously issued) securities which are available to be held by the public. Hence, if at a given security price excess stock demand is positive (i.e., demand exceeds supply), the price will rise. Thus, the state of the excess stock-demand for securities determines the price in the second-hand securities (rather than new-issues) markets. Of course, as long as new issues are very good substitutes as liquidity time machines, the price in the new issue market can not diverge significantly from that of second-hand securities of equal quality.

holdings because of their saving during the period (what we have called the flow-demand for securities function—equation (1) *supra*) relative to the external investment funds financing needs of corporation via new issues (what we can label the flow supply function for securities). This function can be formulated

$$s_t = i + l \quad (2)$$

where s_t is the flow supply of securities, l is net investment spending, and i is the fraction of net investment which firms wish to finance externally by selling new issues to households (where $0 < i < 1$). Thus for analytical simplicity we assume at this stage that the excess stock-demand for securities is zero; i.e., that during the period of analysis there are no complications arising from changes in household bearishness tendencies regarding the preexisting stock of securities which they are already holding in their portfolios. Under this analytical simplification, or what economists term the *ceteris paribus* assumption, the price of securities will increase (be constant or fall) if the excess flow-demand for securities²¹ at the current price is positive (zero, or negative). In section X the removal of this *ceteris paribus* assumption is discussed.

If the economy is growing the entrepreneurs will be increasing capacity and productive output in each successive period. Consequently the level of fixed capital expenditures will increase over time while the existing pool of construction fund finance via short-term bank credit at the end of (say) period t_1 will *not* be sufficient to finance the increase in payrolls and materials in period t_2 which must be met if the supply of capital goods production is to keep up with the hypothesized increasing orders.

Investment firms plan to finance the fixed capital goods delivered at the end of t_1 either (partly) internally or externally via new issue of long-term corporate securities. In either case at beginning of t_2 , before signing the forward purchase contracts for the increasing orders of fixed capital, these investing firms will require commitments from the financial community so that the firms are assured that they can make the agreed upon payments to suppliers at the appropriate stages of the gestation period of fixed capital. It is therefore necessary for many investing firms to engage an investment banker (or promoter) before placing orders for additional fixed capital goods. After convincing themselves of the reasonableness of the firms' long-term expectations, these financial middlemen will be willing to underwrite the issue of new long-term securities at the end of the period at some agreed price. Then, either the underwriters will borrow some short-term finance from a commercial bank and make these bookkeeping facilities available to the firm; or on the firm, armed with the underwriter's commitment, may borrow directly from the banks. As a consequence the money supply may be expanded during the period.

The investing firms, assured of some short-term credit at the bank at the beginning of the period and long-term funding from the underwriters at the delivery date can enter into contractual agreements for the delivery of plant and equipment from the capital-goods producers. During the gestation period of the capital goods production, interim partial payments by the buyers from their short-term bank loans, and/or working capital finance which is at least partly obtained by short-term borrowing from the banks by the capital-goods producers are used by these producing firms to meet their interim-wage and raw-material bills.

If external investment funding is involved, the final payments by the "investing" firm, which is normally made when the fixed capital goods have been satisfactorily installed and most of the variable costs of production have already been paid, is paid out of receipts from the floating of a long-term new issue. The revenues from the flotation are used, therefore, to complete payments to suppliers, to pay off the interim short-term bank credit obtained either directly or indirectly by the underwriter, and to pay for the value added of the resources used to market the issue. A portion of the final payment received by the suppliers is caused to repay their working capital bank loans, and the rest is used for final payments of payrolls and raw materials, with any remainder becoming the gross profits of the capital goods producer. Thus these repayments of short-term credit out of the proceeds of long-term funding become a revolving pool of finance which

²¹ The excess flow-demand function for securities equals the difference between the new issues being offered by firms and the public's demand for securities purchased out of current household savings.

can be used to maintain a similar level of investment expenditures in the next period.

The flotation of new issue—the flow-supply of securities—is normally carried out via financial institutions such as investment bankers, underwriting syndicates, or new issue houses at about the time the fixed capital good is to be delivered and placed in productive service. These financial institutions have either direct (or indirect via other financial intermediaries such as insurance companies, investment trusts, etc.) access to household savers. This access would not be easily available to each investing firm since the latter is in the market for such funding only occasionally over time whereas the financial intermediaries are in this market continuously. Furthermore these financial institutions can normally expect preferential treatment from commercial banks and even perhaps from the Monetary Authority if the portion of the stream of household savings going to purchase securities unexpectedly dries up. The generally recognized preferential access of financial intermediaries to the institutions that create money in our economy is the ultimate basis in the public's belief in the liquidity of instruments traded in the financial markets.

The problem in each period facing the financial middlemen is to bring that portion of household savings looking for securities into equality with the investing firms' desires for external investment fund finance. The condition for achieving the balancing of household flow-demand for securities with entrepreneurial flow-supply, is obtained via equations (1) and (2) as

$$il = ms_s y_h \quad (3)$$

Given the security price level (or rate of interest) equation (3) specifies the equilibrium condition where the aggregate planned external investment funding of firms is growing *pari-passu* with the aggregate planned growth in security holdings (as a store of liquidity) of households.

If the funds used to internally finance investment spending is equal to corporate savings out of profits ($s_c P$) (i.e., if $s_c P = (1-l)I$) and if entrepreneurial expectations of sales proceeds from current production are being realized, then aggregate savings out of household income *must* be equal to the fraction of spending which is being externally financed, that is

$$s_h y_h = il \quad (4)$$

for otherwise the demand for AO would not equal the supply of AO and entrepreneurial sales expectations regarding current production (GNP) can not have been realized.²² If an economy is to be on an equilibrium growth path where

- (a) aggregate savings equals aggregate investment;
- (b) the money supply increasing at the same rate as the increase in real transactions (via the expansion of construction fund finance for the expanding working-capital flows which make up the expansion in GNP); and
- (c) an unchanged level of security prices (which implies an unchanged rate of interest)

then according to equations (3) and (4) the marginal propensity to purchase securities (m) *must equal unity*. When m equals unity, households do *not* increase their demand for money as a store of value even when their wealth increases. Instead household's are putting *all* their savings into securities. It therefore follows that when $m=1$, that corporate savings plus household savings just equal the required equity and debt investment fund finance needed to meet all the forward purchase obligations for fixed capital being undertaken by investor firms.²³

²² This is what is meant when economists state that at the equilibrium level of GNP aggregate savings must equal aggregate investment.

²³ For example, if in Figure 1 the demand curve D_0 is the stock demand for securities given the existing wealth of households, and the vertical supply curve S_0 is the existing stock of outstanding securities, then the price of securities will be P_0 . For simplicity, assume *ex ante* savings equals *ex ante* investment and all investment in the periods are planned to be externally financed so that the supply curve shifts from S_0 to S_1 as the quantity of outstanding securities, offered to the public period 1, increases from q_0 to q_1 . If the increased demand for securities in period 1 is a function of savings during the period, the demand curve D_0 will shift outward. If $m=1$, the demand curve will shift to D_1 (which must have a rectangular hyperbolic relationship to D_0 if a constant sum out of savings will be spent on additional security holdings) and the rectangle AB_1q_0 will equal the value of planned savings (and it also equals value of planned investment). Thus if $m=1$, all

(Continued)

Brechling has demonstrated (1957, p. 193) that the orthodox liquidity preference theory of neoclassical Keynesians (such as Tobin) implicitly assumed m equals unity. Hence the investment fund financing of fixed capital projects are never a problem for such Keynesian models. Yet an assumption that m always equals unity is unrealistic for it would assert that in a monetary economy, households never hold any savings in the form of money. Thus an assumption that m equals unity tends to reduce the model to a pre-Keynesian level where "money was a veil": i.e., where money does not matter. If, however, m is less than unity, then for an economy to be on an equilibrium growth path where savings equals investment (item (a) *supra*), equation (4) implies that either item (b) and/or item (c) *supra* can not apply. In other words, in order for an economy (where m is less than unity) to be on an equilibrium growth path,

(Continued)

new issues can be floated without a change in the security price level of P_0 . If however $m < 1$, the demand curve shifts only to D_1 and the ratio of the area of rectangles $ACFq_0$ to ABq_0q_1 equals m as $ACFq_0$ equals the amount spent on purchasing additional securities. Thus, when $m < 1$, in the absence of open market operations, the price of securities will fall to p_1 (interest rates will rise), and the level of planned investment will decline!

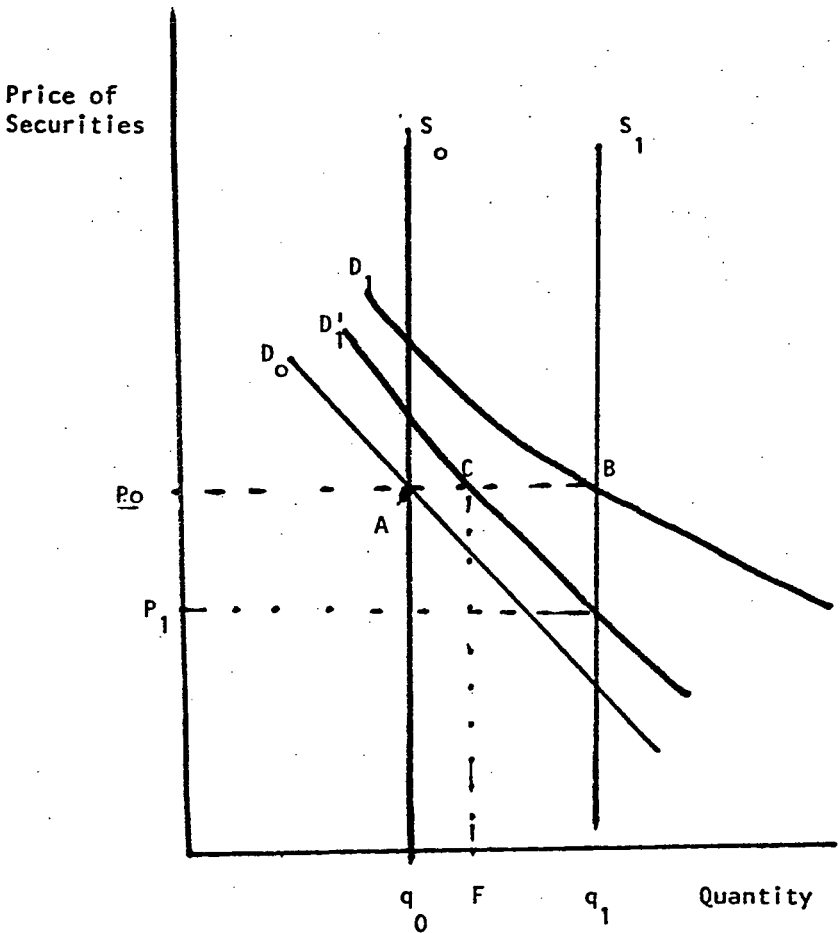


FIGURE 1

either the money supply must grow at a rate which exceeds the rate of growth in GNP or the interest rate will rise.

In a monetary economy, where households are free to use securities and money as liquidity time machines, there is no reason to expect m will equal unity. In fact, it is more reasonable to assume that for any level of household savings, some portion will go to the accumulation of idle cash balances and hence $m < 1$. If $m < 1$ then even if sales expectations of entrepreneurs of GNP can be met, in the sense that aggregate planned savings equals aggregate investment, or

$$s_e P + s_h y_h = (1-i) I + iI, \quad (5)$$

excess flow demand for new issues will be negative, and there will be market pressures for security prices to fall and interest rates to rise. Unless the Monetary Authority takes deliberate steps to prevent this via open market operations which either (i) remove some old securities from household portfolios and therefore make room for households to absorb more new issues, or (ii) removes some of the new issues which would otherwise have to be sold to the public, the economy will stagnate as the rising interest rates (falling security prices) chokes off some of the planned investment. Hence even if there is neither a shortage of planned household savings or aggregate demand, financial conditions can lead to stagflation. This surprising conclusion will be analyzed in greater detail in the following appendix.

APPENDIX B

TECHNICAL ANALYSIS: GROWTH WHEN EXCESS FLOW-DEMAND FOR SECURITIES IS NEGATIVE

If investor-firms needs for external, investment-fund financing exceed household desires to purchase additional securities out of saving at the current price of securities (i.e., if $i l > m s_h y_h$) then the economy will lower its rate of fixed capital formation. This is true even if there is no shortage of household saving, i.e. $i l = s_h y_h$ and even if the banking system is responding to the needs of industry for working capital finance. As this section will demonstrate the policy required to prevent this slowdown in capital formation is to increase the money supply by open market operations in order to provide sufficient liquidity to meet the bearish sentiment of households and provide sufficient funds to take up all the new issues offered. Any attempt to offset the slowdown in capital formation by adopting policies which will stimulate additional savings out of household income (as advocated by SOS theorists) will, as appendix C demonstrates, merely depress the rate of capital formation even further.

When $i l > m s_h y_h$ then, *ceteris paribus*, the excess flow-demand for securities is negative at the current security price level (rate of interest); this means the new issues (flow-supply) of securities being offered to the public exceeds the household sector's desires to absorb additional securities in its portfolio (for non-speculative reasons). Consequently, there is downward market pressures on security prices as the entrepreneurial needs of investment fund finance are not being met by households or the banking system even if in the aggregate planned savings equals planned investment at the initial rate of interest.

In an uncertain world, the underwriters will become aware of this negative excess flow-demand only as they observe a stochastic decline in the spot securities market and/or a resistance to buy by their normal customers. These financial intermediaries will attempt to protect their "goodwill" with their normal customers (who have bought previous new issues) by reducing the pressure on security prices. These financial middlemen will therefore either (1) discourage some firms who currently desire to float new issues (thereby forcing these firms to reduce their planned investment spending) and/or (2) increase their indebtedness to the banking system in order to finance an "undesired" increase in dealers inventories. By these methods, the underwriters hope to support the market against this unforeseen slump (Hicks, 1967 p. 48) and to maintain a continuous market for securities. To the extent that the financial intermediaries adopt the latter method and to the extent the banking system accommodates the financial requirements of the dealers via an expansion of the money supply, the banking system is looking after that portion of the real wealth (NAO) of the community which, for, the

moment, at the current rate of interest, the household sector does not wish to hold legal title to or to hold debt contracts against.²⁴

In sum, even if the real forces in the economy are such that the planned saving ratio of households out of current income is equal to the proportion of aggregate product which entrepreneurs want in the form of capital goods, while excess demand for securities is negative (i.e., $i_l > m_{sh}$), then financial conditions in the securities market caused ultimately by the Monetary Authority failing to expand the money supply fast enough via open market operations will induce a slowdown in the rate of capital accumulation. This slackness can initially be avoided if investment underwriters finance their excessive security inventories by increased borrowing from the banks, and the banking system in turn endogenously responds to these needs of the financial circulation (in excess of the needs of trade) by increasing the money supply.

If, however, the Monetary Authority does not permit the banks to expand the money supply while the financial intermediaries have preferential access to the revolving fund of bank credit, then, as security dealers borrow to finance their swollen inventories, the banks will have to ration the remaining credit among the borrowers from the industrial circulation. (This may take the form of raising the cost of bank loans in general and/or discriminating against small firms such as house builders, etc. who require working capital.) This rationing of credit to the industrial sector will obviously reduce growth and may even induce a slump, even if financial intermediaries took no voluntary actions of their own to staunch the forthcoming flow of new issues.

Even if initially the banking system were to permit expansion of credit to aid financial middlemen to hold their "undesired" inventories, these financial intermediaries will be unwilling continuously to increase their excessive holdings if the excess-flow demand for securities remains negative for any length of time. Instead, these financial institutions will feel encumbered by their increasing indebtedness and must ultimately severely limit their willingness to float new issues in the future until they can disgorge their swollen inventories without adversely affecting the spot price of securities. Hence, even if the banking system endogenously increases the money supply to help financial intermediaries finance excess inventories of securities resulting from a negative excess flow-demand for securities, expenditures on the output flow of the capital goods industries will ultimately be reduced by such Procrustean devices as rationing access to long-term funding, offering to float new issues at prices which are low compared to the current spot price of securities, and/or permitting a slow, continuous decline in security prices. These actions by the financial intermediaries will reduce the ability of entrepreneurs to obtain external finance and therefore prevent firms from entering into as many contracts for the delivery of capital goods per period as they would otherwise desire.

Accordingly, adequate finance provided by the banking system is a necessary and sufficient condition for implementing current plans of businesses for accumulating capital, independent of the savings propensities of households (as footnote 15 points out, even at full employment, the availability of finance will permit the expansion of net investment even if each household does not change its savings propensity). The absence of adequate financial conditions, on the other hand, can restrict the rate of capital accumulation even if households propose to be sufficiently thrifty out of current income. Since in a monetary economy households always have the opportunity to hold their planned saving in liquid time machines other than reproducible durables and corporate securities (and hence m need not equal unity), the equality of planned saving (given the distribution of income) with planned investment is neither a necessary nor a sufficient condition to assure that entrepreneurial plans for capital accumulation can, or will, be carried out.²⁵ If excess flow-demand for securities is negative ($i_l > m_{sh} y_h$), the

²⁴ If the underwriters were to draw down their precautionary balances to finance the "undesired" increment in inventory (perhaps because they think the downward pressure is only temporary), the immediate impact is for these financial intermediaries to offset the "excessive bear holdings" of the general public. Of course, these financial intermediaries could not continually add to their inventories by drawing down their precautionary balances; sooner or later they must resort to either discouraging further flotations or borrowing from the banks. Cf. R. E. Kahn (1954, pp. 237-238).

²⁵ As long as capitalists have higher savings propensities than workers, if capitalists get sufficient finance to carry out their investment plans, the distribution of income must change sufficiently to bring planned savings into line with planned investment (see footnote 16.)

Monetary Authority can redress the financial constraints on growth by undertaking a monetary policy which will increase the excess flow-demand to zero—that is, by relieving the dealers of their unwanted inventories via open market operations and thereby supplying sufficient cash to meet all the bearishness desires of households and dealers. Thus, as Keynes declared:

“The banks hold the key in the transition from a lower to a higher scale of activity . . . The investment market can become congested through a shortage of cash. It can never become congested through a shortage of saving. This is the most fundamental of my conclusions in this field” (Keynes, 1973, p. 222).

Moreover, since expectations of future spot prices of securities can greatly affect the current security market conditions, it may be necessary and desirable for monetary policy to operate before adverse expectations are generated in the securities market. In other words, it would be desirable for the Monetary Authority to purchase securities on the open market prior to the negative excess flow-demand for securities appearing in the market. By removing securities from either the public or the dealers just before the excess bearishness appears, the Monetary Authority can create financial conditions such that the entire new issue can be voluntarily taken up by the public and/or the dealers.

In general, a growth-oriented monetary policy would necessitate providing increases in the money supply in anticipation of all the needs of trade and finance as long as the point of effective demand does not exceed full employment. Of course, to diagnose these needs in advance and to achieve an exact balance is not possible via any simple quantitative rule for expanding the money supply. Nor is it possible in an uncertain world to forecast excess flow-demands for capital goods and securities precisely using an econometric analysis of past events. Instead, if the Monetary Authority is to promote a financial atmosphere which is compatible with rapid economic growth, its decisions will have to be guided by a fragile mixture of the “best” scientific forecasts of growth of the industrial circulation and the “best” judgement forecasts of the trend of forces in the financial markets. As long as the world is uncertain and a continuous spot market for securities exists, the current spot-market price will depend primarily on the precautionary and speculative demand for securities, that is, on expectations. The Monetary Authority will need flexibility and discretion if it is to anticipate, or at least not frustrate, the “needs” for the financial “paving stones” which will permit the real factors to achieve the warranted rate of growth path.

If, on the other hand, a simple quantitative rule based on the expected rate of growth of the industrial circulation is used as the basis for expanding the money supply, then unless both the excess flow-demand and the excess stock-demand for securities are both equal to zero at the current placement price, a steady rate of growth cannot be maintained. If excess flow-demand is negative while excess stock-demand is zero, then financial constraints will hamper growth. A positive excess flow-demand (while excess stock demand is zero), on the other hand, is symptomatic of a *shortage of effective demand*, that is of excessive savings by households (or firms), and unless savings out of income can be lowered, the real forces in the economy will induce a slowdown.

APPENDIX C

A POSITIVE “NONSPECULATIVE” EXCESS FLOW-DEMAND MEANS TOO MUCH SAVING

When the “nonspeculative” excess flow-demand for securities is positive at the current security price level (i.e., when $il < m s_A y_h$), then, in a two sector analytical model, although there is a tendency for the price of securities to rise, real economic activity tend to contract or to expand at a rate that disappoints businessmen’s expectations. Consequently investor firms will find they are installing capacity at a rate which exceeds what entrepreneurs can justify as sufficiently profitable. Thus, there will be an incentive for businessmen to cut back on their plans for capital formation; there will exist the seemingly paradoxical result of a stagnating economy occurring while the price of securities are rising.

Internally financed investment spending can never exceed (and is usually equal to) total corporate saving (retentions) out of profit income;²⁸ therefore

²⁸ If internally financed investment is less than corporate saving, then stagnation tendencies will be exacerbated.

if the proportion of household savings spent on demanding securities exceeds the flow-supply of new issues (at the current rate of interest), household saving plus corporate saving must exceed aggregate investment at the given level of income.²⁷ Consequently since m is less than (or equals) unity, when $i < m s_1 y_1$, entrepreneurial short-period sales expectations associated with the given level of employment must be disappointed as planned aggregate saving exceeds planned aggregate investment spending. Hence, if this level of employment is undertaken, some firms will be saddled with losses, or at least, they will have a smaller cash flow than expected and will be earning less than normal profits.

Entrepreneurs, faced with disappointing cash flows and possessing existing capacity which is deemed excessive for current realized sales, are unlikely to have visions of additional investment opportunities which can become profitable solely because of a decline in the rate of discount. Of course, with rising security prices, investment underwriters will find it easy and profitable to float new issues and they therefore may beat the bushes in order to flush out additional investment projects from entrepreneurs, particularly from those who might under other circumstances be part of the unsatisfied fringe of borrowers. If these financial intermediaries are successful they may be able to increase real investment and the demand for external finances sufficiently so that a slowdown is avoided.

If, on the other hand, the investment underwriters are not successful in encouraging additional investment spending, the bullish behaviour of the public in the securities market will induce security dealers—especially stock specialists and others whose function it is to maintain a continuous spot market in second-hand securities in order to sell off inventories and to build up their cash position.²⁸ In essence, these financial intermediaries are draining cash (via savings out of household incomes) from the industrial circulation; they are absorbing cash in Hawtrey's terminology. (1932, p. 361).

The stock specialist is the residual buyer and seller in the second-hand market. He is not required to hold off a rise or a decline in security prices; his function is merely to maintain continuity. The major source of specialist profits is on intraday trading and on normal days his purchases and sales are almost in balance.²⁹ If, however, the stock jobber stochastically finds that his inventory of securities is declining and his cash position is rising, at some stage he will perceive this is a permanent change in excess demand, and he will use some of the profit revenues from the sale of securities to reduce working capital indebtedness to the banking system. Thus, the public's excess flow-demand for securities permits the draining of cash from the industrial circulation initially to financial intermediaries and then to the banks. Unless these funds can be recirculated into the industrial circulation by finding borrowers who wish to finance additional capital expenditures, an economic slow-down is inevitable.

²⁷ Since corporate savings $(S_c) = (1-i)I$, if $i < m s_1 y_1$ while m is equal to or less than unity, the $S_c + s_1 y_1 > (1-i)I + I$ and therefore $S > I$.

²⁸ The investment underwriter may also run down his normal inventories in order to prevent the spot price from rising too rapidly. Too rapid an increase in security prices would provoke the enmity of firms who have recently issued new securities via the underwriter. These firms might feel that the underwriter induced them to sell their securities at too low a price.

²⁹ See *Report of Special Study of Securities Market of the Securities Exchange Commission*, Part II (Washington, U.S. Government Printing Office, 1963) p. 85.

THE ECONOMIC EFFECTS OF TAX CHANGES: A NEOCLASSICAL ANALYSIS

By Norman B. Ture*

CONTENTS

I. Introduction: The "supply side" versus aggregate demand approach to fiscal policy.....	Page 316
II. Basic features of the neoclassical fiscal theory.....	321
A. First-order income effects in the Keynesian approach.....	321
B. First-order price effects in the neoclassical analysis.....	322
C. Comparison of the neoclassical and Keynesian analyses of tax changes.....	328
III. Taxes, effort, and saving.....	334
A. The labor-leisure choice.....	334
B. The saving-consumption choice.....	338
C. Policy implications.....	341
IV. Summary and conclusions.....	343

APPENDICES

A. Income as a parameter of the supply of labor curve.....	345
B. The effect of taxation on the stock of capital.....	346

I. INTRODUCTION: THE "SUPPLY SIDE" VERSUS AGGREGATE DEMAND APPROACH TO FISCAL POLICY

Since the late 1930's, fiscal policy in much of the noncommunist world has been strongly influenced by a set of theories developed from "The General Theory of Employment, Interest, and Money," by John Maynard Keynes. Keynes views represented major shifts in many respects from the then prevailing neoclassical way of looking at the determinants of the total economy's performance. His analysis ascribed an extremely important role, quite different from that following from the neoclassical analysis, to public policy. No place was this difference more dramatic than in the case of fiscal policy.

The signal attribute of the Keynesian theory as addressed to fiscal policy is its emphasis on aggregate demand as the determinant of the economy's performance, and the influence of tax and expenditure policies on aggregate demand. A collateral view, quickly perceived and implemented by Keynes' disciples, is that if one or more of the private sector components of aggregate demand is a stable function of variables subject to government control, government policies can dictate the aggregate performance of the economy. A third major proposition is that consumption is a highly stable function of disposable—after-tax—income; no matter how volatile other components of aggregate demand might be, government can assure a relatively smooth

*Institute for Research on the Economics of Taxation.

growth path for the economy by adding to or subtracting from disposable income, hence consumption, through tax and spending actions. In this conceptual framework, the conditions of supply of factors of production are treated as determined by long-term autonomous influences. For the most part, therefore, aggregate supply is taken as given and is not seen as an appropriate or feasible fiscal policy target—indeed, not significantly subject to fiscal influence. As a corollary, the possible effects of aggregate demand management policies on the conditions of factor supply, hence on the change in production capacity, are largely ignored. With supply conditions unaffected by fiscal actions, changes in output and employment are treated as responses to changes in demand, which are subject to fiscal influences.

Given this conceptual context, the emphasis in fiscal policy on tax and spending aggregates as the keys to control of disposable income, consumption, aggregate demand, and employment is quite understandable. The focus in tax policy on the structure of the tax system has been primarily on equity and income distribution criteria, not on the likely consequences of structural changes for the total level and composition of economic activity. To be sure, on occasion tax policy has stressed promoting or curbing private capital formation; but, as often as not, this has been a concern with an allegedly unruly element of aggregate demand rather than with the contribution of capital-stock growth to the expansion of the economy's production potential.

The fiscal policies embodying the Keynesian ideas have continued to prevail even as aggregate economic outcomes have repeatedly failed to conform with the results forecast by econometric models built in the Keynesian image. The persistence of serious problems of unemployment, slowing productivity growth rates giving way to decreases, and accelerating inflation has led many of these designers of the conceptual content of fiscal policy to conclude that the economic world has changed its shape and that it is the mutation of the structure of the economy which accounts for the failures of contemporary fiscal policy; not any inadequacy of that policy's theoretical foundations.

Until a few centuries ago, the conventional wisdom held that the world was flat. With the technology of those times, this perception was acceptable; within the spatial limits of travel for most people, there was little likelihood of mischance in assuming that the Earth was a plane surface. At a later point, it became clear that it was much more nearly accurate to describe the world as a sphere. As this conviction spread and became the conventional wisdom, no one asserted that the earth had once been flat but had, in some mysterious way, suddenly become globular. Surely we would treat as fatuous any assertion that the earlier theories about the world being flat had been right and would still be useful if the shape of the world hadn't changed.

By the same token, we should dismiss as inane the notion that the shape of the economic world has changed. In fact, no sudden or major structural change in the economy has occurred. The basic technical relations which govern output have not abruptly altered, no drastic or abrupt shift in consumers' tastes and preferences have been noted, there is no observable overnight transformation of the basic institutional arrangements of the economy, and the fundamental laws of production have not been repealed—nor have the basic principles of opti-

mizing behavior for households and businesses been eliminated. To be sure, the economy and its institutions have not been static, and there is much to be learned about the economy's current conditions and prospects in examining these changes. For example, it surely seems reasonable to associate the enormous growth in public regulation, which has limited the efficient exercise of property rights and reduced incentives and rewards for innovation, with an apparent blunting of the entrepreneurial drive. Inflationary monetary policies have taken their toll of saving and investment and have accentuated the biases in the existing tax system against productive personal effort and capital formation. The growth in the scope and composition of government, similarly, has increasingly preempted production resources and increased the costs of their use in the private sector. In these institutional changes and their economic consequences we can find many insights concerning the slowdown in the growth of—indeed, decreases in—labor's productivity, the shift toward services and away from manufacturing, the deterioration of our trade relations with the rest of the world, and the many other stresses on our economy. These unhappy developments do not, however, reflect a change in the shape of the economy; they are, instead, a measure of the extent to which public policies have been misguided.

Recently, there has been an increasing awareness and acceptance of this proposition by many public policy makers. The Joint Economic Committee, which many times in the past has taken the lead in signaling the need for new public economic policies, in its 1979 and 1980 annual reports, pointed to the requirement for refocusing policy—away from concerns with the level of aggregate demand and toward concerns with the adequacy of incentives for production. To many observers, this change in focus appears to be impelled by a "new economics". In fact, the turn to "supply-side" fiscalism is properly perceived as a return to basics, not as a daring venture into hitherto unexplored intellectual territory. Effective implementation of this shift in focus will entail major changes in the content of all public policies; these changes will be particularly dramatic in tax policy. Whether the policy changes which will be made will be appropriate to the change in focus will depend on a clear understanding of the differences in concepts underlying "supply-side" fiscalism and those on which aggregate demand fiscal policies have been based.

At first blush, the distinction seems clear. Aggregate demand policies presumably have been based on analysis of how tax and government spending actions affect households' and businesses' demands for goods and services; in parallel fashion, the supply-side approach presumably should focus on how the fiscal action affects the supplies of goods and services. In fact, however, far more fundamental distinctions are involved and their implications for public policy concern not merely the identified objective of fiscal actions—control of aggregate supply or of aggregate demand—but, far more importantly, how any fiscal action affects either or both supply and demand conditions.

In the Keynesian aggregate demand analysis, tax changes (and changes in government expenditures) are identified in terms of their effects on the amount of income available to the affected persons or businesses. In the "supply-side" analysis, the initial effect of any tax or

government spending change is identified as a change in the actual or implied price of something(s) relative to that of others. In the technical terminology, the distinction is between first-order income effects or first-order relative price effects, respectively. This distinction transcends that of supply or demand effects, although in tracing out the adjustments of fiscal changes, the Keynesian approach emphasizes demand consequences while the neoclassical analysis simply follows the lead of the relative price change to a demand and/or supply adjustment.

There is an enormously important implication of this distinction for the basic strategy of fiscal policy. The Keynesian approach, for the most part, calls for changes in aggregate tax collections relative to aggregate government expenditures—i.e., for changes in the budget totals—in order to generate changes in aggregate economic activity. The neoclassical analysis on the other hand, demonstrates that changes in the tax structure, even those entailing no initial net change in tax liabilities, may nevertheless have substantial effects on the magnitude as well as the composition of total economic activity.

The reliance on first-order income effects in the Keynesian approach explains much of its concern with average or “effective” rates of tax. The neoclassical analysis, on the other hand, incorporates the well-known, generally accepted, but widely neglected principle that taxes enter into household and business decision-making at the margin—that it is the amount of tax to be extracted from (or offset by) the incremental dollar of income (or expense) which affects the price or cost of alternatives and therefore is the relevant decision-making tax variable. Since structural tax changes may entail increases or decreases in marginal tax rates—without changes in total tax liabilities (hence in average tax rates)—pursuit of aggregative policy objectives need not be confined to changing budget totals. While the neoclassical approach thereby enlarges opportunities for constructive tax policy concerned with the total economy’s performance, it also imposes the requirement for great care in making structural tax changes ostensibly aimed at serving other objectives. Tax changes aimed at improving fairness or at easing administrative or compliance burdens, for example, may well have significant effects on the allocation of production resources and on the total amount of resources employed (hence on total output and income) even if these tax changes result in no changes in total tax revenues.

The distinction between first-order income and first-order price effects (which will be elaborated in Part II of this study) is highly significant with respect to the appropriate tax strategies for dealing with a wide range of policy problems. For example, consider the contribution of fiscal policy to efforts to curb inflation (recognizing that the fundamental approach must be to slow the growth in the stock of money). The Keynesian fiscal strategy focuses on attempts to reduce or slow the rate of growth in aggregate demand by reducing or slowing the increase in disposable income, either by raising taxes, reducing government outlays, or both, relative to the amounts that would otherwise prevail. But in the Keynesian analysis, decreases in demand are virtually the same as reductions in output. In effect, therefore, this strategy calls for reducing output, a prescription which puzzles those

who believe that inflation results from "too much money chasing too few goods."

In the Keynesian approach, moreover, the form of the tax increase intended to reduce aggregate demand is of secondary significance, at best, for this purpose. Thus, whether the tax increase is effected by raising marginal rates or by any other device is deemed to be of little consequence; the criterion, instead, is the change in tax liability relative to income; that is, the increase in the effective tax rate.

In contrast, a fiscal policy embodying the neoclassical analytics would concentrate on reducing marginal tax rates in order to reduce the costs of effort and of saving, thereby increasing the amount of labor and capital services supplied and employed, resulting in increases in real output. It would also seek to reduce government spending, particularly those outlays which tend to raise the cost of labor and capital services to the private sector. The neoclassical approach, in other words, focuses on increasing the supply of goods and services by reducing the costs of production services, with any given stock of money. Any such increase in real output will reduce upward pressure on the price level.

Note that it is the marginal tax rate on which the neoclassical analysis is focused. As indicated, it is the tax on the marginal dollar of income which affects one or more relative prices and which, therefore, enters into individual and household discussions about the amount and composition of economic activity. A tax reduction which reduces tax liability without reducing marginal tax rates, accordingly, is ineffectual.

For public policy makers, the relevance of the distinction between the Keynesian and neoclassical approach is far more complex a matter than whether the focus of policy should be on demand or supply. If policy is to continue to be based on the Keynesian analysis, the principal criteria will continue to be the effects of tax changes on the income level distribution of tax liabilities, horizontal equity, and compliance and administration concerns. These are, to be sure, important concerns of tax policy, but tax changes designed with only these criteria in mind should not be seen as having no allocational or aggregative economic effects. On the other hand, if the neoclassical approach is to be implemented in policy formulation, policy makers will confront both a far greater range of opportunities in designing and enacting tax changes and substantially greater problems of analysis in doing so.

To illustrate, a current pressing concern of public economic policy is to identify the obstructions to growth in labor's productivity and if feasible to reduce these impediments. While a large number of factors may well be adversely influencing productivity, surely the observable and measurable deceleration of the growth in the capital: labor ratio in recent years must be an important contributing factor.¹ Relying on the neoclassical price analytic approach, policy makers will discover that a large number of existing public policies discour-

¹ Other things being equal, maintaining a given rate of advance in labor's productivity requires maintaining a given rate of increase in the capital: labor rate. A slower rate of increase in that ratio may well result in a reduction, not merely a slower rate of increase in labor's productivity. Cf. Norman B. Ture and B. Kenneth Sanden, "The Effects of Tax Policy on Capital Formation," Financial Executives Research Foundation, (New York, 1977), pp. 16-23.

age savings relative to consumption, and therefore discourage capital formation. Such policies impede a rate of capital formation adequate to sustain the growth in productivity at acceptable rates.² Dealing effectively with these public policy barriers to capital formation will require policy makers to change sharply the focus of their concerns and priorities.

II. BASIC FEATURES OF THE NEOCLASSICAL FISCAL THEORY

The principal distinction between the neoclassical and Keynesian analyses of how tax changes affect the economy concerns the identification of the attribute of a tax to which affected households or businesses respond. As indicated in Part I, the Keynesian approach perceives a tax acting principally to reduce the income available to the taxpayer and seeks to identify how that disposable income change affects behavior. In the neoclassical approach, on the other hand, the aspect of a tax which results in changes in economic behavior is its effects on the cost to the affected household or business of one good relative to another.

A. First-Order Income Effects in the Keynesian Approach

The basic deficiency in the Keynesian approach is its assumption of and heavy dependence on first-order income effects of a tax or tax change. The view that a decrease in the income tax liability on one's given income increases one's command over goods and services is intuitively appealing; it is also correct from the perspective of any one person. It is wrong, however, when applied to the economy as a whole. In the aggregate, a tax reduction cannot itself increase the command over goods and services at any given pretax income level; it can merely redistribute the potential effective exercise of those claims. This is true, moreover, whether the tax reduction is selective or applicable to all taxpayers.

Reducing taxes in and of itself cannot and does not instantaneously increase the total real output of goods and services which, by definition, equals the aggregate real income of the economy. Real output increases only as a result of using more production inputs, or of using a given amount more efficiently. A tax reduction alone does not increase the amount of real productivity of production inputs or enhance the efficiency of their use. Change in aggregate output and income, therefore, is not an inherent attribute of a tax change.

In the Keynesian exposition, the question of the first-order income effect on which the analysis relies is finessed by delineating the response rather than its cause. A tax reduction, for example, is deemed to result in an increase in spending, which generates an increase in demand for output, in turn increasing the demand for production inputs, hence an increase in their employment, leading to an increase in output and in real income which validates the increase in spending—that is, provides the real income which affords the real command over goods and services. The fatal and obvious flaw is in the sequence of those responses: no increase in total real spending can ensue from

² Several of the features of the existing tax system which increase the cost of saving relative to consumption are discussed in Part II.

the tax reduction itself without a coincident increase in total output and real income. By assuming that a tax reduction results in an increase in aggregate effective demand which then generates the necessary increase in output and real income, the Keynesian approach relies on an analytical sleight-of-hand.

To be sure, the Keynesian exposition focuses on the consequence of a tax change for disposable income rather than aggregate real income. This distinction, however, is without substance. A tax reduction for everyone, unless accompanied by an equal reduction in government purchases, cannot increase the amount of production inputs used to produce goods and services which households and businesses can buy; it cannot, in and of itself, increase the total output for which the private sector can exercise income claims.

Efforts by the private sector to increase the total amount of their claims on output could be effectuated only if private sector entities more rapidly turned over the stock of money and/or if the stock of money available to the private sector increased. But in either case, the increase in monetary claims on the unchanged amount of output could result only in an increase in the average price of the output which the private sector buys. If the tax reduction is not accompanied by a discretionary increase in the stock of money and if the velocity of money is relatively stable, not even the nominal increase in private sector claims on output would occur.

If government were to reduce its purchases, production inputs would thereby be released for use in the private sector to meet private sector demands. This would change the composition of total output but not, in and of itself, increase the amount thereof.^{3 4}

B. First-Order Price Effects in the Neoclassical Analysis

The neoclassical analysis, in contrast with the Keynesian approach, treats changes in income as a second-level consequence of a tax or tax change. The first-order effect, to repeat, is a change in one or more of the relative costs which private sector entities confront.

Every tax has this attribute of altering relative costs. This proposition obvious in the case of selective excises; an excise tax on, say, mink coats is seen by virtually everyone as an increase in the price the buyer must pay for the coat compared with the price he must pay for other things. This price or cost effect, however, is not limited to levies we identify as excises. Every tax, to repeat, increases the price or cost of one good relative to another. Indeed, it is appropriate to think of every tax as having some "excise effect."

A truly neutral tax, were it possible to design one, would not alter any of the relative prices or costs confronting any entity in the private sector; it would increase the cost of effort in the same proportion as the cost of leisure, the cost of consumption in the same proportion as the cost of saving, the cost of any one consumption good or service in the same proportion as any other, the cost of using labor services in the same proportion as the cost of capital services and of any one kind

³ An increase in total output might ensue if production inputs were more productively employed in meeting private sector than public sector demands.

⁴ In some analyses, instead of an income effect, a tax change is represented as having a wealth effect. But wealth is, by definition, the capitalized amount of expected continuing or permanent income. A change in taxes, therefore, can no more *initially* change aggregate wealth than it can change aggregate income.

of labor or capital service in the same proportion as any other, etc. On the other hand, even a perfectly neutral tax would have to increase the cost to the private sector of using production inputs to produce output for the private sector—relative to the public sector's use of production inputs or of the private sector's use to produce output for the public sector. If it were not to have this effect in increasing private sector costs relative to public sector costs, the tax would not in fact act as a tax.

No perfectly neutral tax or tax system has yet been devised, nor is its attainment a realistic objective of public policy. As a practical matter, the objective of tax policy in this connection is to reduce to the greatest extent possible the excise effects of existing taxes and to rely to the greatest feasible extent on taxes which least alter the relative costs confronting households and businesses.

Effective pursuit of any such policy objective requires identification of the excise or differential cost effects of existing taxes. The number and variety of these excise effects in the existing tax system is so great that trying to delineate any substantial number of them would greatly exceed the compass of this paper. The type of analysis that is called for, however, may be illustrated in a number of the existing tax system's features which contribute to raising the relative cost of effort and of saving.

1. EFFECT OF AN INCOME TAX ON THE RELATIVE COST OF EFFORT

To begin with, consider some of the principal elements in the existing tax system which distort the cost of effort relative to leisure. "Effort" is an expositional shorthand for those uses of one's time, energy, skills, tools, and other resources to produce goods and services exchanged in market transactions; these activities give rise to income flows which are measured by the market mechanism. "Leisure" refers to nonmarket uses of one's time and resources. This type of activity may be just as productive of satisfactions but for the most part there is no explicit measure of the income it affords because it is not directed through the market and ordinarily does not entail a market transaction.

Insofar as the income generated by effort is subject to a tax whereas that produced in leisure activities is not, the tax must raise the cost of the former relative to the cost of the latter. The concept of cost that is relevant for this purpose, as in the case of most economic analysis, is that of opportunity cost—the value of that which must be foregone in using production resources in a particular way. The concept derives its pertinence from the rudimentary facts of economic life that production resources are scarce relative to the wants they are used to satisfy and that, with few exceptions, the use of given quantities of given resources to produce particular outputs excludes production of other outputs in that same time period.

In the case of effort and leisure, with 24 hours per day it is clear that for each hour in which one uses one's resources for effort there is an hour less leisure available. The cost of a marginal hour of effort, then, is the value of the hour of leisure which must be foregone. For example, suppose a person were to earn \$10 an hour in a particular job. Each hour the person could spend on the job but chooses instead to

spend in leisure costs him or her \$10. To optimize, the person would allocate time between the two alternatives such that the value of the rewards for the last hour of leisure was just equal to \$10.⁵ Then one might say that the marginal cost of the effort is \$10 (the value of the foregone leisure); similarly, the marginal cost of leisure is \$10 (the foregone reward for effort). The cost-ratio of effort relative to the cost of leisure is 1 : 1.

An income tax which is levied on the explicit rewards for effort but not on the imputed returns for leisure uses of one's time clearly increases the cost of the former relative to the latter. For example, suppose an income tax is imposed and that the marginal tax rate the person in the preceding example faces is 25 percent. With the 25 percent marginal tax rate, the net reward for an hour's effort is \$7.50—the amount of hourly wage left after paying the tax. The marginal cost of an hour's leisure falls, therefore, from \$10.00 to \$7.50, while the marginal cost of an hour's effort—the value of the foregone leisure—remains at \$10.00, in absolute terms. The cost of leisure relative to the cost of effort becomes $7.50/10.00 = .75$, and the cost of effort relative to the cost of leisure becomes $10.00/7.50 = 1.33$. In other words, the marginal cost of effort increases by a third relative to leisure; equivalently, the marginal cost of leisure falls by 25 percent relative to effort.

This excise effect on effort in the income tax is greater the higher the marginal rate of tax. A 50 percent marginal tax rate, for example, doubles the cost of effort relative to leisure; a 70 percent marginal rate increases the cost of effort by $233\frac{1}{3}$ percent.

A graduated or progressive income tax enhances this excise effect. On the appealing assumption that, for the most part, the higher the rate of compensation for effort the more productive the effort is, a graduated income tax increases the cost of effort relative to leisure the more productive the effort.

There is an even more severely adverse, though perhaps more complex, aspect of this excise effect of progression. In the general case, achieving a higher level of productivity is not costless but entails investment, in one form or another. It appears fair to posit a positive relationship between the extent of the productivity advance and the amount of cost which must be incurred to attain it. A graduated income tax adds to the cost of advancing productivity; moreover, the higher the attained level of productivity, the greater is the tax-induced increase in the cost of achieving any given dollar amount of additional productivity gain. Graduation of income tax rates may be usefully perceived as a surcharge on activities to advance productivity.

There are numerous other elements in the fiscal system which contribute to increasing the cost of effort relative to leisure. The second largest revenue producer in the Federal tax structure is the payroll tax which is an excise on labor. Given the present and projected upper limits on taxable wages and salaries and the rates at which the tax is and will be imposed, the payroll tax in itself substantially increases

⁵ This assumes the person is substantially free to determine hours of work and of leisure. The popular view is that there are severe institutional limitations on one's ability to determine the allocation of one's time between leisure and effort. This view, however, grossly exaggerates the constraints; through an array of devices, people can and do respond to changes in the relative cost of effort and leisure by changing their allocation of time between the two.

the cost of effort relative to leisure.⁶ With the income tax taken into account, the excise on effort is substantial even at quite low levels of compensation.

Less familiar, because it is more difficult to identify, is the excise effect in welfare and similar programs. For the most part, whatever their stated purposes, these programs may be appropriately perceived as imposing negative taxes on leisure, hence as subsidizing leisure relative to effort. Most obvious in this respect is unemployment compensation, but virtually any transfer program which affords payments to recipients on a means basis contains a substantial element of this negative excise on leisure.⁷ For example, the earnings test in the Social Security retirement system creates an explicit and very high excise on effort after a given amount of wages and salaries have been earned in the year.

2. EFFECTS OF TAXES ON THE RELATIVE COST OF SAVING

In the same vein, but perhaps not so obviously, the income tax raises the cost of saving relative to the cost of current consumption. Just as effort and leisure exhaust one's available time, saving and consumption exhaust one's available income. The cost of saving a part of one's income, then, is the amount of current consumption that one must forego. Similarly, the cost of using part of one's income for current consumption is the amount of saving given up. Since saving is the purchase of a future income stream, the cost of any given amount of consumption is the future income which one must forego.

For example, suppose that with no tax one might use a marginal \$1,000 of income to buy \$1,000 worth of consumption goods and services now or buy an asset, say a bond, which, at an interest rate of 10 percent, will produce \$100 a year forever. Clearly, the marginal cost of \$1,000 of current consumption is the foregone \$100 per year; by the same token, the marginal cost of an additional \$100 of income every year is \$1,000 of foregone current consumption.

If an income tax of the sort levied in the United States is imposed, the terms of this trade-off between current consumption and future income are altered. Again suppose one's marginal tax rate is 25 percent. Then one's marginal \$1,000 of income is reduced by the tax to \$750, with which one can buy \$750 of consumption goods and services now or a future income stream of \$75.00 per year, assuming the interest rate remains at 10 percent. But the \$75.00 of future income will also be subject to income tax, let us assume at the same marginal rate of 25 percent. Then the net-of-tax future income is \$56.25. Before the tax was imposed, one had to give up \$1,000 of current consumption to obtain \$100 per year of additional income; the marginal cost per dollar of future income was \$10. With the tax, one must forego \$750 of current consumption to obtain \$56.25 additional income per year;

⁶ A contrary view holds that the payroll tax is best perceived as a fee paid by workers for their post-retirement maintenance and security. This view may be challenged on the basis that there is no precise functional relationship in the system between the amount of such fees one pays and the amount of annuities and other benefits one receives, as well as on the basis of the involuntary character of the "fees."

⁷ The excise effect on effort is often most severe on low-income individuals. Welfare programs with means tests impose an earnings barrier to effort: when earnings exceed some maximum, the welfare recipient not only is subject to payroll and income taxes but also loses part of the welfare benefits. The real marginal tax rate, which enters into determination of the cost of effort relative to leisure, may exceed 100 percent.

the marginal cost with the tax is \$13.33 per dollar of future income. The 25 percent income tax increases the cost of future income relative to current consumption by $3\frac{1}{3}$ percent.⁸

With graduation of income tax rates, the tax increases the cost of future income relative to consumption more than in proportion to the amount and/or productivity of saving. At a 50 percent marginal tax rate, for example, a marginal \$1,000 of current income will buy \$500 of current consumption but only \$25.00 per year of additional future income. The marginal cost per dollar of future income becomes \$20, twice its cost in the absence of the tax. At a marginal tax rate of 70 percent, the relative cost of savings is $3\frac{1}{3}$ times the no-tax cost. Since the marginal tax rate depends in large part on the amount of one's income, and since the amount of one's current income is likely to reflect in some part the amount one has saved in the past, the excise effect of the tax on saving is likely to be greater the greater the amount one saves. Similarly, the greater the return per dollar of saving (i.e., the more productive one's saving), the higher the marginal tax rate is likely to be and, therefore, the greater the cost of additional saving relative to additional consumption.

To an even greater extent than in the case of the effort-leisure trade-off, the existing tax system is biased against saving and in favor of consumption. The basic bias, as shown, derives from the fact that the individual income tax is levied both on the amount saved and on the future income generated by the saving. But severe as this tax penalty itself may be, it is only the base of a pyramid of taxes resting on the same income stream. In the Federal tax system, the corporation income tax constitutes another major tier of taxes on the returns to individuals' saving. The amount an individual saves is taxed as part of his current income as shown above. If the saving takes the form of purchase of corporate stocks, the returns on the saving will be taxed initially under the corporate income tax at marginal rates as high as 46 percent. Insofar as the corporation pays dividends to the individual saver-shareholder, the individual pays tax again, further reducing the return to him per dollar of saving. For a 25 percent bracket individual, for example, \$1,000 of current income shrinks to \$750 after tax which, when invested in a corporation with a pretax yield of 10 percent, affords a pretax return of \$75. If the corporation pays tax at a marginal rate of 46 percent, this return shrinks to \$40.50 in the corporation. If the after-tax earnings were paid to the shareholder, the individual tax at 25 percent would apply, reducing the available return to \$30.37. Then to obtain \$30.37 per year in additional income, the individual must forego \$750 in current consumption; the marginal cost per dollar of the additional future income is \$24.69, not quite $2\frac{1}{2}$ times the cost in the absence of the tax. For a 70 percent bracket taxpayer, the individual and corporate taxes raise the marginal cost per dollar of future income to \$61.73, more than six times the cost absent the taxes.

⁸ An equivalent way of looking at this effect is that prior to the tax, with an interest rate of 10 percent, the capitalized value of the \$100 per year of additional income is \$1,000 (= \$100/.10). With the income tax, the capitalized value of the after-tax additional income per year is \$562.50 (= \$56.25/.10). Before the tax, the ratio of the marginal outlay on consumption to the present worth of the future income is \$1,000:\$1,000=1; with the tax, the ratio becomes \$750:\$562.50=1.333. The cost of future income relative to the cost of consumption increases by one-third; equivalently, the cost of consumption relative to saving falls by 25 percent.

Another layer of tax on the returns to savings is provided by the tax on capital gains. A capital gain is the market's capitalization of an increase in the expected future income attributable to an asset. Suppose that the corporation in the previous example were to pay out as dividends only half of its after-tax earnings, instead of the full amount, investing the retained earnings in assets which also produced returns to 10 percent a year, before tax. Then the shareholder's equity grows at a rate of 2.7 percent a year (given the assumptions in this example), representing the annual rate of increase in the market's capitalization of the increase in the future income resulting from the corporation's retention and investment of part of each year's earnings. At the end of 10 years, the shareholder's initial investment will have increased by 30.53 percent. If he decides to liquidate this investment, a capital gains tax will be imposed, at a maximum rate of 28 percent. This is an additional "one-shot" tax on the same stream of future income which the shareholder bought with the initial investment. It is the equivalent of a capital levy of 8.55 percent on the original saving or of an additional tax of 4.6 percent per year, in the case of the 70 percent bracket taxpayer and of 1.8 percent per year for the person with 25 percent bracket, on the returns to that saving over the 10 years the investor holds the shares.

The source of the capital gain is the amount of earning retained after the corporate tax was paid. At the time the gain is realized, it is the capitalized value of the expected increase in future earnings, which will in turn be taxed as they accrue. The tax on capital gains, thus, is an additional levy on an income stream subject to several layers of tax in any event.

The same returns on saving are also subject to the income taxes imposed by all but a few of the States. And insofar as the saving takes the form of real property, the same income stream is likely to be subject to State and local government property taxes, which though levied on the assessed value of the assets may be usefully perceived as imposts on the explicit or imputed income they generate.

Federal and State taxes on property transfers by gift or at death are akin to capital gains taxes with respect to their effects on the cost of future income compared with present consumption. The base of such taxes is the market value of the transferred property, which in turn equals the present value of the future income the property is expected to produce. That future income will, in the ordinary course of events, be taxed as it materializes over time. Taxing its capitalized amount on the occasion of the property transfer is an additional levy on the same income stream.

Moreover, the property may also be perceived as the accumulated amount of past income which had been reserved from consumption: Again, in the ordinary course of events, that past income had been taxed as it was received. Taxes on the value of the property on the occasion of its transfer are a further layer of tax on the same income stream.

The extra burden of these transfer taxes on saving is mitigated by the various tax provisions which reduce the amount of the taxable property. It is also moderated by the fact that for many individuals the tax liability lies in the relatively remote future; the present value

of the tax liability as it enters saving-consumption choices, is relatively low except for the elderly or those contemplating inter-vivos transfers in the relatively near future. Notwithstanding, these taxes must be seen as incremental burdens on the returns to saving, hence as increasing the cost of saving relative to current consumption.

The tax laws, particularly the income taxes, contain numerous provisions which somewhat ameliorate the effects of the multiple layers of tax on the rewards for saving. For example, if saving takes the form of depreciable property used in a trade or business, depreciation deductions and the investment tax credit mitigate the additional income tax burden entailed in taxing both the amount saved and the subsequent income generated by the saving. But unless the present value of the depreciation deduction and investment credit equals the present value of the costs incurred to acquire the depreciable property (i.e., the amount saved), at least some of the additional costs of saving, imposed by the income tax, remains. To satisfy this condition, the amount saved (equivalently, capital outlays) would have to be expensed—that is, deducted in full in the year in which the saving occurs—while the gross returns on the saving are included in taxable income as they are realized.⁹

Apart from capital recovery deductions, a wide array of special provisions are generally noted as reducing the aggregate burden of the income taxes. These so-called “tax expenditures” are often characterized as subsidies, but are more appropriately seen as mitigations of the effects of the income tax in increasing the cost of saving and of effort relative to the cost of consumption and of leisure, respectively. According to a recent estimate, after allowing for all of these tax expenditures, the tax-induced extra cost of saving relative to current consumption is about 66 $\frac{2}{3}$ percent.¹⁰ Applying the neoclassical analysis, one finds that whatever the case that may be made for eliminating or reducing these “tax expenditures” on equity grounds, doing so will in all likelihood raise the relative cost of effort and of saving.

C. Comparison of the Neoclassical and Keynesian Analyses of Tax Changes

The neoclassical analysis begins with identification of the initial impact of a tax on relative costs and seeks to describe and explain how affected persons alter their behavior in response to tax-induced changes in relative costs. The adjustments people make in their behavior, in response to the initial relative cost changes resulting from the tax, comprise the tax shifting process. When this process has been completed, there is a new equilibrium state of affairs. The differences between this state of affairs and that which would have existed if the tax had not been levied, with respect to the volume and composition of economic activity and the amount and distribution of income and wealth, delineate the incidence of the tax.

While the neoclassical analysis posits that it is the relative price effect of a tax or tax change which initiates the adjustment process,

⁹ Cf. Ture and Sanden, *op. cit.*, pp. 93–94.

¹⁰ Cf. Norman B. Ture, “The Tax Bias Against Saving,” Proceedings of the Sixty-Ninth Annual Conference, 1976, National Tax Association-Tax Institute of America, p. 23.

it by no means excludes or depreciates the consequent changes in income as influences on the nature and magnitude of the adjustment. Indeed, the adjustment process far more likely than not will result in income changes, and these changes in income will, in turn, affect economic behavior, hence influence further adjustments. But the tax change in and of itself does not alter income; the change in income is one of the consequences of the responses of households and businesses to the change in some relative price which the tax change does, in and of itself, produce. A tax or tax change, in other words, has a first order price effect; its effects on income are second order.

To compare and contrast the Keynesian and neoclassical analyses, consider some specific, although hypothetical tax changes.

Suppose the Congress were considering as alternative tax reduction measures a \$50 per capita rebate or an across-the-board individual income tax marginal rate reduction of equal effect, initially, on Federal tax revenues. In the Keynesian system, these two tax reductions would be perceived as having essentially the same aggregative economic effects. Each would be seen as reducing the effective income tax rate to the same extent. Each would be seen as increasing households' disposable incomes by the same amount, leading to essentially the same increase in aggregate consumption outlays, which would be determined by the marginal propensity to consume—a presumably stable relationship between changes in consumption and changes in disposable income. The expansion of consumption would result in an expansion of nominal disposable incomes of the producers of consumption goods, leading to a further increase in consumption outlays.¹¹ If resources were less than “fully” employed at the time of the tax reduction, this increase in consumption spending would result in increases in real output, which would entail increases in the demands by business for labor and capital. Hence, employment would increase as would capital formation. The increase in capital formation would generate further increases in disposable income, leading to further increases in consumption outlays.¹² If “full” employment were reached in the process of this multiple expansion of private sector demands, any further expansion of consumption of investment outlays would generate increases in the price level—inflation.

This is, to be sure, a much simplified and reduced explanation of the Keynesian analysis but it does capture the relevant major elements of the analytical apparatus. Note that in the Keynesian analysis, either tax reduction does lead to an expansion of supply—total real output increases except where “full” employment exists or after it is attained in the course of the adjustment. But neither of these tax reductions results in an increase in the amount of production inputs which will be supplied at any given market (pre-tax) price. Neither tax cut, in other words, is treated as directly affecting the conditions of supply. The output adjustment is, essentially, a passive response to the change in demand. Note, further, that in terms of the magnitude of the effects

¹¹ The limit on the expansion in a static analysis would be $(\alpha/1-\alpha)(\Delta t)$, where α is the marginal propensity to consume and Δt is the initial change in tax liabilities. The term $\alpha/1-\alpha$ is the tax change multiplier.

¹² If investment is specified as some function of disposable income, there emerges the concept of the marginal propensity (of the private sector) to spend (on both consumption and investment). Then the limit on the expansion is $\lambda/1-\lambda \Delta t$, where λ is the marginal propensity to spend, the sum of the marginal propensity to consume and the marginal propensity to invest.

on employment, output, price levels, etc., the analysis makes no distinction between these tax reductions.

This is not to say that those employing the Keynesian analysis would be indifferent between these (or any other) tax changes. But their choice would be determined by considerations other than the magnitude of the aggregate economic effects they would attribute to each. For example, the rebate might be preferred on the grounds that more of the tax reduction might go to lower- and middle-income individuals than in the case of the across-the-board rate cut. Other considerations, trading on refinements of the Keynesian analytics (e.g., the likely speed of response to one or another tax cut), might also be addressed in favor of one or the other tax proposal, but no basic distinction between the two with respect to effectiveness in expanding aggregate demand would be drawn.

This limitation on the discriminating power of the Keynesian analysis stems from its dependence on first-order income effects as the attribute of a tax or tax change which affects economic behavior. The consequence is that with this approach "a dollar of tax (or tax cut) is a dollar of tax (or tax cut)," irrespective of the form it takes

The neoclassical analysis, by virtue of its reliance on first-order price effects, would treat the two tax proposals as very different, indeed, with respect to their relevant economic effects. The across-the-board rate cut, because it reduces marginal tax rates, would be identified as a reduction in the cost of using one's time and capabilities in market-oriented activities compared with their use in household or leisure activities. It would also be identified as cutting the cost of saving relative to consumption. The response to the tax rate reduction, therefore, depends on how people behave when these relative prices change. Assume that when market-oriented effort becomes less costly relative to leisure and saving becomes less costly relative to consumption, given the level of income, people work and save more. More precisely, for any given number of hours of labor services, the required price per hour is lower than before the tax cut. Equivalently, at any given pretax wage rate, more hours of labor services will be offered when the tax rate is cut. Similarly, for any given amount of saving, the required pretax rate of return will be lower after the tax rate reduction, and at any given pretax rate of return, more dollars will be saved when the tax is lower.

On the basis of these assumptions, the income tax rate reduction results in an increase in the amount of labor services offered at any pretax wage rate and in the amount of saving at any pretax rate of return. With (initially) unchanged conditions of demand for labor services, there will be an increase in employment. Similarly, with initially unchanged conditions of demand for capital services, the reduction in the cost of capital entailed in the increase in the amount saved will result in an increase in investment. Both labor and capital inputs, therefore, increase, although not necessarily in the same proportions. The proportionate amounts of the increase depend on: (1) the respective percentage reductions in the relative cost of market-oriented effort and of saving; and (2) the elasticities of the respective supply and demand conditions. With the existing tax structure, for any given across-the-board rate reduction, the reduction in the cost

of saving is likely to be proportionately greater than that in the cost of effort. The consequence may well be a proportionately greater increase in the amount of capital services than in the amount of labor services employed. If this is indeed the result, this increase in the capital: labor ratio will result in an increase in labor's marginal productivity and, therefore, in the real wage rate. This, in turn, implies a further increase in both the quantity of labor services supplied and demanded.

These increases in employment of labor and capital services consequent to the tax rate reduction necessarily result in increases in total real output. It is this expansion of real output which is the source of an increase in real income, and this increase in real income will, in turn, affect both the amount of saving and of labor services offered in the market.

As just stated, saving responds positively to an increase in income, according to the neoclassical analysis. That is, given the cost—the amount of current consumption which must be foregone to acquire a source of future income, the desired or optimum stock of such sources—the desired or optimum stock of capital—will grow through time with the growth of total income. With a decrease in this cost, resulting in this example from the reduction in marginal income tax rates, there is an increase in the desired stock of capital at each income level, hence a new growth path for the stock of capital through time. Proceeding from the existing to the new growth path in response to a change in the cost of capital, however, is not likely to be achieved instantaneously; as this adjustment occurs, the rate of investment—the share of total output allocated to adding to the stock of capital—will increase. When the new growth path is achieved, annual net investment will reflect the year-to-year change in the desired stock of capital along with new equilibrium growth path.

As the additional capital is brought into use, aggregate income will increase above the levels that it would otherwise reach. On this higher growth path of income there is at any point a larger stock of desired capital. Thus, even with no further change in the relative cost of capital, the expansion of income generates a further increase in the optimum capital stock. The ultimate change in the growth path of the optimum stock of capital, therefore, will reflect the change in both the relative cost of saving and the increase in income which results as people adjust to the relative price change.

In the case of effort, on the other hand, the increase in income which emerges as a second-order effect of the marginal income tax rate reduction is generally deemed to have a negative effect on the supply of labor services. At the higher than otherwise levels of income, that is, less labor services will be offered at any given wage rate. At issue is which of these effects predominates; the empirical evidence pertaining to the relative strength of these income and price effects is subject to conflicting interpretation. It seems more likely than not, however, that there will be some increase in the supply of effort compared to that which would otherwise be forthcoming in response to a reduction in the cost of effort relative to the cost of leisure.¹³

¹³ The issue of the relative importance of income and price effects in the determination of the supply of labor and some of the empirical evidence pertaining thereto are examined in Part III.

The neoclassical approach, it is clear, does not ignore income effects; on the contrary, these are important determinants of the ultimate outcome of a tax change. In contrast to the Keynesian approach, however, the effect of the tax change on income is a second-order effect in the neoclassical analysis.

The adjustment of the supply of labor to the tax-induced change in the relative cost of effort and to the subsequent changes in income is likely to be relatively prompt. On the other hand, as indicated, the adjustment in the stock of capital is likely to be an extended, time-consuming process. The adjustment process comes to an end, in the ordinary case, when the new equilibrium growth path of the stock of capital and of total income is achieved. On this new growth path, the amount of investment is larger than it otherwise would be, although the share of the aggregate output allocated to capital formation is likely to be much the same as before. As indicated, the equilibrium growth path of total output and income is also higher than otherwise; the amount of consumption, therefore, is also greater than it would have been had the tax rates not been reduced.

Note that the neoclassical approach does not ignore demand nor assign a secondary role in the analysis to the effects of tax changes on demand. The change in saving out of a given level of income in response to the tax change clearly is the complement to an equal change in consumption of opposite sign. Indeed, there is no impediment in theory to specifying a consumption instead of a saving function through which to trace the initial response to a change in the relative cost of saving, hence of consumption, resulting from the tax change. Similarly, the analysis assigns a significant role to the change in investment in response to the tax change. But in both cases, these changes in demand components occur initially in response to changes in relative prices, rather than to changes in income.

The higher level of the equilibrium growth path of total output and income means that most tax bases will be larger than before the marginal income tax rate reductions. This does not mean, however, that total tax revenues will be greater than if the tax rates had not been reduced. If individual income tax revenues were to be greater than they otherwise would have been, the percentage increase in the income tax base would have to be substantially greater than the percentage reduction in tax rates. For example, if the reduction in marginal tax rates averaged, say, 20 percent, the increase in individual income subject to tax would have to increase by close to 25 percent merely to obtain the same tax revenue that would be provided without the tax cut.¹⁴ In the general case, this implies that the stock of capital and the number of employed persons would have to be about 25 percent more in each year than if the tax rates had not been reduced. In turn, such gains in employment and in the stock of capital imply extraordinarily high degrees of responsiveness in the supply of labor services and in the optimum stock of capital with respect to the reductions in the relative costs of effort and of future income, respectively.¹⁵

¹⁴ If all of the revenue loss were to be made up by expansion of the individual income tax base, that expansion would have to be 25 percent. Since other tax bases will also increase, something slightly less than 25 percent gain in the individual tax base would be needed to break even.

¹⁵ In the case of labor services, the implied elasticity—the percentage change in the amount of labor services supplied in response to the percentage change in the cost of effort—would be somewhere in the neighborhood of 5. For capital, the implied elasticity is something like 2. Neither elasticity is realistic.

The "feedback" effect of increases in output and income on tax revenues offsets some part of the revenue loss resulting from the reduction in tax rates. In some cases, the feedback effect may be sufficiently large to generate larger revenues than would otherwise be realized; this is likely to be the case when taxpayers may confidently anticipate the reduction in the cost of effort and/or of saving resulting from the tax change in advance of the actual reduction in tax liability. For the most part, however, feedback will offset something less than the full effect of the tax reduction on tax revenues.

Applying the neoclassical analysis to the alternative tax reduction, the \$50 tax rebate, the first problem is to identify the relative price which is altered by any such tax device. As a flat per capita sum, the rebate obviously has no effect on any marginal tax rate; accordingly, it can not affect the price of effort relative to leisure nor of consumption relative to saving. If perceived to be a continuing rather than one-shot disbursement, the rebate is the equivalent of a negative poll tax. As such, it would very modestly reduce the cost of raising children and might conceivably, over time, have some effect on average family size. Other than that, however, the neoclassical analysis would conclude that the rebate has no systematic effect on economic behavior. Its likeliest application is to finance the marginal government deficit (the reduction in tax revenues relative to government expenditures) which it generates.

Comparisons of the neoclassical and Keynesian approaches might be extended with a very long list of tax changes. The neoclassical analysis would identify a reduction in the capital gains tax rate, for example, as a decrease in the relative cost of saving, leading to shift in the use of existing income from consumption to saving and in the allocation of existing production inputs from production for consumption to capital formation. The resulting additions to the stock of capital would enrich the capital/labor ratio, increase the real wage rate, and lead to an increase in employment. Total output and income would expand above the levels that would otherwise be attained by virtue of the increases in both labor and capital inputs. Moreover, these expansionary effects do not derive from the actual reductions in tax payments but from the change in tax liability contingent upon realization of gains. As a consequence, the total tax base might well increase sufficiently to provide net gains in tax revenues.

In the Keynesian approach, on the other hand, the initial effect of the reduction in the capital gains tax rate would be identified and measured as a decrease in tax liabilities, hence an increase in the disposable income of the taxpayers currently realizing capital gains. This increase in disposable income would be treated as resulting primarily in an increase in consumption, not in saving. The increase in consumption would, presumably, have some multiple effect on total income, entailing increases in employment and investment. But this tax cut would be deemed to have substantially the same aggregate economic effects as virtually any other tax reduction of equal effect on existing tax liabilities.

One of the conclusions which emerges very forcefully from all such comparisons is that the neoclassical analysis not only provides a sounder theoretical basis for determining the effects of taxes and tax

changes, it also affords a vastly greater capacity than is available in the Keynesian approach to distinguish among taxes and tax changes with respect to these effects. The explanation, of course, is that the first-order price effects of tax changes which are their distinguishing attributes in the neoclassical system are more varied in character and magnitude than the alleged first-order income effects upon which the Keynesian approach relies. The neoclassical approach, accordingly, provides a greatly expanded capacity to analyze and differentiate among tax alternatives. It affords the basis for tax policy formulation far better informed with respect to the effects of the policy on the allocation of the economy's production resources and the expansion of economic potential over time.

III. TAXES, EFFORT, AND SAVING

There can be little argument that most taxes—particularly income taxes—affect the cost of effort relative to leisure and of saving relative to consumption. There are, on the other hand, widely differing views about how people respond to these changes in relative costs. Will a person want to work more hours or less if a tax cut increases his after-tax wage rate? Will one want to save more or less of one's current income if the after-tax return on one's saving increases? The answers to these questions have obvious implications for tax policy. For example, if, as is often assumed, people want to work less when their take-home pay increases, reducing taxes on labor income will be a counterproductive strategy for increasing employment and output. And if people save less when the after-tax return on their saving increases—presumably because they can obtain some targeted amount of future income and consume more currently—reducing taxes on capital returns at the same time will be counterproductive in a policy aimed at accelerating the growth in production potential. Important as these questions are in theory, they are also of great consequence for shaping public economic policy.

At issue are the fundamental determinants of an individual's trade-offs between market-directed effort (labor) and leisure and between saving and consumption. A close examination of these determinants would entail a substantially more extensive excursion into economic theory than is warranted in this discussion, which will, instead, briefly summarize the basic analytical propositions, point up their policy implications, and show how they are incorporated in the neoclassical analysis of aggregate economic performance.

A. The Labor-Leisure Choice

As presented earlier in this discussion, an individual's allocation of his time and resources between labor and leisure depends on the opportunity costs of these alternatives. The individual is perceived to optimize in this allocation when the return for the marginal amount of labor service he provides equals the marginal cost of that amount in terms of the value of the marginal amount of foregone leisure. By the same token, when he optimizes, the marginal return on leisure just equals its marginal cost—the compensation for the marginal amount of foregone labor service. While the rewards for labor are usually ex-

PLICITLY stated—e.g., so many dollars per hour, the importance the individual attaches to these rewards is not generally known. These rewards comprise the person's command over current consumption and future income. Presumably, the greater the amount of current consumption, with any given amount of future income, the less the satisfaction to be obtained from an additional unit of this consumption. And the greater the amount of future income, with any given amount of current consumption, the less the importance attached to an additional amount of future income. The larger the amount of current income, then, the less the additional satisfaction to be obtained from an additional amount of current income.

Presumably, the same sort of thing is true with respect to leisure. Some of the leisure uses of one's time and resources take the form of particular kinds of consumption, and some leisure activities are directed toward expanding one's capacity to obtain income in the future—or to obtain greater satisfaction from any given amount of income. The greater the amount of the rewards for leisure, then, the less the additional satisfaction to be obtained from an additional amount of leisure.

Both labor and leisure, therefore, are perceived to entail diminishing marginal returns. For this reason, both involve incurring increasing marginal costs. To repeat, the individual optimizes when the marginal returns and marginal costs of each are the same.¹⁶

Given these attributes of labor and leisure, two conclusions about the supply of labor services follow. First, with any given, fixed amount of income, an individual requires an increasing reward per unit of labor service the greater the amount of labor he provides; he has a positively-sloping labor supply curve; the *price* elasticity of this supply of labor is positive. Second, the greater the amount of an individual's income, the less labor service he will provide at any reward per unit of labor or, equivalently, the greater must be the reward per unit for any given amount of such service. The income elasticity of labor supply is negative.¹⁷

In pure theory, there is no basis for determining whether price or income effects are stronger—whether the response to a higher rate of reward for labor services most often is more or less labor services supplied. It does seem clear that a higher reward is required to induce a person to work additional hours a day or additional days per week or weeks per year or to work more intensively in any given hour. On the other hand, if a person receives a higher rate of pay for any given amount of labor, it is not certain whether this will induce more or less hours of labor or more or less intensive effort per hour. On the one hand, the person can obtain the same amount of income as before while working less than before or more income than before working the same amount as before. On this score, it may be difficult to perceive any impetus for the person to work more at the higher than at the lower rate. On the other hand, the increase in the reward for any hour of work means that the cost of leisure is greater than before which should

¹⁶ The costs of labor often include items in addition to the value of the foregone leisure. One's job may entail risks of injury, emotional stresses, and other nonpecuniary costs as well as monetary costs for clothing, commuting, meals, etc. Similarly, the costs of leisure often include more than the foregone rewards for labor.

¹⁷ For a theoretical discussion of this point, see app. A.

induce one to economize on it—to allocate less time to leisure and, accordingly, more to work. Then the question remains whether the negative income or positive price effect is stronger.

The empirical evidence, unfortunately, is not sufficiently clear-cut to resolve the theoretical issue. On the one hand, it certainly is true that over quite long periods of time, the average hours per year in which a person is employed in market-oriented work has decreased as real per capita income has increased. There can be little doubt that this historical record provides solid evidence of strong income effects. On the other hand, in itself this record doesn't argue that these income effects are more powerful than the price effects. Income gains have been generally derived from sources other than labor rewards along with the increases in the real wage rate. Predominance of income over price effect depends on demonstrating that the percentage decrease in average labor hours with respect to the percentage increase in real labor income per unit of labor—the income elasticity—is numerically greater than the percentage increase in units of labor service which are forthcoming, for a given percentage increase in the real wage rate, holding income constant—the price elasticity.

Part of the ambiguity in interpretation of the record stems from changes in the composition of employment along with differences in the institutional arrangements of various lines of work and from demographic trends. The post World War II period affords an instructive illustration. Since 1947, average hours of work per week for the U.S. private nonagricultural labor force have decreased quite substantially and steadily—from 40.3 hours in 1947 to 35.8 hours in 1978. In the same period, the average real wage rate increased at an overall trend rate of about 1.75 percent per year. This record is frequently cited as persuasive evidence of the dominance of income effects. But these overall averages conceal important variances from one employment sector to another. For example, the data reveal no downward trend in average weekly hours in manufacturing, a slight decline in construction, and a sharp drop in trade. If these changes in hours were to reflect the relative strength of income and price effects, one would expect to find that real hourly earnings had increased slightly less in manufacturing than in construction and substantially less than in trade. In fact, the rates of increase in hourly earning rates were substantially the same for manufacturing and trade and significantly less than in construction; measured on a weekly basis, gross earnings increased only slightly more rapidly in construction than in manufacturing, and in both manufacturing and construction, the increase was far more rapid than in trade.

These disparate relationships between rates of compensation and hours of work reflect, among other things, the increasing prevalence of part-time employment in trade, occurring to a far lesser extent in manufacturing and construction. And the fact that less than full-time employment schedules have become increasingly commonplace in trade results in part from the increasing labor-force participation by students and housewives seeking part-time jobs for which no extensive training is necessary. The sharp decline in average weekly hours of work in trade, therefore, more reflects the increasing use of part-time employees than the response of workers in trade to changes in the

real wage rate. And with the increasing shift from manufacturing to nonmanufacturing employment, the change in the institutional arrangements for employment in trade has depressed the overall average weekly hours of work throughout the private, nonagricultural sector.

The inconclusiveness of both abstract reasoning and of empirical analysis regarding the way in which any one person responds to changes in the rate of compensation for labor services doesn't pertain in examining the effects of tax changes on the aggregate supply of labor. As shown in Part II, a payroll or income tax raises the cost of labor relative to that of leisure. In and of itself, this relative price effect will tend to reduce the amount of labor services supplied compared to the amounts that would be forthcoming at the same pretax wage rate if there were no tax. For example, if a person with a given amount of total income were to require a take-home hourly wage of, say, \$10 if he is to provide, say, 8 hours of labor service per day in a five-day-a-week, 48-weeks-a-year work schedule, then the imposition of a, say, 25-percent tax on his wages will result in his requiring \$13.33 per hour if he is to provide the same amount of labor service. At a lower pretax wage, hence a lower after-tax wage, the cost of leisure to him is less than in the absence of the tax and, other things being equal, he will allocate a larger fraction of his time and resources to it.

But doesn't the reduction in his income induce him to work more in order to maintain his former income level? Possibly so. As already indicated, theory provides no firm conclusion as to whether the person's total amount of effort will be greater or less than if there were no tax. But as shown in Part II, the imposition of the tax, in and of itself, does not alter the aggregate amount of production resources in the economy or their utilization. It does not, therefore, change the amount of total income produced. To the extent that the income of taxpayers is reduced by the tax, some other persons must have more income than if the tax hadn't been levied. For those who receive the additional income, the income effect, of course, is opposite to that of those who pay the tax. At least to a first approximation, therefore, *these* income effects cancel out. On the other hand, insofar as people reduce their supply of labor services in response to the price effect of the tax, aggregate income will be less than if the tax hadn't been levied. Then any income effect of the tax on the aggregate quantity of labor services materializes only after the initial response to the price effect of the tax. The tax has a first-order price effect on the aggregate supply of labor which may be offset in some part by the second-order income effects.

One of the principal deficiencies in the Keynesian aggregate demand approach is its disregard of the price effects of tax changes on the condition of labor supply. In this approach, the supply of labor is treated, essentially, as given and not significantly affected by changes in the way in which the rewards for labor services are taxed. Indeed, those relying on the aggregate demand approach generally reject the utility of tax changes aimed at reducing the relative cost of effort as a means of expanding employment, arguing that the income effects of the tax change are likely at least to offset its price effects so that no change, possibly even a decrease, in the supply of labor will result.

Given the Keynesian reliance on first-order income effects of tax changes, the distinction between marginal and average tax rate changes in terms of how each affects economic behavior is at best secondary to the effects of each in altering disposable income.

If there were a first-order negative income effect on the aggregate supply of labor, this would be as damaging for the conventional aggregate demand policies as it would be for supply-oriented policies. In essence it would mean that income tax reductions aimed at boosting aggregate demand would have no effect on employment or would reduce the amount of labor service offered at any wage rate. By the same token, there would either be no gain in real output or an actual decrease. But then, if the tax reduction in fact were to result in an increase in aggregate demand, the consequence would necessarily be an increase in the overall level of prices. The Keynesian approach, no less than the neoclassical, must rest on the assumption that the positive price effects of changes in net-of-tax rates of reward for labor services are greater than the negative income effects.

B. The Saving-Consumption Choice

The discussion in Part II was at pains to show how various attributes of the existing tax system serve to raise the cost of saving relative to that of consumption. The question is whether this price effect of taxation is consequential with respect to the amount people save out of any given aggregate income.

In neoclassical theory, the impetus for saving is to acquire sources of future income streams in order to have a greater command over resources at a future time than one would otherwise have. The greater the amount of future income to which one has claim, the less is likely to be the gain in satisfaction from acquiring any additional amount of future income. The marginal utility of future income decreases, in other words, with increases in its amount.

As pointed out in Part III, acquiring sources of future income entails foregoing current consumption uses of one's current income. The real cost of any amount of such future income sources is the amount of satisfaction from current consumption which must be foregone by using some of one's income to acquire those sources. Presumably the marginal utility of current consumption also decreases the greater the amount of this use of income. Thus, with any given income, the real cost of any incremental amount of future income increases as the amount of saving—foregone consumption—increases. Similarly, the real cost of any increment of consumption is the additional satisfaction which would have been obtained from the future income which must be sacrificed. The real marginal cost of consumption increases, therefore, as the amount of consumption increases.

To optimize, an individual will allocate his available current income between consumption and future income in such a way that the marginal cost and marginal utility of each is the same. If something changes the amount of current consumption one can obtain with a stipulated amount of current income, i.e., the explicit price of consumption, the allocation between consumption and saving will change, given no change in the person's preference system. Similarly, if the

amount of current income one must forego to obtain any given amount of future income (i.e., the explicit price of future income) changes, this will impel the person to change the division of available income between saving and consumption. For example, a reduction in the cost of future income relative to current consumption will increase the amount of future income desired. With real income held constant, this entails an increase in the proportion of current income which is saved, (i.e., used to acquire sources of future income) and a reduction in the amount of consumption. Allowing for an increase in real income, both saving and consumption will increase.

These relationships may be depicted as the conditions of supply of capital. At each given level of real income, an individual requires a greater amount of future income per dollar of foregone current consumption, the larger the amount of current consumption he foregoes. Expressing the amount of future income per dollar of foregone current consumption as the rate of return on his saving, the amount of saving out of any given current income is described as positively elastic with respect to the rate of return. At higher levels of income, a greater amount of saving will be undertaken at any given rate of return, that is, saving is also positively elastic with respect to income.

The amount of return that can be obtained (in contrast with the amount of return desired) per dollar of foregone consumption used to acquire capital depends on how much capital is used in production with given amounts of other production inputs. Given the technical conditions of production and the demand for the output of the production process in which the capital is used, the greater the amount of capital in relation to the other production inputs, the less will be the incremental total revenue obtained from any given additional amount of capital. The marginal value productivity of capital, in other words, decreases with increases in the amount of capital, given the quantity of other production inputs.

The equilibrium amount of capital is such that its marginal value product equals the rate of return that people require to willingly hold that quantity, i.e., to forego that amount of current consumption.

With taxes levied both on the current income which is saved and on the future income acquired with the saving (as in the present U.S. tax structure) the relative cost of saving—the amount of current consumption which must be foregone to obtain any given net-of-tax future income—increases. Unless the imposition of the taxes per se decreases peoples' preferences for future income compared with current consumption, the pretax rate of return required to elicit any given amount of saving will be higher than that required in the absence of the taxes. But with no change in the basic determinants of capital's productivity, the higher pretax return is obtained only with a smaller amount of capital in relation to labor services and other production inputs. A tax structure of this sort, therefore, results in a smaller stock of capital than would otherwise exist.¹⁸

Since the productivity of labor, hence real wages, depends in significant part on the amount of capital with which labor is employed, this tax-induced shortfall in the stock of capital also results in lower rewards for labor services than would be provided in the absence of the

¹⁸ For a theoretical elaboration of this point, see app. B.

tax. And as shown in the preceding discussion, this is likely to entail less employment than otherwise.

In turn, the lesser amounts of capital and labor services employed mean that total output and real income are less than would be forthcoming in the absence of the tax bias against saving and capital formation. And at the lower level of income, aggregate saving will be less than otherwise.

Analogous to the case of the labor-leisure choice, the initial effects of taxes on the saving-consumption choice are responses to the tax-caused distortion of the cost of saving relative to the cost of consumption. These responses to this relative price change lead to lower levels of productivity and of total production inputs, hence to lower income than would otherwise be realized. In turn, this reduced level of income, the second-order income effect of the taxes, further reduces saving and capital formation.

In the aggregate demand approach, as indicated earlier, consumption is deemed to be determined primarily by disposable income; so, too, is saving. The relative costs of saving and consumption are either completely ignored or given little weight as determinants of the allocation of income between these alternative uses. Saving, hence consumption, is described as completely "interest inelastic." By the same token, the effects of taxes on these relative costs are generally dismissed as inconsequential in the determination of individuals' saving-consumption choice. Instead, taxes are treated as having first-order income effects on consumption and saving, by virtue of their effects on disposable incomes.

This treatment should pose an interesting paradox to those relying on the aggregate demand approach. Consider a tax structure which is heavily biased against saving in the sense that it raises the cost of saving relative to current consumption. Whether or not one believes that saving and consumption are influenced by these relative costs, there is some division—presumably a functionally stable allocation—of income between current consumption and saving. Now suppose the tax structure is drastically altered so as to reduce, if not completely to eliminate, the bias against saving, i.e., the tax structure becomes more nearly neutral, in the sense defined in Part II, between saving and consumption. Suppose, for example, that the existing income taxes were replaced by a uniform value added tax.¹⁹ And suppose, further, that initially the tax change involves no change in total tax liabilities. Then the cost of consumption has been significantly increased and the cost of saving has been dramatically reduced. But since disposable income has not been changed, the aggregate demand approach would hold that there would be no change in consumption or in saving. If this were in fact the result, not only must saving be characterized as completely "interest inelastic," consumption must be treated as completely inelastic with respect to its price as well. But if this is so, there clearly is no basis for the assertion that a value added tax or a sales tax is in any meaningful sense, a burden on consumption.

¹⁹ For a demonstration of the proposition that a value added tax of the so-called "consumption" variety in fact equally increases the cost of consumption and saving, see Norman B. Ture, "The Value Added Tax: Facts and Fancies," The Heritage Foundation and Institute for Research on the Economics of Taxation, Washington, D.C., 1979.

A second paradox in the aggregate demand approach lies in its treatment of the response by business organizations to tax changes which are deemed to affect the net rate of return on business-owned capital. A reduction in the corporation income tax, more accelerated depreciation allowances, an increase in the investment tax credit, and similar tax changes are perceived as increasing both business cash flow (the sum of after-tax profits plus capital consumption allowances) and the net-of-tax rate of return. Both the income and price effects are deemed to lead to increases in business demands for capital facilities—to greater capital outlays by business. “Businesses,” in other words, are deemed to have interest elastic demands for capital.²⁰ Individuals, the ultimate owners of businesses, on the otherhand, are deemed to have completely interest inelastic saving behavior. This suggests that the proprietor of an unincorporated business closes his eyes to the after-tax rate of return when, as the owner, he considers how much capital to keep in the business rather than withdraw and consume, while as the manager of the business he is keenly responsive to the effects of tax changes on the net rate of return obtainable on the business capital.²¹ The notion of any such split view is highly implausible and if one believes that sooner or later corporate business executives and managers must come to realize, if only when facing a collapse in equity values or bankruptcy, that they are merely the stewards for the company owners, it is just as implausible to attribute to them the same split personalities.

C. Policy Implications

A major distinction between the neoclassical and Keynesian treatment of the effects of taxes on the saving-consumption choice derives from identifying taxes in terms of first-order price effects (neoclassical) or first-order income effects (Keynesian). This is, of course, the same distinction that was identified with respect to the neoclassical and Keynesian treatment of the labor-leisure choice. As a corollary to this distinction, the neoclassical analysis identifies taxes and tax changes in terms of their effects on marginal tax rates and treats these effects as the operational mechanism of tax policy; the aggregate demand approach, on the other hand, focuses on changes in average tax rates as the means by which taxes affect economic activity.

There are important implications for public policy in this difference in analytical approach. The failure to distinguish between price and income effects and their sequence accounts for much of the misdirection of tax policy in the past. By the same token, appreciation of these differences and of their priorities will contribute to the design of a tax system which less significantly burdens saving, effort, and productivity-advancing economic activity.

One of the most broadly applicable as well as important of these implications is that tax changes should operate to change marginal rather than average or effective tax rates if tax policy is to be efficiently used to pursuit of economic objectives. For example, if the aim is to make more intensive use of the labor force, it is necessary to reduce

²⁰ All too familiar is the Keynesian litany that “tight” money drives up interest rates which reduces business’ capital outlays.

²¹ The cure for this schizophrenia, if in fact it afflicted proprietors, would be to get them to kick the Keynesian habit and take up the old-time religion of neoclassical economics.

the cost of labor relative to leisure; the focus of the tax policy to this end should be on reducing marginal income tax and payroll tax rates. Reducing effective tax rates, for example by providing a per capita tax credit or rebate while leaving marginal tax rates intact, will not alter the cost of effort relative to leisure and will not, therefore, expand the supply of labor and employment.

Similarly, in order to offset the adverse effects of inflation on the supply of labor, the focus should be on reducing marginal tax rates. The argument frequently advanced by the Treasury Department that by virtue of discretionary tax reductions effective income tax rates have not advanced with inflation is not really an answer to those urging indexing or some alternative income tax adjustment to offset the tax-bracket creep inflation produces. Only if the Treasury could demonstrate that these discretionary adjustments had also held constant the incremental tax per dollar of incremental real income could they show that tax policy had effectively offset the adverse thrust of inflation with respect to the conditions of labor supply.

In the same vein, a higher overall saving rate in the interests of achieving a larger stock of capital, a higher capital-labor ratio, hence greater advances in productivity, real wage rates, and employment calls for reducing the amount of tax on the marginal returns to saving rather than the overall effective tax rate on these returns. As shown in Part II, this can be accomplished by reducing marginal individual income tax rates. Highly effective would be reductions in corporate income tax rates. Increasing the width of income tax brackets is a useful device for this purpose. Indeed, a wide variety of tax provisions, not merely reductions in statutory tax rates, may be used to this end. For example, more generous capital recovery provisions, e.g., the proposed "10-5-3 capital cost recovery system", the investment tax credit, ADR, etc., serve to reduce the marginal tax rate on the returns to capital, hence to reduce the marginal cost of saving.

To be sure, many such tax features do not, initially, impact with equal weight on all of the alternative channels for saving. Insofar as they reduce the marginal tax rate on the returns on one or more types of capital relative to others, these tax provisions impel a shift in the composition of saving and investing toward the tax-favored and away from the less-favored saving outlets. Other production inputs also shift, in varying proportion, with this shift in saving and capital allocation. As this shift occurs, the pretax rate of return on the types of capital favored by the tax provision tends to fall while that on the unfavored capital rises. This adjustment process continues until the after-tax rates of return on capital in all uses are once again equal. When the shift is completed, the allocation of the total amount of capital among all alternative uses is likely to differ, possibly substantially from its composition if all taxes equally altered, initially, the cost of saving in all uses.

Unless marginal tax rates on the returns to capital in the nonfavored uses are increased so as to offset precisely the reduction in marginal tax rates effected by the tax differentials on the favored uses, the overall marginal rate of tax on all capital returns will decline. So, too, therefore, will the overall cost of saving. The aggregate volume of saving, hence the size of the total stock of capital, will increase.

Tax provisions which differentially reduce the marginal rates of tax on the returns to particular types of capital, therefore, not only

change the allocation of capital but increase its total volume as well.

There may well be a loss of efficiency resulting from the change in the allocation of capital, and it is to this efficiency loss, seldom if ever measured, that the attention of policy makers is generally directed. A tax structure which is more nearly neutral with respect to its effects on the cost of capital in alternative use, is certainly highly desirable. It does not follow, however, that there would be any gain for the economy in merely eliminating tax differentials. The real question is whether the efficiency losses resulting from tax differentials are as great as the efficiency gain which results from the reduction, overall, in the tax bias against saving and the consequently larger stock of capital. In general, the efficiency losses in the misallocation of the stock of capital are likely to be of secondary importance compared with those resulting from the shortfall of capital from the amount which would be forthcoming if the tax system were less severely biased against saving. By the same token, eliminating these tax differentials without offsetting tax changes—i.e., those which equivalently reduced marginal tax rates on the returns to saving—would entail a net efficiency loss to the economy.

This further emphasizes the point that evaluation of the effectiveness of any proposed tax change in achieving economic policy objectives must rely on identifying how the tax change affects relative prices, and for this purpose it is the effect of the tax change on marginal tax rates, not tax liabilities, *per se*, which matters.

This is not to say that there is no policy objective reflected in concern over effective tax rates. Insofar as equity criteria can be rigorously and meaningfully delineated in terms of the amount of tax per dollar of income borne by persons in differing economic circumstances, clearly the average rate of tax is a useful measure. But for purposes of understanding how taxes enter into decisions to work and to save rather than to use one's resources in nonmarket-oriented pursuits and to consume, respectively, the focus should be on marginal tax rates.

IV. SUMMARY AND CONCLUSIONS

The ineffectual application of tax policy to the pursuit of economic policy objectives during the last decade has sometime been ascribed to an explicable change in the nature and structure of the economy. Others have concluded that taxes, *per se*, are ineffectual policy instruments and that, accordingly, taxes should be used solely to raise revenues.

Neither conclusion is warranted. The fact that the economic results sought in the use of tax policy have not been achieved doesn't mean that the world used to be flat and just suddenly became a sphere, nor does it mean that taxes are impotent devices for influencing economic outcomes. The inference that is properly drawn, rather, is that policy has been formulated on the basis of misapprehension as to how taxes affect economic behavior. In the popular view, correcting the tax policy mistakes of the past calls for shifting the focus from control of aggregate demand to expansion of aggregate supply. What is really called for, however, is reliance on a different analytical approach in identifying the attributes of taxes that affect economic behavior and, therefore, the development of a better, more accurate understanding of how people react to taxes and tax changes.

For the past several decades, tax policy has been largely guided by a set of views about how taxes affect behavior derived from the work of John Maynard Keynes. In this approach, the operational attribute of taxes is their effect on disposable income. Changes in disposable income are perceived to result in changes in consumption and, to a substantial extent, in investment which, in turn, leads to changes in total output and income. The conditions of supply of production inputs are deemed to be little influenced by taxes and their effects on disposable income. Hence the focus in this approach on aggregate demand.

There is a growing awareness that this aggregate demand approach relies on a misspecification of the attribute of taxes which affect economic behavior. The neoclassical analysis demonstrates that taxes and tax changes can have no initial impact on the aggregate income of the economy and cannot accordingly, influence economic outcomes by way of first-order income effects. Instead, taxes initially affect the behavior of households and businesses by altering the relative prices, explicit or implicit, of the economic alternatives they confront. Thus, to understand how tax policy will affect the aggregate economic performance of the economy, it is necessary first to identify the relative prices which are altered by taxes and to specify how individuals respond thereto.

At the highest level of aggregation, the initial effect of a tax change is identifiable in terms of a change in the price of saving relative to consumption and/or of effort relative to leisure. This identification tends to focus the analysis initially on the conditions of supply, since tax-induced changes in these relative prices lead to changes in saving, hence in the stock of capital and the flow of capital services in production, and in the amount of labor services offered at any given pretax wage rate. But changes in the conditions of supply of capital and labor services obviously entail changes in total output and income, and these second-order changes in income themselves influence the willingness of individuals to work and to save at given rates of reward for effort and saving. In turn, therefore, these second-order effects of tax changes alter the volume of consumption and investment—the private sector components of aggregate demand. The relevant distinction between the neoclassical and Keynesian analyses, therefore, is not that one is concerned with the supply effects and the other with the demand effects of taxation, but that one perceives taxes as first altering relative prices leading to changes in income while the other identifies taxes as primarily changing income, with effects on relative prices treated as of secondary importance, if any.

The neoclassical analysis does not discard analysis of the effects of taxation on aggregate demand and its components; instead, it joins to that concern an explicit analysis of the effects of tax changes on the conditions of factor supply. The “supply-side” characterization of this analysis is warranted only by contrast with the aggregate demand approach which, for the most part, does not explicitly consider factor supply responses to tax changes.

Relying on the neoclassical analysis has major implications for tax policy. For one thing, insofar as tax policy is concerned with economic policy objectives, the neoclassical analysis urges deemphasis of average rates of tax and a focus, instead, on marginal tax rates, since marginal, rather than average, tax rates affect relevant relative prices. As corollary, changing the aggregate amount of taxes relative to income is

not the effective way to use tax policy to achieve desired changes in economic aggregates; devices such as per capita income tax credits or rebates should not be relied upon to affect aggregate levels of output or employment. By the same token, to implement the current policy concern for more rapidly increasing the stock of private business capital, in the interests of raising productivity, real wage rates, and total output potential, the focus should be on reducing the existing excessive tax cost of saving relative to consumption. This calls for reducing marginal income tax rates, rather than for reducing average tax rates.

This is not to say that there is no occasion for concern with effective tax rates. If equity objectives can be meaningfully specified in terms of the amount of tax per dollar of income paid by persons in differing economic circumstances, the average or effective rate of tax becomes an important and useful measure. But policy makers should be alert to the likelihood that pursuit of equity objectives, guided by changes in effective tax rates, may seriously conflict with pursuit of economic objectives for which changes in marginal tax rates are the operational instrument.

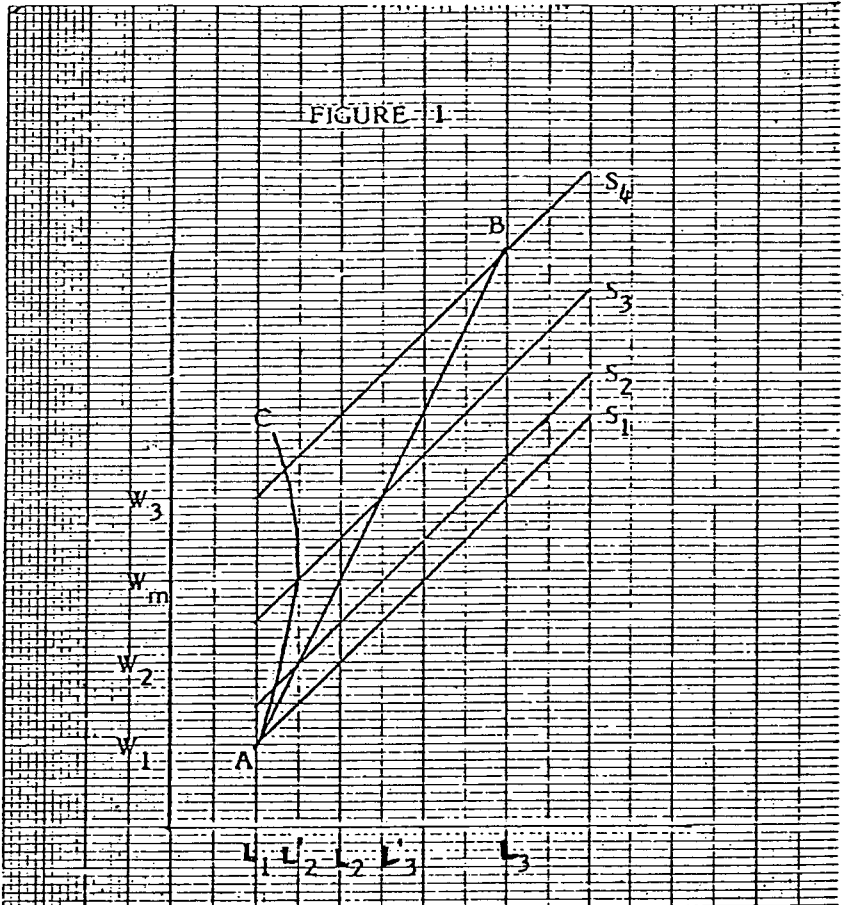
The application of neoclassical, price-theoretic analysis to tax policy offers enormous promise for greatly expanding our understanding of how taxes affect economic behavior. It greatly enriches the potential of tax policy for dealing constructively with a far larger array of economic problems than have been effectively dealt with in the past. The path to a more constructive tax system, one which is more congenial to productive effort, to advancing productivity, to innovation, and to economic self-reliance is made far clearer by the application of this sort of analytical approach. In the last analysis, however, the progress on that path will depend on policy makers' willingness to shift their intellectual gears. Hopefully, this study will facilitate the transmission.

APPENDIX A

INCOME AS A PARAMETER OF THE SUPPLY OF LABOR CURVE

The relationships among the amount of labor services offered and the income and price effects of alternative wage rates are illustrated in figure I, in which the amount of labor service is shown on the horizontal axis and the wage rate is shown on the vertical axis. Each of the lines S_1 , S_2 , S_3 , etc., represents the various amounts of labor service the individual will offer at each alternative wage rate, given a fixed amount of total income. The supply curve S_2 represents the conditions of labor supply when the individual has some greater total income than the amount for which the curve S_1 is drawn; S_3 represents greater total income than S_2 , etc.

It is obvious, of course, that other things being equal, an increase in the amount of labor services provided with an increase in the reward per unit of labor service results in an increase in total income. But then the individual's conditions of labor supply are no longer correctly represented by the original labor supply line but by a new line drawn with respect to the greater amount of income. For example, suppose to begin with an individual were supplying L_1 hours of labor serviced at a wage rate of W_1 on supply curve S_1 . At wage rate W_2 , the individual would provide L_2 of labor if his total income were unchanged. But taking into account the gain in his income, he will provide L'_2 of labor at wage rate W_2 —he'll now be on supply curve S_2 . At wage rate W_3 , the amount of labor he would offer would be L_3 if his income remained the same amount as that for which S_1 is drawn. But at the higher income level, the amount of labor offered at W_3 is L'_3 , and this point lies on labor supply curve S_2 . And so on. Connecting the points $W_1L'_1$, $W_2L'_2$, $W_3L'_3$, etc., which allow for the effect of the income changes on the individual's willingness to offer labor services at any given wage rate, i.e., which recognize the negative income effect, there emerges the supply of labor curve AB.



This curve, it should be noted, depicts increasing amounts of labor with increasing wage rates; the positive price effect is greater than the negative income effect.

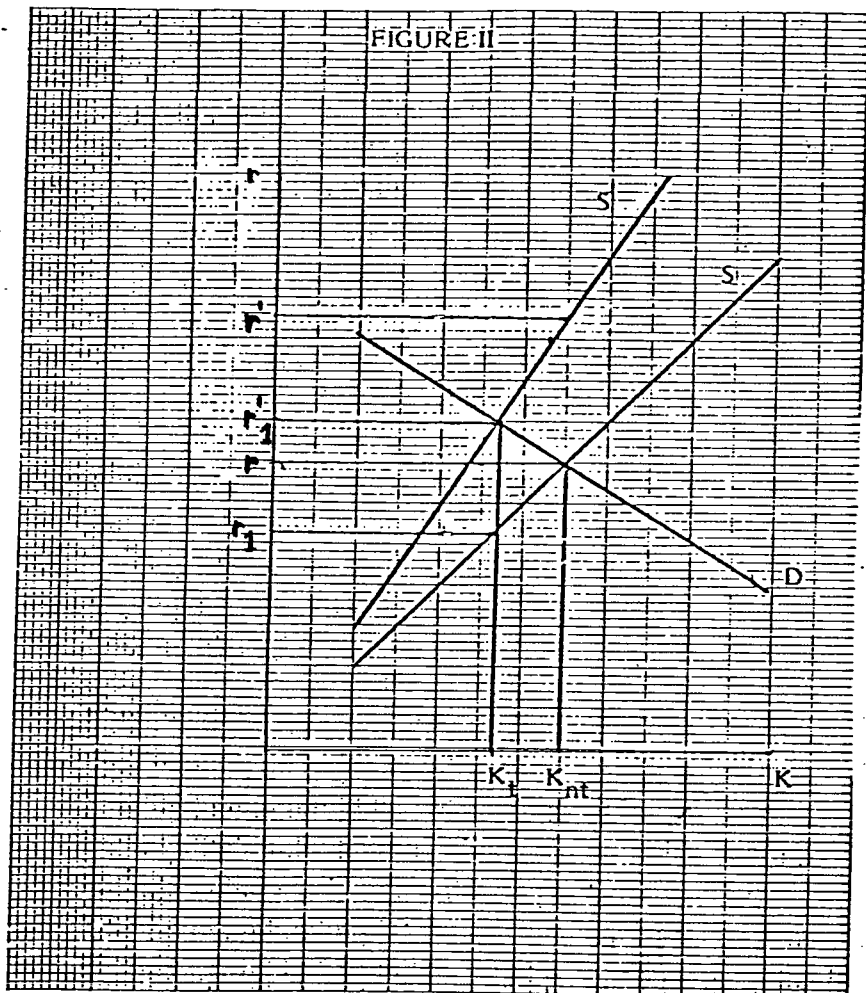
Curve AC , in contrast, shows much less responsiveness of the amount of labor service offered to increases in the wage rate and much more negative response to the implied increase in income. At a wage rate W_m , halfway between W_2 and W_3 , the amount of labor supplied is a maximum. At higher wage rates, for example at W_3 , the amount of labor supplied is a maximum. At higher wage rates, for example at W_3 , less labor is supplied than at W_m . This labor supply curve bends backward. At a wage rate greater than W_m , the negative income effect of a wage increase exceeds the positive price effect.

APPENDIX B

THE EFFECT OF TAXATION ON THE STOCK OF CAPITAL

The effect of the tax structure on the size of the capital stock is illustrated in figure II. The line S represents the amount of capital— K —people want to hold at each net rate of return— r . The line D is the marginal value product of the differing amounts of K . With no tax, the equilibrium amount of capital is K_{nt} , the amount for which the marginal value product and the net rate of return which individuals require if they are to hold a given amount of capital are the same— r . With a tax, the required pretax rate of return must rise sufficiently so that after

paying the tax the net return will be that required to induce people to hold the indicated amount of capital. The line S' delineates the pretax returns which are required to provide the net returns for various amounts of capital shown on the line S . For K_{nt} of capital, for example, the pretax return would have to be r' , so that after paying the tax the capital holders would obtain a net return of r . But the marginal product of K_{nt} of capital is r , for less than r' . With the tax, the equilibrium amount of capital is K , at which both the marginal value product and the pretax return are r' . The after-tax return is r , the rate of return required to induce people to hold K of capital. This amount of capital, of course, is significantly less than people would want to have in the absence of the tax. One way of measuring the cost of the tax, thus, is in terms of the foregone capital— $K_1 K_{nt}$ —and the income it would produce.²²



²² There is some discussion in the profession over how to measure the use of capital in this type of graph. Some would put capital on the horizontal axis. Others would put capital services on the axis, noting that capital can be used more or less intensively as circumstances dictate, at least in the short run. However, in a long-run stock adjustment picture, and adjusting for changes in technology, services of capital move in rough proportion to the capital stock. Thus, a tax on either capital or the services of capital will reduce the quantity of both capital and the services of capital supplied to and used by the market.