

1068

97th Congress }
1st Session }

JOINT COMMITTEE PRINT

EXPECTATIONS AND THE ECONOMY

A VOLUME OF ESSAYS

SUBMITTED TO THE

JOINT ECONOMIC COMMITTEE
CONGRESS OF THE UNITED STATES



DECEMBER 11, 1981

Printed for the use of the Joint Economic Committee

U.S. GOVERNMENT PRINTING OFFICE

WASHINGTON : 1981

85-380 O

For sale by the Superintendent of Documents, U.S. Government Printing Office
Washington, D.C. 20402

JOINT ECONOMIC COMMITTEE

(Created pursuant to sec. 5(a) of Public Law 304, 79th Cong.)

HOUSE OF REPRESENTATIVES

HENRY S. REUSS, Wisconsin, *Chairman*
RICHARD BOLLING, Missouri
LEE H. HAMILTON, Indiana
GILLIS W. LONG, Louisiana
PARREN J. MITCHELL, Maryland
FREDERICK W. RICHMOND, New York
CLARENCE J. BROWN, Ohio
MARGARET M. HECKLER, Massachusetts
JOHN H. ROUSSELOT, California
CHALMERS P. WYLIE, Ohio

SENATE

ROGER W. JEPSEN, Iowa, *Vice Chairman*
WILLIAM V. ROTH, Jr., Delaware
JAMES ABDNOR, South Dakota
STEVEN D. SYMMS, Idaho
PAULA HAWKINS, Florida
MACK MATTINGLY, Georgia
LLOYD BENTSEN, Texas
WILLIAM PROXMIRE, Wisconsin
EDWARD M. KENNEDY, Massachusetts
PAUL S. SARBANES, Maryland

JAMES K. GALBRAITH, *Executive Director*
BRUCE R. BARTLETT, *Deputy Director*

LETTERS OF TRANSMITTAL

NOVEMBER 20, 1981.

To the Members of the Joint Economic Committee:

I am pleased to transmit a volume of essays entitled "Expectations and the Economy."

Interest in the role of expectations in economics and in economic policy has recently risen significantly due to the stress on the importance of expectations in President Reagan's program. This stress led many to hope that rapid reduction in inflation, interest rates, and increased real economic growth in the economy might be made possible by changing expectations. Unfortunately to date this hope has not been fulfilled.

In April of this year, I wrote to a number of leading professional economists and economic analysts, inviting them to submit short essays concerning the role of expectations in economics. Participants were asked a number of specific questions, listed in the appendix; they could either respond to these or submit a more general essay. I believe that the 18 responses in this volume will be of major interest to policymakers, forecasters, economists, and all who are interested in this important topic.

This study was designed and directed by James K. Galbraith, executive director, and Paul B. Manchester, staff economist.

It should be understood that the views expressed in this volume are exclusively those of the authors and do not necessarily represent the views of the Joint Economic Committee or of individual members.

Sincerely,

HENRY S. REUSS,
Chairman, Joint Economic Committee.

NOVEMBER 18, 1981.

Hon. HENRY S. REUSS,
*Chairman, Joint Economic Committee,
Congress of the United States, Washington, D.C.*

DEAR MR. CHAIRMAN: I am pleased to transmit a volume of essays entitled "Expectations and the Economy." These are the responses of 18 leading economists, representing a wide variety of schools of economic thought, to your letter of April 1981.

This study was directed by myself and by Paul B. Manchester, staff economist, with the able assistance of Deborah DuBrule.

The Committee wishes to thank the 19 distinguished individuals who contributed to this volume. Their papers are printed in the order in which they were received. One of the authors, Dr. George

Katona, died before this volume could be brought to press. The Committee shares with his family, friends, and colleagues a profound sense of loss.

The views expressed in this volume are exclusively those of the authors and do not necessarily represent the views of the Joint Economic Committee or of individual members.

Sincerely,

JAMES K. GALBRAITH,
Executive Director, Joint Economic Committee.

CONTENTS

	Page
Letters of Transmittal.....	III
EXPECTATIONS AND THE ECONOMY	
Introduction—By Chairman Henry S. Reuss	1
Statement of—	
Sidney Weintraub.....	4
Otto Eckstein.....	7
Paul Davidson.....	10
George Katona.....	26
William Fellner.....	35
Axel Leijonhufvud.....	40
Bennett T. McCallum.....	48
Robert Eisner.....	54
Lawrence R. Klein.....	62
Stanley Fischer.....	66
Arthur B. Laffer and Victor A. Canto.....	70
Rudolph Oswald.....	94
Mark H. Willes.....	102
Alfred S. Eichner.....	113
Leonard Forman.....	119
John Rutledge.....	121
F. Thomas Juster.....	130
Leon W. Taub.....	139
Appendix. Questionnaire on the Role of Expectations in Economics.....	144

INTRODUCTION

By Chairman Henry S. Reuss

Recently, Administration spokesmen have been saying that the Reagan Economic Recovery Program has only been in effect since October 1, 1981. But in early 1981 a very different view was held. At that time, Administration spokesmen stated repeatedly that the introduction of the President's plan¹ and congressional passage of the tax and nonmilitary budget cuts would bring a quick and gratifying response. On March 10, 1981, the President said, "Our tax proposal will, if enacted, have an immediate impact on the economic vitality of the Nation, where even a slight improvement can produce dramatic results."² Following enactment of his tax program in late July, the President said: "I think the very fact of its passage before the program begins to show results is going to have a psychological effect that we will see in the expectations of the people."³

To assess the basis which may have existed for this claim one should not start with October 1, 1981, but with the dates when the four pillars of the Reagan economic plan were first effectively instituted:

(1) May 21, 1981, the date of the final passage of the first concurrent budget resolution for fiscal year 1982.

(2) August 3 and 4, 1981, the dates of final House and Senate approval of the conference report on the tax bill. The rationale for three year tax cuts is that taxpayers will respond favorably now to future cuts, even before the cuts take effect; protestations that "the program just took effect October 1" negate this basic theory.

(3) January 29, 1981, the date of the first major regulatory suspensions and revisions by the Administration.⁴ These changes required no congressional action.

(4) February 18, 1981, when the Administration announced its strong support for the current Federal Reserve policy, instituted in October 1979.

Thus, two of the four pillars of Reaganomics date from the first month of the Administration; the other two were passed by Congress in May and August.⁵

Economists have long felt that there are significant time lags between the initiation of policy changes and the effects of these changes. The Administration disputed this in early 1981, predicting rapid improvement in the economy. Their view was based on a

¹ America's New Beginning: A Program for Economic Recovery, February 18, 1981.

² Fiscal Year 1982 Budget Revisions, March 10, 1981, p. M-2.

³ Washington Post, July 30, 1981, p. A10. The Conference Board's Consumer Expectations Index rose steadily from February through July, but has fallen steadily since July; by October it was 18 percent below the July peak.

⁴ As discussed in the February 18, 1981 Report, pp. 18-21.

⁵ The fifth pillar, sure and predictable movement toward a balanced budget (March 10 message, p. M-1), has recently crumbled.

novel and unsubstantiated theory concerning the importance of expectations about economic policy in determining the course of the economy. This theory was the genesis for this volume.

Support for the expectations theory was expressed in the President's February 18, 1981, message:

Central to the new policy is the view that expectations play an important role in determining economic activity, inflation, and interest rates. Decisions to work, save, spend and invest depend crucially on expectations regarding future government policies.

Four months later, Budget Director David Stockman said that passage of the President's budget would have "a major favorable effect on attitudes and expectations around the country, particularly in the financial markets."⁶

The Administration's view that the mere introduction of their plan would have major beneficial impacts lay behind their forecasts of interest rates. In December 1980 the average yield on three month Treasury bills was 15.7 percent. On February 18, 1981, the Administration forecast an average yield of 11.1 percent for 1981—a drop of 4.6 percentage points from the December 1980 level. For the first ten months of 1981, the average yield has been 14.7 percent, 3.6 percentage points above the forecast. By July the Administration raised its forecast to 13.6 percent; this has now also been overtaken by events, though rates are finally falling due to the recession.

The performance of the economy in 1981, in spite of enactment of the four pillars of Reaganomics, suggests two possibilities:

(1) The Administration's theory about rapid improvement in the economy by some expectations mechanism was wrong.

(2) The theory was correct, but expectations are not that the President's program will lead to low inflation and rapid growth, but to continuing inflation, recession, higher unemployment, and economic stagnation.

The essays in this volume help analyze these possibilities.

In April of this year, I wrote to a number of leading economic analysts inviting them to submit short essays concerning the role of expectations in economics. Participants were asked a number of specific questions, listed in the Appendix; they could either respond to these or submit a more general essay.

The economists whose essays appear in this volume represent a wide variety of schools of economic thought—Keynesians, monetarists, supply-siders, post-Keynesians, rational expectationalists, and eclectics. Not surprisingly, they have very different views on the nature and importance of expectations in economics.

But one conclusion seems clear. The Administration's optimistic view that its policies would "have an immediate impact on the economic vitality of the Nation" was and is unsupported by any significant body of economic thought. Those who attach little significance to the power of positive expectations reject the Administration's optimism on straightforward, traditional grounds. And those who believe that "rational expectations" do influence economic behavior generally see no necessary reason to view the optimism put forward by the Administration in support of the

⁶ Washington Post, June 28, 1981, p. A1.

President's program as the rational response to the measures it contained.

Beyond immediate political concerns, these essays range widely over the role which expectations play in economic theory and in the construction of economic models. They describe and evaluate the data currently available on the expectations of private market participants. And they present a wide variety of views on the proper role and usefulness of information about expectations in policy formation. Members of the Joint Economic Committee, of the Congress, and of the general public will find a mine of insight and information in the pages which follow.

STATEMENT OF SIDNEY WEINTRAUB*

INFLATIONARY "EXPECTATIONS": SOME MODERN ECONOMIC FADDISHNESS

President Reagan, in his February 18 message, was merely purveying the conventional trendy exaggeration of "expectations of inflation" in explaining our ongoing stagflation plight, consisting of excessive inflation, indefensible unemployment magnitudes, havoc in housing construction, financial market disorientation, and intolerable interest rates which border on "loan-sharking" made legal. The inflation diagnosis borrows too heavily from the prevailing misconceptions of economists who seem anxious to emulate the "power of positive thinking" in a form reminiscent of Vincent Peale, Dale Carnegie, or Dr. Coue, that thinking will make it so regardless of the nature of external events and their unruly evolution.

Modern economists who convey these thoughts, without cognizance of their roots, are unconsciously anxious to rekindle the hoary philosophic disputes over the merits of "materials" and "idealism" in motivating conduct. There is an even more unwitting and sophomoric lapse, in this context, to promote economics as being a sort of subdivision of psychology; "expectations" thus play a dominant part in decisionmaking. Yet the "expectational addicts" have so far been only very reluctant psychologists, not especially notorious for viewing the subject matter of economics from a psychological standpoint, beyond their primitive hit-and-run references to expectations and a resort to "rational expectations" as a proxy for perfect foresight and a backdoor entry for phenomena that do not describe the human condition. Proponents of the position are even less willing to enter into the philosophical fray that their language choice invites.

Surely economics has traditionally been viewed as examining the complex market phenomena that evolve from subjective and behavioral facts, and their mingling with the objective natural, technological, and institutional materials, including the political context. From the interactions come the inflation, production, job, and interest rate results.

Emphasis on "expectations" thus seizes on only a fraction of the transparencies. Interdependencies are given short shrift. Explicit in the President's statement is the unwarranted axiom that if only people believe, and revise their expectations, then all will be well: that thinking will make magic. This is the dangerous oversimplification fostered by the faddish esoteric modern economics. Surely if we all think strongly that we can run the 100 meter dash in 3 seconds, or high jump 15 feet, we are scarcely likely to accomplish these stupendous athletic feats. If thinking can make it so there would be neither poor nations nor poor people.

*Professor of economics, University of Pennsylvania, and co-editor, Journal of Post-Keynesian Economics.

Likewise, we will not be able to wish inflation away by "revising our expectations" and the President, and his economic advisers, do not perform a helpful service in propounding the positive impact of unrealistic thinking. I submit that we will be sorely disappointed if we place our faith in the President's budget policies, and the belief that they will so alter the climate of opinion, that our inflation and assorted miseries and anguish will vanish as yesterday's fog. If money wages and salaries continue to surge by 10 or 12 percent, and productivity creeps along by the recent 1 percent trends, the same old stagflation malaise that has been our national lot for 12 years will endure. The changed rhetoric and the "old new" conception of government will not banish the rot. The Economics of Derision will still prevail.

The President, regrettably, has confused the size of government with the dimensions of the inflation problem though they neither overlap nor do they coincide. He has been urged along this path by ideological advisers who have failed to make the vital points that (1) inflation is a market economy occurrence and (2) that we could still debate the proper size of government and optimal political intervention even under conditions of stable prices, full employment, and moderate interest rate phenomena. The latter issue has little to do with stagflation, and often practically nothing to do with "expectations."

Essentially, expectations are multidimensional, amorphous, and unduly vague, and directed to various time frames. Too, they are grounded in facts or perceived facts, including memories, data, and all sorts of reasonable and even irrational extrapolations as economic transactors attempt to project the several futures. They are made to extend to later in the day, to tomorrow, to next week, month, year, decade, or beyond. While they form a pattern they will often be indistinct, especially for more distant dates; they may conflict, and contain many inconsistencies if they were written out and examined by the hypothetical omniscient mind. Each expectation for each and every date forward will be held with varying degrees of certainty or assurance. Vagueness for dates farther out in time will predominate. Too, if compelled to reveal them the expectational subjects may fail to represent them accurately; they may mistate them deliberately, or offer primarily a ramble in the subconscious. Few of us are able to articulate our intuitions precisely. Further, the same individual may hold different "expectations" at different moments of time for thoughts about the future are subject to change at a moment's notice. It is not uncommon for a stock market speculator to hold different views about tomorrow at different hours of the day, turning from a buyer to a seller to a buyer, sometimes because of new information, often because of a new intuitive "feel."

Just what "expectations" and for what period ahead is the administration, and so many "psychological economists" talking about? I simply do not know.

To pursue the them further could be to invite a tome, or even a collection of volumes. Wishful thinking, in my opinion, is riding high in the saddle presently. The Reagan administration is deluding itself and, what is worse, our people in asserting that budget cuts and tax slashes will restore our economic vitality and end our

stagflation malaise when buttressed by monetary sadism. The Federal Reserve is flailing away once more, in the manner of the seven maids with seven brooms sweeping back the seven seas. Their success should be no better than it has been for 67 years now despite their monotonous promises of jam tomorrow even as it reports the lugubrious inflation statistics today.

In deluding itself and confusing the public on the importance of the budget in our ongoing stagflation anguish the Reagan administration has even gulled itself into thinking that if it trims the tail of the 22 percent government involvement in GNP purchases it will control the size of the 78 percent private sector animal. It simply disregards the fact that inflation occurs in the private economy, reflected in the groceries, appliances, goods and services that we buy. Even assuming President Reagan is fully successful in establishing his programs, and gets his outlays down to rock-bottom, every time market prices for desks, paper, paper clips, submarines, missiles, airplanes, and civil servant pay rises, government expenditures will have to go up because of the inflation.

It is in this sense that inflation is the cause of government outlays skyrocketing, rather than being the effect of government expenditures being made. The Reagan advisers, and the less reflective ideologues, simply read this relation backwards when they argue that government outlays cause inflation. We can—and will on current policies—have inflation even after the Reagan administration succeeds in cutting back outlays to about 18 percent (or less) of the GNP from the recent 22 percent ratios.

To talk of expectations as being at the bottom of our economic rot is to fasten on fashionable and superficial jargon in order to evade thought, and to suppress discussion of more serious policies to relieve our economic plight.

STATEMENT OF OTTO ECKSTEIN*

(1) The role of expectations has been recognized as central to macroeconomics for at least 50 years. To me the highlight of this literature has always been Oskar Lange's tremendous volume, "Price Flexibility and Full Employment." It shows just how critically the particular form of expectations affects all the parameters of the macroeconomic system. The later literature does not seem to be aware of this important early work, but it also covers important ground and serves a useful role in sensitizing us once more to the matter.

Models have always attempted to deal with the expectations question in a reasonable fashion. To my knowledge, no econometric model has used the kinds of simple-minded expectations processes that would be embodied in the accelerator theory of investment. The modeling has always allowed for gradual learning, but the models have not always insisted on rationality in the technical sense.

The attached table summarizes the role of expectations in the DRI model. This table is an excerpt from a recent paper by Drs. Sinai and Brimmer published in the May proceedings of the American Economic Association.

(2) Expectations are important in all economic decisions, but are clearly more important to decisions which have implications for a long time span for the particular economic agent. Thus, the decision to have a snack at a fast food restaurant does not involve much in the way of expectations, the purchase of a house does. Further, expectations are based on a view of the total reality that the individual faces, not just one particular piece. The central role of the money target that is assigned to expectations formation by some recent writers certainly is based on a twisted view of human nature.

(3) Expectations can be measured in several ways. Survey data are one source of information, though most surveys have biases. Econometric equations which infer expectations from the behavior of measurable data, such as interest rates or wage changes, are another, and currently more productive source. Broad historical studies can also be useful.

(4) Expectations seem to be largely formed from learning from past experience. Learning generally seems to be slow, as individuals find it difficult to extract a precise assessment of true conditions from very brief data. This is a form of wisdom, because it allows experience to accumulate before jumping to conclusions.

There is no evidence that pronouncements about future policies or developments have a major impact on expectations. The public seems to learn from experience, not from politicians' speeches.

(5) The public currently holds quite cautious expectations about the future. People are currently adjusted to very modest increases

*President, Data Resources, Inc., and professor of economics, Harvard University.

in standards of living and very modest improvements in inflation. This is clear from their actions in the marketplace. It also is typical of their responses to the various standard surveys.

(6) My own expectations, like the public's, are based on experience and a prudent sense of caution. This is confirmed by my econometric work.

(7) There is little to suggest that legislation covering several years has a dramatically different impact on private behavior than 1-year actions. For one thing, everyone recognizes that the actions of later years can be reversed by later sessions of Congress. For another, the actions of any particular law, or even a Federal Reserve policy, are only parts of a larger mosaic of reality.

The particular argument advanced, that 3-year personal tax cuts are necessary to get the full benefits of supply-side economics, seem to me to be upside down. If the public really knows that taxes will be cut again and again, this knowledge would serve to reduce saving rather to enhance it. In the case of business tax cuts, the knowledge that the reductions are permanent would, of course, enhance investment.

(8) The hypothetical cases posed in question 8 do not permit a strong answer. Multi-year tax cuts would discourage saving and encourage work, but the magnitudes are unknown.

Short-run deviations from the money targets nowadays seem to be taken as strong evidence that the Federal Reserve will be forced into corrective action. Consequently an increase in the money supply triggers high interest rates, and vice versa. If the Federal Reserve really is monetarist, this is the only sensible interpretation.

(9) Little is known of the dispersion of expectations about the future course of the economy. Certainly in fields such as the stock market, dispersion of expectations is a necessity in order to have the markets function. There is some evidence that high variability of experience makes it more difficult to learn and actually slows down the process of expectations formation. Thus, for example, wages increased less than would ordinarily be expected during the highly volatile price experiences of the late 1970's because of the workers' recognition that the experience was difficult to interpret, and perhaps abnormal.

ROLE OF EXPECTATIONS IN THE DRI MODEL—SOME MAJOR CATEGORIES

Impact	Expectations variable(s)	Concept
Consumption:		
Furniture.....	Unanticipated income, permanent income, expected inflation.....	RE, extrapolative
Motor vehicle and parts.....	do.....	Do.
Other durables.....	do.....	Do.
Clothing and shoes.....	do.....	Do.
Food.....	do.....	Do.
Other nondurables.....	do.....	Do.
Services—		
Other household operations.....	Permanent income.....	Extrapolative
Transportation.....	Unanticipated income, permanent income.....	RE, extrapolative
Investment:		
Nonresidential equipment.....	Unanticipated sales, expected debt service, expected capacity utilization.....	Do.
Plant.....	Expected debt service, expected capacity utilization.....	Extrapolative.

ROLE OF EXPECTATIONS IN THE DRI MODEL—SOME MAJOR CATEGORIES—Continued

Impact	Expectations variable(s)	Concept
Housing-single family starts	Expected inflation median sales price of new single family homes.	Do.
Interest rates and stock prices:		
90-day Treasury bill rate	Unanticipated monetary growth, expected inflation.....	RE, extrapolative
New issue rate on AAA-equivalent corporate bonds..	Unanticipated inflation, expected inflation, expected growth in the monetary base, expected stock prices.	Do.
S. & P. Index of 500 common stocks.	Expected growth in earnings per share	Extrapolative
Wages:		
Hourly earnings of production workers.	"Short-run" expected price inflation, "long-run" expected price inflation, expected unemployment.	Do.
Prices:		
Implicit GNP deflators.....	Expected unit labor costs, expected materials prices, expected input costs.	Do.
Producer prices.....	Expected "stage of processing" or input costs.....	Do.
Core inflation	Expected cost of capital, expected productivity growth	Do.

STATEMENT OF PAUL DAVIDSON*

EXPECTATIONS AND ECONOMIC DECISIONMAKING

I. THE ROLE OF EXPECTATIONS

Time is a device which prevents everything from happening at once. Production takes time; consumption takes time. Decisions and actions in these spheres of economic activity are therefore guided by an estimate of the future. These estimates are based on subjective expectations about future events. In a world where uncertainty and surprises are unavoidable, expectations have unavoidable and significant effects on economic outcomes.

A. Expectations—Which Theory as the Basis for Policy?

All useful theories are logical abstractions and simplifications of reality. The purpose of theory is to make the real world in which we live intelligible; theory should not substitute either ideology or a hypothetical world in place of actuality. In order to intelligently comprehend the current discussion of the role of expectations in economic theory, it is essential to possess an historical perspective as to how various schools of economic thought have dealt with the concepts of knowledge of future events, uncertainty and expectations. For those who do not study history are required to repeat its errors.

Neoclassical theory dominated the economic literature for over a half century prior to the 1930's. By the end of the decade of the 1920's, when the benefits of unfettered market activity, the gold standard, and neoclassical Monetarist theory dominated the economic literature and provided rationalizations for a laissez faire approach by governments and Central Bankers, one after another capitalist economy collapsed.¹ Neoclassical theory unable to prescribe any solution to the Great Depression was displaced in the 1930's and 1940's by a revolutionary new theoretical construct developed by John Maynard Keynes—a model of the real world which emphasized the importance of uncertainty and expectations on decision making in a developed monetary entrepreneurial economy. This model provided guidance on how to save the capitalist system and ushered in a quarter century of unprecedented economic growth and prosperity guided by the visible hand of basically well-managed non-neoclassical governmental fiscal and monetary policies. After World War II, however, neoclassical theory began to

*Professor of economics, Rutgers University, and coeditor, *Journal of Post Keynesian Economics*.

¹ It is instructive to note that pre-Keynesian neoclassical analysis united a supply-side concept known as Says' Law of Markets ("Supply creates its own demand,") with the Quantity Theory of Money (which emphasizes limiting the growth of the money supply to prevent inflation) to assure full employment without inflation. Exactly one week before the Stock Market Crash, the world famous Monetarist economist, and precursor of Professor Friedman, Professor Irving Fisher of Yale announced that the U.S. economy was marching along a "permanently high plateau" of economic prosperity.

reassert itself as economists at the University of Chicago and elsewhere attempted to provide a resurrected, more sophisticated version of their 19th century analysis. This regression to an earlier and outmoded economic system has reached its zenith in the Reagan Administration's emphasis on monetarist and supply-side analyses where expectations about the future are handled in a very artificial manner in order to achieve precise—but wrong—solutions to our pressing economic problems.

In pre-Keynesian neoclassical theory, the perfectly competitive model of the economy was the fundamental building block. One of the many artificial conditions assumed under perfect competition was that *all* market participants possessed perfect certainty knowledge about the future. In other words, it was assumed that everyone had the same (homogenous) *correct* expectations. Moreover, no participant could affect the future by any action he or she might undertake. Thus, the future was immutable. If one further assumes each individual is rational (motivated by self interest), while possessing perfectly correct expectations, then it follows that individuals without any help from the government will always behave in an economically optimal way. Thus, neoclassical analyses "proved" by assumptions that any government interference with private economic decision making could not improve future events but could make them worse.

The fundamental neoclassical assumptions, although completely unrealistic, provided policy makers with a rationale which indicated if government did not interfere in the economy, the result would be—

- (1) Everyone who wants a job can always get one. All unemployment is voluntary;
- (2) Scarce resources are optimally utilized, i.e., GNP is maximized;
- (3) Rigid controls on money supply growth prevent inflation; and
- (4) Government policies which interfere with the market solution are ill-conceived, and will always make things worse.

The neoclassical theory justification of the belief that basically everything will be perfect if "only we get the government off the backs of the people" is merely a deduction resulting from the false assumption that everyone has perfectly accurate expectations about the future.² This assumption has no basis in fact. Everyone knows that the economic future is hardly predictable, much less perfectly certain. If only the future was as obvious as neoclassical theory assumes, all of us could be instant millionaires for we would all know, for example, the value of the Dow-Jones Stock index tomorrow, with either perfect certainty or at least actuarial precision. Yet, the economic landscape is littered with mistaken actions

² It also implies that "left-wing liberals" and Democratic politicians who advocate certain governmental activities such as incomes policies, discretionary monetary policies, etc., either (a) have incorrect expectations about the future or (b) are irrational, or (c) are motivated by self-interest to improve their real income at the expense of the rest of society. All three possibilities, however, are logically incompatible with the fundamental neoclassical assumptions of (i) homogenous expectations based on perfect foreknowledge and (ii) rational behavior. It should be obvious why (a) and (b) are irreconcilable with such assumptions while (c) is incompatible for even "liberals" in a neoclassical world would know with perfect certainty that, in the long run, you cannot fool the other economic agents who possess the identical knowledge and expectations that you do.

and decisions, i.e., what the economists call "false trades." Lockheed and Chrysler are only some of the most obvious, but the growing rate of business bankruptcies in the U.K. under Thatcherism and the U.S. under Reaganomics is evidence that many private sector participants possess incorrect (irrational?) expectations.

Professor Milton Friedman, however, has defended the use of neoclassical models based on obviously false assumptions³ when he insisted that, for the development of a useful positive economics, to "be important, therefore, a hypothesis must be descriptively false in its assumption" (Friedman, 1953, p. 14). For Friedman, as for all Monetarists, the test of a theory is not the correctness of its assumptions; rather "its performance is to be judged by the precision, scope, and conformity with experience of the predictions it yields" (Friedman, 1953, p. 4).

When the Great Depression provided an experience that was not "in conformity" with the full employment prediction of neoclassical theory, however, the opportunity was available for John Maynard Keynes to develop a new economic theory in which expectations about an uncertain and unpredictable economic future could affect current economic events. In such a model free market behavior, in certain circumstances, could cause unemployment, inflation, stagnation, and other economic ills. Moreover, once these maladies developed free market activities were liable to encourage expectations of even further calamities, and therefore short of the complete collapse of the economic system, no free market adjustment mechanism need exist to cure the unfortunate economic disorder. In other words, without proper governmental administered medicine, in Keynes's conceptual model, episodes of unemployment or stagflation may be chronic or even fatal, while in neoclassical analysis, such episodes are always the result of bad doses of governmental medicine which can always be cured by removing the governmental nostrums and letting nature take its course. In the long run, in neoclassical theory no patient ever dies or is even permanently disabled from natural causes!

Keynes's original conception challenged the perfect certainty models of neoclassical analysis. He explicitly introduced the importance of expectations on economic decision making—but unlike later neoclassical theorists who substituted the concept of actuarial certainty for perfect foreknowledge—Keynes's conceptual apparatus permitted expectations to be heterogeneous, exogenous, and just as likely to be wrong as right in a world of uncertainty. Modern Post Keynesian theory has developed along Keynes's path-breaking conceptual handling of expectations under uncertainty; while modern neoclassical theory has tried to force the concept of expectations back into the old bottle of perfect certainty, under a new label—Rational Expectations.

Many of the market institutions of modern entrepreneurial economies, however, have no special role to play in either the old neoclassical world of perfect certainty or the modern equivalent neoclassical world of rational expectations. Only in a world where the future is uncertain in a nonpredictable sense is there a need

³ Or modern variants which substitute the concept of actuarial foreknowledge for perfect foreknowledge. See *infra*.

for the institution of money,⁴ pecuniary contracts and the law, security markets, spot and forward foreign exchange markets, and the financial newspapers which report such information. Only in Post Keynesian models do these institutions play specific roles which affect real outcomes as the realism of the assumptions are fundamental to the development of policy models.

Post Keynesians emphasize the role played by heterogeneous expectations which are exogenous to the economic system, as well as the importance of the fact that future events cannot be fully anticipated. Exogenous expectations means that expectational formation cannot be explained entirely by forces determined within the theoretical model. Heterogeneity of expectations implies that any instant of time, different economic agents have different and conflicting expectations about specific future events. Moreover, there need not be any set of market prices which can prereconcile these conflicting expectations.⁵ For example, every business day on Wall Street, the Bulls and the Bears are acting on conflicting views of the future, the Bulls expecting tomorrow's security prices to be higher, the Bears anticipating falling security prices. When tomorrow becomes today, at least half of yesterday's market participants must find their expectations were incorrect and they had engaged in "false trades"—unless there has been no change in security prices, in which case all the market participants had false expectations. The example illustrates an obvious point about economic decision making in an uncertain world which does not permit one to abrogate contractual commitments without penalty when events turn out differently than expected. From hindsight "false trades" and errors because of faulty expectations are ubiquitous economic phenomena—and in the real world of laws and contracts we must be prepared to pay for our follies.⁶ All entrepreneurial economies find that the enforcement of the law of contracts is a necessary condition for the efficient operation of real world economies since

⁴ Thus, despite the Monetarist motto that "Money Matters," the equational system known as general equilibrium which is the logical foundation of modern neoclassical theory (including Rational Expectations), has no role for money to play in determining the real growth, employment, and GNP of the economy. As Friedman readily admits:

We have accepted the quantity theory presumption * * * that changes in the quantity of money as such in the long run have a negligible effect on real income so that nonmonetary forces are "all that matter" for changes in real income over decades and money "does not matter" * * * I regard the description of our position as "money is all that matters for changes in nominal income and for short-run changes in real income" as an exaggeration but one that gives the right flavor of our conclusions. (Friedman, 1974, p. 27, italics added.)

Thus, for Friedman and modern quantity theorists, the real income level is in the long run independent of the money supply, while long-run changes in nominal income are caused by changes in M and not vice versa. In the short run in which we live, on the other hand, the modern quantity theory, as Friedman admits (1974, p. 50), "does not specify anything about the division of a change in nominal income between prices and output." Thus the modern quantity theory, according to Friedman, is devoid of any short-run theory of inflation. Moreover, in Friedman's view (1977, p. 470), the attainment of this long-run position by the economy "may take a long chronological time * * * time to be measured by quinquennia or decades, not years." If monetary theory can only provide anti-inflation policy guidelines for such a long run, then we are all truly dead! If the real income of society is independent of the money supply as Friedman claims, then unless we suffer from a money illusion, we should care at what rate the money supply grows, since real income will, in the long run, be the same under any money supply conditions.

⁵ While the essence of neoclassical analysis is the belief that free markets can harmonize and prereconcile all divergencies in outlook!

⁶ In a neoclassical world only the government is capable of engaging in economic follies. The private sector, by assumption, is protected from such fruitless and expensive activities in neoclassical models either by assuming actuarial knowledge and self interest, or by permitting recontracting without penalty when one is advised that a previous contractual commitment is a false trade.

many economic agents find they have made real contractual commitments based on faulty expectations and hence, from hindsight, such commitments are not in their best interests. (As footnote 6 suggests, however, the enforcement of all contracts is logically incompatible with any neoclassical world in which perfect certainty of expectations does not exist.)

As opposed to neoclassical models in which the wisdom and the realism of the expectational formation and other assumptions are never questioned, Post Keynesian theory follows the advice of Nobel Prize winning economist Sir John Hicks who stated "one must assume that people in one's models do not know what is going to happen, and know that they do not know what is going to happen. As is history!" (Hicks, 1977, p. vii.)

The "Keynesian Revolution" in economic theory involved the introduction of the concept of expectations under uncertainty and its implication for economic activity. It is only in an uncertain world that there is a role for the government to provide a guiding hand in the development of institutions which promote expectations that the future cannot be very different from today, i.e., that economic values are "sticky" over time, and therefore, forward contractual commitments can be undertaken without undue fear. After the Keynesian Revolution, it was difficult for neoclassical economists to blithely use perfect certainty models—except for strongminded individuals such as Professor Friedman who flaunted his claim that the irrelevance of his assumptions was a "positive" virtue of his theoretical framework. Other neoclassicists, while in moments of candor admitted using the assumption of perfect certainty,⁷ normally hid such postulates under a host of pretentious mathematical symbols. In recent years, by the use of semantic legerdemain, neoclassical theorists have developed pseudo-sophisticated models which give the specious appearance of dealing with time and decision making by economic agents facing an uncertain (but fully anticipated via rational expectations) future while replicating the policy solutions of pre-Keynesian perfect certainty models.

The logical basis of modern neoclassical theory avoids dealing directly with the concept of perfect certainty. Indeed, expectations are explicably introduced into the core of the adjusting mechanism. These expectations, however, are assumed to be (a) endogeneous, i.e., determined within the theoretical model by real forces and (b) rational. The concept of rationality here implies that in the current period there already exists adequate information about future events so that rational agents will process that information in their computer-like minds and reach efficient (i.e., correct) decisions on the basis of expectations so formed. Consequently, just as pre-Keynesian theory assumed individuals possessed perfectly correct expectations about the future and were rational about their self interests and therefore one could demonstrate the optimality of laissez faire solutions, so modern neoclassical theorists assume rational expectation formation so that actuarial quantitative prediction of future economic activities based on current correct infor-

⁷ For example see Patinkin's admission that "our concern * * * is with the demand for money that would exist even if there were perfect certainty with respect to future prices and interest." D. Patinkin, "Money Interest and Prices," 2nd edition (Harper and Row, 1964) p.79.

mation about the future is equally available to all, in order to demonstrate, free market agents can correctly expect the future (in an actuarial sense) and undertake optimal activity. Nowhere in the neoclassical liturgy is the question as to whether information (correct or otherwise) about the future currently exists. Nowhere in the neoclassical model can agents say about the possible future outcome of any decision "We simply do not know!" Nowhere in the logic of the neoclassical model is there the possibility that the future is out there to be created by human action, not merely discovered!

The logic of the neoclassical world requires that all decisions involving present and all future actions are taken at a single initial instant in time; errors are (at least in the long run) by assumption impossible. Thus, neoclassical economics implicitly denies human fallibility, for to admit the possibility of error is to admit that a general equilibrium solution via market prices (which are supposed to coordinate people's plans and expectations without altering the initial parameters) need not exist. In a neoclassical system, the existence of competition guarantees that no one undertakes erroneous (wasteful) activities, as resources must always be "optimally" allocated.

Neoclassical theorists assume that the uncertainty of the future can be adequately represented by means of probability statements about an economic world which, without being absolutely determinate, is at least statistically predictable. The monetarists Laidler and Parkin, for example, have noted that in neoclassical theory:

Expectations—even if erroneous—are usually treated as if held with certainty, or it is assumed that any variance in expectations does not influence behavior. There exists a well-developed analysis, based on probability theory, of individual behavior in the face of risk elsewhere in our subject and there surely are gains to be had from applying this analysis to aspects of the problems of inflation. This at least would be our view, but there are many economists, notably Davidson (1972) and Shackle (1955), who would presumably regard the application of such analysis as misconceived (though possibly better than assuming all expectations to be held with certainty). They would stress that uncertainty in the Knightian sense as opposed to risk lay at the root of the problem. Certainly an analysis of behavior of this kind would provide an interesting alternative to the approach based on probability. There can be no guarantee *ex ante* as to which line of work will prove more fruitful, as a means of replacing the widespread assumption (often unstated) that people's actions are the same as if their expectations were held with certainty. (Laidler and Parker, 1975, p. 795.)

Replacing the concept of certainty by the concept of a known probability distribution merely replaces the assumption of perfect foreknowledge by the assumption that economic agents possess actuarial knowledge. In such a situation costs and benefits can be calculated, and the economic agent can act "as if" he possessed absolute foreknowledge (or, in modern monetarist parlance, expectations are "rational" and "fully anticipate"). This semantic legerdemain permits neoclassical economists to develop sophisticated theories which replicate the solutions of pre-Keynesian perfect-certainty models while giving the specious appearance of dealing with time and decision making by economic agents facing an uncertain (but fully anticipated!) future. Such literary deceptions are, in fact, required by the neoclassical economists to enable them to reach their invariable conclusion that government intervention to improve employment (by means of fiscal policy) or to fight inflation (by means of incomes policy) is always bound to be ineffective. In

the "rational expectations" models, for example, the conclusion that government intervention is futile is connected with the concept of a "natural rate of unemployment" (which is the equivalent of full employment in a world of perfect certainty). As Laidler has argued:

... any rate of inflation is consistent with a state of zero excess demand in the economy provided it is fully expected. If to this we add the proposition that there is a unique level of unemployment in the economy associated with a situation of zero overall excess demand then we have it by implication that this so-called "natural" employment rate is consistent with *any fully anticipated rate of inflation*. (Laidler, 1976, p. 59, italics added.)

Is there really a difference between "fully anticipated" events and perfect certainty?

Modern neoclassical economists have developed models of expectation formation in an attempt to shore up their collapsing analytic structure. These models are, as even their advocates have admitted, "naive," "arbitrary," or "inconsistent." (Laidler, 1976, p. 62f.) "The simplest lesson to be learned from consideration of the rational expectations hypothesis," Laidler concedes, "is that there is likely to be far more to the formation of expectations than the blind application of some mechanical formula to a body of data . . . [Moreover] we must face the implication that heterogeneity of expectations at any moment is more likely to be the rule than homogeneity." (1976, p. 69.)

Yet the fundamental monetarist concept of a "natural rate of unemployment" requires, as the monetarists admit, a "fully anticipated future"—which means a future which "can only be perfectly anticipated in any actual economy if all people hold the same expectations since otherwise some expectations are bound to be wrong." (Laidler and Parkin, 1975, p. 743.) Elaborate monetarist models which show that controlling the rate of growth of the money supply is an effective method of fighting inflation (in the long run!) are based, however, on a "natural rate of unemployment" and hence on a fully anticipated future with everyone holding the same expectations.

Heterogeneity of expectations, which Laidler admits to be the more likely real-world situation, however, precisely means that people have differing expectations about the future. This guarantees that most of those holding expectations today will find, as events unfold, that their expectations were in some degree incorrect. Certainly mistakes, false trades, and, above all, changing economic parameters are unavoidable in the real world. Consequently, the monetarist proposal to fight inflation simply by controlling the money supply has no sound basis. It appears to be an article of faith!

In contrast to this neoclassical approach that handles uncertainty as if it were the same as predictable risk, Post Keynesians build upon the fact that the future is uncertain, and as Hicks observed, people know that they do not know the future when they undertake economic actions. By recognizing this obvious fact of life, the Post Keynesians aim, when discussing future events to be approximately right; whereas the neoclassical economists, in aiming to be precise, end up being precisely wrong. The economic future, Post Keynesians note, is created by man, not simply discovered.

Thus, policymakers have to choose between the use of two different logical models for dealing with expectations and the future:

(1) In neoclassical models, expectations are endogeneous and actuarially certain for the private sector. In such models errors are attributable apparently only to governmental officials, congressmen, and economic maniacs. Rational people do not make errors—at least in the long run. Those who believe in this way of handling expectations in economic theory will argue there is no role for government as real income is determined by exogenous real forces such as population growth and technological progress.

(2) In Post Keynesian models, expectations are exogenous and the future is uncertain and unpredictable. To err is human. In such a world, government has an essential role in assuring the development of policies and institutions which encourage continuity and stabilize people's visions of the future, while providing an environment which stimulates prosperity and stability. Since the future is uncertain this will require eternal vigilance by policy makers and continuous restructuring of policies and institutions as events change. No simple rule can be a substitute for sober judgment and discretion.

The choice between neoclassical models and Post Keynesian models is between using the former to be precisely wrong or the latter to be roughly right.

B. Expectations and Empirical Analysis

Most existing empirical econometric models are based on the belief that historical statistically determined functional relations among economic variable are stable over time. If, however, expectations are exogenous and hence cannot be inferred from the given factors within the model, as Keynes assumed (1936, p. 246) and as Post Keynesian analysis insists, the identified historical statistical relations cannot be presumed to be stable into future periods and therefore economic prediction becomes a dangerous occupation. Sir John Hicks notes that econometric estimation of demand and supply relations by means of time series data requires econometricians to make the very strong assumptions that consumers' wants and firms' supply systems remained invariable in the past (during the period of observation). This assumption of invariance cannot be proven by any statistical test. Moreover, using the econometrically identified economic relation for any purpose except to shed light on the past requires the further heroic assumption that the relationship will continue to be invariable into the future. Hicks believes that if a relation has held for say fifty periods in the past, we might safely (or luckily?) project it one or even two periods into the future, but it is not "reasonable" to guess that the relation will continue to hold very far into the future. (Hicks, 1979, p. 38).

For neoclassical theory, however, properly specified empirical relations over time are estimates of true structural models which are assumed to be invariable over future time. (Unpredictable variability in the future would make rational expectational formation logically meaningless). Since neoclassical models—based on general equilibrium theory—assume all relevant variables are endogenous to the system, then any random shock will always be adjusted via the hypothesized endogenous structural mechanism. Of course, con-

ventional econometrics models are often castigated by modern supply-side neoclassical economists. This chastisement by supply-siders is not based on the Hicks-Keynes-Post Keynesian view that quantitative historical relations cannot be assumed to be invariable in the future. This Post Keynesian position violates the belief that underlies rational expectations models, namely, that sufficient information currently exists which permits anyone (not only trained econometricians) to efficiently form correct expectations about the future. Rather, Reaganomic criticisms of traditional neoclassical models is based on the supposition that econometrician professors at Harvard, Yale, and other prestigious centers of learning are dumber than the average person in a neoclassical world. It is claimed that the professors have incompletely or incorrectly specified the structure of the economy despite their prodigious processing to the economic facts via computer printouts. All denizens of rational expectational models, however, can efficiently process information and correctly identify the invariable structural relations for the future, even without access to large scale electronic computers.

If this claim were applicable to the real world, it would be interesting to ask a rational expectational theory advocate to explain why major corporations pay good money for the services of Data Resources, Chase Econometrics, etc. and other econometric modelling firms. If corporations in their normal economic decision making activities are already efficient processors of all existing market information, why do they need the services of such econometric firms who are clearly inefficient information processors? If the Rational Expectation Theorists are correct, no corporation should waste resources on the purchases of such econometric modelling services. And, if corporations that buy these services do exist, does this mean that rational expectations hypothesis is wrong, or does it mean that all these corporations will not survive in the long run?

C. Have Econometric Models "Failed to Keep Pace" with the Increasing Role of Expectations in Economic Theory?

This query, posed in a Joint Economic Committee inquiry is a "when did you stop beating your wife" question. It implies that theories which assume expectations are endogenous represent progress (rather than regression) in the development of economic theory. But, in moments of candor even important Monetarist advocates such as David Laidler have recognized that theories using concepts of endogenous expectational formation are "naive," "arbitrary," and "inconsistent." The truth was never better expressed than when Laidler wrote "There is more to the formulation of expectations than the blind application of some mechanical formulation to a body of data." (Laidler, 1976, p. 69.) Expectations will always defy complete endogenous specification in the economic world. Hence, it is a foolish and hopeless task to require econometric models to completely incorporate endogenous expectational variables into their equational systems.

This means that an entirely different approach to the use of econometric models must be adopted by decision makers. Econometrics use to shed light on past relationships can be helpful; but

its use to predict the future as a basis of action is a perilous venture. Econometric models need not be discarded; they are a tool which provide some information. They are not a universal tool for understating the economy, however, and the magic of the computer printout cannot be a perfect substitute for sober judgment about the future. Hence, corporate and/or governmental actions involving future events can never be taken with a belief in the complete rationality (or certainty) of the expectations about the future. The element of surprise cannot be eliminated, even in the long run. Nevertheless, the establishment of long-lived policies and institutions which promote continuity and "stickiness" over time can encourage *stable* expectations which are more important than rational ones and which make forecasts based on econometric models more reliable.

II. THE SIGNIFICANCE OF EXPECTATIONS

In some areas of economic analysis, it has been long recognized that expectations can dominate the outcome. For example, in the 1950's and 1960's economic textbooks had listed "moral suasion" as a discretionary policy instrument of the Federal Reserve. Moral suasion meant that by speeches and other media-attention gaining activities, Federal Reserve officials could affect the public's liquidity preference and therefore market interest rates without actually engaging in open market operations. Thus, if the Fed wanted interest rates to drop, for example, the Chairman via moral suasion could merely announce he expected this to occur and the Fed would not have to buy government bonds and thereby increase the money supply.

In what history will someday record as the most fantastic capture of a Federal Reserve policy by Monetarist economists, "moral suasion" has become in fact a perverted tool of Monetarism. Monetarist economists have convinced the public that "abnormal" expansion of the money supply in any week means the nominal rate of interest will rise (instead of declining as neoclassical Keynesians of the 1950's would have claimed). Consequently, individuals wait eagerly for the Fed's weekly announcement about the money supply, and the public reduces its liquidity preferences when they expect a too rapid money supply growth announcement and vice versa. Thus, interest rates rise (fall) because all expect them to rise (fall) when the Fed announces a large (small) increase in the weekly money supply.

This recent phenomenon of interest rates changing due to expectations about weekly Fed announcements can usefully illustrate a point which is too often ignored. All spot security markets are inherently restless and dominated by expectations. As we all know, day-to-day bond market and stock market transactions are engaged in by bulls who expect future bond and/or equity prices to increase, and bears who expect future security prices to decrease. The willingness to hold bonds (or stocks) and/or buy spot depends on the conjecture that the next movement of the price bonds (or stocks) will be upward, while if it is expected to be downward then a sale is the rational decision in the spot security markets. At any given set of bond prices (Dow-Jones stock average, etc.) the collection of existing securities have a given market value. Any who

think the securities will rise should place a rational order to buy based on these expectations and vice versa for sellers. Since most financial markets for securities are well-organized, continuing transactions in these securities must mean that some bulls and some bears are continually changing their expectations about the future for otherwise no one would buy or sell after the initial trade. Since the "interest rate" is inversely related to spot bond prices, the interest rates must be in a continuous flux, as most of the participants in bond markets expect the spot price to change. As long as spot bond transactions occur there must be conflicting expectations as to the direction as well as the magnitude of that change in the bond market. For the rate of interest to come to an equilibrium rest for any period of time, either all participants must simultaneously and coincidentally expect no change in the rate of interest, or there must be a "market-maker", i.e., an institution whose function it is to stabilize prices by buying or selling to offset the expectational behavior of the bulls and bears. A free financial market (substitute bond market, stock market, foreign exchange market) is inherently unstable unless all expectations are that there will be no change and such expectations themselves remain unchanged. In the absence of an institutional "market maker" whose primary function it is to make sure such prices are at least "sticky" over time, it is unlikely that expectations of private economic agents will promote constancy in spot prices of bonds, equities or foreign exchange. The constancy of such spot prices is contrary to the expectations on which the participation of the bulls and bears depends. Moreover, to the extent these spot markets operate, in the absence of a governmental institution to directly or indirectly assure stickiness (i.e., slow rates of change of prices over time), individuals will be encouraged (a) to try to outguess others who are guessing about future market activity and/or (b) to try to convince others as to future market performance in order to improve their wealth positions by either selling "newsletters" or actively engaging in speculative activity just in advance of market movement or both.⁸ Because of the need for an unfailing market maker the government via the monetary authority has a necessary role in assuring the preservation of liquidity and the continuous functioning of the financial markets by acting as (a) the lender of last resort to private institutions who act as market makers in specific financial markets, and (b) actively acting as a market-maker in the government bond and foreign exchange market. In pursuing these functions, it is clear that the government can with proper management exert an effective influence on interest rates and foreign exchange. The government and its monetary authority, on the other hand, cannot under existing institutions effectively control the money supply. Moreover, in my view, would such controls over the money supply be per se desirable even if they could be established?

⁸ For example note the growth in the market of "gold-bug" newsletters, books, etc. since the U.S. government gave up the role of "market-maker" in the gold market.

A. Summary on the Role of Expectations

In sum, since all economic activity takes time, expectations about the future tend to dominate current period decision making. In a world of uncertainty, there can never be any guarantee that the heterogeneous and myriad economic expectations held by the public (domestic and foreign) are consistent and/or compatible with encouraging actions which promote economic progress without inflation. Thus, there is a role for governmentally promoted institutional developments which advance expectations to encourage enterprise rather than speculation, i.e., which embolden income and profit possibilities resulting from expanding output at stable prices, rather than profiting merely by buying cheap and selling dear. "Speculators may do no harm as bubbles on a steady stream of enterprise. But the position is serious when enterprise becomes the bubble on the whirlpool of speculation." (Keynes, 1936, p. 159.)

Thus, governments will always have a role in developing institutions and policies which strongly reward and encourage income generating activities rather than speculative activities, for in a world of uncertainty *laissez faire* cannot assure these desirable activities will always be undertaken. There is always a need to devise governmental policies geared to creating expectations which encourage expansive non-inflationary economic activity. In current circumstances, such policies include (a) levying taxes which penalize, or at least do not encourage, speculative activity over income earning activity;⁹ (b) providing institutions which insure continued liquidity of widely traded financial assets. Such institutions much encourage expectations of "sticky" spot prices for liquid assets;¹⁰ (c) developing permanent institutions which insure an equitable distribution of income compatible with increases in productivity and changes in the international terms of trade, i.e., a permanent incomes policy in which residents *expect* their claims for real income are treated in a fair manner.

B. Expectations and Inflation

Perhaps nowhere in our current economic environment is the case of where expectations can play a devastating role in our economy more obvious than in the case of inflation. As economic agents see inflation eroding the purchasing power of the money incomes they agreed to in past wage or sale (price) contracts, agents expect further inflation to erode future contractual agreements. Hence they perceive the need for higher contractual money wage (relative to productivity) settlements and higher profit margins in sales contracts as a way of protecting oneself from the greedy demands of others. (Since every price involves someone's income, inflation is symptomatic of all trying to obtain higher money incomes.) As higher wage and profit demands are institutionalized into money contracts, the economy suffers from an incomes inflation.

⁹ One obvious conclusion of this view is that capital gains (which are often due to successful speculative activities) should not be treated by lower tax rates than those levied against income.

¹⁰ In my forthcoming book, "International Money and the Real World," I discuss the implication of the need for expectations of continuous liquidity on international monetary relations, the undesirability of flexible exchange rates, and the requirements for an international institution to coordinate monetary, fiscal and incomes policies among trading partners.

There are only two basic (with many variants) competing anti-Income Inflation policies being advocated—one by neoclassical theory, one by Post Keynesian analysis. The traditional analysis calls for restrictive monetary and fiscal policy—what Professor Friedman calls “bullet-biting”—which so impoverishes the economy that it cannot be held up for economic blackmail by powerful subgroups who are attempting to gain more of the national product for themselves. Thatcherism is symptomatic of this painful medicine offered to the unions in the U.K. Rational expectation theorists, however, have held out the hope that merely the threat of such a painful medicine will be sufficient to achieve a painless remedy to incomes inflation in the U.S. These Reagan “supply-side” nostrum peddlers suggest that inflation can be stopped by merely announcing that this administration will have a tight monetary and fiscal policy and, like Mrs. Thatcher, permit people to price themselves out of the market if they insist on raising wages and profit margins. If the unions and management believe Messrs. Reagan, Regan and Stockman, it is claimed, then “rational expectations” will prevail as everyone recognizes that everyone else will stop asking for inflationary wage and profit margin increases, and inflation will stop dead in its tracks without the bullet-biting and punishing depression of Thatcherism. (If you believe in this scenario, you probably believe in the Good Tooth Fairy.)

The alternative to an appeal to “rational expectations” to trust your neighborhood plumber, oil company, landlord, etc. not to raise his price if you do not raise yours is a specific, National Policy to Coordinate Incomes Policy (NPCIC) which assures each agent that there will be an equality of sacrifice when economic events are unfavorable and an equality of sharing of gains when our economy is prosperous. In other words, the government must develop a policy which assures the public that the current Darwinian free market struggle for income shares which is the primary cause of our current inflation problems is not endemic to our economy. Just as society encourages fair and efficient traffic flows by a judicial system which extracts penalties (related to the severity of the offense) for drivers who violate traffic laws which are well defined and kept constantly in the driving public’s view, so must we develop institutions which provide a fair and efficient income distribution in our “zero-sum society” to make sure that the aggregation of our individual income claims do not total more than 100 percent of available real income. If the public was educated to the need and objectives of a well designed legal system for coordinating income claims, then expectations of the law abiding public would be that there would be overall public compliance. Hence, the creation of an institution to carry out a fair NPCIC would immediately create an expectational environment where its success without significant deprivation could be assured.

No civilized nation leaves the decision as to which side of the road to drive on to individual free choice and to see who is “chicken” when autos approach each other, and each driver tries to intimidate the other in determining who is “king of the road.” Yet, some would suggest a similar process of intimidation and dominance for determining the distribution of income, under the guise of free market libertarianism. One would have hoped that mankind

abandoned this Social Darwinistic view when we learned that cooperation under society's laws of contract rather than plunder should dominate transactions in a civilized society.

Adoption of a NPCIC does not mean that income must be distributed equally. There are indeed social, economic and psychological justifications for significant inequalities of income and wealth. The task is to manage human nature and the desire of income, not to transmute these desires. Enterprise and the production of desirable goods and services are the props of society, and most citizens would recognize that those who contribute most are deserving of a somewhat larger share of the national product. But, simultaneously the average person wants to be assured that all receive some share of the national product, and that each one's share is determined by some equitable and clear rules of the game, agreed on by all, and when any who feels aggrieved by the current rules, they can have their day in court. If instead, the rules of the game for the distribution of income are such that each expects the other to grab as much as he can without consideration of others, and therefore expectations are generated that there may not be enough to go around, then a mortal blow will be thrust at our entrepreneurial society because it destroys the psychological expectational equilibrium which permitted the societal acceptance of unequal economic rewards within the available output of a zero sum society.

III. SHOULD EXPECTATIONS BE MEASURED?

The question as to whether expectations should be measured places the emphasis on the wrong aspect. More importantly than measured, expectations should be influenced via the development of institutions and the education of the public. Judicious governmental regulation should be provided to promote a coordination of economic activities within the potential of the U.S. It is not that we need to measure more expectations; we already take enough public opinion polls. We already are aware that in the current political and economic environment, expectations are all too ephemeral. What is needed is institutions which provide a strong foundation for developing "sticky" expectations that are constructive, not measurement of more and more transient expectations.

The task will not be easy, but that is not an excuse for not trying to develop the institutional structure to coordinate production plans and income distribution within and among the entrepreneurial economies of the world. The alternative is to leave our economic fate to money supply constraint policies or gold standard policies, and/or 19th century supply side policies—all of which have littered economic history with the wrecks of economic systems where *laissez-faire* created, under certain circumstances, a market coordinated plan for economic disaster!

IV. EXPECTATION FORMATION

To ask whether expectations are formed primarily in response to past economic occurrences is to assume that expectations are primarily endogenously determined. As already indicated, neoclassical theory postulates this endogenous view of expectations. Keynes and Post Keynesian theory, on the other hand, assumes that in general

the general state of expectations can at any moment change independently of the economic forces in one's model, whether or not past expectations are being validated by current events or not. For example, as Sir John Hicks noted in his Noble Prize winning work on "Value and Capital," it is possible to classify three sorts of influences to which price expectations, for example, may be subject. These are:

(1) Non economic forces; e.g., weather, political news, public's psychology;

(2) Economic forces unrelated to current price movements; e.g., market superstition, expert forecasts and newsletters, etc.; and

(3) Actual recent experience.

The first two sorts of influences can be treated as autonomous causes of expectational change. Hicks reminds us that expectations may "react along these channels in mysterious and indirect ways. We must never forget that expectations are liable to be influenced by autonomous causes; otherwise we must leave it at that." (Hicks, 1939, p. 204.)

Uncertainty is the root of the problem—and expectational formation can never be completely modeled endogenously. Neoclassical theories which claim to do so (e.g., adaptive expectations, rational expectations, etc.) are illusory. They imply that observed functional relations among variables are ultimately stable, robust and repetitive stereotypes independent of the historical and institutional setting. Such theory permits policy makers and economists to persist in the daydream that there exists ultimate unifying simplicities and self-regulating economic mechanisms that can be discovered (if only NSF would provide another grant). There is, however, abundant contrary evidence since under certain circumstances, economic systems have collapsed, and no economic system can operate in an institutional vacuum.

V. EXPECTATIONS AND POLICY DESIGN

It follows from the above analysis that specific multiyear policy proposals legislating actual changes in magnitudes (e.g., 30 percent tax cut over three years, or 4 percent annual growth in the money supply) are a spurious way to assure future economic success. Future events are too uncertain to lock oneself into specific magnitudes over too long a future period. Instead, policy should be developed which provides for institutions whose clearly established rules will promote the stickiness of expectations in a manner consistent with a bias towards expansionary economic activity. Given proper design of these institutions and proper education of the public as to their functions, obligations, degrees of freedom, etc., economic activities can be managed and coordinated in a more useful manner than has been in the past decade. Nevertheless, we should never forget Hicks' warning that autonomous expectational changes can always occur, and hence, policies must be flexible enough to deal with new and rapidly changing situations.

REFERENCES

- P. Davidson, *International Money and the Real World* (Macmillan, London 1981 forthcoming).
- M. Friedman, "The Methodology of Positive Economics" in *Essays in Positive Economics* (Univ. of Chicago Press, Chicago, 1953).
- , "A Theoretical Framework for Monetary Analysis" and "Comments on the Critics," in R. J. Gordon, ed., *Milton Friedman's Monetary Framework*, Chicago: Univ. of Chicago Press, 1974.
- , "Nobel Lecture: Inflation and Unemployment," *Journal of Political Economics*, 1977, 85.
- J. R. Hicks, *Economic Perspectives* (Oxford Univ. Press, Oxford, 1977).
- , *Causality in Economics* (Basic Books, New York, 1979).
- , *Value and Capital* (Oxford Univ. Press, Oxford 1939).
- J. M. Keynes, *The General Theory of Employment, Interest and Money* (Harcourt, New York, 1936).
- D. Laidler, "Expectations and the Phillips Trade Off: A Commentary," *Scottish Journal of Political Economy*, 23, 1976.
- and M. Parkin, "Inflation—A Survey," *Economic Journal*, 85, 1975.

STATEMENT OF GEORGE KATONA*

EXPECTATIONS IN ECONOMICS

A. THEORY

A1. A Revised Paradigm

For many years economists operated on the basis of an old-fashioned, no longer acceptable paradigm: Stimuli elicit responses; there is a one-to-one correspondence between the two ($St \rightarrow R$). The new paradigm, generally accepted in psychology (with the exception of such rare limiting cases as reflex action), is derived from the thesis that $B = f(P, Env.)$: Behavior is the function both of the person and the environment. Therefore S - O - R represents the new generally accepted paradigm. The Organism represents an intervening variable between Stimuli and Responses, it influences the perception of the stimulus as well as the response to it.

Examples of the old paradigm are that consumption is determined by income, investment by profits, inflation by money supply. It follows from the new paradigm that two people do not necessarily respond in the same way to the same stimulus. Also, the response to the same stimulus by the same person may differ at different times. The basic feature of the organism is that it is capable of learning. It can change its response to the same stimulus by acquiring new experiences, new information and understanding.

The greater the distinction between a quasi-automatic reflex action and complex behavior, the greater is the role of "O" and with it the discretion of the organism. Applied to economics, this means that in a poverty-ridden, primitive society the response resembles reflex action. A small increase in resources most commonly leads to somewhat greater expenditures on food. In today's highly developed affluent societies, wide choices prevail between different forms of response, and people's discretion of action is very substantial.

The organism is represented by intervening variables among which, in economic behavior, motives (e.g., the motive to save), attitudes (e.g., satisfaction or dissatisfaction with recent past trends), and first of all, expectations (optimism or pessimism toward future developments) are of paramount importance. The function of expectations has been enhanced in our inflationary age.

A2. Measurement of Expectations

Over the past several decades the concept of expectations has been widely used by economic theorists, especially by Swedish economists and John Maynard Keynes. Yet the discussion of expect-

* Former professor of economics and psychology, University of Michigan. Deceased, June 18, 1981.

tations remained exclusively on the retical grounds. The continuous measurement of expectations—income expectations, price expectations, etc.—was initiated by the author of this essay at the time of the establishment of the Survey Research Center (SRC) at the University of Michigan (1946). In surveys of representative samples of consumers or businessmen, questions were asked about their expectations and quarterly data were collected about the proportion expecting (for instance) prices of things they buy to go up, stay the same, or go down during the next six or twelve months, or five years. The extent of the expected price changes was asked in follow-up questions in later years. Thus extent as well as spread of the prevailing expectations were determined.

Being based on quantitative measurement, the procedure opened the way to testing hypotheses about the impact of expectations on economic processes. It was possible either to confirm or to reject hypotheses about the role of expectations.

(J. A. Livingston of Philadelphia also collected data for many years from volunteer economists about their expectations. Such nonrandom data often deviated from the expectations of businessmen and consumers or workers, reflecting greater knowledge of underlying conditions.)

The Survey Research Center data on expectations have been used to predict forthcoming economic trends. Assuming that optimistic people increase their expenditures on one-family houses, automobiles, and other durables, and that pessimistic people curtail them, trends in such expenditures were predicted six to twelve months in advance. Because of the impact of consumers' durable expenditures on business cycles, it was also possible to predict every one of the postwar recessions in advance.

A3. The Formation of Expectations

Thirty years of studies on the formation of expectations revealed that expectations may originate under a variety of circumstances. Sometimes expectations are extrapolative: past trends of prices appear to correlate very well with their expected trend. At other times, government policy, or people's understanding of government policy, determined the expectations. For instance, the introduction of price controls might lead to a rapid fall in price expectations. Confidence in the government's ability to deal with economic problems played a great role in forming expectations, especially at times when such confidence was absent. The rate of unemployment as well as expected cyclical trends likewise served to explain expectations occasionally.

Post hoc, that is, after the prevailing expectations have been determined and people queried about the reasons for their expectations, it was usually possible to explain how expectations were formed. Ex ante, that is, based entirely on theoretical arguments, the prediction of expectations was only occasionally successful. The rational expectations hypothesis which dispenses with empirical research on expectations does not represent an appropriate scientific procedure because businessmen, consumers, and workers often have a very limited horizon of knowledge about existing conditions and may not always form their expectations rationally. (See Bibliography 8.)

A4. Inflation

As said before, the response to the same stimuli (or the same stimulus constellation) may differ from time to time. It has been shown that from 1947 until the 1970's the American people generally felt worse off when inflation accelerated. (This was true even of people whose incomes rose much more than prices; such people complained that they could not make use of the well-deserved fruits of their labor.) In addition, inflation made people feel uncertain and fearful that later they would have trouble purchasing necessities. Therefore, in response to inflation people reduced their discretionary expenditures and increased the amounts they saved.

But in 1950 after the outbreak of war in Korea, in 1973 after large Russian grain purchases and OPEC oil restrictions, and especially between 1978 and 1981, the response to inflation was primarily to hasten the purchase of goods in excess and in advance of needs in order to beat inflation. People in general learned a lot about inflation in the 1970's and applied their knowledge to their actions.

Thus, today inflation is both a monetary and a psychological phenomenon. The widely accepted old adage that "more money chases fewer goods" is of course a metaphor. The money doesn't do the chasing; it is people who use their money to chase the goods. When we apply this small correction, it becomes necessary to analyze people's motives and expectations which lead them to behave in a certain way. Fighting inflation likewise has both a monetary and a psychological aspect. Neither suffices alone. Restriction of money supply may not destroy inflationary expectations. Persuasion alone would fail because people must understand how and why certain financial measures would have beneficial results.

B. CURRENT ECONOMIC PROBLEMS

B1. *The Public Response to Government Policy*

Success or failure of diverse important measures of economic policy depends to a large extent on the response by consumers and businessmen to the measure. This response in turn is strongly influenced by people's attitudes toward the measure—their notion whether it would be effective and fair—and on their expectations about the probable results of the measure.

Public opinion, of course, has a broader influence on the government's policy. This influence may be reflected in the results of elections or in votes in Congress. In this brief discussion we shall restrict ourselves, however, to the economic response by business and consumers to measures of economic policy.

Needless to say, there are measures of economic policy which are not dependent or hardly dependent on the public response. Take, for instance, the increase in social security taxes enacted a few years ago, which takes a large additional bite out of the income of every wage earner in 1981. Not only are these tax increases compulsory—which is also true of several measures discussed below—but the public response to them is also of limited influence because the additional taxes are simply withheld from their paychecks by employers.

We shall restrict our discussion to three major forms of economic policy: general price controls, a cut in income taxes, and sharp increases in interest rates.

B2. Price Control

At first sight, a general price freeze introduced by law or decree that imposes stiff penalties on those who raise prices appears to be a compulsory measure not dependent on the willingness of businesses and consumers to cooperate. Nothing could be further from the truth! First, there are countless instances in which external events determine the prices charged and the price controller must make exceptions by permitting price increases. It suffices to point at bad crops due to unfavorable weather or, during the last ten years, the increases in oil prices by the OPEC cartel. Second, and most important, if and when the majority of people do not cooperate, the enforcement mechanism breaks down. There are innumerable ways to circumvent price control, for instance; reduction of quality or service as well as black markets. Without the willingness of both sellers and buyers to make sacrifices for the sake of what is understood to be the common good, even a very large and efficient control agency would find it impossible to carry out its task. This is true even in a police state and not just in a democracy.

During World War II price and wage controls worked. This does not mean that prices and wages were stable. But World War II was the first great war in history fought without substantial inflation. Speaking of the United States alone, we may recall that people in general approved of the war against the Nazis and the Japanese, and were willing to make sacrifices to insure victory.

I published a book shortly after Pearl Harbor with the title, "War Without Inflation" (Bibliography 2). I called attention not just to the availability of economic-financial measures—especially tax increases rather than financing the war through borrowing—but first of all to the climate which would insure the success of controls. I also implied that inflation was much more probable after the end of the war than during the war because after victory was achieved, the patriotic motive for cooperation would weaken greatly. This was the case shortly after the war ended. Somewhat later public opinion forced the government to abandon the controls.

Of course, price control did not operate in a perfect manner during World War II. Very large government bureaus had to be established to deal with thousands and thousands of requests for exemptions. Countless instances of price increases, evasions and cheating had taken place. But survey research revealed that (1) most businessmen and consumers were in favor of price control and rationing and asserted that they would abide by the regulations, and (2) in those instances when people did not do so they were apologetic and expressed regret about not being in a position to comply. The aggregate effect of all forms of evasion was therefore limited. The prevailing expectations during the War were for small rather than substantial price increases.

Price control was again introduced in the U.S. twice during the following decades. I shall not discuss the price controls of 1951 or 1971 except to say that the 1951 measures were introduced too late

when they were no longer needed and the 1971 measures were introduced too early, long before rapid inflation set in.

After a period of rapid inflation in 1973-74, inflation slowed down in 1975, 1976 and 1977. Beginning in 1978, two-digit inflation took off again. In 1978 and 1979 the introduction of price control was urged by some experts, but President Carter did not follow their advice. Data obtained through survey research supported the President's position. The socio-psychological climate that prevailed at that time and still prevails today would have made it very difficult if not impossible to enforce a general price freeze. A sharper contrast could hardly be imagined than that between the climate during World War II and the late 1970's. While during the war and also during the first twenty-five years after the war, optimism, confidence in the government and rising aspirations were the rule, in the 1970's people lacked confidence, were pessimistic, distrustful and skeptical.

In the years 1978 to 1980, instead of attempting to fight inflation, very many people were found to be preoccupied with fighting for a higher income and buying enduring goods in excess and in advance of their needs in order to beat inflation. Many businesses were found to practice anticipatory pricing, transmitting not only actual but also expected cost increases to their customers. When surveyed in 1979-80, the majority of Americans said that they had succeeded in keeping even with inflation, rather than being hurt by it.

It should not be inferred from what I just said about President Carter's policies that the measures he took against inflation were appropriate. Just because a general price freeze was not advisable, it does not follow that inflation could not have been fought more energetically. For instance, the price and wage guidelines could have been strengthened through penalties and primarily by granting tax advantages to those who adhered to the guidelines. But very little was done and the notion that the government was not only unable, but also unwilling to fight inflation spread all over the country. Inflation came to be viewed as a permanent fixture of our age, expected to endure for many years.

B3. Tax Cut

An analysis of a rather different important measure of economic policy, the introduction of tax cuts, likewise yielded the conclusion that its success or failure depended on the public response to it. Together with my colleagues I conducted extensive studies of the Kennedy-Johnson tax cut of 1964, by interviewing a panel of consumers several times in succession. (See Bibliography 4.)

In 1962 when President Kennedy first proposed the tax cut, and during most of 1963, the majority of Americans agreed that it would be good for them to pay lower taxes but bad for the country. ("I'd like to pay lower taxes" and "The government can't afford it" were two frequent replies.) As late as in August 1963 the majority of respondents said that in periods of deficits and large necessary government expenditures a tax cut was not feasible and therefore would not be passed by Congress. Only after the assassination of President Kennedy did new notions take hold. Many people began to accept the argument that a tax cut would serve to increase consumers' expenditures and therefore improve business condi-

tions, generate additional income and, ultimately, larger tax payments to the Treasury.

In August 1963 only 27 percent of the respondents said that the tax cut law would be passed; in January 1964, 59 percent believed it would pass. Those who expected the tax cut to take effect were consistently more optimistic than those who believed the tax cut would not be passed by Congress. The differences were pronounced both in the expectation of improved business conditions and in discretionary purchases of houses, automobiles, and other durable goods.

In early March, 1964, after the tax cut passed, tax rates were reduced substantially and retroactively to January 1, 1964. Taxpayers got the first benefit when, beginning March 15, 1964, tax withholding rates were reduced. Interviews revealed that most people were disappointed with the amount of tax reduction. In June, only 4 percent felt the tax cut had a considerable effect, while 57 percent said it made a small difference and nearly a third, 31 percent, no difference at all. In the second quarter of 1964 aggregate data indicated that personal savings in banks or securities increased by more than 40 percent.

In the second half of 1964 personal incomes continued to increase at a fairly rapid rate and so did the rate of consumer borrowing. Both disposable incomes and extensions of installment credit were 9 percent higher than in the second half of 1963.

The results of the 1964 panel study may be summarized as follows:

American consumers experienced sizable real increases in before-tax as well as disposal income after the enactment of the tax cut in 1964.

An unusually large proportion of consumers viewed their income gains as enduring rather than transitory.

Families feeling better off and expecting to maintain or even improve their favorable situation stepped up their purchases of durable goods and their additions to savings.

Is it possible to make use of the experience of 1964 in 1981? There can be no doubt that the task has become much more difficult in 1981. This year the two-digit inflation persisted, while in 1964 the price level was practically stable. Equally radical were the differences in the sociopsychological climate in which the economy functioned. Extensive survey data indicate that this year the American people are much more pessimistic than in the 1960's; in 1981 there is little confidence in the economic policies of the government relating to fighting inflation and unemployment; in 1981 the people are uncertain, doubtful, and discouraged. In contrast, during the first twenty-five years following World War II, including 1964, confidence in the government and optimism prevailed.

The differences between the 1950's and 1960's on the one hand and the 1970's on the other were so substantial that we chose the title, "A New Economic Era" (Bibliography 6), for a book that analyzed the trends arising in the 1970's. It follows that the success of a tax cut in 1981 depends on reversing the beliefs and expectations of the 1970's. The conviction that inflation and stagflation would continue for several years must be changed before a new tax cut can hope to accomplish its goal of revitalizing the economy.

The new tax cut must catch the imagination of the people by being viewed as a new beginning, the start of an era of growth and renewed stability of the economy. A substantial, repeated, enduring and equitable tax cut may be suitable to accomplish this goal.

I may add that the first and proximate effects of a tax cut appear, of course, on the demand side. But strong stimulation of the purchase of enduring goods such as one-family houses and automobiles, as indicated by the effects of the 1964 tax cut, would extend to the supply side as well. Increased demand for such goods is not necessarily inflationary because the construction and auto industries operate at present far below capacity. Of course, such demand would lead to increased borrowing because homes and cars are purchased on mortgages or the installment plan. Yet the tax cut itself is expected to stimulate increased saving in the form of additions to liquid assets, which are greatly needed to make larger business investment possible. To be sure, specific measures that stimulate saving, for instance by granting tax advantages to savers, might also be needed.

B4. High Interest Rates

During the last two or three years, rising interest rates have resulted from major policies introduced by the Federal Reserve Board intent on restricting the money supply. The Reagan administration apparently approves of our era of excessively high interest rates. We all know that in 1980-81 the prime rate charged by banks to their leading borrowers exceeded 20 percent three times and that interest rates have recently fluctuated to a greater extent than ever before. This policy was introduced and carried out without conducting any research on people's predispositions and attitudes. Some such research was conducted during the past several years by the Survey Research Center, but was ignored in Washington. I may summarize our findings briefly, which held true for the majority of Americans.

1. Interest rates are seen as business costs. Both large and small businesses are thought of making use of "other people's money." Businesses are believed to transmit their costs to their customers and ultimately to the consumers. Therefore rising interest rates mean rising prices and are seen as inflationary.

2. Interest rates are also seen as part of the cost of buying homes and autos because of their impact on the cost of mortgage debt and installment loans. These two most important purchases the American people ever make are therefore thought to be inhibited by high interest rates. In the opinion of many people, thereby recessions and unemployment are promoted.

3. Rising interest rates make people expect further increases in the rates. Such expectations result in increased dispositions to borrow in order to get the goods before one is priced out of the market—and not in reducing the amount borrowed.

4. Rising interest rates tend to promote pessimistic attitudes and expectations on economic matters. Rapid fluctuations of interest rates shake people's confidence in the government's economic policies.

Success of a tax cut in revitalizing the economy depends to a great extent on reducing the inflationary expectations as well as

the prevailing interest rates. Unless these goals are accomplished, the benefits of a tax cut could be dissipated. A reduction of the money supply brought about by a recession and high interest rates may not suffice to lower inflationary expectations and to end the struggle for higher income and the accumulation of enduring goods.

B5. Social and Behavioral Research

The more extensive and the more radical policy measures a government proposes, the more necessary it is that it conduct social and behavioral research. If the Reagan administrative were a "do nothing" government, it might perhaps dispense with such research. Yet, there is hardly any area of government expenditure which Mr. Stockman, the Director of the Office of Management and Budget, proposed to cut more sharply than federal grants in support of social research. In some instances, the proposed cuts amounted to 75 percent of the fairly small expenditures for social research during the Carter administration. In opposition to these proposals, I want to emphasize that a government introducing major new economic policies is in great need for three forms of survey research. (1) Research intended to find out what the public predispositions and attitudes are before a new measure is introduced, (2) The new policy measures must be explained to the people and research is required to find out what the provisions are that must be explained and how they should be explained, (3) After the measure has taken effect, its impact on consumers and businesses must be continuously assessed.

Such research is required because the public response to government policies is not automatic and is not necessarily in accordance with what the government intends to do.

Moral suasion, or persuasion in general, does not suffice to change the socio-psychological climate. Inflation must be fought both in the monetary and the psychological fronts. Confidence in the effectiveness of financial policies has the psychological function of making people understand why and how the new policies will accomplish their goals. (See Bibliography 1.) Such understanding is not brought about by simple oft-repeated assertions that inflation will slow down (or that "recovery is around the corner.")

CONCLUSION

Chairman Reuss in proposing the preparation of a compendium on the role of expectations in economics quotes President Reagan's message about the important role of expectations in determining economic activity. I fully agree. I disagree only with the assertion that the role of expectations has increased greatly under the Reagan administration. In 1951 I published a book with the central thesis of the paramount role of expectations. (See Bibliography 3.) Thirty years is not too long a time between publishing a scholarly thesis and its political acceptance.

BIBLIOGRAPHY

1. *Organizing and Memorizing*. Columbia University Press, 1940, 3 printings. The book analyzes the process of acquisition of knowledge through problem solving and understanding.
2. *War Without Inflation*. Columbia University Press, 1942. On the triumph of price controls during the war.
3. *Psychological Analysis of Economic Behavior*. McGraw-Hill, 1951. Basic considerations of the interrelationship.
4. With Eva Mueller. *Consumer Response to Income Increases*. Brookings Institution, 1968. On the tax cut of 1964.
5. *Psychological Economics*. New York: Elsevier, 1975. Comprehensive textbook.
6. With Burkhard Strumpel. *A New Economic Era*. New York: Elsevier, 1978.
7. *Essays on Behavioral Economics*. Ann Arbor: Institute for Social Research, 1980.
8. "How Expectations Are Really Formed." *Challenge*, November/December 1980, 32-35. On the rational expectations hypothesis.
9. "The Lessons of the 1964 Tax Cut: Will They Apply Today?" *Public Opinion*, American Enterprise Institute, February/March 1981, 7-9.

STATEMENT OF WILLIAM FELLNER*

WHY POLICY MAKERS NEED TO PAY MORE ATTENTION TO THE CRUCIAL ROLE OF MARKET EXPECTATIONS

I. FOUR PROPOSITIONS BRIEFLY DESCRIBING THE POSITION OF THIS PAPER'S AUTHOR

(1) Over a recent period of roughly fifteen years we have tried unsuccessfully to achieve employment policy objectives by accommodating, with minor interruptions, increasingly inflationary cost and price expectations that were developing in the markets. These expectations have become unstable "upward" because the posture of the authorities has been that of trying to adjust their policies to the expectations rather than that of ensuring an adjustment of the expectations to consistently pursued price-level objectives of the authorities.

(2) It is imperative that, along with adopting badly needed incentive-strengthening measures, we should shift to a credible policy of disinflation and that by such a policy we should condition market expectations and thereby cost trends to firmly pursued policies directed at price-level stability. Only such a policy can, after an inevitable adjustment period, restore the efficiency of our economy and place it on a path of satisfactory productivity and employment trends.

(3) At present chances are still good that the objective can be achieved by what I will describe as credible gradualism with perceptible speed, rather than by a strategy of abrupt full disinflation, essentially in one big step. But time is about to run out on developing an effective and promising strategy of the gradualist variety.

(4) Disinflation itself is mainly a matter of an appropriately restrained Federal Reserve policy. But fiscal policy must also play an essential role in any program that aims at credibility and at the conditioning of market expectations. Fiscal policy must make the tax structure more compatible with market incentives. At the same time it must avoid large deficits that raise interest rates, suppress investment, and can interfere with disinflationary monetary policies also by providing the public with financial instruments that are close substitutes of money and thus tend to raise the velocity of money. The so-called tax cuts now planned on a multiyear basis are needed for preventing a further increase of the tax burden in relation to income, and for undoing at least part of the recent inflationary distortion of the tax structure, but the expenditures side of the budget needs to be shaped in such a way that the tax adjustments should be compatible with a movement toward budgetary balance without sacrificing our defense objectives.

In the following pages I will elaborate on the first three of the preceding four propositions. The fourth proposition, concerning the

*Resident scholar, American Enterprise Institute, and professor of economics, emeritus, Yale University.

role of monetary policy on the one hand, and of fiscal policy on the other, is more in the background of any analysis focused on the effect of expectations on the success of a disinflationary policy.

II. ELABORATION

Economic agents would have to be wholly irrational not to be guided in their behavior by expectations. This is not even a proposition deserving a weighing of pros and cons. The question deserving more detailed consideration is how expectations are formed.

The reason why the position of some analysts gives the impression of denying the importance of expectations is that expectations, which are by their very nature forward looking, must always be based on experience as it manifests itself to us when we are looking backward. It is possible, though (I will argue) highly undesirable, to formulate analytical systems in such a way that the entire emphasis is placed on the backward look, in which case the essential fact tends to get lost that the backward look is merely instrumental to looking forward. During the postwar era quite a bit of unconvincing analysis has developed, over a span of a good many years, from implying that expectations represent projections into the future of very simple descriptions of the past record. In this case it would be possible to "substitute" these simple descriptions of the record—this simple backward look—for an acceptable theory of expectations. Recognition of the fact that this is a misleading procedure has recently been spreading, but not as rapidly as might have been hoped.

Unilateral emphasis on an oversimplified backward look has led several investigators to very pessimistic predictions about the possibility of disinflating the economy. In models so constructed it is assumed that given any "present" level of resource utilization, the wage increases and price increases of the past few years determine the "present" wage increases. Further, these present wage increases which thus are supposed to be determined by the cost and price-setting record of the past few years are in turn the principal determinants of the present general price increases, at any given level of resource utilization. These elements of the past record are in such models regarded as the principal determinants of the present general price increases though an additional role is usually assigned to the present crude-material price increases in determining the present general price increases. What follows from such models is that, given any significantly inflationary wage and price record of the relatively recent past, one would have to have exceptionally good luck with crude-material prices to be able to obtain a noteworthy deceleration of inflation by any method other than that of creating very uncomfortable degrees of underutilization including unemployment. One would either have to create promptly a very substantial degree of underutilization or have to create more moderate degrees of underutilization but over a very long period of time.

Some of us have found these models unconvincing all along. They imply that market expectations are uninfluenced by whether policy makers have or have not demonstrated that the policy line has changed as compared to what it was over a past period. Wage and price-setting practices would obviously not continue to be de-

rived from the practices of the past years in an unchanging way if the experience of market participants gave them reason to believe that in the future policy makers will not continue to react to these practices the same way as they did during those years. After all, it may be taken for granted that any specific way of deriving one's rules of conduct from past experience rests on the belief that one has captured that part of past experience which is relevant to the conditions one will be facing in the future and which therefore is projectable into the future. Thus, the cost and price-setting practices of specific past periods can be relevant guides to present and future cost and price-setting practices only if, given such market practices, policy makers are apt to behave the same way as in which they did behave in the past years for which those practices were observed. Any demonstration that policy makers have changed their posture is an essential part of the relevant experience—of the relevant backward look on which markets base their forward look—and this fact is disregarded in conventional models that have been widely used.

Even before taking a closer look at the data—relying merely on a general appraisal of events known to have occurred in the history of Western economies and relying on common sense—it seems clear enough that, in an environment in which policy makers have become credible in their firm determination not to accommodate inflationary price trends, cost commitments for the future will after a while fall in line with a hard-boiled policy posture so interpreted. Hence, price trends also will come to fall in line, even if not laglessly. As for models that disregard this, these have also a number of technical weaknesses; in addition to implying assumptions that are implausible on grounds of common sense and broad historical experience. Considering that all econometric models have inevitable weaknesses, and that they all should be used with a good deal of judgmental adjustment, this would not be worth pointing out were it not for the fact that at least in three cases at which I have taken a closer look, the weaknesses point in the same direction.¹ By examining these models it can be shown that the pessimistic conclusions concerning the possibility of eliminating inflation without a major depression or an extended period of stagflation are strongly influenced by the effect of the past ten-to-fifteen years on the estimates derived from these models. These ten-to-fifteen years make up the period during which the public got gradually used to lax demand policy—to one that soon returned from occasional brief interludes of anti-inflationary restraint to a highly expansionary stance even at significant inflation rates. This was the recent period in which demand policy restraint—occasional restraint that was rightly not expected to last—produced an unfavorable mix of output-reducing with cost-moderating effects.

The earlier period, extending from 1951 to the second half of the sixties, was one in which the public expected the authorities to continue to maintain a consistent anti-inflationary posture. Whenever there occurred upward deviations from practically a noninflationary price trend during that earlier period, these deviations

¹ On this see my article "The Valid Core of Rationality Hypotheses in the Theory of Expectations", *Journal of Money, Credit and Banking*, November 1980 Supplement, and my "Comments" in "Brookings Papers on Economic Activity," 1980, Volume 1, pp. 243-248.

were suppressed without much delay. They were suppressed by failure of demand-management policies to accommodate these upward deviations. At that time such a policy of restraint achieved its cost and price trend objectives without causing any prolonged phases of underutilization, that is, with a favorable distribution of the effects as between cost and price moderation on the one hand, and unemployment or excess capacity on the other.

Needless to say, even in those earlier years policy restraint did not reduce any temporarily steepening rate of cost and price increase by as many percentage points as would be needed at present to restore price stability. This goes without saying because a reduction by the now needed number of percentage points would at that time have established a steeply deflationary trend which the authorities clearly were not expected to generate. What matters is that at that time failure to accommodate temporary upward deviations from a practically noninflationary price trend resulted without much delay in the restoration of the cost and price trend for which policy makers were rightly expected to aim. Somewhere about the mid-sixties they ceased to aim consistently for a practically noninflationary price trend, and as a result of this market expectations changed accordingly. The markets came to anticipate the fact that, despite occasional short-lasting episodes of demand-policy restraint, the basic tendency became dominated by inflationary pumping-up efforts in the pursuit of employment policy targets which in such circumstances could be achieved only temporarily and have left us with a painful aftermath.

Our present problems call for a return to a consistent and credible anti-inflationary policy such as we had prior to the mid-sixties. Difficulties of a period of adjustment will be inevitable along such a route because, after the antecedents of the recent past, it will take some time to establish the credibility of the required policy shift and also because the carry-over effects of past cost-commitments will remain bothersome for a while. But these two adverse factors—the need to establish the credibility of a consistent policy shift and the effects of commitments entered into in the past—cannot be expected to influence the course of events for longer than a very limited period. The limited period in question is apt to be of the duration of a typical business cycle during the successive stages of which the level of resource utilization would be less favorable than will be the case subsequently. In any event, it is inevitable that we should make the adjustment if the uncertainties and the inefficiencies resulting from our inflationary environment are not to become perpetuated.

There is as yet a very good chance that the adjustment can be made by what I suggest calling “gradualism with perceptible speed”. But there is no time to lose. If against our hopes it should turn out that too much of a tight-rope walk is involved in a variety of gradualism that would become completed in, say, about four years and would thus establish and retain its credibility, then it would become necessary to resort to sudden and abrupt disinflation. That would be full disinflation in one big step along with the incentive-strengthening measures that are needed in any event. But given the inflationary implications of past commitments involving future payments, such a policy of fully disinflating in one

big step would in my appraisal require providing strong specific incentives for renegotiating contracts, which would, of course, raise a number of thorny problems. For the time being, we should therefore give gradualism with perceptible speed priority over the strategy of the one big step.

There is no reason to develop a skeptical attitude concerning the prospects that market expectations and cost trends can again be conditioned to a consistent and credible course of anti-inflationary policy. Nor is there at present reason for developing a defeatist attitude about the outlook of achieving the desired objective by the proper variety of gradualism, though that particular option will not remain open for long. As for the outlook in this regard, the procedural change announced by the Federal Reserve in October 1979 was a step in the right direction. The results during the first year (first four-quarter period) under the new procedure were disappointing, but there has been much discussion of methods available for obtaining greatly improved results in the future without giving up at this stage on gradualism with perceptible speed.

Let me end these comments by calling attention to the fact that it would be highly unpromising to try to condition expectations to the stabilization of some observed appreciable inflation rate instead of to the restoration of a practically stable price level. Avoiding the discomfort of reducing and eliminating a "now" observable so-called underlying inflation rate but promising to accept in the future the even greater discomfort of adopting anti-inflationary measures whenever the inflation rate rises further would mean basing policy on a promise which for good reasons lacks credibility. Such a policy would therefore not prevent costs trends from steepening further. It would merely postpone facing the difficulties which in the meantime become even more severe.

STATEMENT OF AXEL LEIJONHUFVUD*

EXPECTATIONS: POLICYMAKER'S PREDICAMENT

1. The readily apparent disarray in the economics profession creates a very difficult predicament for politicians and civil servants who have to take some measure of responsibility for macroeconomic policies and their consequences. Whose advice do you rely on?

The role of expectations in macroeconomic theory seems to be the crux. On the one hand, you have the "Old Keynesian" macroeconomics that once looked so solid and reliable, that had very little to say about expectations—and that now, apparently, is thoroughly discredited for its lack of attention to such ephemeral matters. On the other hand, you have the "New Classical" economics that looks so paradoxical and speculative, that has very little to say except about expectations—and that now, obviously, gets all the attention from economists. In between, you have the already "Middle-aged Monetarism" that used rational expectations arguments to undermine the one-time Keynesian belief in a stable Phillips-curve tradeoff—but that balks at the new Rational Expectations doctrine that fully anticipated money stock policy is totally ineffective. The "Old" advise you that monetary policy alone is no way to cure inflation; the "Middle-aged" tell you that only monetary policy will do but the safe way is slow and gradual; the "New" urge a quick, clean end to inflationary money growth.

2. The older macromodels disgorged policy options in the form of readily understandable quantitative predictions: For a change in a policy variable of some given magnitude, GNP will rise by x dollars, employment grow by y percent, and prices go up by z percent. And so on.

The new models tell you that the effects can be this or that depending upon the state of expectations. Unless you can ascertain (in some quantitative manner) what the state of expectations is or will be, therefore, it would seem that you cannot know what it is that you are doing. Unfortunately, measures of expectations generally do not inspire trust. Their unreliability (or unavailability) makes direct tests of the influence of expectations difficult or impossible. And, if you cannot know what it is you are doing, how are you to choose from the alternative policies that different factions clamor for?

One escape from this predicament might be the following. Suppose we match each policy variable in turn with each goal variable that it affects. If there are n policy variables and m goals, we have nm pairs. The marginal income tax rate paired with the work/leisure choice would be one such pair. Next, we try to divide the pairs into three classes:

*Professor and chairman, Department of Economics, University of California, Los Angeles.

(i) Policy/goal pairs for which the cause-effect relationship can be quantitatively determined without bothering about expectations because they do not much matter.

(ii) Policy/goal pairs for which the cause/effect relationship depends significantly on expectations, but for which we can know what the relevant state of expectations is.

(iii) Policy/goal relations for which expectations are significant, but the relevant expectations cannot be accurately ascertained.

Now, if we were lucky, almost all pairs that did not fall into the first category would fall into the second where we can handle the complications that expectations of significant influence bring in. If the third category were empty, policymakers would never be called upon to fly by the seat of their pants.

This, in my opinion, is a vain hope. Most of the things we care about fall into the last category. A rational approach to policy, therefore, must accept two inconvenient facts of life. Expectations matter. Sensible policy judgments cannot be made at all without taking this into account. Expectations cannot be accurately measured. Significant progress on their measurement, moreover, is very unlikely. We may as well think of them as unobservable.

3. The "old" macroeconomics did not trouble us much with predictions conditional on expectations. But the reason why relatively little was said about expectations was not that they were assumed to be unimportant or else sufficiently measurable for econometric purposes. A different avenue of escape from the expectations predicament is possible. Expectations might be "well-behaved" (let's call it). Expectations are well-behaved if linked in a stable manner to the system of observable variables.

In the simplest imaginable case we would have one-to-one correspondence between the observable and the unobservable aspects of the state of the system. Let S be a vector of observable state variables and E a vector of unobservable expectational variables. If S' were always associated with E' , S'' always with E'' , etc., the unobservability of E would not matter. It does not prevent us from developing reliable macromodels. We can learn to predict the effects of policy measures on S without knowing E .

In the more interesting case, the state of expectations associated with S' may be either $E'a$ or $E'b$. We cannot determine whether we are dealing with $E'a$ or $E'b$ by direct observation—but it matters. Suppose, for example, that a policy of monetary expansion will reduce unemployment if we have $(S', E'a)$ but produce only added inflation if we have $(S', E'b)$. The past history of observables might provide the required clue however. One possibility is that $E'a$ occurs if S' was preceded by S^1, S^3, S^5 , while $E'b$ occurs in the wake of S^2, S^4, S^6 . The correspondence is now between sequences of observable states and states of expectations. Reliable prediction is again possible.

In Keynesian theory, investment expectations were not necessarily well-behaved and Keynesian macromodels had, in fact, not much success in predicting investment. But for the rest, the "old" macro-models actually did pretty well in their time by assuming expectations to be well-behaved. Their time ran out with the arrival of the Great American Inflation.

4. It is the Great Inflation of the last 15 years that has destroyed faith in macroeconomics. By the same token, it is not expectations in general that is the problem here but specifically expectations about inflation. Why should expectations about the future of the price level give us more trouble, serious trouble, than expectations about other things?

It is tempting to jump to the conclusion that, perhaps, price-level expectations are ill-behaved, i.e., not related in any stable manner to observables. Then the system can in principle not be modelled in a reliable way and making policy in it is simply and unavoidably a dangerous business. But it cannot be true in general that price expectations are ill-behaved. If that were the case, we would not have had to wait until the decade of the 1970's to discover that we were in trouble.

Inflation expectations are not well-behaved in either of the two ways that the older macroeconomics habitually sought to rely on. Clearly, people do not form their expectations about the future of the price level just from observing the present state of the economy. Extrapolating from the immediate past, as we know by now, would be irrational. If the present and the past will not do, there is only one way left: Assume that people's expectations match the macromodel's predictions about the future.

Note the apparent costs of not accepting this Rational Expectations development. If we have to give up on making expectations well-behaved, we must either start faking expectations measures or else condemn ourselves to an indefinite future of doubletalk: "The effect will be either this or that. . . ." Of course, giving up on macroeconomics is also an alternative and one that many economists have found the most attractive of late.

Accepting the Rational Expectations approach in this broadest sense, however, simply presents us with a question that looks almost worse than the ones we started with: What limits to rational forecasting should be built into our macromodels? What is it that people can and cannot know about the future of inflation? The "New" macroeconomics has as yet not moved perceptibly toward a sensible answer. We have one clue: If the system poses a difficult predicament to policymakers (who can call on all the best economists for advice), it must be worse still for private sector businessmen, investors, and consumers, who have to cope with the added uncertainty of not knowing what actions will be taken by policymakers who do not know what they are doing.

5. The model of anticipated inflation is a starting point. It assumes that people can predict inflation accurately enough that they are able very nearly to neutralize its effects. It is important to understand what exactly is wrong with this idyllic picture. The model's influence in the economics profession has been an unfortunate one. It seemed to lend credence to the notion of the relative "harmlessness" of inflation and sapped professional resistance to inflationary policies through the first decade of the Great Inflation. It is still influential. In the "New Classical" economics, it figures very prominently (with a rational expectations twist) in the proposition that monetary policy has real effects only as long as people have not fully caught on to what the central bank is doing to the current rate of change of the money supply.

Imagine a constant rate, fully anticipated inflation of, say, 15 percent per annum. For simplicity, suppose that the economy has adjusted to it completely. All outstanding contracts have been concluded on the presumption, shared by both parties, that the inflation will continue at 15 percent indefinitely. There are two way of getting back to stable prices.

The quick and painless way is by an overnight currency reform which I call the "Blueback scheme." A 15 percent inflation means that "greenback" dollars depreciate in real purchasing power by 15 percent per year. So we issue a new blueback currency and make it, by law, appreciate relative to greenbacks at 15 percent per year. On the date that the reform takes effect, the exchange rate of bluebacks for greenbacks is unity, but from that day onward bluebacks grow constantly in their legal capacity to extinguish debt contracted in greenbacks. One year later, 85 cents blueback will pay off a \$1 greenback debt; two years later, it takes approximately 71 cents; ten years later about 19 cents.

If the originally held expectations of constant 15 percent greenback inflation of indefinite duration were indeed rational (as supposed), the blueback reform will ensure perfect price stability indefinitely. Note carefully that no one is getting swindled in the process. All contracts are fulfilled according to the real terms originally envisaged. The creditor who after 10 years receives 19 cents blue, instead of \$1 green, is getting exactly what he expected to get in real purchasing power. Nothing could be simpler, or politically easier, than to cure an inflation that conforms to the assumptions of this model. (This only means, of course, that the model is somewhat silly.)

The slow and painful way is to disinflate by reducing the rate of growth of the greenback money supplied by 15 percent. Under the assumptions of the model, this is bloody murder. It violates firm and universally held expectations and will, therefore, cause a major recession. In real terms all outstanding contracts are broken as a massive, forced wealth transfer from debtors to creditors take place. The magnitude of the deflationary shock should match the onset of the Great Depression.

6. The right way to get rid of an anticipated inflation is to convert to bluebacks. The wrong way is to disinflate. This analytical conclusion is unambiguous and inescapable.

It does not follow that the blueback scheme is preferable to disinflation in coping with the Great American Inflation (to take a case in point). What mostly follows is the conclusion that the anticipated inflation model becomes a bad piece of theory if we apply it to actual inflations. What is wrong with it?

A useful theory should match its assumptions about what people know and can predict to the policy regime with which they have to live. Rational agents will not anticipate a rate of inflation that no one is trying to bring about. If the expectations of the model are rational, therefore, the model also assumes a believable precommitment by the government with regard to future rates of money growth, a precommitment which extends, moreover, into the indefinite future. The model presupposes, in effect, the existence of a quite rigid monetary standard which happens to have the peculiar property that it dictates a 15 percent annual depreciation in the

real purchasing power of money. The monetary authorities are bound to create money at the requisite rate to produce a steady 15 percent inflation. They have either given up, or been deprived of, all short run discretionary authority. What could be less descriptive of the policy regime that has been allowed to develop in the United States during the last twenty years?

Nonetheless, we can draw an important lesson from this piece of analysis. We could, if we so desired, put a system into effect that would fit the anticipated inflation model. To do so would require adopting a monetary constitution depriving Administration, Congress, and the Federal Reserve System of the discretionary power to mess around with the monetary growth rate in the short run. The point is that, in the resulting system, inflation expectations would be well-behaved.

It is not possible to have a macroeconomic science that can predict well in all possible worlds. If expectations are unobservable (or unmeasurable) and ill-behaved, macroeconomics will predict very badly, and policymakers will not be able to rationally precalculate the effects of what they are doing. It is possible, however, to change the world to fit what macroeconomics can do. All constitutions put effective constraints on discretionary powers. Not all useful ones need eliminate discretionary policy entirely, however.

7. Let us define a monetary regime as a system of expectations that governs the behavior of the public and that is sustained by the consistent behavior of the policy-making authorities. The reaction of the public to any particular policy action (such as a reduction in the growth rate of money) will depend upon the regime within which the action is undertaken. Consequently, each regime requires its own applied macrotheory; macromodels that do reasonably well for one regime may totally break down for its successor. We can choose among the different possible monetary regimes by choosing behavior rules for the fiscal and monetary authorities. Some regimes are better than others. The present American regime is a thoroughly bad one, although not the worst imaginable. The choice of regime, therefore, is an extremely important matter. It is not a choice that can be left to central bankers or Treasury officials or their economists-in-waiting. It is fundamentally a political problem that can only be settled by Congress.

To see why this is so, consider the reasons why bluebacking is not unambiguously preferable to disinflating as a means of bringing down the U.S. inflation rate. The dollar-denominated contracts now outstanding in the world were concluded at various dates in the past; the modal inflation rate expectation was different at different past dates; hence we have dollar-contracts, the terms of which are still to be carried out fully, which embody modal inflation expectations ranging from 0 percent on up into the double digits. At any one time, furthermore, we have a dispersion of expectations, and many contracts owe their existence to nothing else than the difference in inflation expectations between creditor and debtor (these will be associated with inefficiencies in resource allocation). Picking at random we might find someone who is in a pension plan presuming zero inflation, has a mortgage embodying a 5 percent inflation premium, presently expects a 10 percent

inflation rate, but still is paying off a loan embodying a 15-percent expected inflation. And so on.

What expectation do we choose to validate? Disinflation all the way back to price stability means that debtors who expected a continuation of inflation will have to pay much larger sums in real terms to their creditors. Imagine having today's 20 percent nominal interest rates converted into a real rate while, at the same time, the principal that has to be repaid no longer will shrink in real value as expected. At the other extreme, suppose we stabilize the greenback inflation rate at 15 percent, preparatory to bluebacking back to zero inflation. All creditors who expected a lower inflation rate than 15 percent will see part of their wealth transferred to their debtors. The sums involved are huge. Whichever way you go, the redistributive consequences are complex and colossal.

The Federal Reserve System cannot be expected to decide such an issue. It is out of the question that the non-elected members of the Federal Open Market Committee should on their own make and enforce decisions with such vast redistributive implications. Consequently, it is very largely pointless to blame the Fed for the erratic course of monetary policy over the last two decades. The concept of an independent Central Bank, manned by professional bankers and standing apart from politics, necessarily requires something like a monetary constitution if it is to be put into practice. Professional central bankers could be held responsible for managing a gold reserve standard, or a Friedman rule, or a price stability rule, for example. The choice of such a monetary standard is a political decision to legitimize a particular set of expectations; it is then the Central Bank's job as far as possible to validate these legitimate expectations. If no such political decision is reached—if no monetary standard at all is chosen—a fiat money producing Central Bank can only bend with each day-to-day shift in the political pressures on it. This will be true also of a Central Bank staffed with people of unquestioned competence, courage, and integrity.

The responsibility for monetary stability lies *of necessity* where the Constitution puts it—with Congress.

8. In 1981, what is the monetary regime of the United States? How do we characterize it? What are its effects?

A governmental precommitment to a particular inflation rate—of 0 percent, of 15 percent, or any other number—is politically easy to uphold in an economy that already has a long history of monetary stability around the inflation rate in question. To decide for such a number in today's situation will, as we have emphasized, have great redistributive consequences. In addition, such a move is fraught with risks of unknown magnitude in that we cannot predict with much confidence what would be the consequences for various industries and for aggregate employment of an unanticipated return to monetary stability. Consequently, it is more convenient not to decide today.

This refusal, each day, to decide today is the basic feature of our present monetary regime. In order to have a label for it, I will refer to it as the Random Walk Monetary Standard (RWMS), al-

though it is not as neat and tidy a money supply process as a random walk in the technical statistical sense.

Under the RWMS, the policy-making authorities decide one period at a time whether to accelerate, keep constant, or decelerate the rate of money stock growth. Only current economic conditions and immediate political pressures are taken into account in making the decision. It is not constrained by concern with a more distant future. What the rate of money stock growth is going to be at future dates will not even be discussed until the last minute—and then chosen on the basis of what seems most pleasant and convenient under the exigencies of that moment to those who happen to be in charge. Short run discretion is maximized. It is constantly exercised. The result is not a rational system.

If we look ahead only one "period" at a time, RWMS theory does not seem to introduce anything new. Unanticipated monetary policy will, in familiar fashion, cause rates of output and employment to diverge from "natural" activity levels. But it is not obvious that monetary policy over the next six or twelve months is harder to anticipate today than it was twenty years ago.

What is harder to anticipate is the cumulative effects of random walk monetary management over several periods. The 1981 price-level may not have looked much more uncertain in 1980, than the 1961 price-level did in 1960. But in 1960, reasonable people thought the 1970 price level could be predicted within reasonable bounds. In 1980, the apparent variance on the 1990 price level was so enormous that prediction could only be a joke. Under a RWMS, the uncertainty attaching to future price-levels increases rapidly as one tries to look further into the future. It is especially the longer-term commitments of the private sector that will be adversely affected by the refusal of the monetary authorities to precommit themselves over the longer run.

The effects of the RWMS will have to be analyzed elsewhere. Here I can only assert and enumerate. Real earnings on the existing capital stock will be depressed in a RW inflation. The real rate of profit in prospect on new investment will fall commensurably. Hence, aggregate (non-housing) investment will be reduced under RWMS conditions. It will also be less efficiently allocated. The fall in investment should not be expected to have the "Keynesian" effect of decreased employment, for RW inflation will reduce net financial saving by households even more. Real rates of return available to households (outside the real estate sector) will be significantly depressed. Short term real rates are, indeed, likely to be negative in a RW steady state. There will be over-investment in housing and other real estate but accumulation of wealth in forms that directly or indirectly finance American industry will be reduced. Productivity performance will be poor. It all adds up to disappointing economic growth.

Short term price expectations may, indeed, be tied to current money stock growth in roughly the manner portrayed by the "New Classical" economics. Current resource allocation decisions spanning several such short runs will be governed, however, by expectations about the behavior of the price level over longer periods. These longer term expectations are likely to show considerable dispersion (with adverse consequences for the productivity of the

economy). Furthermore, we can hardly expect them to be well-behaved in some average sense.

The reasons why expectations are unlikely to be well-behaved are that the monetary authorities themselves are neither sufficiently well-behaved nor, so to speak, ill-mannered enough. If the monetary authorities make a believable longer-term pre-commitment, obviously, longer-term price expectations are going to reflect that fact. The trouble is that, when they refuse to do so, they also refuse to go all the way to the other extreme. If accelerations and decelerations of money growth were indeed picked by a truly random device, then everyone would soon learn to form expectations in accordance with the corresponding statistical theory. The Drunkard's Walk of the statistician, however, requires someone who is very drunk. The RW monetary regime resembles more the Progress of some Garrulous Inebriate. His next step is not purely random, for his intentions have some bearing on it. For the same reason, it makes some sense to listen to his pronouncements: "Just one more for the road." "I'm going home." "Tomorrow, or next week, I'll swear off the stuff." But it is reasonable for rational observers to form very different opinions about his likely progress from such evidence. The macroeconomic policy analyst is not going to find these opinions tractable in his model.

9. The random walk monetary regime depresses economic growth, both by reducing capital accumulation and by slowing down productivity increases. It will also exacerbate social tensions and undermine popular confidence in inherited political institutions and social arrangements. The last decade and a half of monetary mismanagement, in my opinion, has been a self-imposed disaster for the United States the dimensions of which most American economists have only begun to recognize.

The present task, therefore, is not just one of bringing down the current inflation rate. It is Monetary Reform. The tactics of reducing the inflation rate should be planned as part of a strategy to end the Random Walk monetary regime. If we can find a way back to monetary stability, the policy-maker's predicament over price-expectations should be reduced to manageable proportions.

STATEMENT OF BENNETT T. McCALLUM*

THE ROLE OF EXPECTATIONS IN ECONOMICS: AN ESSAY

The purpose of this essay is to discuss several issues raised by the increased emphasis on the role of expectations that has been a feature of economic policy analysis and pronouncement under the new Reagan Administration. Most of the essay consists of responses to questions posed by the Joint Economic Committee. I have not attempted, however, to reply to all of the questions provided. Instead, I have selected some that seemed to be of particular importance and some others to which my answers may reflect a viewpoint that differs from those of other respondents.

Question 1 asks about the importance of expectations in economic theory, in existing econometric models, and in real life. In my opinion, expectations are crucially important in successful economic analysis—both theoretical and econometric—precisely because they are important in actual economic behavior (“in real life”). After all, the purpose of economic theory and of econometric models is to provide guidance to the ways in which actual economies will respond to postulated changes in external conditions, so expectations will be important in these analytical contexts if (and only if) they are in reality.

To document the importance of expectations in the actual U.S. economy would be impossible in a brief discussion of the present sort. One piece of evidence may, nevertheless, be worth mentioning briefly. During recent weeks—May and June of 1981—interest rates have been extremely high by historical standards. The demand for many types of loans has remained relatively brisk, however, prompting some commentators to conclude that the behavior of loan demanders and suppliers must be different than in the past—financial markets “don’t work like they used to.” But recognition of expectations reminds us that it is the *real* rate of interest on any loan—the “nominal” stated rate less the rate of inflation expected to prevail over the life of the loan—that is relevant for supply and demand decisions. It is likely that many participants in financial markets have not been convinced that the new administration will succeed in quickly reducing inflation. Consequently, the expected-inflation component of nominal rates has been high, so these rates have not indicated that real rates have been exceptionally high.¹ Thus the evidence does not imply that any mysterious change in financial market behavior has taken place.

The point of the previous example is, of course, that one cannot even begin to analyze financial market conditions sensibly without

*Professor of economics, Carnegie-Mellon University, and research associate, National Bureau of Economic Research.

¹This is not to deny that real rates may have been unusually high during a portion of the period. But they have not been nearly as high as the nominal rates, uncorrected for expectations of inflation, would suggest.

taking account of expectations. Failure to do so can lead to serious mistakes on the part of analysts or of policy makers.

All of this might induce some readers to ask why, if expectations are so important, economic analysis has only recently begun to accord them a central role. My response to this question would come in two parts. First, dynamic economic analysis has actually assigned great importance to expectations since the 1930's.² What has changed in that regard is the dominant hypothesis about the way in which expectations are formed. Specifically, until the 1970's the usual procedure relied upon rule-of-thumb formulas relating expectations of a variable to its own past actual values. Recently, however, most leading economic theorists have become persuaded that a different and superior procedure is provided by the hypothesis of rational expectations. The basic idea is simply that economic agents (firms, households, labor unions, etc.) will be hindered in accomplishing their aims by expectational errors. Thus these agents will typically utilize more information than only the history of a single variable and, generally, will seek to eliminate sources of error. The hypothesis presumes that, while specific expectational errors may be large, systematic sources of error are successfully eliminated. Thus agents' expectational errors are not systematically related to data available at the time of expectation formation. This new hypothesis has drastic implications for policy because it suggests that any change in policy will shortly be recognized by private agents and that their expectations will take such changes into account. Thus expectations can change much more quickly than was possible under the previous rule-of-thumb hypothesis, which related them immutably to past values of the variable in question. It is this possibility for rapid changes in expectations that is new, that poses problems for econometric model builders, and offers opportunities to policy makers.³

Question 3 asks about the measurement of expectations and adequacy of existing data. It is tempting to think that existing controversies and uncertainties exist largely because of data inadequacies which might be eliminated by a feasible (if, perhaps, expensive) program of data acquisition. More and better surveys could, it might be thought, determine what households' and firms' expectations are like on a regular basis.

But this belief seems likely to be mistaken. What is relevant for economics is the way in which views of the future affect the supply and demand decisions of firms and households, not the answers given by firms and households to questions posed by interviewers. In making their supply-demand decisions, typical private agents take account of expected future developments but do not necessarily develop explicit expectations, i.e., magnitudes of variables expected to prevail in the future. Thus there are no record sheets to which agents can turn for answers to questions posed by surveys and nothing to induce conformance between "actual" and reported

² See, for example, the most important treatise of the pre-war period: J. R. Hicks, "Value and Capital" (Oxford: University Press, 1939). Expectations are also mentioned frequently and prominently in J. M. Keynes, "The General Theory of Employment, Interest and Money" (New York: Harcourt, Brace, and World, 1936).

³ Two recent collections focussing on the topic of rational expectations are S. Fischer (ed.), "Rational Expectations and Economic Policy" (Chicago: University of Chicago Press for N.B.E.R., 1980) and "Journal of Money, Credit, and Banking," Vol. 12, No. 4, Part 2 (November 1980).

expectations. There is, after all, no financial reward to agents for accuracy in replies to survey questionnaires. Responses to surveys may then provide a very poor indication of the actual implicit expectations that guide supply and demand decisions. Consequently, there is reason to be skeptical of the value of existing survey information regarding expectations and to be doubtful that additional data would do much to settle outstanding issues.

It should be stressed, parenthetically, that there is nothing inconsistent about an argument that assigns expectations a central role and yet claims that agents may be unable to provide accurate answers to questions concerning their expectations. In fact there is no inconsistency even if the argument presumes that expectations are formed rationally, i.e., without systematic errors. The essential point is that expectational theories suggest that agents act as if they formed explicit expectations according to some criterion such as rationality. But these theories do not imply that agents are explicitly aware of their expectational magnitudes any more than traditional economic theory implies that firms explicitly aware of their marginal revenue and marginal cost functions at each moment of time. Sophomore students of economic principles learn that businessmen may be able to operate their firms in a profit-maximizing manner without ever summarizing their choices in a way that directly or clearly involves the economist's concepts of marginal cost and marginal revenue. Similarly, dynamic profit or utility maximization may be accomplished by firms or households that do not summarize their ideas in forms analogous to the expectational variables that economists find useful and crucial in their models.

Question 4 asks whether expectations are formed primarily in response to past occurrences or to beliefs about future policies and developments. In this question the alternatives are not well-posed. Expectations must, simply by definition, refer to beliefs about future policies and developments. But these beliefs may themselves be formed, at least ordinarily, in response to past occurrences.

What is actually at issue, I believe, is whether distributed-lag expressions in existing econometric models in fact reflect expectations or instead the effects of "inertia." Consider, for example, a Phillips-curve relationship between inflation and unemployment of the form

$$\Delta p_t = \alpha_0 + \alpha_1 u_{t-1} + \Delta p_{t-1} + \xi_t$$

where Δp_t is the change in the logarithm of the price level between periods $t-1$ and t (i.e., the inflation rate), u_t is the unemployment rate in period t , and ξ_t is a purely random disturbance.⁴ In this formulation Δp_{t-1} might appear as an explanatory variable either because the economist formulating the relation believes that Δp_{t-1} is a reasonably good measure of the expected inflation rate (the value of Δp_t expected earlier, in period $t-1$) or simply because, for reasons alien to neoclassical economic analysis, current inflation rates are directly and immutably related to past inflation rates. These are, of course, quite different hypotheses and have sharply different implications relevant to monetary and fiscal policy issues.

⁴ Here is the distributed lag in the degenerate form which involves only a single period of time, i.e., $\Delta p_{t-1} = \omega_1 \Delta p_{t-1} + \omega_2 \Delta p_{t-2} + \dots$ with $\omega_1 = 1.0$ and $\omega_2 = \omega_3 = \dots = 0$.

Specifically, inflation can be ended with much lower cost (in terms of increased unemployment) if the expectational interpretation is correct.

It would, clearly, be desirable to know which of these two hypotheses is in fact applicable to the U.S. economy. Unfortunately, however, it is exceedingly difficult to distinguish between them empirically. The reason for this difficulty is simple: as our foregoing example illustrates, the hypotheses can lead to identical representations in terms of the equations of an econometric model—they can fit the data equally well. Consequently, standard econometric tests are not capable of distinguishing between the hypotheses.

A few investigators have attempted to overcome this difficulty by using survey data on expectations, instead of representing expectations in terms of their observable determinants (as is done in the example above). But the weaknesses of survey data that were described in connection with Question 3 make any such test attempt dubious in the extreme.

Given this situation, the most satisfactory (or least unsatisfactory) approach seems to be to rely upon standard economic reasoning rather than empirical investigation. Doing so leads to the conclusion that the expectational hypothesis is more plausible than the one involving "inertia." Indeed, the latter flies in the face of the fundamental notion that "sunk costs" cannot rationally affect current behavior. In particular, parties to any bargain desire to make an agreement that is best individually in terms of its present and future consequences. It is difficult to see how the basic possibilities, relevant to these consequences, can be affected by price changes that may have occurred in the past.

Question 9 concerns the "dispersion of expectations"—i.e., the notion that different agents may have different opinions concerning the future. The question asks whether the existence of this dispersion is important, whether it is adequately accounted for in econometric models, and whether it is constant or variable over time.

Whether the dispersion of expectations is analytically significant will depend, it would seem, on the issues at hand. For example, in an analysis designed to investigate the volume of trading in a stock exchange or other market in existing assets, it will be important to take account of expectational differences. But for issues involving the main variables of macroeconomic concern—inflation and aggregate output or unemployment rates—it is unclear that the existence of a dispersion in expectations is significant. To put this matter into perspective, it should be kept in mind that macroeconomics is aggregate by its very nature. Thus the use of macroeconomic models presumes that differences across consumers or across firms are not crucial—that the existence of individuals with above-average amounts of some resource or characteristic will be offset by the existence of other individuals with below-average amounts of that resource or characteristic. The hope is that such distributional matters are not important for the understanding of issues involving inflation, unemployment, and aggregate output. This hope may be in vain, but the prevalence of macroeconomic discussion indicates that many analysts believe it is not.

From the foregoing point of view, the relevant issue is whether it is more dangerous to ignore the dispersion across agents of expectations than it is to ignore the dispersion of a host of other variables or characteristics. I know of no obvious reason for believing that the dispersion of expectations should be particularly important, and would myself play down this possibility. But the main point I wish to make is simply that the issue at hand is one involving distributional effects, which are typically considered to be unimportant in macroeconomic analysis.

In conclusion, and in response to the opportunity provided by Question 10, I would like to discuss a point directly relevant to recent debates concerning the Reagan Administration's macroeconomic policy proposals. The point involves a distinction—the distinction between conditional and unconditional forecasts—that is crucial in understanding the use of econometric models for policy purposes but which has been neglected in many discussions.

All prominent, existing, large-scale macroeconomic models (e.g., those of DRI, Wharton, Chase, etc.) were designed and formulated before the insights of the rational expectations hypothesis had been widely appreciated. As a result, those models treat expectational behavior in the inadequate rule-of-thumb manner mentioned above. In fact, in various places most of them fail to distinguish between expectational and "inertia" effects as discussed with regard to Question 4. Consequently, it is widely agreed among macroeconomics specialists that these models do not accurately depict the way in which agents form expectations or the way in which their supplies and demands will respond to various policy measures. In particular, it is widely agreed that these models are incapable of doing a good job of conditional forecasting—forecasting conditional upon various assumptions regarding governmental policy. Consequently, any significant change in policy will lead to changes in agents' supply-demand behavior that will not be reflected in the equations of the models. So the effects of policy changes will be poorly predicted by these existing large-scale econometric models. The prediction errors, moreover, will not be random—the models' forecasts will be systematically incorrect.

Nevertheless, these models have been used in recent months to predict the effects of various policy proposals put forth by the Reagan Administration. And an attempt to justify this seemingly inappropriate usage has been made by some knowledgeable economists.⁵ The argument proceeds in two parts. First, some quantitative model or models must of necessity be used to obtain numerical predictions for planning purposes, budget documents, etc. Models which attempt to take account of the difficulties described above are now in their infancy; there is none that has been used or tested extensively. Second, existing large-scale models can, despite their weaknesses, do a creditable job of unconditional forecasting—of forecasting what will in fact happen under a given policy regime. Consequently, these models can be useful in predicting magnitudes of inflation rates, budget deficits, etc., provided that the policy to be followed is not markedly different from the one in force when the model was designed and estimated. So, the argument concludes,

⁵ See, for example, the generally thoughtful and perceptive article by Robert J. Shiller in the *New York Times* of April 7, 1981, p. A-19.

the best that can be done is to use these models and hope that the policies being studied are not so different from those of the past as to make the models' forecasts misleading.

But, as may be clear from the foregoing description, that position justifies the use of these existing models to study the advisability of Reagan Administration proposals only under the maintained presumption that the implied policy is essentially the same as that of the past. Both the Administration and its critics agree, however, that the proposals amount to a substantial change in direction in terms of both fiscal and monetary policies. So the justification described above for the use of existing models is simply inapplicable. One cannot accurately predict the effects of a major policy change using an analytical tool that is valid only if there is no policy change!

The upshot of this discussion is that the major existing econometric models cannot reasonably be used to predict the effects of any significant changes in policy proposed by the current administration. The development of econometric models that are specifically designed to avoid the weaknesses mentioned above would accordingly seem to be an important matter.⁶ Such models will need to take explicit account of expectations and should incorporate the hypothesis that expectations of private agents are formed in a manner that is consistent with their own self-interest; that is, that expectations are rational.

⁶ A number of important pioneering attempts are included in the following collection: Robert E. Lucas, Jr., and Thomas J. Sargent (eds.), "Rational Expectations and Econometric Practice" (Minneapolis: University of Minnesota Press, 1981). A brief discussion of some of the issues appears in Bennett T. McCallum, "Topics Concerning the Formulation, Estimation, and Use of Macroeconomic Models with Rational Expectations," American Statistical Association 1979 Proceedings of the Business and Economic Statistics Section, pp. 65-72.

STATEMENT OF ROBERT EISNER*

EXPECTATIONS IN ECONOMICS

1. Man is forward looking. Expectations of the future and of the consequences of current actions are hence critical in economic behavior.

That said, we cannot make of expectations a *Deus ex machina*. We cannot assume that policies with no sound basis in fact will be effective because they will generate "favorable" expectations.

(a) Since economic behavior is forward looking, economic theory cannot ignore expectations. It is important, however, that economic theory recognize the critical information gaps which make it difficult in most situations to form firm, knowledgeable expectations either of the future or the consequences of current action. Economic theory that presumes people do know the future or that they act as if the future will be determined according to a particular economist's model is *Hamlet* without his mother, uncle and murdered father. What economic behavior in a market economy is all about is precisely decision-making under imperfect information and uncertainty.

(b) Existing empirical econometric models largely ignore expectations and are in this sense seriously defective. Structural or behavioral relations are estimated among past and current variables. These relations may prove robust up to a point, as long as people, lacking firm knowledge about the future, act as if "tomorrow" will be like today. People certainly do behave this way much of the time, for lack of a better alternative. But when conditions or policies change so that it becomes clear tomorrow will not be like today, the behavioral relations estimated when people presumed otherwise are likely no longer to prove accurate.

What is worse, if over periods of time the relation between current and expected future variables changes, the proxy or "reduced form" relations involving current variables will themselves prove biased and shifting. Changes in the rate of interest, taxes, income and prices will all have different implications for behavior if they are expected to persist in the future than if they are expected to be temporary or transitory.

Econometric estimates of responses of consumption, saving and capital formation to such changes will then depend critically upon how these changes during the period of estimation were perceived to be related to the future.

Econometric models can in principle be improved and should be improved by taking explicit account of the role of expectations. They are likely to be made worse rather than better, however, by the introduction of arbitrary assumptions about the formation of expectations, introduced primarily to serve the ideological preferences of model-makers or their sponsors.

* William R. Kenan Professor of Economics, Northwestern University.

2. (a) Expectations are particularly significant with regard to tax policies. If personal income taxes are changed only temporarily, as in the Vietnam war tax surcharge of 1968, the effects on spending are likely to be considerably less than for permanent tax changes. Individuals can be expected to be sufficiently forward looking so that their consumption spending (and saving) is based upon more than current income. Until a change in after-tax income induced by a change in taxes is perceived to be lasting, the effects on consumer spending may be relatively small.

Other kinds of tax changes than those on income can, however, have more substantial effects upon spending if they are temporary. In particular, for example, the temporary removal of an excise tax, as on automobiles, may induce purchases now before the tax is reimposed.

Government spending for goods and services is more likely to have an immediate impact on output regardless of expectations. Businesses will produce what government is buying. If future spending is uncertain, though, long term commitments such as capital formation to produce the government-demanded output, may be delayed.

Government spending in the way of transfer payments may more generally be viewed as negative taxes, with expectations similarly significant. Thus a temporary increase or decrease in government transfer payments would be expected to have distinctly lesser effect upon spending than a long run or permanent increase. The extent to which individuals can or are likely to moderate their responses to short-term changes in taxes or spending will depend on the extent of their accumulated savings or ability to borrow. My own view, nevertheless, is that unless changes in income taxes or government transfer payments are viewed as long run or permanent their effects upon economic behavior will be modest.

I have put all of this in terms of individual responses in the thought that individuals act much more on the basis of their own experience than the expectations which economists may say they should have. I have little confidence in broad generalizations that individuals will adjust their spending or pricing policies on the basis of presumptions that government spending or tax cuts, for example, will be inflationary. They will react to their perceptions of inflation, but these will relate to their own experience rather than an a priori view of the consequences of particular policies.

(b) Expectations are clearly vital in responses to monetary policy, at least in financial markets. In holding, selling or buying securities one must be vitally concerned with future monetary policy and future interest rates. Responses to any current movement in policy must then depend critically on what expectations it generates with respect to future policy.

(c) Aside from government tax and spending policy, consumption and saving decisions will relate to expected future incomes and expected price movements. The higher are expected future incomes, the more will be consumed now and hence the less will be saved now. The higher are expected future incomes and prices relative to the present, the more will be consumed now to take advantage of lower current prices unless interest rates have risen to fully reflect the difference between current and expected future

prices. If prices are expected to rise more in the future than money incomes, thus reducing real incomes, current consumption may well fall, thus raising current saving.

(d) Expectations of the future should again prove vital in decisions to undertake capital formation. It is important to recognize though what expectations will prove decisive and the extent to which lack of knowledge of the future causes firms to some considerable extent to operate by the rule of thumb that tomorrow will be like today. Of dominant importance in capital formation decisions are expectations of future demand. There is no point to acquiring additional capital if nobody will buy the output which it will produce.

Capital formation will be influenced essentially by the expected profitability of investment. This is quite different from both current and expected profits. Profit-maximizing firms will undertake capital formation not because they are enjoying or expect to enjoy high profits but because the additional capital will add to whatever profits they are earning or even merely because the additional capital will reduce their losses. Tax changes can be expected to influence capital formation, therefore, to the extent that they make capital formation more profitable or make current capital formation more profitable relative to future capital formation, but not merely because they leave firms with higher profits regardless of whether or not they do invest more.

(e) Expectations will be important in work-leisure decisions if only because individuals will, to the extent they can, plan for a future with an optimal combination of work and leisure, taking into account the need for income from work as well as the time to enjoy the income. Expectations of more income in the future may reduce the pressure for current work. How much work-leisure decisions are in fact affected by the uncertain expectations which may be held remains a somewhat unsettled empirical issue.

(f)(g) Labor market settlements and pricing decisions will also be influenced in principle by expectations of the future. Lacking firm knowledge of the future, most workers, unions and firms are likely to make their decisions to considerable extent on the basis of the current situation.

(h) Financial markets, in principle most forward looking and affected by expectations, in practice prove fairly mercurial. This relates to the precariousness of many expectations, based as they are on inadequate and changing information.

(i) Similar considerations appear to apply to foreign exchange markets, as exchange rates vary widely with little apparent change in the underlying economic situations which determine their equilibrium values.

3. It is very difficult to measure relevant expectations by asking people what they expect. Expectations of the future are revealed implicitly by current behavior. My work in analyzing McGraw-Hill survey data, with regard to sales change expectations, indicated that business respondents are much better at anticipating their changes relative to those of other firms than at estimating their absolute amounts. Firms in growing industries anticipate correctly that their sales will rise more than those of firms in stable or

declining industries. But none do particularly well in anticipating the economy as a whole or the averages for all firms.

Nevertheless, data should be gathered, both with regard to explicit statements of expectations and those implicitly revealed by current economic behavior. And despite the current vogue of reducing the role of government, it would seem that this is an area where government enterprise is essential. There is no advantage to individual firms in giving information. Yet they may all profit from the dissemination of information once gathered. The fullest measures of expectations should prove useful in business and other enterprise decision-making as well as in the formulation of government policy.

4. Substantial knowledge of future policies and developments will clearly influence expectations. Commitments of the Reagan Administration to make increases in military expenditures clearly have their effects upon the value of stocks in defense-oriented firms. Uncertainty as to the future forces most individuals and firms to make their decisions and implicitly to form their expectations on the basis of past and current events. Who, after all can be certain of the fate of the MX missile or the future price of oil?

I view public expectations as much more pragmatic and ideological. Repeated assertions that reduced government spending, for example, will reduce the rate of inflation have more political effect than influence on public expectations of inflation. If oil prices come down (or fail to resume a significant rate of increase) inflation will slow and as the public perceives inflation slowing its expectations of inflation will slow. Markets can be fairly impervious to politics.

Thus, repeated statements by spokesmen for the Federal Reserve Board and the Administration that tight money will lower interest rates by lowering public expectations about inflation have little effect. If money is tight, interest rates will be high. The persistence of high current rates of interest generates, increasingly, expectations that interest rates will stay high. These expectations then become embedded as determinants of long term interest rates. Expectations are affected by results, not public pronouncements as to what they should be.

5. My view of the effects of current and proposed economic policies is that they will be far less in the aggregate, for good or for evil, than indicated by many of their proponents or opponents. There will be sizeable effects, though, on the distribution of income and economic well-being.

The much vaunted budget changes are likely on balance to have relatively minor effect on total output and the rate of inflation. The major cuts in government transfer payments will tend to hurt the poor and some lower-income working households but will not entail reductions in total spending in excess of the increases in government spending for the military and in private spending induced by tax cuts. The proposed tax cuts will be of major benefit to upper income groups but will do little more than counterbalance, and frequently less than counterbalance, increases in taxes resulting from inflationary bracket creep and social security contributions among lower and middle-income groups.

6. I do not share the view that the tax cuts proposed by the Administration are likely in themselves to be inflationary. They

are not that much in excess of inflation and other tax increases just mentioned and I do not, in any event, view the current inflation as stemming from excess demand. There is enough slack in the economy so that modest increases in demand induced by tax cuts need not and should not add to inflation.

Proposed increases in military expenditures are likely to prove inflationary, not merely because of their substantial amount, but because of their tendency to concentrate surges in demand on relatively scarce labor and materials in particular sectors of the economy. These will not be mitigated by cuts in government expenditures which will tend to be much more for transfer payments, rather than goods and services.

With regard to inflation, much will depend upon the commitment of the Administration and the Congress to elimination of inflationary government actions. A purported Administration promise to accept higher sugar price supports to buy congressional votes for budget cuts does not augur well. American pressure inducing the Japanese to reduce automobile exports to us is already having the substantial expected effect in raising car prices to the American buyer. A slowdown in trucking deregulation reportedly suggested by the new nominee for head of the Interstate Commerce Commission is also likely to prove inflationary.

Tight money policies will keep current interest rates high, restrict investment particularly in housing and cause special hardship for those without easy access to a broad variety of financial markets.

The proposed business tax cuts will do little for business investment. To the extent that the huge Treasury revenue losses of immediate action force a phase-in, either of 15-10-5-3 or of the equipment expensing proposed by the Ways and Means Committee, some business investment may actually be delayed. There may be substantial effects though in the way of changing the mix of investment in the direction of that with the greatest tax advantage. There will also be substantial income distribution effects as between various kinds of investment and firms, with substantial gains to those adept at the development and use of tax shelters. Similarly, new tax preferences or exemptions for particular kinds of saving are likely to have much more effect in changing the pattern of saving and the kinds of institutions and funds in which saving takes place than in affecting its total amount.

I base these views on economic analysis, substantial work with investment functions, some study of consumption and saving functions, and analysis of major econometric models as well as observation of current data.

7. Tax and spending policies are inevitably enacted for several years into the future, whether their effects on expectations are favorable or not. The question is what kind of policies will be enacted.

Military spending programs, for example, have very long lives. Once initiated they tend to grow and grow over many years.

If tax cuts are not now legislated for several years ahead, taxes will automatically resume their rise as a proportion of gross national product because of normal growth and primarily because of

inflation. Hence to cut taxes for only one year is to precommit new higher taxes later.

The issue of tax and spending policies for several years would seem to relate more to basic political philosophy and the distribution of income than to macroeconomic considerations. A precommitment of future tax cuts increases the political pressure for cuts in government spending in the future. Since apparently the cuts in government spending will not be in the military, the issue comes down to the size of government domestic programs and transfer payments for social security, medical services, education, manpower training, mass transit, and the like.

Similarly, the argument about monetary policy is not properly essentially one of effects on expectations. Those that retain the view that the economy must be slowed down to reduce inflation support efforts for a persistent, tight monetary policy along with budgetary restraint. To many, including myself, these policies if "successful" will create considerable unemployment and loss of output with only minor and substantially delayed effects upon inflation. In some instances, as with higher interest costs and higher costs of food and transportation as government subsidies are removed, effects on inflation may even be perverse.

There are generally advantages to setting policies on a relatively long term basis, while retaining flexibility to adjust prudently to changed circumstances. Despite the rhetoric, I doubt that the current issue is really one of long-term stability in policy versus short-term flexibility. The issues really are those of what the policy should be. Should we change the tax and transfer system in the direction of favoring upper income groups at the expense of those with lower and even middle incomes? Should we increase military programs at the expense of non-military programs? Should we aim to reduce inflation by cutting income after taxes and transfer payments while raising after-tax income of the rich? Should we cut business taxes by relatively neutral cuts in individual and corporate tax rates or by changes in "capital recovery" or depreciation which give particularly large tax reductions to capital-intensive firms? I find it hard to believe that any of this has much to do with general expectations.

8. (a) The effects of single or multi-year cuts on work effort are ambiguous and, whatever their direction, *de minimis*. The one place where marginal tax rates are in fact so high as to have major effects on work effort is at the bottom of the income scale, particularly among those enjoying government transfer payments. Here the combination of income-based welfare payments, medicaid, low-rent housing, payroll taxes, expenses related to work, and child care and other costs is such that the effective marginal "tax" on working is often over 100 percent. The cuts under consideration do virtually nothing to lower that rate and the reductions in transfer payments actually tend to make the high marginal rate applicable at even lower incomes.

As far as middle and upper income groups go, it is highly implausible that lowering tax rates will induce more work. How many \$50,000 a year executives will work harder because their tax rates are reduced? As economic analysis, regardless of point of view, has made clear for many years, the effects of higher returns

on work effort are ambiguous. A lower tax rate would generate more work via its substitution effect as a consequence of the higher after-tax cost of each hour of non-working leisure. A lower tax rate also has an income effect, however, which runs in the opposite direction. With higher after-tax income per hour of work, individuals or households can afford to work less and enjoy more leisure.

It is argued, for example, that because of high marginal tax rates, it may not pay women to leave the home and take a job. But in fact, of course, there has been a dramatic increase in female labor force participation in recent years. That could be encouraged by lower real after-tax incomes which induced families to have more than one income-earner in order to make ends meet.

Quite similar arguments apply to saving. Again there is a substitution effect and an income effect. Greater after-tax rate of return to saving will create a substitution effect in favor of saving. It will pay people to lower current consumption in order to enjoy more consumption in the future as the higher after-tax return makes more future consumption possible for each dollar of reduced current consumption. But for the bulk of households with positive savings or planning to save for their future retirement, higher after-tax return on saving generates an income effect which makes less saving necessary to accumulate the wealth desired for the future.

In the face of these ambiguities, the question of single-year or multiyear tax cuts has little impact. It is hard to believe that there are many individuals who will plan to work less now in anticipation of the higher after-tax return to future-year work when taxes are further reduced.

The whole notion of the currently proposed tax cuts substantially increasing work effort can best be described as wishful thinking or, less charitably, as ideological dogma.

The view that tax cuts will raise saving suffers from a further elementary confusion. Lower taxes will by definition increase conventionally defined private saving, which is income minus taxes minus consumption. But since the lower taxes must also, by accounting definition, increase the government debt, it becomes clear that any increase in private saving will merely be "invested" in increased government debt, or that there will be less public saving, with no effect on the presumed ultimate object of capital formation. But further, as lower taxes raise after-tax income they will tend to increase consumption

Then, if total income and output in the economy are not increased, the increase in consumption will in fact imply lower saving. Saving indeed will only increase if, contrary to the presumed scenario, the lower taxes bring about more consumption and more output.

(b) As to short-run deviations from previously announced monetary growth targets, these may be viewed as insignificant, they may be viewed as changes in the targets or they may be viewed as deviations which the Federal Reserve will shortly correct. All possibilities are plausible. Market reactions will indicate in any period which perception dominates. It would appear that recently deviations have been generally viewed as subject to short-term correction. Hence, when the deviation has been positive, interest rates

have risen as the market has generally anticipated that the target is not being changed and that monetary growth will be reduced to get back to target path. Since the reduction in monetary growth can be expected to raise interest rates, they rise immediately in anticipation of this increase.

This view is currently particularly plausible because the nature of Federal Reserve controls, including the currently lagged reserve requirements, is such that the Fed is unable to control even its targeted aggregates in the short run. Thus, lacking an indication that the targets have changed, it is most plausible to view any short run deviation as unintentional and subject to correction. In fact, the way the Federal Reserve operates with lagged reserve requirements and a fairly open discount window, the demand for money tends to create the supply. Once the Fed observes that the demand and supply have increased, it takes further measures to reduce supply. Even these actions do not control important broader measures of the supply of money and credit.

9. There is indeed a dispersion of expectations about inflation and other aspects of the course of the economy. This is important. It is an essential part of the real world of costly information and uncertain expectations. With the lack of information and uncertainty comes dispersion.

Data about the dispersion are not readily available. That views differ is evidenced, if by nothing else, by the volume of transactions. When some are selling and some are buying securities or titles to futures, views in many cases clearly differ.

While this dispersion is generally not adequately accounted for in econometric models, models would be much worse if in an attempt to provide "rational expectations," the reality of the dispersion is explicitly ruled out.

There is probably little reason to believe that the dispersion is stable. Its variability may be expected to be a function of the changes taking place in the economy but its exact determinants surely require empirical investigation.

10. Discussions of expectations have a way of focusing on market variables, particularly those that are financial and related to business decision-making. Of vast importance, however, are expectations regarding essentially non-market phenomena, such as the length and quality of life and the returns from investment in human capital. Current policies and discussion might with great profit return to these considerations.

Adequate training programs for the young might cause vastly different expectations of the return from work and hence influence work effort decisively. Subsidies to employment, as opposed to subsidies for the acquisition of physical capital, would change expectations as to relative return from factors traditionally labeled as labor and capital. Expectations of stable and assured labor income would cause profound differences in patterns of consumption and saving. They might raise the total amount of capital formation, broadly defined, increase the efficiency and productivity of its allocation and most importantly contribute to the growth of output and economic welfare.

STATEMENT OF LAWRENCE R. KLEIN*

1.(a) Expectations are very important in all phases of economic analysis, no less in theoretical economics than elsewhere. Economic theory is based on individual decision making, and individuals base their decisions on their own perceptions of what is to be taking place at the time economic actions occur—this obviously involves expectations. Most economic decisions are spread over a time span that necessitates looking ahead. The natural way to theorize about looking ahead is to introduce expectations.

(b) Expectations play a very strong role in existing empirical econometric models. Speaking for the Wharton Models, I can say, with some authority, that they are based on theoretical specifications of economic relationships. Since economic theory is based on expectations, so are econometric models.

(c) The main objective of econometric model building is to portray realistic economic life, up to an approximation. Since models are based on theoretical specifications and since economic theory is based on expectations, it follows that the realistic life of the economy, portrayed in models, is thought to be based on expectations. People do seem to follow their expectations about prices, interest rates, personal economic prospects, and other forward economic factors. The daily turnover volume on futures markets are striking examples of the involvement of expectations in real life.

It is utterly false that forecasts and policy analysis based on econometric models have, in recent years, failed to keep pace with the increasing role of expectations in economic theory. Econometric model building has consistently been on the cutting edge of new developments in economics. Econometric model builders are the creators of new frontiers in economic thinking. From the late 1940's, when the present generation of models was first being developed, expectations played a key role in the formulation of model structure.¹ To a large extent, expectations extend model structure through lag distributions, and this has taken a significant line of development, but the most powerful use of expectations occurs in model development through the use of sample survey information. We model builders are both realistic and theoretical; therefore, we do engage in speculative analysis about how people might behave or ought to behave under some stylized conditions. We try to represent people as they do behave. Accordingly, where expected values are wanted in econometric models, we go right to the source and measure these expectations by tabulating answers to questions posed to economic actors in sample surveys. We have used indexes

*Chairman professional board, Wharton Econometric Forecasting Associates, Inc., Benjamin Franklin Professor of Economics and Finance, University of Pennsylvania; and Nobel Laureate in Economics, 1980.

¹ See L.R. Klein, "Economic Fluctuations in the United States 1921-1941" (N.Y.: John Wiley, 1950).

See also the reference by B. Friedman, where the modern exponents of rational expectations were reminded of this doctrinal point, "After the Phillips Curve. Persistence of High Inflation and High Unemployment," (Boston: Federal Reserve Bank of Boston, No. 19), p. 74.

of consumer sentiment, expected purchases, expected income, and expected prices directly in our models. There can be no closer measure of expectations than those held by the people of the economy. The use of such measures has a long history in econometric model building.² We have found, in extensive econometric analysis, that consumer expectations are very interesting to study in the context of econometric model building but that they have not changed our results in a significant way. For a number of years, the Wharton Models were operated in a dual mode, with and without direct measurement of expectations variables. It has been an interesting scholarly experiment to treat consumer expectations as endogenous variables but they have not been decisive for our purposes. We have, therefore, concentrated on the use of business expectations for capital formation, but have not retained consumer expectations in recent generations of Wharton Models. Housing starts, which indicate a form of household and business expectations, are kept in the models. The same is true of business orders. The Wharton Models explain investment expectations, housing starts, and business orders in terms of market determined and other variables, while phasing these forward looking variables into actual economic performance through lag distributions of realization functions.

Given this extensive background of theorizing about and using expectations in econometric models, I can say that forecasting models have fully kept pace with the increasing role of expectations in economic theory. Model builders contributed in a pioneering way to this development, far ahead of those who have recently taken up this line of inquiry. There is no failure and no liability associated with the use of expectations in econometric models.

There is no new approach that looks more promising than our continuing use and scholarly investigation of actual expectations. As more such variables are measured in sample surveys and as we build up longer time series histories of these variables, we can make more intensive investigations of the dynamic lag structure of the associated relationships. This appears to be the most fruitful line of further study.

2. (a) Tax and spending policy affect market prices, income, and general economy performance. People react to their expected values of incomes and market conditions. Consider, for example, the so-called tax rebate of early 1977, when it was widely expected that each tax paying unit would receive a \$50 rebate, as a consequence of the fiscal debate that was then taking place. Regardless of the fact that the tax rebate proposal was never implemented, many people did react in the theoretically deduced way and "spent", to a considerable degree, their expected rebate in advance of its possible time of receipt. It is clear from this example that people did react as expected to the presumed policy change. Income expectations did matter, but these expectations were not formed and acted upon in such a way as to nullify the policy action

² S. Hymans, "Consumer Durable Spending: Explanation and Prediction," *Brookings Papers on Economic Activity* (Washington, D.C.: Brookings Institution, 1970) No. 2.

F. G. Adams and L. R. Klein, "Anticipations Variables in Macro Econometric Models."

F. T. Juster and Paul Wachtel, "Uncertainty, Expectations, and Durable Goods Demand Models."

H. T. Shapiro, "The Index of Consumer Sentiment and Economic Forecasting—A Reappraisal," *Human Behavior in Economic Affairs*, ed by B. Strumpel, et al. (Amsterdam: Elsevier, 1972.)

according to the tenets of the "rational expectations" school of thought.

(b) In many respects the significance of expectations runs along similar lines in response to monetary as well as tax or spending policy. In the case of monetary policy responses, however, there is added significance for portfolio choices, meaning that interest rate and security price expectations are of special significance in this case.

(c) As for decisions to consume and save, they depend on income, interest, and relative price factors, all of which are based on expectations.

(d) Capital formation, like consumer spending and saving decisions, depends on economic factors such as production levels, relative prices, interest rates, and similar indicators of market conditions. But even more than in the case of current spending and saving decisions by households, investment decisions for capital formation have to take a longer look into the future and be stretched out over more planning periods; therefore nearly all the determining factors are strongly influenced by expectations. These expectations are carefully modeled into the expected levels of capital formation in separate industry lines for econometric model construction. This is particularly true in the case of the Wharton Models.

(e) Decisions about work and leisure are based on the same considerations as those shaping decisions to consume and save; therefore the significance of expectations is the same as in 2(c), above.

(f) Wage bargains in labor market settlements are strongly based on expected rates of inflation. There are considerations involved for catching up with past inflation and protecting against future inflation.

(g) The pricing decisions of enterprises are based on their stock, order, and expected demand position. These are all significantly related to expectations about future market conditions.

(h) Expectations in financial markets are, in fact, the expectations involved in response to monetary policy and are already dealt with in 2(b), above.

(i) Foreign exchange markets generally extend the conditions of financial markets to consider the same range of factors as in 2(h), but at an international level; therefore, expectations of world interest rates, world inflation rates, current account balances at home and abroad, and international capital flows are involved. International expectations must supplement those deemed significant in purely domestic analyses.

3. Expectations are formed from the actual data of the performance of the economy, in various dimensions, and are generally available to all. These data can always be improved by being made more available in terms of frequency, historical length, and speed of reporting. Improvements in accuracy are always wanted. But there are all too few data on measured expectations. Those that are available are used, but more sample survey information from improved samples to cover a wider range of expected prices, more details about expected income, more expectations about aspects of peoples' financial conditions, regional expectations, and business

expectations would, of course, strengthen our ability to deal more effectively with expectations in applied economics. I would re-emphasize, however, that there are no better indicators of expectations than the direct measurement of these magnitudes from appropriately designed sample surveys.

4. Expectations are formed on the basis of what people can see happening in the economy, what they are told by authorities about the economy and statutory or legislative actions that bear on the economy. We do not know precisely how expectations are actually formed except by introspection and by studying patterns of expressed expectations as they are discerned from sample inquiries. They are presumably formed according to dynamic relationships.

5. At the present time, we can see consumers slightly improving their expectations about the economy and about their own financial prospects.

6. My own expectations about the effects of current and professed economic policies are determined by my own projections of the Wharton Models. This is not the way that the ordinary citizen gets his information about economic prospects, but it is my way. At the present time, I expect a continuation of modest, but steady gains in real incomes, some reduction in inflationary pressures, and some slight lowering of nominal interest rates.

7. The principal feature of Congressional tax policy or spending policy should be to remain flexible. These decisions are made in the face of a great deal of uncertainty, and flexibility is important in order to adjust for mistakes, as they are perceived. In this respect, I think that Congress would be ill advised to lock themselves in to policies for several future years, all at once. The effect of multi-year decisions by Congress on public expectations is not known, and it is not worth the loss of flexibility to make long term commitments on the basis of weak evidence about possible beneficial effects.

8. (a) The effect of tax rate reductions on work effort is not known with great certainty. From a logical point of view, the effect could go either way. More careful statistical investigation with cleverly designed samples is needed in order to throw more light on these issues. I believe that sample investigations of worker attitudes to tax based income gains are needed. Also, historical data on individual responses to major wage changes and major tax changes is needed. Establishment data on these issues are available and merit immediate intense research investigation to try to establish sound estimates of the relevant effects.

(b) Similar study of responses to the meeting; undershooting; or overshooting of monetary growth targets is needed in order to establish sound estimates of expectation responses. These responses are not presently known, but data do exist or could be designed to throw some light on the matter.

9. Dispersion of expectations and dispersion of response to policy changes are very important phenomena. Economists may speculate about the effects of these dispersions, but very little is known in a concrete way about them. They do, indeed, merit a great deal of research study.

STATEMENT OF STANLEY FISCHER*

EXPECTATIONS IN MACROECONOMICS

1. INTRODUCTION

The importance of expectations in affecting economic decisions has long been recognized, for most economic decisions have future as well as present consequences. The increased attention expectations have received in economics in the last decade is associated primarily with the development of the rational expectations hypothesis of expectations formation. At its simplest and most compelling, the hypothesis says only that individuals' expectations are the best predictions they can make on the basis of the information available and potentially available to them.

Such a general statement does not much narrow the range of expectations formation, because the notion of the best prediction involves the cost of making a forecast. For unimportant decisions about the future, it does not make sense to spend resources obtaining an excessively sophisticated forecast, and the best prediction might be, for instance, that there will be no change in a variable between this year and the next.

Where major decisions are involved, though, or where major changes in the economy are being made, individuals will invest resources in forming expectations. Then narrower definitions of rational expectations become relevant: for instance, individuals' expectations are the forecasts of the relevant economic theory. Under such circumstances individuals can be expected on average to forecast correctly, though on each occasion they are likely to commit some error.

2. EXPECTATIONS IN ECONOMICS

The increased attention given to the study of expectations in economics in the last decade is not primarily a result of a growing awareness of their importance in practice. Rather, it is the result of the internal development of the field, interacting with the need to explain developments of the early seventies—particularly rising inflation. The development of the rational expectations hypothesis made it possible to embody expectations in theoretical models in a more satisfactory and interesting way than hitherto; because the resulting theoretical questions were difficult, important, and tractable, much of the talent in macroeconomic theory moved in this direction. Similarly, the questions opened up in econometrics by the rational expectations hypothesis provided interesting and important areas of research, in which careful and useful work has been done. Much remains to be done, particularly on the empirical side, where the techniques needed to take account of rational ex-

*Professor of economics, Massachusetts Institute of Technology.

pectations are extremely sophisticated and not yet entirely understood.

Because methods of estimating econometric models with rational expectations are complicated and not entirely developed, large scale econometric models were not estimated imposing rationality of expectations. A variety of expectations mechanisms is included in these models. There are some small scale econometric models that do embody rational expectations. Estimation of large scale econometric models with rational expectations remains a formidable task. For many routine applications, the absence of rational expectations in the large scale models is not a serious problem, since individuals may be assumed to continue forming expectations in much the same way as those models say they have in the past. When significant policy changes are being made, the models will be less reliable. But rather than dismiss the model predictions out of hand, it makes sense to start from the model forecasts and ask how they should be amended to take account of differential expectations behavior.

Expectations are of course important in any choice that involves the future. Much of the traditional material of economics is studied in a static setting where the future is not essential: here one thinks of questions of how best to allocate a given budget among alternative goods, or how firms maximize current profits for instance. But any intertemporal choice—investment, consumption versus saving, work today versus work tomorrow, the choice of assets in which to invest, for example—involves expectations of future variables.

The role of expectations is typically important in studying the response of the economy to policy decisions. The way in which monetary policy operates on interest rates and output, the effect of temporary income taxes on saving and consumption, the effect of depreciation allowances on investment, and most other actively debated policy questions will involve questions of expectations formation.

3. ON WHAT ARE EXPECTATIONS BASED?

Expectations are likely to be based on whatever factors are relevant to understanding the future consequences of current actions. When times are normal, expectations will likely be formed on the basis of how the economy has behaved under similar circumstances in the recent past. When times are special, economic agents will bring more than recent history to bear. Predictions of economists, economic models, old history, common sense, and anything else that might be helpful will be considered. Attention may even be paid to the predictions of policymakers, though deep scepticism is likely to attach to these.

The main lesson of the rational expectations approach is that expectations cannot be manipulated independent of reality. Statements about what policymakers hope will happen, dressed up in the form of predictions, are unlikely to have a serious effect on expectations, particularly if other information is available. Nor is policy that attempts to manipulate expectations independent of actuality intelligent, for it at best buys short run benefits at the expense of future losses of credibility.

4. OBSERVING EXPECTATIONS

Information about expectations can be obtained either by direct observation, or by observing the consequences of expectations. Opinion polls frequently ask questions about expectations of inflation. These questions have become increasingly sophisticated, and provide useful information about expectations. There remains a suspicion however that people answer such questions lightly, and that answers are very sensitive to the wording of questions. The latter charge at least does not appear to be accurate for the major United States polls asking about expected inflation.

The forecasts of economic models can also be viewed as expectations. Purchasers of the models' forecasts must find the information for which they have to pay useful. We may thus assume that model forecasts at a minimum affect expectations of future variables, and that they are perhaps expectations of the relevant variables.

A third source of information on expectations is prices or quantities transacted in markets where actions reflect expectations. For instance, expectations of inflation must affect interest rates. Armed with a theory of how expectations affect interest rates, it is possible to estimate expectations of inflation from observed interest rates. The only difficulty here is that there has always to be a theory between the observed facts—such as nominal interest rates—and the implied expectations.

Survey expectations are gathered by the University of Michigan Survey Research Center, and a variety of commercial enterprises. Despite questions that have been raised about the validity of these expectations, careful study shows them to be reasonable and useful. Because direct observations on expectations are useful in interpreting changes in other variables—such as interest rates—whose behavior is affected by expectations, it is important that surveys of expectations formation and the study of the methodology of the surveys be continued.

5. WOULD PRECOMMITMENT STABILIZE EXPECTATIONS

Would expectations be stabilized if policies were somehow cast in stone for long periods? If such precommitment on policies were credible, expectations about policy would of course be more stable than they are now. But this is not of itself an important consideration for policy. The important question is whether precommitment of policies is conducive to improved economic performance.

There is no general argument that says precommitment is either necessarily stabilizing or destabilizing for the economy. It is often asserted that economic policy disturbances have in fact been the major cause of poor economic performance, but that case is not well documented. Certainly there have been mistakes, but any policies that were precommitted could as well have been the wrong as the right policies. For instance, tax rates precommitted over long periods for the seventies might well have ignored problems caused by inflation. Further, the economic environment is always changing, and appropriate policies change too.

The main requirement of policymakers is that they explain and justify what they are doing, and avoid tinkering.

6. THE DISPERSION OF EXPECTATIONS

Surveys show a substantial dispersion across individuals of expectations about inflation. The degree of dispersion is related to the overall inflation rate—when the inflation rate is higher, the dispersion of expectations is greater. Because individuals are acting on their beliefs about inflation, increases in the degree of dispersion mean that the misallocation of resources is increased—for not everyone can be right about inflation. Thus the dispersion is potentially important. However, I am unfamiliar with quantitative estimates of the extent of the misallocations implied by dispersion of expectations.

As far as I am aware, econometric models do not explicitly include the dispersion of expectations. But I see no good reason for them to do so.

7. EXPECTATIONS AND ECONOMIC POLICY

Given the important role of expectations in determining the outcome of policy decisions, it is essential that the effects of policies on expectations be taken into account in predicting the outcomes of the policies. This is a complicated task, the theory and empirical analysis of which has advanced significantly in the last decade. But precisely because expectations are so important, it is also tempting to believe that they are an independent force that can be harnessed in support of some policy of the other. This is a dangerous illusion. Expectations are a consequence of the nature of policies being introduced, and of previous experience. They will behave favorably when experience, theory, and the design of policy says that the outcome of the policy changes will be favorable. The way to affect expectations when making policy is to make the policies credible.

STATEMENT OF ARTHUR B. LAFFER AND VICTOR A. CANTO*

THE MEASUREMENT OF EXPECTATIONS IN AN EFFICIENT MARKET

INTRODUCTION

There are several ways to obtain estimates of the effects of fiscal and monetary policy on the level of aggregate economic activity. The desirability of these estimates rests on the belief that the true structure of the economy is such that spending and/or tax rate changes affect economic activity. An obvious way to incorporate any existing feedback effects would be to estimate a structural model which includes such effects. This model could be used to obtain forecasts of what economic activity, inflation and revenues would have been in the absence of tax rate and/or spending changes. These forecasts could, in turn, be compared to actual levels of economic activity, inflation and tax revenues. Alternatively, the model could be used to simulate the effects of various policy changes.

There are several difficulties with this approach, however. The sheer effort required to design and estimate a complete structural model is enormous. Furthermore, the resulting forecasts would be subject to certain sources of error in addition to the parameter estimation errors. Parameter estimation errors affect all attempts at statistical inference. An important source of error is mis-specification of the true structural model, either through an incorrect choice of variables to be included in the model or through the imposition of incorrect identifying restrictions. Lucas¹ points out that policy simulations based on the usual structural models (those consisting of decision rules such as consumption and investment functions) are inherently suspect because the parameters of the models are, in general, functions of policy variables and will change in response to shifts in those policy variables.

Sargent² has shown that, when agents form rational expectations about the future, there are rarely any zero restrictions to impose. If the structure can be identified at all, it can be identified only by imposing nonlinear restrictions on the covariance matrix.

Sims³ has suggested that economists give up identifying general-equilibrium, structural macromodels. He has suggested that one should instead fit vector auto-regressions to the data one wishes to explain or predict. Implicit in his suggestion are still three a priori restrictions. The important variables to include in the analysis

*The authors are the Charles B. Thornton Professor of Economics and assistant professor of business economics, respectively, University of Southern California.

¹R. E. Lucas, "Econometric Policy Evaluation: A Critique," Phillips Curve and Labor Markets, edited by Karl Brunner and Allan Meltzer, North Holland 1976.

²T. Sargent, "Interpreting Economic Time Series" *Journal of Political Economy*, Vol. 89, 1981, pp. 213-248.

³Christopher, Sims, "Macroeconomics and Reality," *Econometrica*, Vol. 48, January, 1980, pp. 1-48.

must still be selected; since the number of parameters in a vector auto-regression goes up as the square of the number of variables in the model, the number of variables in the model must be restricted in order to obtain reasonable estimation power. Second, the maximum lag length must be chosen a priori. Third, and most important, an appropriate order for the variables must be chosen since Sim's crucial identifying restriction is that the matrix of coefficient be lower triangular.

Zellner and Palm⁴ provide an exhaustive taxonomy of the various types of equations associated with dynamic simultaneous equation systems and discuss the uses and limitations of each. It is interesting to note that the univariate time series properties of the system's endogenous variables are implied by the structure of the model and the time series properties of the exogenous variables. It is thus meaningful to fit time series models to each of the endogenous series over periods when both the structure of the complete model and the time series properties of the exogenous variables are stable. One of the primary uses of such a simple univariate model is in forecasting the series to which it is fit. Moreover, these models make much more modest demands in terms of data requirements and a priori knowledge of the system's structure than would full-blown structural estimation. Furthermore, as Nelson⁵ points out, univariate time series models are not subject to errors in specifying the structure of the complete model and, in theory, need not yield less accurate forecasts than would structural estimation. The results reported in Nelson⁶ indicate that this conclusion holds in practice as well as in theory.

The previous paragraphs clearly suggest that the use of vector auto-regression may in fact be superior in their forecast as well as less demanding in terms of resources than large scale macro-models. This is true during periods when government policy is changing as well as when the structure of the economy and the forcing variables are stable.

I now turn to an alternative to the use of vector of auto-regression to obtain forecasts of different economic variables, found in the efficient market hypothesis.

An efficient market is a market in which all prices and quantities fully reflect the sum total of known information. In such a market, there are no exceptional expected returns available. While the hypothesis that markets are efficient is clearly extreme, this concept is a useful base point for analyzing economic or financial phenomena. Any alternative assumption about the general mode of behavior is strictly *ad hoc*. Nonetheless, the degree to which the efficient-market concept is applicable in practice is open to debate. It is an hypothesis, and not an established fact.

USE AND LIMITATIONS OF THE EFFICIENCY CONCEPT

At best, the proponents of strict efficiency can only argue that existing data do not allow rejection of the hypothesis. As is now

⁴ A. Zellner and F. Palm, "Time Series Analysis and Simultaneous Equation Models," *Journal of Econometrics*, Vol. 2, May, 1974, pp. 17-59.

⁵ C. Nelson, "Applied Time Series Analysis for Managerial Forecasting," San Francisco, Holden Day, 1973.

⁶ C. Nelson, "The Predictive Performance of the FRB-MIT-PENN Model of the U.S. Economy," *American Economic Review*, Vol. 62, October, 1972, pp. 902-917.

literally legend, the capacity of both economists and financial analysts to predict the future is generally rather weak. To put the assumption of efficiency in the most favorable light, many of the highly restrictive and aggregative tests performed to date have been unable to reject the notion. This is a far cry from believing that markets have been shown, let alone proven, to be efficient.

The use and limitations of the concept of market efficiency go beyond whether one sides with the efficiency advocates. In the absence of in-depth knowledge, an assumption of efficiency is difficult to contradict by empirical evidence. On the other hand, there are a number of well-documented exceptions to the rule of strict efficiency, although none of these exceptions is naive or readily exploitable by the novice. The documented exceptions are rather intricate and complex, but there are a number of obvious pitfalls whereby the unwary can lose even on an expected basis in an efficient market.

Take, for example, two people who believe monkeys throwing darts at the Wall Street Journal can, on average, do as well as investment advisors and portfolio managers. Imagine that the owner of the first monkey is in a high tax bracket while the owner of the second is in a low bracket. If the first monkey's dart hits a taxable bond, while the second monkey's dart hits a tax exempt bond, both owners will lower their expected return after tax. In this event, each selects a security that common sense would have excluded *a priori* from the set of possible investments. Similarly, it makes little sense for a young investor to put his money in "flower bonds", whereas an aging investor concerned about death duties may find them attractive.

Thus, even if strict efficiency existed, throwing darts is very far from the whole story. If nothing else, restricting each asset owner's relevant investment set will make him better off. There are numerous well-known exceptions to the blind belief that investment advice is not worth it at any price.

EFFICIENCY AND FORECASTING

The most important development emerging from the debate on market efficiency is a consensus that market data do reflect expectations about the future. This does not mean that what the market expects actually does occur, only that current market data contain both correct and incorrect forecasts of the future. Through a careful analysis of current market data, the asset manager can develop insights as to what the market collectively anticipates. In this way, he can utilize the collective wisdom of the market to see events more clearly and to differentiate between his own views and those of the market.

Besides facilitating economic forecasts, the use of an efficient-market framework implies the ineffectiveness of certain forecasting techniques which are commonly used.

This paper consists of practical illustrations.⁷ It is divided into two parts:

I. Implied Forecasts From Market Data, including:

⁷ An earlier report, A. B. Laffer, "Practical Applications of Global Monetarism", H. C. Wainwright, May 23, 1977, explores the implications of efficient worldwide markets for money and goods.

- (a) Interest rates;
- (b) Inflation rates;
- (c) Exchange rates; and
- (d) Corporate profits.

II. Non-Forecastables in an Efficient Market, including:

- (a) Attempts to forecast GNP from past money supply data; and
- (b) Attempts to find relationships between exchange rates and trade balances;

I. IMPLIED FORECASTS FROM MARKET DATA

(a) *Interest Rates*

The interest rate on a newly issued fixed instrument is nothing short of the market's anticipated nominal yield on capital over the term to maturity of that asset, with appropriate corrections for tax and risk characteristics, etc. If this were not true, and expected yields exceeded interest rates, then borrowers would outnumber lenders and bid interest rates up. If interest rates were higher than expected yields, lenders would outnumber borrowers and interest rates would fall. In an efficient market, all known information is incorporated into market prices to the point that expected yields on all assets are equilibrated.

Much information can be gleaned from interest rate patterns in an efficient market. The term structure of interest rates at any point in time imply market forecasts of future interest rates. Lending at one maturity combined with borrowing at a different maturity is nothing more than making a futures contract for a loan. The yield on this implicit future loan is the future expected interest rate for a term equal to the difference in maturity of the two original loans, and beginning at the maturity date of the shorter of the two loans.

For example, suppose \$100,000 is borrowed on a 30-day note at a 10 percent annual rate, and, simultaneously, a \$100,000 60-day note is purchased at an 11 percent annual rate. The investor has, in effect, agreed to a futures contract to lend \$100,000 for 30 days at 12 percent, 30 days from today.

In general, the yields on two assets (identical except for maturity date) automatically imply futures-contract yields for the same type of asset. Using U.S. Treasury bills of various maturities as an illustrative set of equivalent assets,⁸ future spot rate forecasts are readily derived from the current term structure of interest rates. This is shown in Table 1. Implicit market forecasts of the whole term structure are also visible in the table.

⁸ In this context there may indeed be subtle differences among government obligations of different maturities. For example, they may have different covariances with the market (betas) or may have slightly different coupon or call provisions. They may even have slightly different liquidity characteristics due to variations in transacting costs from market to market. The size of the average transaction may also differ, giving rise to other reasons for different yields. Taxes may also give rise to spurious differences.

TABLE 1.—ACTUAL AND FUTURE EXPECTED INTEREST RATES DERIVED FROM THE TERM STRUCTURE OF INTEREST RATES

[Yield on Treasury Bills (mean of bid and ask)]

Maturity date	Spot rate	Market's implicit forecast as of May 21, 1981—number of weeks ahead																
		4	8	12	16	20	24	28	32	36	40	44	48					
4	17.00																	
8	17.03	17.06																
12	17.02	17.03	17.00															
16	16.75	16.66	16.47	15.93														
20	16.36	16.19	15.91	15.36	14.79													
24	15.99	15.78	15.46	14.95	14.46	14.13												
28	15.86	15.66	15.38	14.98	14.66	14.60	15.08											
32	15.55	15.34	15.05	14.66	14.34	14.19	14.22	13.37										
36	15.21	14.98	14.68	14.29	13.97	13.76	13.64	12.92	12.48									
40	15.09	14.87	14.60	14.25	13.97	13.81	13.73	13.28	13.24	14.01								
44	14.92	14.70	14.44	14.12	13.86	13.71	13.63	13.27	13.23	13.61	13.21							
48	14.86	14.66	14.42	14.13	13.91	13.78	13.72	13.45	13.47	13.81	13.71	14.20						
52	14.75	14.56	14.33	14.06	13.85	13.74	13.68	13.45	13.46	13.71	13.61	13.81	13.43					

Charts 1 and 2 convert some of these data into a more easily interpreted form. As of May 21, 1981, it appears that the market expected interest rates to rise steadily for about one month, and to fall thereafter. (See Chart 1.) Rates higher than 16 percent did not seem to be expected during the ensuing year. According to Chart 2, the market expected the entire term structure to fall during the next six months, and thereafter to stabilize.

CHART 1

Interest Rates on U. S. Treasury Bills with 4 Weeks to Maturity
Actual and Market Forecast as of May 21, 1981.

percent per
annum

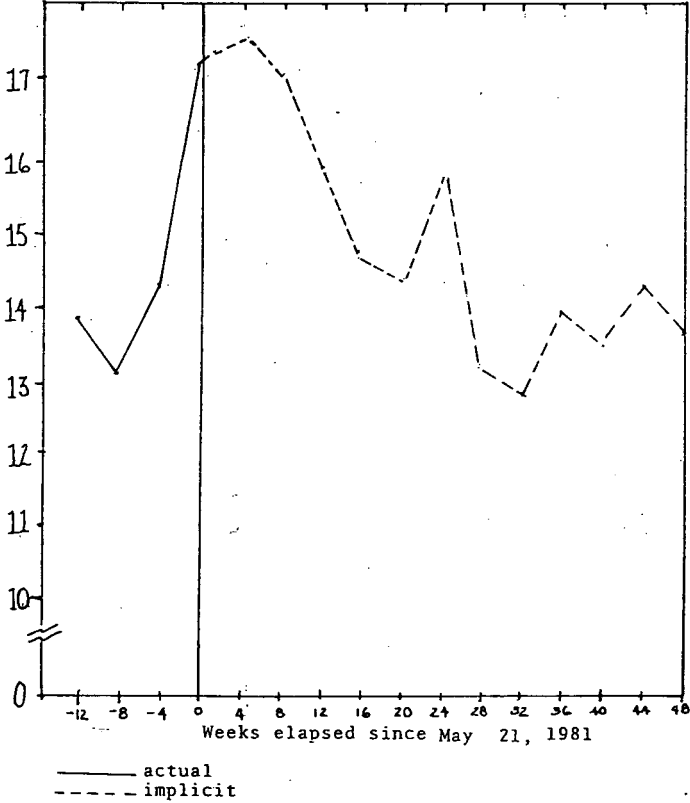
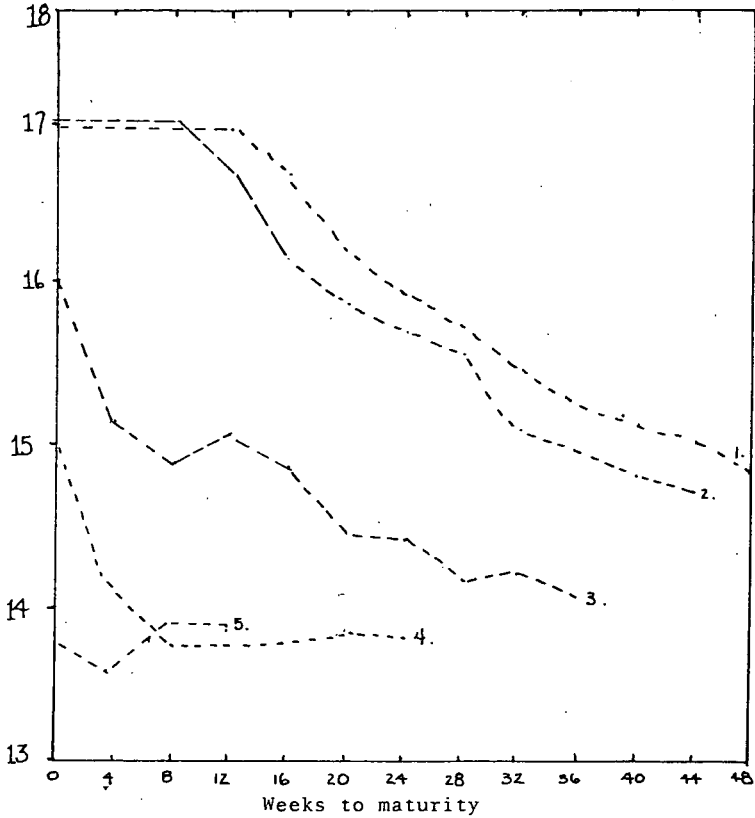


CHART 2

The Term Structure of Interest Rates on U. S. Treasury Bills
Actual and Market Forecast as of May 21, 1981



- 1. as of May 21, 1981
- 2. 4 weeks out
- 3. 12 weeks out
- 4. 24 weeks out
- 5. 36 weeks out

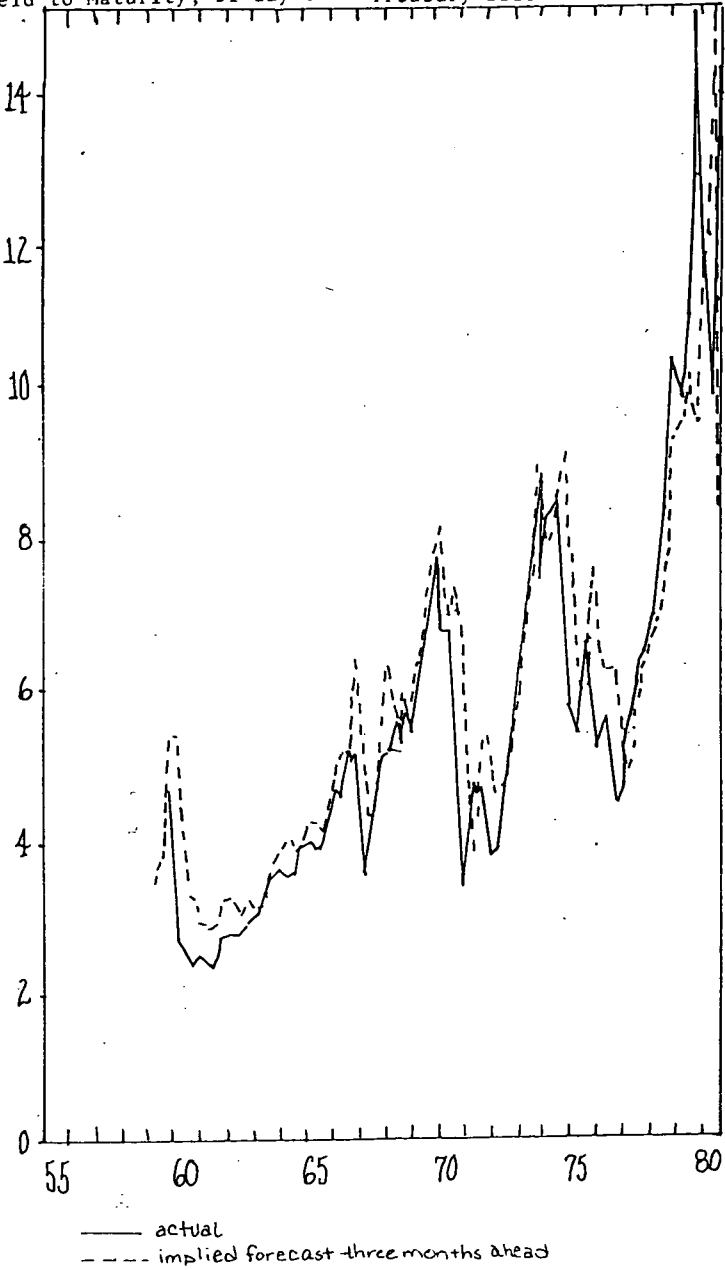
Numerous studies have attempted to measure the general accuracy of the interest rate forecasts contained in market term-structure data.⁹ Most of these studies have, aside from the usual bickerings among academics, concluded that over short horizons the market forecasts contained in term structure data are relatively accurate. As an illustration of the degree of accuracy, Chart 3 plots future actual 3-month Treasury bill rates against the forecast of that 3-month rate implied in the term structure of three months earlier. The time period covered is from 1959 to the present. Not surprisingly, accuracy tends to diminish the further into the future the current term structure is used to forecast.

⁹ See David I. Meiselman, "The Term Structure of Interest Rates," Prentice-Hall, 1962; Reuben A. Kessel, "The Cyclical Behavior of the Term Structure of Interest Rates," National Bureau of Economic Research and Columbia University Press, 1965; Richard Roll, "The Behavior of Interest Rates," Basic Books, 1970; and Charles R. Nelson, "The Term Structure of Interest Rates," Basic Books, 1972.

CHART 3

Interest Rates: Actual versus Market Forecast

Yield to Maturity, 91-day U.S. Treasury Bills



For longer horizons, market forecasts of interest rates can be inferred from today's prices in explicit futures markets. For example, the data in Table 2, computed from May 21, 1981, shows price quotations of Treasury bill futures at the International Monetary Market in Chicago.

TABLE 2.—Market forecasts of 3-month treasury bill yields derived from futures market prices as of May 29, 1981

[Percent]	
Date:	Forecast
August.....	12.99
November.....	13.15
December.....	12.36
June 1982.....	12.28
September 1982.....	12.26
December 1982.....	12.26

Source of data: International Monetary Market of the Chicago Mercantile Exchange, as reported in the Wall Street Journal.

For maturities beyond six months, there seems to be a widening disparity between the forecasts implied by the term structure and those implied by the futures market. The source of the disparity is unclear, but might be explainable by a variety of differences between the spot and futures market, which have not been taken into account in the rough calculations made here (see footnote 2). For example, the bid-ask spread in spot interest rates is sometimes quite wide, resulting in some uncertainty as to the yields on actual transactions. And questions in both markets reflect the possible diverse effects of capital gains taxes.

(b) Inflation Rates

A major component of the market's anticipated nominal yield on capital is the anticipated increase in the general price level (inflation). Thus, 30-day interest rates reflect expected future 30-day inflation rates, and 60-day interest rates reflect expected future 60-day inflation rates, and so on. To the extent that anticipated real yields remain stable, interest rate changes should primarily reflect changes in the market's anticipation of inflation.

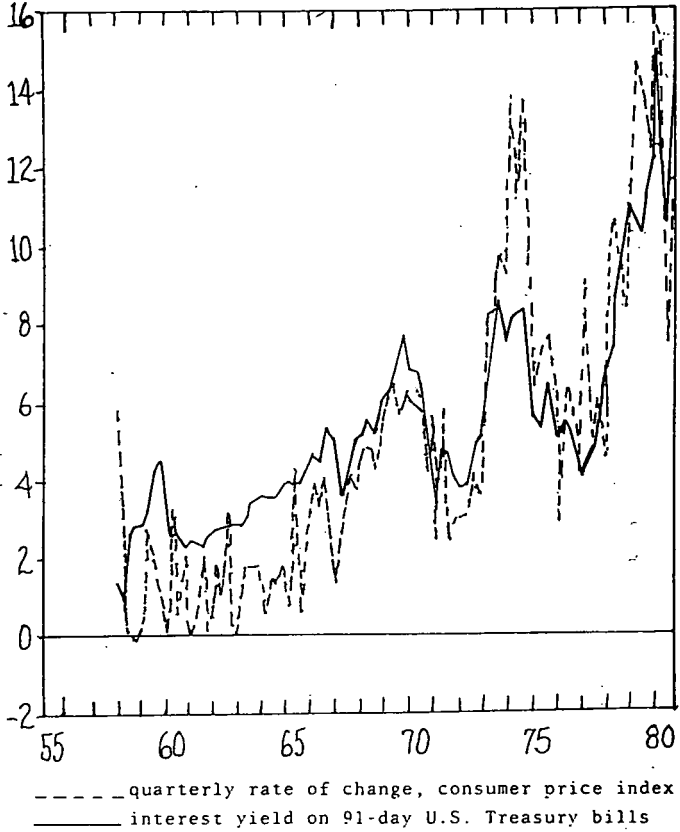
There is fairly extensive documentary evidence for the accuracy of the implied inflation forecasts contained in the term structure of interest rates and in futures commodity contracts.¹⁰ The general drift of these studies is that over a short horizon the forecasts have substantial ability to predict what will actually occur. Over longer periods, however, the market's ability deteriorates rather sharply. To illustrate the forecasting ability contained in Treasury bill rates, Chart 4 plots 91-day bill rates against actual inflation rates during the ensuing 91-day period (up to the maturity date of the bill). The chart indicates that the major ups and downs in interest rates in the past 20 years reflected, to an important extent, ups and downs in the rate of inflation.

¹⁰ See Arthur B. Laffer and R. David Ranson, "A Formal Model of the Economy", *Journal of Business*, July 1971, pp. 247-70; Eugene F. Fama, "Short-Term Interest Rates as Predictors of Inflation", *American Economic Review*, June 1975, pp. 269-82; and Arthur B. Laffer and Richard Zecher, "Some Evidence on the Formation, Efficiency and Accuracy of Anticipations of Nominal Yields", *Journal of Monetary Economics*, July 1975, pp. 327-42.

CHART 4

Interest Rates and Contemporaneous Inflation

percent per annum



This relationship can be used to forecast future inflation rates. Accordingly, Table 3 lists inflation rates (based on the Consumer Price Index) out over a one-year horizon as implicitly forecast in the term structure of Treasury bill yields shown in Chart 1.

TABLE 3.—Market forecasts of the inflation rate derived from the term structure of Treasury Bill yields

[Expected inflation per annum]

Weeks following May 29, 1981:	Percent
From 0 to 12.....	8.8
From 12 to 24.....	8.0
From 24 to 36.....	7.0
From 36 to 48.....	6.4

According to the table, in mid-1981 the market expected the inflation rate to decline during the ensuing year.

Forecasts of future inflation are also implicit in futures commodity contract markets. In these contracts, market participants agree to buy or sell quantities of standardized commodities at some pre-specified date in the future. The prices of these contracts reflect an efficient market's best guess at to what the spot price will be at the date of settlement. On a more subtle level, the price of gold also provides an indicator of the market's expectation of general price level changes. Gold prices, however, imply much more than a forecast of inflation and, as such, discussion will be deferred.¹¹

(c) Currency Exchange Rates

The framework of market efficiency also allows for various different ways of inferring forecasted movements in currency exchange rates. The most obvious method uses explicit futures contracts in currencies. Here transactors make contracts to buy or sell one currency in exchange for another at some agreed-upon price and at some pre-specified date. The forward premium (or discount) on a currency reflects the forecast percent appreciation (or depreciation) of that currency over the specified contract length.

Table 4 below lists the expected changes in the dollar exchange rates of selected currencies, using currency futures market data for May 29, 1981.

TABLE 4.—EXPECTED PERCENT APPRECIATION (+) DEPRECIATION (—) OF SELECTED CURRENCIES VIS-A-VIS THE DOLLAR AS OF MAY 29, 1981

[In percent]

	30 days	90 days	180 days
British pound	-0.0066	-0.0098	-0.0153
Canadian dollar	0.0023	0.0028	0.0032
French franc	0.0400	0.0500	0.0550
German mark	-0.0295	-0.0490	-0.0743
Swiss franc	-0.0394	-0.0682	-0.1273
Japanese yen	-5.5800	-9.8100	-15.8300
Dutch guilder	-0.0356	-0.0572	-0.0932
Italian lira	13.3300	26.5000	51.5000
Weighted averages ¹	-0.6533	-0.8869	-0.7711

¹ Weights are computed using the country's GNP.

Source: Bankers Trust Co., New York, as reported in the Wall Street Journal.

¹¹ J. C. Turney, "Gold," A. B. Laffer Associates, January 25, 1980.

Another method of inferring the market's forecast of exchange rate movements examines interest differentials between countries on equivalent fixed instruments (usually government issues). Covered interest rate arbitrage in an efficient market assures that the uncovered interest differentials will approximately equal the percent appreciation or depreciation implied in the forward currency contracts. In instances where organized currency futures markets do not exist or are very thinly traded, the uncovered interest differentials themselves can provide rough forecasts of future exchange rate changes.

If, for instance, the U.S. dollar interest rate for a one-year maturity is four percent lower than the equivalent U.K. pound interest rate, then the pound is forecast to depreciate by four percent relative to the U.S. dollar. From two countries' own term structures an entire term structure of future exchange rate changes may be forecast.

A third method of inferring exchange rate expectations is to utilize futures contracts in freely traded commodities. If, for example, one knows the six months' futures contract price of sugar in both pounds and dollars, then an implied future price of the pound in terms of dollars emerges. By purchasing sugar forward in pounds and selling sugar forward in dollars one has, in effect, sold pounds forward for dollars.

(d) Corporate Profits

In an efficient market, the value of an asset approximates the discounted present value of the expected net cash flows. Knowledge of the market value of an asset, therefore, implies an estimate or forecast of future net cash flows. In particular, stock prices reflect the market's forecast of net after-tax corporate profits accruing to current shares into the future.

The after-tax corporate profits forecast by the marketplace are true economic profits and not necessarily profits as reported by accountants. Accounting conventions or gimmicks should have no effect on an efficient market's valuation of an asset except insofar as they affect some real factor such as taxes.

For example, the relevant depreciation figure is based on the market value of a company's plant and equipment rather than their historical cost. In other words, it is expressed in terms of today's dollars. The relevant figure for cost of goods sold is likewise evaluated at replacement or market prices and not historical cost. In times when inflation has been high, accounting conventions which use historical costs for depreciation and for the pricing of goods sold out of inventory tend to overstate economic profits substantially.

Thus, in order to arrive at a profit figure corresponding to values as perceived by an efficient stock market, reported profits must be adjusted for underdepreciation of capital equipment (CCA), the undercosting of inventories (IVA) and, of course, the actual corporate taxes paid, which are based on reported profits, not economic profits. In an ideal setting, these figures should also be adjusted for capital gains accrued on owned assets, for changes in the purchasing-power value of debt outstanding, for capital gains taxes paid on

stock transfers, and for income taxes paid on corporate dividends. These additional corrections are, however, difficult to quantify, and have not been used here.

To provide a visual representation of the significance of the adjustments to profits, Chart 5 plots stock prices, reported profits, and after-tax profits corrected for IVA and CCA (all in current dollars) over the past twenty-five year period. As is readily apparent, all three variables are closely correlated. It is apparent that both after-tax profits and economic profits track the S&P 500 stock index fairly well. However, the economic profits series outperforms the other throughout this period and especially the recent times when the U.S. has experienced significant inflation. This evidence tends to confirm that the market is not fooled by illusory profits.

Stock prices are rather accurate forecasters of after-tax real economic profits over a very short horizon. The more distant the future horizon, the less accurate are the forecasts.

In Chart 6, the percentage changes in the S&P stock index and an appropriately weighted average of current and future after-tax rate of return are compared for the post war period on an annual basis.¹²

¹²The rates of returns are calculated by deflating by the S&P 500 the year to year changes in economic and reported profits. As computed from the historical relationship, the weights in the average are 45 percent for contemporaneous rates of return and 55 percent for the rate of return 1 year ahead.

CHART 5
Corporate Profits and the S and P 500

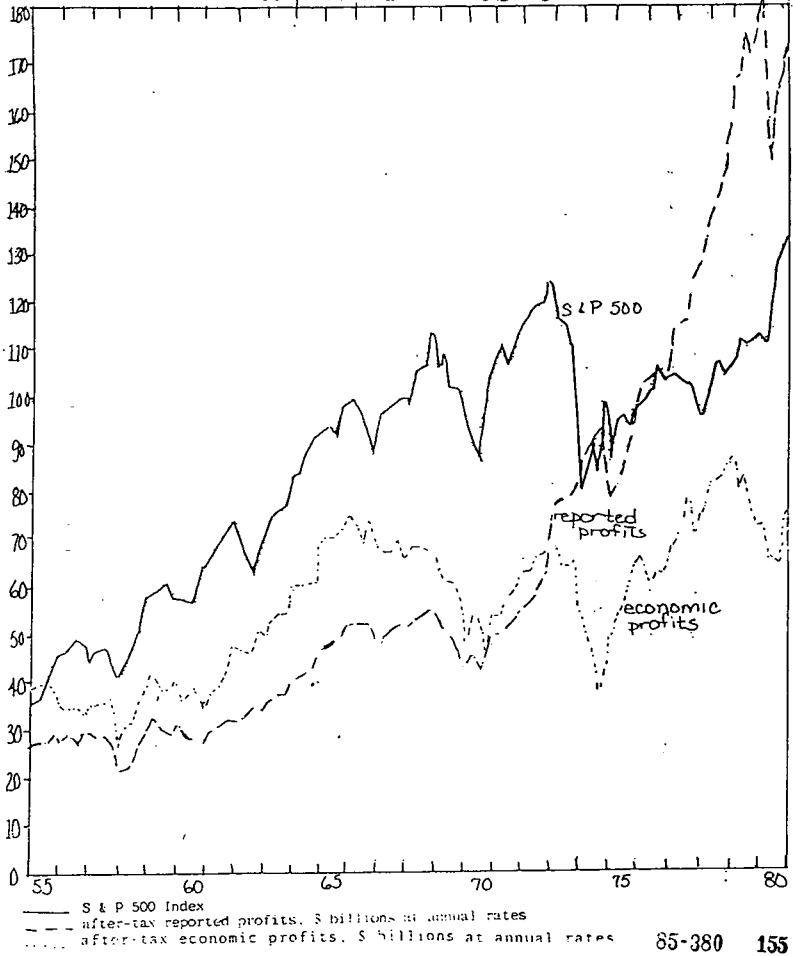
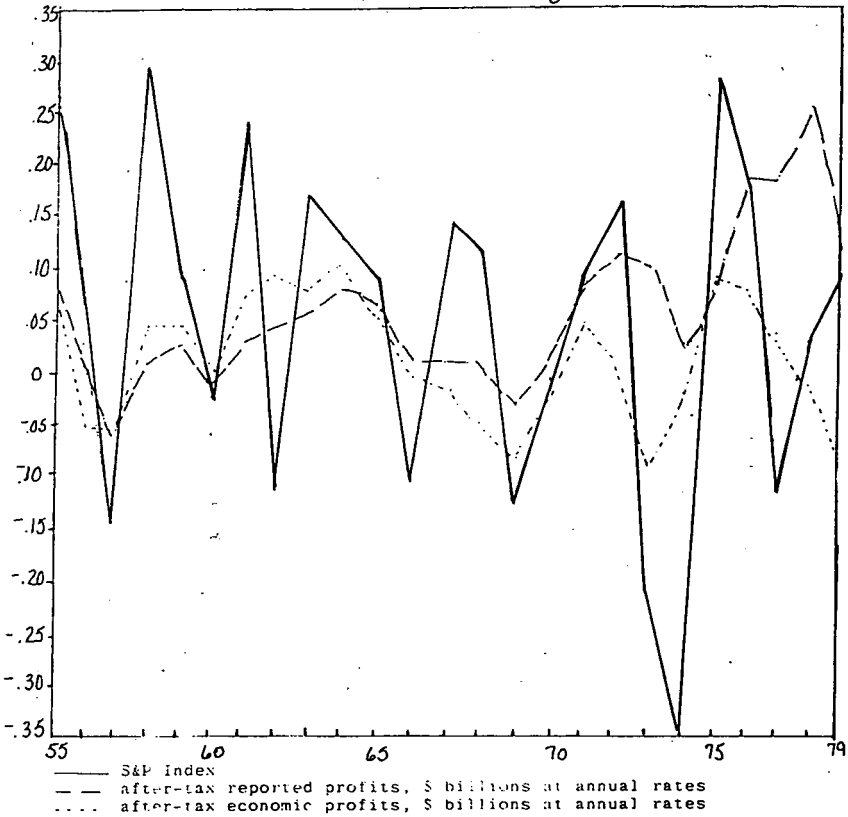


CHART 6

Corporate Profits and the S and P 500
Annual Rate of Change

While stock prices contain forecasts of future economic profits, the nature of the data does not allow precise forecasts period by period into the future. In spite of the lack of precision, stock market movements can be used to estimate profits several months before actual profit figures are published by the Department of Commerce. For example, according to the behavior of the S&P 500 during the first half of 1981, the market anticipates no change in real economic profits from 1980 to 1981.

II. NON-FORECASTABLES UNDER THE ASSUMPTION OF STRICT EFFICIENCY

The assumption of a strictly efficient market has implications that bear heavily on some forecasting approaches currently in vogue. Some of these approaches rely logically on imperfections and inefficiencies in the market. The second half of this paper describes several of these forecasting approaches briefly and then analyzes them in terms of market efficiency. In each example, a cursory review of the relevant data is attempted to enable the reader to compare the espoused technique with actual evidence.

(a) The Lagged Money Supply and GNP

Perhaps the most celebrated forecasting approach that stands at direct odds with the efficient-market concept is the relationship between lagged money supply and GNP. Increases in the money supply after a lag (usually six to nine months) are reputed to lead to increases in nominal GNP.

Under an efficient market, however, any relationship between money growth and GNP should exist almost exclusively on a concurrent (non-lagged) basis. In the absence of highly specific cost-of-adjustment assumptions, increases in money that lead to delayed increases in GNP would imply exceptional expected profit opportunities. Such exceptional profit would be arbitrated away until there were no lag.

To the extent that the increase in future GNP were due merely to higher prices, profit oriented firms and consumers would tend to buy more goods and sell less once they knew prices were to rise. Their actions would result in prices rising sooner rather than later. The final position where no arbitrage potential exists is one where prices rise by the full amount as soon as the money supply increase is known.

To the extent that the increase in future GNP were a result of higher production volume, lags again assume inefficiencies. In the first place, changes in production volume due to money supply changes can ordinarily occur only if there is some kind of illusion on the part of workers, future taxpayers, or consumers. Secondly, even if illusion existed, the relationship would not be delayed. Efficient production planning and smoothing implies that firms which know that demand for its products will be higher in the future will produce for inventory now and sell later out of inventory. The use of inventories as a buffer will save on hiring and firing costs. This production for inventory is itself the increase in real output and GNP. It should occur as soon as the expected

increase in demand is anticipated, i.e., when the money supply increase becomes known.

Therefore, in a strictly efficient market, increases in the supply of money would not be capable of causing increases in production. There could, however, still be a relationship between money supply and production: increases in production could very plausibly cause increases in the demand for money on a contemporaneous basis. In any case, if there is a relationship between the quantity of money and production, it should be contemporaneous.

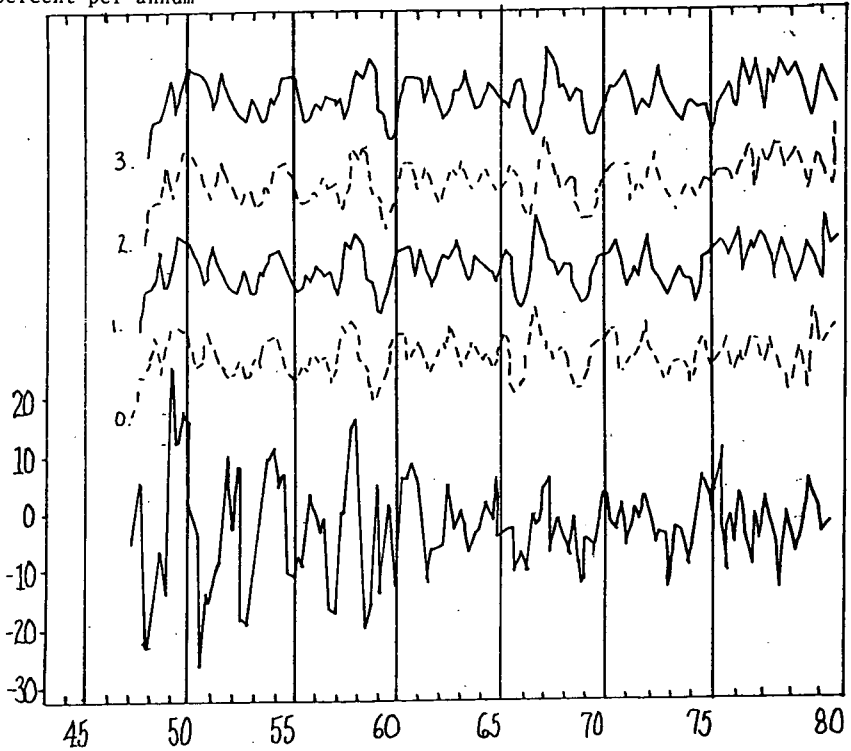
In Chart 7 annual changes in the quarterly growth rates of money and nominal GNP have been plotted using lags of 0,1,2 and 3 quarters respectively. The chart indicates little or no lag between money supply and GNP, although this will not be obvious without careful examination using a ruler. This observation is confirmed by measuring the correlations, which are as follows:

	<i>Correlation coefficient</i>
No lag	0.399
1 quarter lag	0.199
2 quarters lag	0.112
3 quarters lag	0.041

CHART 7

GNP and Lagged Money Supply
 quarterly percent changes at annual rates
 seasonal differences

percent per annum



money supply series

- 0 - - - - no lag
- 1 - - - - one quarter lag
- 2 - - - - two quarters lag
- 3 - - - - three quarters lag

(b) Lagged Exchange Rates and Trade Balances

A country's trade balance is frequently related to the overall "competitive position" of its traded goods in world markets. Thus, if a country's goods are more competitive than other countries' goods, it will allegedly tend to export more and import less and thereby run a trade balance surplus. In practical terms, competitive position is often approximated by relating one country's price level (usually the wholesale price index) to the weighted average (usually using trade weights) of exchange-rate converted price indexes of other countries. The relationship is supposed to have forecasting properties because trade balances are thought to respond to lagged competitive position indicators.

Changes in exchange rates are brought to the fore in that they alter the exchange-rate converted price levels of other countries. Devaluation of one country's currency by itself allegedly improves the competitive position of that country. In due course, the more competitive position will work itself out into an improved trade balance in a sequence of events sometimes termed the "J" curve effect.

To put this theory in the vernacular of the financial press: if a country devalues, the prices of its exports in the world markets are lowered and the domestic prices of its imports are raised. The lower prices of exports in world markets mean, in time, that the country will export more. Likewise, increased import prices domestically mean that the country will eventually import less. Taken together, reduced imports and expanded exports imply an improved trade balance. In sum, exchange-rate changes should be negatively correlated with trade-balance changes after an appropriate allowance for delay.

This widely-held theory breaks down in an efficient market. Excluding tax, transportation and other costs of doing business, there can be only one price for a product at any moment in time, irrespective of location. Arbitrage will equilibrate the relative prices for commodities everywhere in the world. Thus, if markets are assumed to be efficient, the prices of goods (converted to a specific currency) sold anywhere will move in unison. Competitive position will be a matter of basic comparative advantage, and will not be shiftable by a purely monetary means such as currency devaluation.

If efficiency holds, domestic and foreign prices will change relative to one another in such a way as to offset the exchange-rate change. In the case of a currency depreciation or devaluation, domestic prices will rise relative to foreign prices by the exact amount of the depreciation. In the case of a currency appreciation, domestic prices will fall relative to foreign prices by the exact amount of the appreciation. In either case, the competitive position of the country in question will be entirely unaffected. Without a change in the country's competitive position, there would be no reason for the trade balance to change in any prespecified manner. The efficient-market hypothesis is virtually impossible to reconcile with the popularly believed relationship between lagged changes in exchange rates and trade balance shifts.

The efficient-markets hypothesis lends itself to two types of empirical evidence in this regard. First, price movements would be

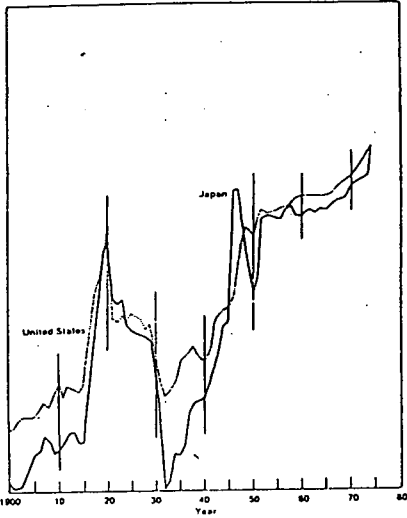
expected to offset exchange-rate changes fully. Second, an inverse relationship between exchange rate changes and trade balances would not be expected to exist.

As an illustration of the price relationship, the four plots in Chart 8 compare the wholesale price index with those of a series of countries (each converted to dollar equivalence by the market exchange rate) from 1900 through 1972.¹³ The correlations are extremely close. Similarly, Chart 9 compares the price indices during the more recent floating experience. The results are basically the same as those of the fixed rate period.

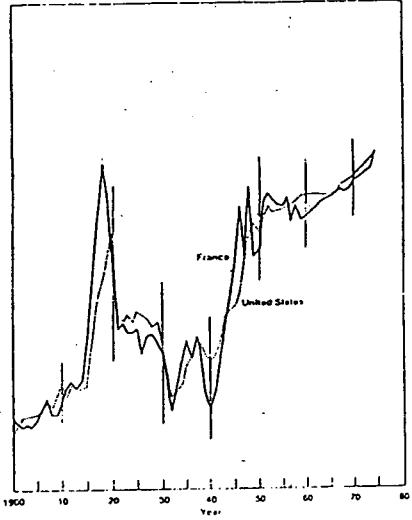
¹³The charts are taken from "The Phenomenon of Worldwide Inflation: A Study in International Market Integration", by Arthur B. Laffer, published by the American Enterprise Institute for Public Policy Research, Washington, D.C., 1975. The data were assembled and analyzed by Moon H. Lee in his Ph. D. dissertation, "Excess Inflation and Currency Depreciation", University of Chicago, 1974.

CHART 8

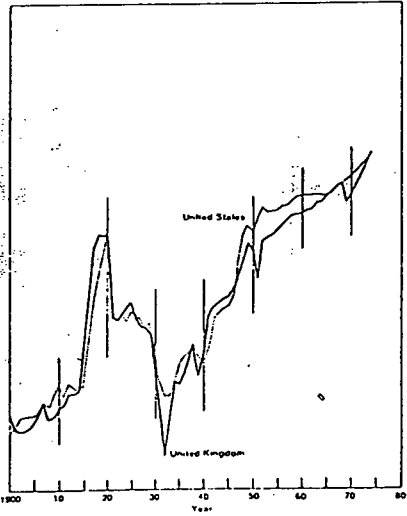
JAPAN: WHOLESAL PRICE INDEX CONVERTED TO U.S. DOLLARS, ANNUAL, 1900-1972



FRANCE: WHOLESAL PRICE INDEX CONVERTED TO U.S. DOLLARS, ANNUAL, 1900-1972



UNITED KINGDOM: WHOLESAL PRICE INDEX CONVERTED TO U.S. DOLLARS, ANNUAL, 1900-1972



CANADA: WHOLESAL PRICE INDEX CONVERTED TO U.S. DOLLARS, ANNUAL, 1900-1972

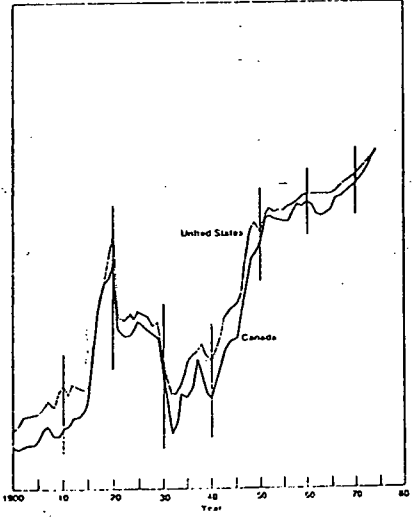
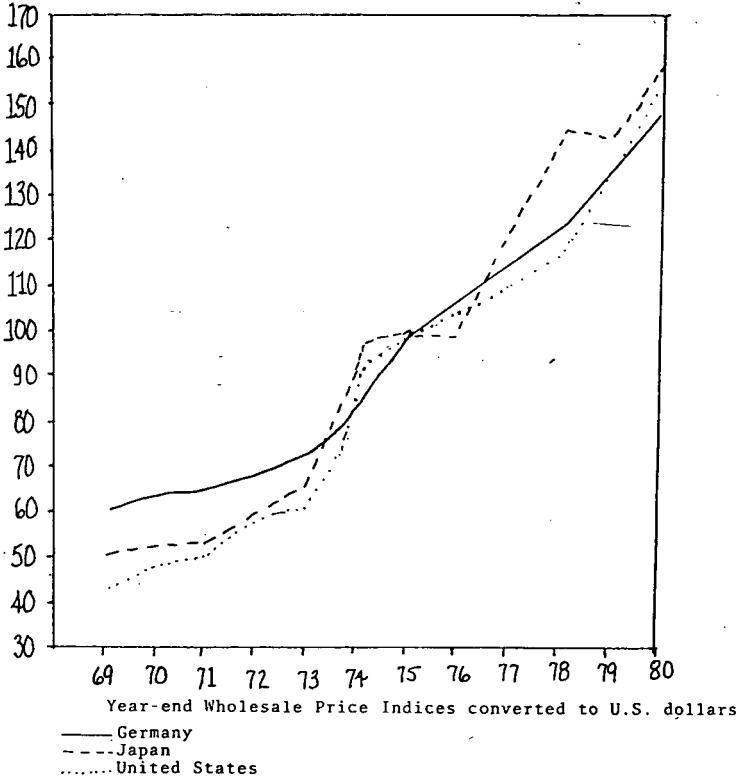


CHART 9

United States, German and Japanese
Wholesale Price Indices(Expressed in U.S. Dollars)
1969 - 1980Index
(January 1975 = 100)

By way of illustrating the comparative behavior of trade balances and exchange rates, Table 5 lists some of the major devaluations prior to 1972, after which there was a general tendency for countries to float their exchange rates.¹⁴ The trade balances are listed in index form (the largest absolute deficit or surplus during the period being set at minus or plus one) for three years preceding and following the year of devaluation.¹⁵ These figures provide little or no basis for the belief that devaluation improves a country's trade balance.

TABLE 5.—TIME PATH OF THE TRADE BALANCE BY DEVALUING COUNTRY

Devaluing country	Year	Percent devaluation	Index of the trade balance						
			Years prior			Year of devaluation	Years following		
			3	2	1		1	2	3
Iceland	61	¹ -62	-.38	-.56	-.93	-.18	-.24	-.78	-1.00
Iceland	68	¹ -51	-.06	-.15	-.53	-.60	-.26	-.18	-1.00
Israel	62	-.40	-.32	-.37	-.45	-.76	-.69	-1.00	-.87
Mexico	54	-.31	-.29	-.23	-.36	-.29	-.24	-.57	-1.00
Finland	57	-.28	+.18	+.17	-1.00	-.61	+.57	0.0	-.93
Finland	67	-.24	-.49	-.51	-.51	-.41	+.12	-.12	-1.00
New Zealand	67	-.19	+.43	-.18	-.04	+.16	+.55	+1.00	-.11
Austria	53	-.18	-.55	-.90	-.65	-.02	-.23	-1.00	-.66
France	57	-.17	-.03	+.16	-.94	-1.00	-.54	+.69	+.76
Spain	67	-.17	-.47	-.75	-.86	-.77	-.82	-.99	-1.00
United Kingdom	67	-.14	-.77	-.58	-.47	-.83	-1.00	-.67	-.68
Iceland	67	-.14	-.61	-.72	-.61	-.51	-.73	-1.00	-1.00
Israel	67	-.14	-.58	-.51	-.42	-.29	-.70	-.88	-1.00
France	69	-.11	-.38	-.39	-.49	-1.00	-.51	-.26	-.25
Denmark	67	-.8	-.43	-.44	-.48	-.54	-.57	-.76	-1.00
Mean			-.32	-.40	-.58	-.51	-.35	-.43	-.72
Upper Quartile			-.06	-.18	-.45	-.29	-.23	-.12	-.66
Median			-.38	-.44	-.51	-.54	-.51	-.67	-1.00
Lower Quartile			-.55	-.58	-.86	-.77	-.70	-.99	-1.00
Number of episodes showing trade balance worse than in year prior to devaluation			2	5	6	6	8	12

¹ Includes devaluation which occurred in preceding year.

Source: International Financial Statistics of the International Monetary Fund, various issues, lines 70 and 71. The trade balance is measured in domestic currency units, and is defined as exports (f.o.b.) less imports (c.i.f.). The index is computed on the basis that the largest deficit (or surplus) of any of the seven years for one devaluation is set at -1.00 (in the case of New Zealand, the largest surplus is set at +1.00).

¹⁴ For a more recent survey, see R. David Ranson, "The Relationship Between Trade Balances and Exchange Rate Changes", H. C. Wainwright & Co., February 16, 1977.

¹⁵ Table 5 is taken from "Exchange Rates, The Terms of Trade and the Trade Balance", by Arthur B. Laffer, in Peter Clark et al (eds), *Effects of Exchange Rate Changes*, U.S. Treasury Department.

STATEMENT OF RUDOLPH OSWALD*

THE ROLE OF EXPECTATIONS IN ECONOMICS

INTRODUCTION: SOME SUMMARY OBSERVATIONS

"Expectations" in a generalized way may be taken to mean a view of what will happen in the future as to the general course of the economy—expected price rises, the level of unemployment, total demand, wage levels, profits, interest rates, and other economic events.

Literature on "expectations" has flourished over the past decade during which the country has suffered an unprecedented period of inflation as well as recurrent recessions and unemployment. "Inflationary" expectations in particular have received the major share of attention, and are themselves alleged to have been a large element in creating and exacerbating further inflation.

Formal expectations theory, especially "rational" expectations theory, gives large weight to expectations of the future as determinants of the current behavior of "economic agents." In the formation of these expectations, government monetary and fiscal policy (and their likely results) are thought to be of special importance.

While most people (agents) do entertain some kind of view of the future, we would not agree that expectations ordinarily dominate the actual course of economic events. In particular we believe the inflation of the 1970's has been caused by "real" events, in which expectations, as such, have played a minor part.

The "real" inflationary events of the 1970's were the extraordinary price shocks occurring for energy, food, and housing, arising essentially out of supply disruptions. To these may be added the runaway behavior of medical care costs, arising out of structural defects in the medical care system of payments.

Government policies in the decade of the 1970's did not address these core problems in any direct manner nor solve them. In some instances, government actions made matters worse, especially through successive attempts to "fight inflation" through tight money and high interest rates, which served to bring about recession and to escalate costs pervasively throughout the economy. Record-breaking interest rates in themselves became "shock" events.

1. HOW IMPORTANT IS THE ROLE OF EXPECTATIONS?

While expectations have assumed an increasingly important role in the construction of theoretical economic arguments, the role assigned to expectations in these arguments is too far removed from real world behavior to have relevance for pragmatic policy. The rational expectations hypothesis, in particular, radically de-

*Director, economic research, American Federation of Labor and Congress of Industrial Organizations.

parts from the way workers and firms actually behave, assigning far too much weight to future expectations, as compared with immediate past and current experience, including income, expenses, interest rates, unemployment and plant capacity utilization.

The rational expectations hypothesis presumes that individual economic agents use all available and relevant information in forming expectations and that they process this information intelligently. The hypothesis further asserts that consumers, workers, and firms will perceive what sort of monetary and fiscal policy is being followed and will take the effects of this policy into consideration when forming and acting upon expectations. This assumption is combined with the "natural unemployment rate hypothesis," that a given rate of unemployment will prevail as long as the economy is in equilibrium with actual inflation no greater than expected. A change in unemployment is related only to the unexpected portion of the inflation rate.

As a result, the rational expectationists conclude that monetary and fiscal policies can affect the course of the unemployment rate only if they affect the unexpected portion of the rate of inflation. Such policies, in their view, can have no systematic effects on the latter, because systematic policies are simply rules relating current average values of variables controllable by policymakers to the observed past values that respond to policy. Economic agents are presumed to be aware of these relationships, and systematic policy measures are therefore taken into account by individuals and firms when they form their expectations. The wide variations in the perceptions of different economic agents, according to their particular circumstances, are not considered relevant. The consequent systematic course of the economy following from such policy does not relate to the unexpected component of the inflation rate, the rational expectationists conclude. Therefore, they believe that systematic economic policy is ineffective in determining the path of the rate of unemployment.

2. SIGNIFICANCE OF EXPECTATIONS IN VARIOUS ECONOMIC AREAS

While the rational expectations theory may be internally consistent, it is based upon assumptions concerning the functioning of the labor market and the formation of expectations that are unreal. Fiscal and monetary policy measures designed to reduce inflation have in fact primarily affected the unemployment rate. They have not affected the inflation rate. The rational expectationists' argument that this is due to policy measures that were unexpected provides a convenient excuse for the disparity between their theory and what happens in the real world.

If wages and prices do not fully respond to expected changes in nominal demand, the predictions of the rational expectations theory do not hold. In both the labor and goods markets, wages and prices are not determined primarily by expectations. In the labor market, for example, wages are determined not as much by expectations of future price increases as they are by efforts to catch up with prior price increases and with wage increases for comparable workers. While this behavior may be statistically captured within

an adaptive expectations framework, in reality it represents a partial adjustment to past price and wage increases.

Most existing econometric models employ an "adaptive" expectations framework. This has been strongly criticized by the rational expectationists as a naive representation of the way expectations are formed. We would not quarrel with the notion that expectations cannot be adequately represented by a fixed set of weights on past values of the variable for which expectations are being modeled. However, in a wage relationship, this formulation does capture the delayed adjustment to prior wage and price increases. It is true that the coefficients in these relationships are not invariant over time, unlike those represented in most econometric models. Nonetheless, we find the assumptions underlying this formulation more consistent with actual behavior than the notion that individuals in the labor and goods markets use all available information, including macroeconomic policy actions, in determining their expectations. Our knowledge of the way wages are determined in collective bargaining demonstrates that while past effects of interest rates and prices are a consideration, future effects of monetary and fiscal policy maneuvers are of tangential relevance at best to wage settlements.

Moreover, this observation is consistent with our belief that expectations do not play a key role in changes in nominal demand responses to tax and spending policy, and monetary policy. These policies primarily have real effects and are not offset by expectations. When income support programs are cut back, for example, the principal effect is a real decline in the income and therefore the spending of those targeted for cutbacks. Reduced spending subsequently induces a decline in output. Similarly, when the Fed adopts a tight money policy, reducing the availability of reserves and raising interest rates, the effects are real. Interest sensitive sectors, like housing and the automobile industry, suffer real declines that are not diminished by expectations.

Capital formation is affected by expected returns over cost, but not in the way hypothesized by rational expectations theory. Monetary and fiscal measures, in our view, affect expected returns, and therefore investments primarily through their effects on interest rates and on the level of real economic activity, including the rate of capacity utilization.

Finally, expectations do seem to have a role in financial markets and foreign exchange markets, but not over the long haul. For example, the money markets initially respond to a jump in the money supply with a rise in interest rates, in the expectation that the Fed will have to restrict the pace of monetary growth in order to meet its monetary targets. Nonetheless, this is a reaction to a real phenomenon and is a direct short term result. It can readily be reversed in a relatively short time through a weakening economy and/or credit controls (e.g. March-July 1980). Furthermore, over the long run, tight money leads to high interest rates which are reflected in higher prices.

Labor Market Settlements

For union negotiators, expectations about the course of the general economy are part of the general "ambience" in which contract

proposals are formed, but they represent little more in specific terms. Unions cannot expect to sell management on the occurrence of probable future events except on a contingency basis. The hard data of bargaining starts with past events, especially those over the life of the previous contract, taking into account such matters as the past increase in the cost of living, unmet worker needs, conditions prevailing elsewhere for workers in the area and industry, the condition of the company and other such factors.

If inflation has been escalating rapidly, as was the case during much of the 1970's, the union is likely to seek a cost-of-living adjustment (COLA) clause (or an improvement in an existing provision) as insurance against the erosion of the value of the negotiated wage over the future life of the contract. The COLA is a contingency provision that becomes operative only if further price inflation actually occurs.

If unemployment has been rising and is perceived as a continuing threat, the union may seek to improve contract clauses on severance pay, layoff notices, relocation provisions, and other related matters in the event the threat should materialize.

The "expectations" involved are generalized ones, unquantified, and produce a "risk insurance" response, that is triggered off by actual experiences and not by theoretical expectations.

Anticipatory Pricing and Borrowing

Anticipatory pricing is a phenomenon quite specifically associated with the introduction of wage-price control programs as firms seek to "beat the deadline" on the date of price restraint measures imposed by the government. If the program includes ongoing provision for specific price increase "allowances" (as did the Carter program) firms will make an effort to use them at the earliest possible moment, regardless of whether relevant cost increases have occurred or not. (The timing of automobile price increases appears to have been permanently altered by the Carter controls program, for example.)

In other situations, firms operate on a "contingency" basis, rather than an anticipatory one. If prices have been climbing rapidly, long-term business supply contracts frequently specify one or more price indexes from the BLS Producer Price Indexes, as a "materials escalator." A BLS estimate placed the value of contracts escalated by PPI indexes at a minimum of \$100 billion at the end of 1976.¹

Anticipatory borrowing has been directly associated with money tightening by the Federal Reserve Board. In a September 1980 article coauthored by Robert Roosa, former Under Secretary of the Treasury, it was pointed out that the Fed had to resort to direct credit controls in March 1980, because corporate Treasurers, who must be "Fed watchers," has become anticipatory borrowers when the Fed earlier had embarked on a stringent new tight money policy.² This effect is clearly contrary to what rational expectationists would anticipate.

¹ John F. Early, "Improving the Measurement of Producer Price Change." Monthly Labor Review, April 1978.

² Robert V. Roosa and Bruce Carver Jackson, "Counter-Revolution at the Federal Reserve," The Banker, September 1980.

The main effect of a policy that relies on aggregate money supply controls accompanied by rising interest rates is an undesired conjunction of high inflation and unemployment. Albert Wojnilower of First Boston Corporation points out that, "since the United States has subscribed to a monetary aggregates policy, the trend of monetary growth, inflation, interest rates—and unemployment—has been upward. . . . the record as described here would suggest that only policy constraints that have a direct understandable message will be effective."³ He ended up by calling for limits on interest rates, loans and other controls to be used from time to time as supplements to money supply controls. Thus these two respected and experienced capital market practitioners indicate that a more useful economic policy is the exercise of credit controls to produce the desired effects.

Work-Effort Response to Multi-Year Tax Cut

It is unlikely that prospective future tax cuts would either increase or diminish current work efforts or savings. Current work income is needed currently. Higher *future* income would not diminish the need for *current* income and hence current effort. The effects on savings of a tax cut, if any, would occur at the time it is realized and there would be additions to consumption at that time as well and not merely additional savings. (As a practical matter net savings in the economy would be reduced, since most of the tax reductions would result in increased personal expenditures, while the government, in a deficit position, would have to borrow in an amount equal to the total of revenue lost through the tax reductions.)

Decisions To Consume and Save

For the consumer, both consumption and saving depend primarily on current income. Unless income expectations are radically altered (e.g., anticipated loss of job) patterns of consumption and saving would tend to continue as in the past. Inflationary price expectations, if very strong, could lead to an alteration in previously planned large purchases—either speeding them up in some cases (anticipatory buying) or causing plans to be abandoned or postponed in others. With inflation outpacing income, more income would be reserved for immediate consumption necessities, and less for durable goods and savings. It is notable that in the year 1980 real spendable weekly earnings for nonsupervisory workers on private nonfarm payrolls had fallen 9.4 percent below 1978 levels.

Work-Leisure Decisions

Most people work because they must—either literally to meet necessary living costs—or to maintain at least a previously achieved standard of living. It is unlikely that future expectations enter strongly into decisions to work or not to work, but rather the press of immediate family events and circumstances. Unemployment of one family member may propel another into the work

³ Albert M. Wojnilower, "The Central Role of Credit Crunches in Recent Financial History," *Brookings Papers on Economic Activity* 2: 1980.

force. High living costs are an additional factor resulting in additional work being sought.

3. HOW SHOULD EXPECTATIONS BE MEASURED?

Expectations have no known measurable weight or duration, so that the whole concept and its influence upon the course of the economy remains very subjective and vague.

Even in sophisticated markets, judging from any day's reading of the Wall Street Journal, expectations shift constantly and analytical evaluations are sharply divergent. (One recent report, for example, said that analysts were "split down the middle" as to the future course of interest rates.) While close attention to Government policy is accorded in the Wall Street Journal, it is nonetheless difficult to judge what weight is to be accorded to overall government economic policy moves—as against foreign events, political upheavals, natural disasters, or in news about particular industries and special government programs.

Expectations in many instances are probably more dominated by what is happening in particular markets (say textiles or steel) or in particular areas (Detroit vs. Houston) than by the outlook for the economy as a whole.

Even in a generalized inflation, particular prices move differently—at different rates and even in different directions. Different areas of the country may be experiencing differing employment-unemployment levels, growth rates, and wage rate increases. There is no "one number" to summarize expectations or their meaning. Averages can be very misleading—the same average on two different occasions may have quite different components and widely different explanations.

4. HOW ARE EXPECTATIONS FORMED?

We believe that actual experience is the most crucial element in the formation of expectations, and that expectations are built up over a period of time. They tend to perpetuate the present and the past. An alteration in expectations will not take place until actual evidence of a new direction has been experienced and been maintained.

Exceptions to this generalization may occur in specialized and sophisticated markets, where the actors are professionally engaged in betting on the future.

It is, of course, possible for expectations to overtake events in certain specialized types of situations, represented by such phenomena as panics—an old-fashioned run on the bank, for example. In more recent memory, expectations of supply shortages became self-fulfilling prophecies, as hoarding developed during the latter stage of the Nixon wage-price controls program, and during the gasoline supply disruptions when "topping off the tank" became a widespread phenomenon. It is doubtless the case also that housing shortfalls (a victim of high interest rates) contributed to speculative run-ups of house and real estate values. Introduction of wage-price programs may encourage price rises at least temporarily as firms seek to "beat the deadline" for the program to go into effect.

It is also likely that expectations play an important role in some markets but not in others. As a generalization it seems reasonable to believe that the nature, role, and importance of expectations differs in different markets and sectors of the economy, and that not all "economic agents" operate from the same set of perceptions or attach the same importance to them. Changes in government monetary and fiscal policy may be avidly watched and anticipated by some, and completely ignored by others. Expectations may change rapidly or slowly, depending on any number of factors. Major "shock" events will eventually impact on expectations in all sectors, although with what speed and with what specific results is subject to conjecture.

Sophisticated expectations formation, of the type prominent in rational expectations literature, would seem most likely to occur in specialized markets, such as the financial markets, the stock markets, the currency exchange markets and futures markets—in which forecasts are the stock in trade. Certain large business corporations may engage in economic forecasting, as an aid to planning for production, investment and sales. Consumers and workers, even those in labor unions, on the other hand, are likely to operate from generalized impressions as to the direction of the economy, without making quantitative estimates or keeping close track of overall government economic policies and what they may portend.

5. EXPECTATIONS ABOUT FUTURE EFFECTS OF ECONOMIC POLICIES

At the present time, public expectations about the future effects of current and proposed economic policies appear to be too diffused to characterize in a completely uniform way.

In the area of money and capital markets, there apparently is a general expectation that: (a) inflation will continue, propped up by a tax bonanza to the upper income groups, and (b) the Federal Reserve Board will maintain tight money and high interest rates. Consequently, interest rates remain high, and are expected to decline only modestly. This scenario also leads to expectations of a continuing depression in housing construction, to a mounting level of bankruptcies, and to growing unemployment.

As the proposed Administration budgetary policies are increasingly recognized as curtailments of income support (in-kind and cash) for lower-income households, such expectations will breed a lack of consumer confidence and expenditure curtailments by lower income households, in turn leading to increased unemployment. The recent decline in President Reagan's popularity in the polls is undoubtedly linked to Administration proposals for cuts in Social Security benefits.

Our own expectation is that the Administration's current and proposed economic policies will lead to greater inequality in income distribution, a further worsening in the unemployment rate, with little improvement in the rate of inflation. Our conclusion regarding the effect on the distribution of income is based upon the structure of the proposed spending and tax reductions. The budget cuts disproportionately affect programs that are designed to help disadvantaged people—CETA, housing programs, food stamps, child nutrition, AFDC, Medicaid, etc. Further, the tax cuts unfairly favor people in upper income brackets, and will drastically reduce the

corporate share of federal tax receipts. Because the Administration vociferously supports a dramatic reduction in the rate of growth in the money supply, we anticipate the resultant high interest rates will largely offset any stimulus to investment that would result from the proposed business tax cuts. Such key sectors as housing and automobiles will bear a disproportionate burden of the Fed's restrictive monetary policy, but the effects will spread throughout the economy, preventing any improvement in the employment situation. Moreover, the policies do not address such key factors generating inflation as housing and energy costs. In fact, the proposed policies have many perverse effects in these areas. For example, cutting housing programs worsens the already short housing supply, while tight monetary policies further raise the cost of housing. High interest rates have the further effect, through their impact on currency exchange rates, of dampening American export markets, encouraging imports, and exacerbating money supply problems through international shifts of funds. Thus, we anticipate the Administration's proposed economic package will worsen the distribution of income, further exacerbate the unemployment problem, and have little beneficial effect on the rate of inflation.

6. SHOULD TAX POLICIES BE ENACTED FOR FUTURE YEARS?

Congress definitely should not attempt to enact tax and spending policies for several years into the future—because of allegedly favorable effects on expectations. Our view stems from our disbelief that expectations are key factors in determining inflation, that expectations are strongly affected by government policy, and that any relationship between government policy and expectations can be reliably predicted. Moreover, we believe that the effects of fiscal and monetary policy are primarily real rather than offset by expectations. Cyclicalities are inherent in our economic system. Rather, macro-economic policy, supplemented by selective credit regulation, can and should be used flexibly at appropriate times to offset these cyclical movements. Fixing fiscal and monetary policy for several years into the future would frustrate any effort to stabilize the economy.

Government is the only available agent for application of stabilization and counter-cyclical policies. It is a function that the private economy, left to its devices, cannot successfully perform.

STATEMENT OF MARK H. WILLES*

EXPECTATIONS AND THE DESIGN OF GOVERNMENT ECONOMIC POLICY

For many years, economists have realized that views about the future play an important part in economic decisionmaking. There is widespread agreement that people's beliefs about what is going to happen tomorrow inevitably affect the decisions they make today about how much to work, save, spend and invest. The question of how people form their expectations about the future state of the economy, is, in contrast, far more controversial. Indeed, it is at the heart of the debate that is currently raging in macroeconomics and in discussions of how to design suitable government economic policy.

This essay investigates the implications for the conduct of government economic policy of the view that expectations are formed "rationally". I first explain why the decisions that people make today depend crucially on their expectations of the future, and in particular on their expectations about future government policies. Next, I show why the attempt by private agents to forecast future policies as accurately as they can substantially complicates the matter of designing appropriate government policy. Two main conclusions emerge. The first is that policy-makers should not think of government economic policies as one-at-a-time, isolated actions that are justified "pragmatically" in terms of the currently prevailing economic conditions. Rather, economic policies should be longer-term strategies or policy-rules that are publicly announced and adhered to. The second conclusion is that because of its large size, the government has a special responsibility in the "policy-design game" to act in a clear, predictable and consistent way.

By doing so, it will enable private economic agents such as firms and households to plan their economic affairs in the most efficient way.

1. EXPECTATIONS ABOUT THE FUTURE AFFECT TODAY'S DECISIONS

I turn first to a discussion of why expectations about the future affect decisions made today. A good example is furnished by Milton Friedman's analysis of the determinants of how much of a household's current income it wishes to spend on consumer goods and how much it wishes to save for the future. For many years, economists have known that a household's current consumption expenditures depend on its current income. The more a household earns, so it is argued, then the more that household will spend. Friedman's important contribution was to point out that current expenditures depend not only on current income but also on expected

*Executive vice president, General Mills, and former president, Federal Reserve Bank of Minneapolis, Minn. I would like to thank Ian Bain for his help in the preparation of this statement.

future income, so that the more a household expects to earn in the future, the more that household will spend today. Thus a person who expects a \$5,000 per year raise sometime soon is likely to spend more today on consumer goods than someone else with the same current salary but no prospective raise. More generally, Friedman argued, life expectancy, anticipated future earnings and, importantly, expected future tax payments, are all likely to influence a family's decision about how much to spend now and how much to save for the future.

Another example involves the case of a firm considering whether or not to purchase an expensive new piece of machinery for use in its factory.

In order to make such an investment decision, the firm will need to weigh the present cost of the machine against the additional profits it expects the machine to generate over its productive lifetime. Hence, forecasts about the future demand for the firm's product and about the price at which the product will sell are an essential part of a rational investment decision. As before, expectations about the future exert an influence on decisions made today. In particular, the firm will need to form expectations about future government policy. Thus, forecasts about future corporate tax rates, future tax credit schemes and even the future regulatory climate are necessary in order for the firm to make the best possible decision. The situation in which oil companies find themselves today is particularly relevant in this regard. In order to maximize their profits, the oil companies need to take into account their views about the future of President Carter's windfall profits tax scheme, the uncertainty about the existence of the Federal Department of Energy, and the extent to which Interior Secretary James Watt succeeds in his attempt to open up Federally-owned lands for oil and gas exploration.

These two examples illustrate the point that economic decisions need to be inherently forward-looking. It will be in people's best interests to take expectations about the future into account when they make today's economic decisions. Recent developments in formal economic theory have indicated the widespread applicability of this basic underlying point. Expectations of the future play an important role in determining the current behavior of economic agents, and in particular their responses to current and anticipated future government policies.

2. HOW ARE EXPECTATIONS FORMED?

No mention has yet been made of what many economists believe to be the central issue in discussions of the precise role played by expectations, namely the matter of how expectations are formed.

Traditional macroeconomic theorists have tended to be rather cavalier in their treatment of how people form expectations. Typically, they assume that expectations are derived from relatively simple and relatively stable forecasting schemes. Future rates of inflation, for example, are supposed to be forecast by simple extrapolations of the behavior of inflation in the recent past. Yet, such "adaptive expectations" schemes suffer from several shortcomings. First, they ascribe to people a distinct naivete about how output, unemployment and inflation are actually determined. Such

schemes imply that in forming their expectations, people ignore the complicated interactions that permeate the modern American economy, such as those among the Federal Government budget deficit, the money supply, the inflation rate, unemployment and so on. Consequently, adaptive expectations schemes in general yield systematically and persistently erroneous forecasts.

The more fundamental objection to adaptive expectations schemes, however, is that people who act in their own best interests, would not form expectations adaptively. This observation led economist John Muth, as long ago as 1961, to propose the alternative hypothesis of "rational expectations".

Simply put, Muth suggested that in forecasting future values of a particular economic variable, people would use all the information they have available in the most efficient manner. Such information would include not only the past behavior of the variable being forecast; but also the past behavior of other economic variables which interact with that variable *and* any other information people have about what they think might happen in the future. An example will help to clarify the point. Consider a firm that uses oil as an input into its production process. In order to plan its affairs in the most profitable way, this firm has an incentive to forecast the future price of oil as accurately as it can.

Suppose the firm expects the price of oil to rise dramatically over the coming years. Then the firm should either purchase oil today and store it until it is needed, or negotiate and pay for contracts today that guarantee delivery of oil in the future. In either case, the firm avoids paying what it expects will be an especially high price when it needs the oil. If the firm were to employ an adaptive expectations forecasting scheme, it would form its predictions of the future oil prices on the basis of the behavior of the price of oil over the past several years. But rationally-formed expectations would incorporate additional information. First, the firm would use information about other factors which determine the price of oil, such as trends in the consumption of oil in Western industrial countries and recent changes in the conditions of the supply of oil, both in the United States and in the OPEC countries. Second, rational expectations of future oil prices would incorporate information about other factors the firm considers likely to affect the price of oil in the future, such as the likelihood of another major Arab-Israeli confrontation, and the possibility of another supply disruption.

The essence, then, of the rational expectations hypothesis is that people who need to make forecasts use all available information efficiently. This is not to say, however, that rational expectations are never wrong. Indeed, in the inherently uncertain environment, that we all live in, forecasting errors cannot be avoided. What can be avoided are mistakes that are *systematic*.

Rational expectations which use all available information efficiently do result in forecast errors, whose size becomes apparent as time passes by and the future runs into the present. However, these forecast errors will not show any systematic or detectable pattern. They are attributable to the uncertainty of day-to-day life. Adaptive expectations, on the other hand, do lead to systematic forecast errors precisely because they are not based on all available

information. An analogy from betting will help to illustrate the distinction between an unavoidable forecast error that is *not* systematic and an unavoidable error that is systematically wrong. Suppose that on three consecutive tosses of a coin, three consecutive heads appear. Consider betting on the outcome of the fourth toss of this coin, which shows every sign of being a fair one. Suppose that heads is bet, but that the outcome is in fact tails.

Such an occurrence does not provide evidence that the bet of heads was a mistake in any relevant sense, because the outcome of the fourth toss is necessarily uncertain. This is an example of an unavoidable forecast error. What would be a mistake would be to pay more than 50 cents for a chance to win one dollar if heads were to come up on the fourth toss of the coin.

Yet this might well be the behavior of a person who forms expectations adaptively; since three heads in a row might well lead that person to surmise that the fourth outcome will also be heads. The forecast produced is systematically incorrect, because the forecaster is ignoring the additional information that the coin in question seems to be a fair one.

3. RATIONAL EXPECTATIONS IN MACROECONOMICS

I can now turn to the application of the rational expectations hypothesis to questions involving the determination of the overall pace of economic activity, the rate of inflation, interest rates and other important macroeconomic variables.

It has already been seen that private economic agents such as firms and households need to make forecasts about future values of variables of interest to them in their decisionmaking. In the macroeconomic context, the most important variables that need to be forecast are future rates of inflation, interest rates and settings of government policy variables such as tax rates, the Federal Government deficit and the rates of growth of various monetary aggregates. Consider, for example, expectations of inflation, which exert an important influence on the workings of the labor market, and thus on supply conditions in the economy. In order for households to make the best decisions they can about what kinds of jobs to accept and how many hours to work each week, they need to be able to evaluate the purchasing power of the wages they will receive over the coming months. That is, they need to form forecasts of how much the prices of the goods and services they will buy will rise.

Put differently, they need to predict the rate of inflation over the coming months. Firms also need to forecast inflation rates. Predictions about the general course of prices in the economy, together with forecasts of the future demand for their products enable firms to plan their production schedules for a period of several months. They can then determine the size of the labor force they want. Overall, therefore, expected inflation affects the labor market not only through the demand for labor by firms but also because of the supply of labor by households.

With the benefit of hindsight, it should not be surprising that one of the most controversial issues in macroeconomics in the 1970's concerned whether expectations of inflation are formed adaptively, as traditional macroeconomists supposed, or rationally.

Unfortunately, no direct evidence can be brought to bear on this question, since reliable observations on inflation expectations do not exist. Consequently, economists must try to deduce how people form expectations by analyzing their behavior, which is observable.

There are two pieces of evidence which seem damaging to the adaptive expectations schemes that constitute an integral part of the large econometric models based on traditional macroeconomics.

The first piece of evidence involves the poor forecasting performance of the late 1960's vintages of the large econometric models. In particular, the predictions about future rates of inflation and unemployment grossly underestimated what actually happened.

For example, the late 1960's versions predicted that a sustained rate of unemployment of four percent would be consistent with an annual rate of inflation of four percent. Yet in each of the years from 1970 to 1973—before the first OPEC supply disruption, it should be noted—both the rate of unemployment and the rate of inflation were higher than the four-four combination that the econometric models suggested was attainable.

The second piece of evidence is that models were not particularly stable. The addition of new data as the 1970's unfolded did not, as the model-builders had hoped, enhance the precision of the existing numerical estimates of the structure of the economy. Instead, the new estimates were significantly different. This suggested that the structure of the economy had changed, so that the initial specifications of the models were no longer appropriate. Indeed, the model-builders themselves implicitly acknowledged that their models would not, as it were, sit still. They routinely employed an elaborate system of *ad hoc* "add factors" in an attempt to compensate for the continuing drift of their models away from the new data that became available as the decade progressed. By their very actions, therefore, the model-builders implicitly admitted that their models had not isolated the stable structure of the economy.

Although neither piece of evidence is completely destructive of the hypothesis that expectations are formed adaptively, an increasing number of economists have concluded that rational expectations is an alternative hypothesis worthy of serious consideration.

Such a conclusion is strengthened by the argument that rational expectations is a natural assumption to adopt, given that nearly all economists accept the principle that in determining their economic behavior people act in their own best interests. Viewed from this perspective, then, rational expectations seems no more than a reasonable and logical extension of a commonly accepted approach to the analysis of economic phenomena.

4. LUCAS'S CRITIQUE OF CONVENTIONAL MACROECONOMICS

Our discussion so far of the concept of rational expectations does not seem inconsistent with the widely-held view that the rational expectations hypothesis constitutes just another way of modelling how people forecast the future. If this were the case, the hypothesis could be used in standard macroeconomic models in place of the more usually adaptive expectations scheme. In fact, such a conclusion is mistaken. Professor Robert Lucas of the University of Chicago has pointed out that what is now known as the "rational expectations critique" of conventional macro-economics is more far-

reaching than many macroeconomists and policy-makers realize. The implication of the critique, stated bluntly, is that economists must reconsider the entire way in which economic models are formulated. Lucas' discussion focussed on people's "decision rules", which express their economic behavior in terms of those factors upon which this behavior depends. The consumption function which relates people's spending to their current and expected future after-tax income constitutes an example of such a decision rule.

Another example is provided by a firm's investment function, which explains the amount the firm wishes to spend on new capital goods in terms of, for instance, current price of those goods, the current interest rate and the current price at which the firm's product is selling.

Lucas's analysis involved the application of rational expectations to a variety of rigorously formulated decision problems that are typical of those faced by people in their everyday decision-making. Lucas was able to show that changes in the general economic environment within which people carry out their day-to-day affairs—in the way the government sets tax rates, say, or the money supply—would result in changes in the entire form of these decision rules. Put a little differently, patterns of human behavior depend very much on the "rules of the game" in which they are participating. Change the rules of the game, therefore, and it makes sense to expect the behavior of human beings to change as a result.

Although this principle is often ignored by macroeconomists and policy-makers, it will come as no surprise to football fans. Consider the following example.

Suppose that a careful investigation of the behavior of the Minnesota Vikings over the past few seasons, on fourth downs in their own territory, reveals that the Vikings punt 95 percent of the time, no matter which team they are playing or where. Further, suppose that it is necessary to forecast how the Vikings will behave in the future on fourth and long in their own territory. It seems safe to predict that Bud Grant will choose to punt under such circumstances.

Note that this quite reasonable prediction is not based upon any deep understanding of the game of football, but rather on a simple extrapolation of past behavior into the future. But now suppose that the Commissioner of the National Football League announced a rule change, effective the beginning of the 1981 season, which would allow a team six attempts in which to make a first down. Would it still be sensible to predict that the Vikings will punt on fourth and long in their own territory?

The answer is no, as anyone familiar with the game of football can tell you. Yet someone using adaptively-formed forecasts would still expect the Vikings to punt, since this is what an extrapolation of past behavior suggests. The point is that the change in the rules of the game can be expected to lead to changes in the pattern of the Vikings' behavior.

Exactly the same principle applies to people making economic decisions, the case discussed by Lucas. If the entire income tax system were to change, for example, Lucas' analysis implies that

the very way people plan their spending and saving would change. Although current spending would still depend on current income, the precise nature of the relationship would in general be quite different after the change in tax rates. In such a case, people's past behavior will not be a reliable guide to their future behavior, because the rules of the economic game have changed. Or suppose that the legislation describing how firms can deduct depreciation allowances from their tax bills were to change. Lucas's critique implies that the entire form of firms' investment functions would change, perhaps in a profound and significant way.

Lucas' message then, is that in order to take account of the principle that behavior depends on the rules of the game, economists must significantly change the way economic models are formulated and used to assess the effects of alternative government policies.

5. AN EXPLANATION OF MACROECONOMIC MODEL INSTABILITY

This "changing structure" principle provides an attractive theoretical explanation for the instability that has bedeviled the large econometric models based on conventional macroeconomics. When, as in the past ten years or so, the environment within which people make their economic decisions is changing, economists will necessarily be thwarted in their attempts to use historically-based patterns of behavior to construct stable macroeconomic models. Because people's decision rules are, as a consequence of the changing environment, themselves subject to change, the attempt to build an entire model out of decision rules that are assumed to be stable is an endeavor that is doomed to failure. Castles cannot be built on ever-shifting sand, and neither can conventional econometric models, including the currently fashionable so-called supply-side models.

6. A NEW VIEW OF GOVERNMENT POLICY

The Lucas critique is also damaging to the way conventional econometric models have been used to assess the likely effects of alternative government economic policies, and indeed to the whole way in which the policy design problem is posed.

The rational expectations view requires that economists and policy-makers distinguish between isolated actions of government fiscal and monetary policy and longer-term government strategies or policy rules. The latter describe, for example, how government expenditures and tax rates are to be set, year after year, in response to the particular state of the economy then prevailing. The reason that this distinction needs to be drawn is simple. People's expectations of what will happen in the future, in this case concerning the stance of government policy, will affect how they behave today. To assess the effects of current government action, therefore, it is necessary to take into account how agents think the government will behave in the future. Some examples will clarify the point under discussion.

Suppose that the economy enters a recession, and that a political consensus emerges as to the desirability of a tax cut to get the economy moving again. Traditional macroeconomists would as a

result start debating how big the tax cut should be. However, the rational expectations view suggests that the proper question to ask is not about the size of the tax cut to enact now in response to the current recession. This would be an example of an isolated policy action whose effects would be very difficult to predict, since things would depend crucially on whether people expected the tax cut to be permanent, to be temporary or whatever.

The correct question to consider, because it is the only question that can be reliably answered, is what constitutes the proper strategy or policy rule for repeatedly setting tax rates under different economic conditions.

The distinction between isolated actions and policy rules also has implications for the current debate about whether or not the revised tax plan proposed by the Reagan administration, which involves cutting tax rates for each of the next three years, should be enacted. Although the discussion I have given can give no guidance about the size of the tax cuts and to whom they are targeted, it should be apparent that the rational expectations view does support the principle of setting tax and spending policies for several years into the future. Such a procedure would amount to announcing and enacting a policy strategy, which would enable private agents to plan their economic affairs in a more efficient way.

However, many economists have claimed that the enactment of definite tax and spending proposals for any period of time stretching into the future, with result in a loss of short-term flexibility for government policy-makers. Underlying the view of these economists is the idea that fixed government policy rules will lead to more pronounced business cycles and more volatile interest rates. The argument is often explained in terms of the analogy of a motorist driving through unfamiliar and uncertain terrain. The conclusion that is drawn is that economic stability will be enhanced by enabling policy-makers to react to changes in the general economic environment. After all, who would want to drive through an unfamiliar landscape with fixed settings for the gas and brake pedals of one's automobile?

Two points need to be made by way of response. First, much research effort has been devoted over the past twenty years or so to the question of whether discretionary changes in government spending, tax rates and credit conditions have reduced the severity of business cycles.

The evidence that short-term changes in fiscal and monetary policy variables have generally enhanced the stability of the economy is mixed at best. I conclude from this that the loss of short-term flexibility may not be quite so serious as many believe.

The second and perhaps more important point is that the pro-activist argument given above fails to appreciate that the prime objective of good economic policy is not absolute stability *per se*, but rather its predictability for people who need to make decisions that are necessarily forward-looking. Faced with the choice between a fixed policy strategy and an unstated reactive policy, the rational expectations view suggests that the former option may well be preferable, because it facilitates the making of forecasts by private agents. The better the forecasts they make, the better off they and the economy will be.

7. USING MACROECONOMIC MODELS TO ASSESS POLICY

The principle that people's behavior depends importantly upon the rules of the economic game is again of relevance when it comes to the matter of assessing the quantitative effects of certain kinds of government economic policy. The central point concerns how people regard such government activities. Suppose that they are believed to be isolated, one-time *actions* that are viewed as unexpected and temporary departures from what people perceive to be longer-term overall strategies. The use of conventional econometric models, under such circumstances, to predict the effects of short-term changes in government policy variables is unlikely to result in large errors. Because people's past behavior will still be a reliable guide to their future behavior, the large-scale models can be employed to evaluate the effects of different government actions.

But suppose these large econometric models are used instead to predict the consequences of what are properly thought of as unprecedented and significant changes in overall policy strategy.

This, change in the policy *rule* will systematically alter structure of the conventional econometric models. It is under precisely these circumstances that the assessment of the quantitative effects of government economic policy has often yielded poor results.

Perhaps the best example of such an inability of the part of conventional macroeconomic models to forecast with any accuracy occurred in the 1970's. Standard Keynesian and monetarist econometric models failed to predict the effects on output, unemployment and prices that were associated with the unprecedentedly large budget deficits and rates of money creation that occurred during that decade.

8. CAN THE CURRENTLY USED MODELS BE PATCHED UP?

Another question that is often debated involves whether the standard macroeconomic models can be "patched up" so as to capture the principle that people's behavior changes significantly when important aspects of their surroundings change. The unfortunate answer to this question is that the deficiencies of the traditional models cannot be remedied simply by adding a few extra variables or a few extra equations. The root cause of the problem is that the expectations schemes upon which these models are based are flawed.

Because of this, the current generation of econometric models cannot be easily amended to predict how their own structures will change, in response to changes either in government policy rules or in the general economic environment. This is a gloomy prognosis indeed for those involved in the attempt to refine the large-scale econometric models by making improvements that are essentially cosmetic. Only when models employing more reasonable assumptions about how people forecast the future are developed can there be any hope that the performance of macroeconomic models will improve. Unfortunately, this requires a major rebuilding effort, the first tentative steps of which are only now being taken.

9. POLICY DESIGN AS A GAME AGAINST INTELLIGENT AGENTS

The final important implication of rational expectations for how policy-makers must think of the design of government economic policy is that policy-makers must realize that their actions impinge upon intelligent agents. The point can be made by considering an example that has been given by Professor William Poole of Brown University. The example, which is similar in most respects to the motoring analogy I discussed earlier, involves the control problem of maintaining an airplane on a steady and safe course. Under normal flying conditions, 35,000 feet above ground in uncluttered skies, a well-designed autopilot can perform the task of keeping the plane moving in the right direction perfectly adequately. Indeed, an autopilot might even outperform a human being, who is, after all, prone to fatigue, boredom and possibly even error.

There are nevertheless two kinds of situations in which it will be in the passengers' best interests for the pilot to regain control of the plane. The first of these involves severe weather. Because this causes the nature of the control problem to go beyond the capabilities of the autopilot it will be advisable for the human pilot to take over the controls of the plane in order to stabilize its course. This example corresponds closely to the view of the policy design problem that predominates in traditional macroeconomics. The plane can be thought of as the economy, while the auto-pilot can be interpreted as well-understood and widely known policy rules. The human pilot, who takes over when shocks buffet the airplane, is the analogue of the government, following whatever policy *actions* seem justified by the exigencies of the moment.

Control problems such as this have come to be known as "games against nature". But consider now the case of two airplanes which are in the same airspace at the same time, so that there is a possibility of a mid-air collision. The control problem is now fundamentally different: it is no longer a game against nature, it is a game involving another intelligent agent, in this case the pilot of the second airplane. What changes the nature of the game is the interaction between the two pilots. Each pilot must still, of course, be concerned about the flight path and operation of his own airplane, but he must also be concerned with the reactions of the pilot of the other plane. In particular, each pilot must consider how any course changes he decides to make will be interpreted by the other pilot. This is because each pilot needs to forecast how the other pilot will behave as they both attempt to land their different planes safely.

Note that this control problem is fundamentally from that of coping with a storm: the underclouds and air currents never try to anticipate or outguess a pilot.

This type of control problem corresponds to the view of policy design that follows from the realization that in forming forecasts people use information efficiently. Appropriately, problems of this kind are referred to as "games between intelligent agents." The first plane is to be thought of as the public sector of the economy, with government policy-makers at the controls. The second plane corresponds to the private economy, and is piloted by intelligent private agents such as firms and households. The overall perform-

ance of the economy is to be interpreted in terms of the behavior of both of the airplanes.

The point of the example is to illustrate the fact that in games against intelligent agents there are important strategic aspects which are absent from games against nature. Actions taken today by government policy-makers will affect people's expectations about how policy-makers will behave tomorrow. In turn, this will affect how people behave today. This is why it is helpful for private decision-making for the government to follow a widely understood and predictable rule. A pilot whose actions are erratic and are apparently determined largely by current conditions is not the kind of pilot to encounter in crowded airspace a few hundred feet above ground level.

Perhaps not surprisingly, macroeconomic models which are consistent with this more sophisticated view of the design of government policy are still in the early stages of their development. As a result, no formal basis yet exists for giving policymakers quantitative advice about how to design economic policy. Nevertheless, as we have already discussed, the rational expectations view does imply that predictability of government policy is important for private decision-makers. But even greater appeal follows once it is recognized that the "game" being played is not one between two similar players, as was the case in our airplane example. Rather, the policy game is one between a highly visible and dominant player, the government, and a very large number of private firms and households. Thus the private economy cannot assume a leadership role, because by its very nature it consists of a huge number of independent decision-makers who cannot act in a coordinated way.

On the other hand, the government, by virtue of its size, can be a dominant player. It has, therefore, a special responsibility to act clearly, predictably and consistently. The conclusion that may be drawn is that once expectational issues are taken seriously, it becomes necessary for government policy to be accurately and easily predictable. This is best achieved by government following well-understood policy rules.

To sum up, the recent burst of interest in the investigation of rational expectations models has provided important new insights into the behavior of the American economy.

Even if some of the assumptions that are employed in rigorously formulated economic models are regarded as being too extreme, this is not to say that the new issues that have been identified are not of relevance. The fact that people do look forward in making their decisions requires nothing less than a major revision of the way economists think about macroeconomic phenomena, and of the way policy-makers think of and attempt to design suitable macroeconomic policy.

STATEMENT OF ALFRED S. EICHNER*

EXPECTATIONS IN ECONOMICS

The recently revived emphasis on expectations is hardly a comforting development—for it threatens to reduce even further the credibility of economics as a discipline.

No one would deny that individuals form expectations of the future, and that these expectations exert an important influence on the economy. Every economist, especially since Keynes, has been aware of this fact. The controversy arises over how a variable like expectations—which, being entirely in the minds of individuals, is not directly measurable—should be incorporated into economic analysis.

The practice generally followed by economists is to focus on the directly observable variables which are thought to shape expectations, such as current sales or employment, and then ascertain what is the relationship between those directly observable variables and the types of behavior thought to be affected by expectations, for example, business investment or consumer spending. In effect, though expectations may be considered to be the intervening variable linking changes in sales and employment to changes in business investment and consumer spending, this factor is omitted from the analysis because, not being directly observable, its actual effect cannot be determined. Any hypothesis based on such a variable would be untestable, and therefore of no value to those interested only in explaining the dynamics of the economy.

In the late 1950's and early 1960's when economists began for the first time to undertake empirical research on a significant scale, efforts were made to take expectations into account more explicitly in explaining both investment and consumption behavior. In the case of investment, stock market prices were used to gauge expectations about further business profitability and, in the case of consumption, the findings from the Michigan Survey Research Center were used to approximate expectations about the future levels of household income. In both cases, the effort to incorporate expectations into the analysis explicitly led to little or no improvement in the ability to model the behavior of business firms and households, and the effort was gradually abandoned. What distinguishes the recently revived interest in the role played by expectations is not the development of better direct measures of the psychological factors at work but rather the willingness to throw any methodological caution to the wind.

Actually, there are two quite distinct, and only loosely connected, lines of argument behind this latest emphasis on expectational factors. One is the line of argument associated with the misnamed "rational expectations" models; the other is the line of argument associated with certain "supply-side" policies.

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

There are, as a further distinction, two separate types of "rational expectations" models, one concerned with the set of relative prices that can be expected to prevail in the long run when, as Keynes noted, we are all dead and the other concerned with the change in the aggregate price level that is likely to occur in the more immediate run. Since the first type of rational expectations model is of no policy relevance—it is intended only to enable theorists to solve the problem of uncertainty by assuming it away—we shall focus on the second. It is this version of the same basic line of argument which gives rise to the claim that attempts to manipulate the economy through monetary policy are likely to prove futile.

The argument goes as follows: individuals have in their minds a correct model of the inflationary process and that, in this model, the factors responsible for inflation are monetary ones—it being generally understood that the price level is directly tied to the growth of the money supply. Thus, when the monetary authorities act to increase the money supply, this in a misguided effort to stimulate employment and real output, they only succeed in persuading businessmen and others active in the various markets that prices will subsequently rise. These individuals will insist on higher rates of compensation in order to offset the higher prices they expect to have to pay in the future, and it is in this way that the inflationary expectations created by the monetary authorities when they act to increase the money supply become self-fulfilling. The point is that, because businessmen and others can be expected to correctly anticipate what will be the effect of the Federal Reserve Board's actions—their expectations and subsequent behavior are, in this sense, "rational"—the Fed cannot use monetary policy to achieve a higher growth of employment and real output than would otherwise occur.

The question here is not whether individuals form expectations about the future trend of prices, or even whether those expectations are based on a correct model of the inflationary process (though this last assumption seems a questionable one, in light of the widespread disagreement over the causes of inflation). The question, rather, is whether the correct model of inflation is one which places the primary emphasis on monetary factors. The role played by expectations, "rational" or otherwise, is really beside the point. Either the rise in prices can be explained by the growth of the money supply, in which case the arguments involving rational expectations merely reinforce the main point, or, alternatively, the rise in prices is to be explained by other factors—in which case the arguments about rational expectations are either irrelevant or need to be reformulated. In other words, as developed so far, the "rational expectations" models are simply frosting on the monetarist cake.

If the rational expectations theorists could suggest some means by which inflationary expectations could actually be measured directly, then the models they have developed might indeed represent an important advance. Instead, the change in expectations is merely identified with the change in the money supply, thereby avoiding the need to model or in any other way approximate empirically the change in expectations. The role of expectations is

brought into the argument only to show it makes no difference to the basic monetarist argument. The whole exercise is simply an intellectual sleight-of-hand—the equivalent of the well-known trick in which an individual is asked to think of a number and then, after being told to carry out a string of mathematical calculations, is correctly told the sum he is left with because, at some point along the way, the number he was originally asked to think of was factored out. If the basic monetarist argument is correct, it is correct for other reasons, and not because any “rational expectations” frosting has been added to it.

Of course, I should hasten to add, there is very little empirical evidence to support the basic monetarist argument. The statistical correlation observed between the growth of certain monetary aggregates and the price level is simply a combination of the common trend factor affecting both variables and the reverse of the generally assumed casual relationship. There is a growing body of evidence, based on the work of post-Keynesian economists, suggesting that the money supply is to a significant degree endogenously determined and depends on the growth of prices, rather than the reverse. In any case, the monetary aggregates with which the price level is statistically associated are not variables over which the Fed has any real control.

It is probably the policies based on the so-called “supply-side” models rather than the implications of the rational expectations models which are the principal reason for the interest now being shown by policy-makers in the role played by expectations. According to the supply side models, a reduction in taxes will lead, because of the effect on “expectations,” to increased work effort, investment, productivity and growth—a line of argument which neatly fits the current political mood. As a contribution to our understanding of the economy, however, the supply-side models leave a great deal to be desired.

The first point that needs to be stressed is that the models are largely outside the public domain—in sharp contrast to what is usually true of scientific research findings. The models have been developed almost exclusively by private consulting groups and investment counseling services, for sale to clients (including the government). The models have not yet appeared in any of the economic journals or in books where, being in the public domain, the evidence in support of the models can be evaluated by those with the necessary technical training. This development, by itself, represents a major step backwards in economics. The point is made all the more poignant by the fact that the results claimed from the models are in sharp contrast to the findings of other investigators, those whose work has been published and therefore subject to scrutiny by knowledgeable critics. At the very least, then, the supply-side models need to be placed in the public domain, and the empirical evidence underlying the models evaluated, before serious thought is given to using the models as the basis for public policy.

Second, there is strong reason to question the statistical methods by which the supply-side models have been constructed. It would appear, on the basis of the limited information available on the models, that at least some of them are a) improperly specified, and b) statistically naive. This is certainly true of the one supply-side

model I have been able to examine in some detail, the "prototype wedge" model developed by Wainwright & Co. under the direction of Professor Arthur Laffer. In that model, various factors—such as the amount of defense spending and "tax progressivity," the latter measured by the ratio of the overall marginal tax rate to the overall average tax rate—are simply regressed against the growth of real GNP per capita each year over a 38-year period (including World War II). The other factors affecting the growth of real GNP per capita, along with the structural relationships by which the growth of real GNP per capita is influenced by the variables taken into account, are simply ignored. It is in this sense that the model is misspecified and the results of questionable value. Moreover, little thought seems to have been given to the likelihood that at least some of the observed relationships are due primarily to a common trend factor. After all, defense spending has increased throughout the period covered, along with real GNP per capita, with particularly large increases during World War II. It is in this sense that the model seems statistically naive. From what has been reported about some of the other supply-side models, it would appear that the prototype wedge model is not unique in its shortcomings as an exercise in econometrics. Only after all the supply-side models have been placed in the public domain will the extent of their statistical deficiencies be fully known.

Third, from the response to critics by some of those responsible for building the supply-side models, as reported in the press, it would appear that, at least in one or two cases, the effects claimed from a reduction in taxes are based, not on any available evidence, but rather have simply been built into the models by assumption. This represents a further step backwards in economics, and indeed is but another form of intellectual sleight-of-hand. If policy is to be based on the results which are built into a model by assumption, then any policy will be equally defensible, it merely being a matter of building a different model based on the assumption that gives the desired result. Indeed, there is little reason to worry about what the available evidence shows since that evidence counts for naught in this type of exercise as a scientific activity.

One can, of course, have sympathy for the argument that the economics journals and the other means of placing research findings in the public domain are not always open to unorthodox viewpoints, such as those represented by the supply-side models. It is too easy for anonymous referees to reject the work as invalid when the real objection is that the work violates some prejudice of the referee. Certainly this has been the experience of post-Keynesian economists like myself who have similarly attempted to build "supply-side models"—though of a radically different sort—only to find that the established journals, as well as the established sources of funding, are closed to them. Still, there are several important differences between the two types of supply-side models in this and in other regards. First, in a post-Keynesian type of supply-side model, little emphasis, reflecting the available empirical evidence, is placed on the effect that taxes are likely to have on production. Instead, the supply-side of the picture is the effect that costs rather than demand will have on price levels. It is for this reason that post-Keynesian supply-side models suggest the futility

of attempting to control inflation by reducing aggregate demand, this on the unfounded belief that there is actually a Phillips curve. The level of production, however, does depend in this type of model on aggregate demand, and it is the level of aggregate demand, as determined by governmental and other types of discretionary spending, which is far more important than any tax rates in explaining the level of production. Productivity is yet another matter that needs to be accounted for on the supply side, it being explained in a post-Keynesian model largely by the rate of business investment.

Second, although expectations play a crucial role in a post-Keynesian supply-side model, they neither are used to negate the significance of uncertainty nor are they built into the model simply by assumption. They are instead reflected both in the structural relationships that constitute the model and in the size of the coefficients for the variables in the structural equations. For example, when the model indicates that a 1 percent increase in aggregate output above its trend value leads to a 1.9 percent increase in corporate plant and equipment expenditures above the trend growth rate, this does not mean that the cyclical increase in aggregate output forces corporations to increase investment disproportionately. It means instead that the cyclical increase in aggregate output causes corporate executives to revise their expectations as to the future growth rate of industry sales and to step up their companies' capital outlays accordingly.

The behavior captured by the model reflects a range over which a change in expectations will have little or no effect on how the economy operates. In this way, the current state of expectations becomes a parameter of the model, indicating when the model does or does not apply. The institutions which are explicitly taken into account in the model—money, financial intermediaries, large oligopolistic business enterprises and industrial trade unions—can be regarded as social mechanisms which have evolved for coping with the uncertainty (unforeseeable future) which is inherent in economic activity. Even so, it is recognized that their behavior, in acting as one would normally expect these institutions to act, may be destabilizing for the system as a whole, either in terms of real output and employment or in terms of prices. Moreover, it is recognized that these institutions may, at times, even behave in ways other than expected, thereby contributing in historically unique ways to the instability of the system. It is at those points in time that it can be said that expectations, as a parameter of overall economic activity, have changed. Expectations, then, are important in defining the normal behavior of economic institutions within a post-Keynesian model, the only behavior which can be captured in an econometric model. When these expectations change, and the behavior of the institutions being modeled is no longer normal, the model itself no longer applies.

Third, although it has not been easy to gain funding for and publish the results from the post-Keynesian types of supply-side models, those models are nonetheless in the public domain. More importantly, it is not the authors of those models who have been reluctant to make the results available to critics for whatever reason. In this way and in the greater scrupulousness with which

the available empirical evidence is taken into account, the post-Keynesian type of supply-side model represents a more promising alternative to the conventional demand-side models, both orthodox Keynesian and monetarist, than the better publicized supply-side models which naively suggest that production can be increased and inflation controlled simply by lowering taxes.

STATEMENT OF LEONARD FORMAN*

The way in which economic agents make decisions when confronted by imperfect information and uncertainty has always been a major unsolved problem for economics. Indeed, there are some schools of thought which hold that the nature of the problem makes it insolvable—that because of uncertainty the proper paradigm for economics is one in which disequilibrium is the normal state of affairs. Unfortunately, much of the discussion with regard to expectations, particularly the current intellectual fashion—rational expectations—takes place within the timeless framework of equilibrium analysis in which social and cultural mores and attitudes are absent. Such discussions are deeply flawed.

The Walrasian general equilibrium framework, which provides the microeconomic foundation for conventional macromodels, eliminates any possibility of an endogenous cyclical process. Equilibrium, not disequilibrium, is the pervading metaphor.

There is, however, an alternative vision of the economy's macrodynamics which seems to be more easily reconciled with the institutional characteristics of a modern industrial society. Cycles are viewed as an endogenous process in a decentralized market economy where the future is uncertain, production takes time, and the financial system, which supports the production and spending activities of society, is fragile and periodically subject to speculative excesses. Random shocks exacerbate the cyclical problems but they are not necessarily, in this view, the fundamental cause of cycles.

Indeed, changes in economic activity in the short period are viewed as being the result of changes in discretionary expenditures by households, government and the business sector. The decision to increase or decrease such expenditures depends on one's view of the future. Because of uncertainty—the unpredictability of future events—expectations are continuously revised on the basis of new information. More importantly, such expectations or anticipations are often wrong. It is the deviation between our expectations of future economic activity and the actual unfolding of that future which causes a continuous revision in discretionary expenditures. The cyclical turbulence we observe in the economy is therefore often the result of disappointed expectations. When one extends the concept of uncertainty from imperfect information about the future to imperfect market information about the present, one understands why cycles are an inherent part of the economic process.

In modern industrial decentralized economies, markets are uncoordinated. The institutional characteristics of such economies do not lend themselves easily to the instantaneous elimination of market imbalances either within markets or between markets. Imperfect information and adjustment costs in the purchase, hiring and firing of factor inputs forces firms to respond slowly to supply-

*Director of planning and chief economist, New York Times.

demand imbalances. The primary mechanism for adjusting to such imbalances is the variation in the level of capacity utilization, the stock of inventories, and the size of the labor force. The combination of volatile discretionary expenditure patterns and uncoordinated markets, i.e., markets which take time to adjust to the volatile swings in spending, results in the fluctuations we observe in every market economy.

This basic instability is further aggravated by the financial arrangements peculiar to industrial market economies. The desire and willingness to spend must be matched by the ability to finance spending. Periodically, the need for credit strains the financial sector's ability to supply that credit. There is in all market economies a flow of funds cycle which follows a rhythm similar to cycles in real sector activity. To paraphrase Hy Minsky, during prosperity, firms are induced to borrow to help finance discretionary expenditures. As the economy expands, carrying costs and debt ratios rise, long-term credit becomes relatively harder to get, and short-term credit easier. The financial system, because of this layering of debt, becomes increasingly fragile. Eventually a slowdown or downturn in economic activity can be severe enough to impair confidence. Credit standards are raised and a liquidity crunch ensues. If the crunch is severe enough, a full-blown financial crisis erupts. Central bank behavior often contributes to this process of financial destabilization by the withdrawal of reserves at precisely the moment the economy is being drained of liquidity.

The first step required in developing a rational economic policy is to recognize the importance of economic institutions and the adoption of an economic framework which incorporates those institutional realities which are part of the landscape of a modern industrial economy.

STATEMENT OF JOHN RUTLEDGE*

THE ROLE OF EXPECTATIONS IN ECONOMICS

ECONOMIC THEORY

Virtually all economic decisions reflect explicit or implicit judgments about future conditions. Multi-period contracts, price and wage setting, saving, investment, job training, and the ownership of assets all represent decisions which impact the economic agent's welfare over time. But the future is inherently uncertain; therefore, economic agents' decisions must be based on information represented by their subjective probability distributions of future events. In principal, then, expectations—by which we mean the properties of such subjective probability distributions about future events—lie at the heart of every theoretical argument in economics. Expectations are especially important in theoretical analyses of the path through which an economy moves over time, hence, for government policy making which attempts to first predict, and then alter, the path of an economy over time.

EXISTING EMPIRICAL MODELS

The importance of expectations in the structure of existing empirical models is somewhat more difficult to assess due to the variety of existing models. At the conceptual level, expectations are as important in empirical model building as in theoretical work for the same reasons cited above. In practice, however, the treatment of expectations in the vast bulk of postwar empirical work has varied from neglect to ad hoc rules of thumb. The recent work of the rational expectations school, led by Robert Lucas and Thomas Sargent, which makes an attempt to place expectations at the core of both theoretical and empirical economics, marks a sharp contrast to this trend.

The structure of existing empirical models grew out of the mathematical revolution which took place in the economics profession after World War II. Initially, and perhaps understandably, the tools of mathematical economics were taken from the physical sciences, where economists found well developed techniques for analyzing problems of dynamic adjustment. I believe this intellectual cross-fertilization is responsible for the nearly uniform practice of ignoring expectations in empirical work in the following two decades and for the failure of standard econometric models to perform up to the hopes of their builders during the turbulent 1970's.

The key distinction between economics and the physical sciences lies in the recognition that economic agents are able to think, plan, speculate, arbitrage and, in general, respond to anticipated wealth-maximizing incentives; in contrast, although molecules, atoms, and

* President, Claremont Economics Institute.

chemical compounds can respond to direct physical stimulus once it has been applied, they cannot do so in advance of the event, even if it were capable of being fully foreseen. It is not surprising, therefore, that economic models based on laws of motion drafted from the physical sciences tend to underpredict the speed with which market participants adapt to changing economic policies.

For the same reasons, early econometric modellers ignored the distinction between current actual values of economic variables and the anticipated values which would be specified by economic theory, substituting actual values for expectations in empirical work. This practice had the twin virtues of allowing the researcher to avoid the tough question of how expectations are formed, and allowing the researcher to use standard government data without alteration. Formally, this procedure is equivalent to assuming "static expectations", i.e., that economic agents expect current observed values of the variables in question to remain unchanged in perpetuity.

During the past twenty years, expectations have played an increasingly important role in both economic theory and empirical work. It has become standard practice to include at least some discussion of expectations in almost every empirical study of the determination of price level, real output, interest rates, exchange rates, commodity prices, and equity prices. Indeed, the existence of formal futures markets in which people can, and do, take active positions based on the expectations of future conditions in the major grain, meat, metal, currency, money and bond markets, virtually forces any researcher doing work on price determination to devote time to the question of expectations.

AUTOREGRESSIVE MODELS

Most of the empirical work on expectations formation over the past years has proceeded on the assumption that economic agents form expectations of future events according to a particular simple rule; the value of variable X which people expect to observe in the coming period is simply a weighted average of the values of X which have been observed during the previous n -periods, i.e.,

$$(1) X_t^e = a_1 X_{t-1} + a_2 X_{t-2} + \dots + a_n X_{t-n} = \sum_{i=1}^n a_i X_{t-i}$$

Both the values for the weights $[a_i]$ and the order of the weighted sum, n , are either arbitrarily chosen by the researcher or based on statistical procedures. The general class of expectations models represented by (1) is known as "autoregressive" (AR), since expected future values of X are based solely on past values of X . Static expectations, discussed above, can be seen to be a special case of AR model with $a_1=1$ and $a_2=\dots=a_n=0$. While they surely represent an improvement over static expectations, general AR models should be viewed as an extremely restrictive class of expectations models. AR models assume that the information set used by economic agents may have information about future values of a variable X is restricted to its own past values. In some cases, i.e., where economic agents may have information about future paths of other variables which are known to be systematically related to X , AR models can be interpreted as assuming that economic agents "waste" potentially valuable information.

Autoregressive models of expectations formulation have grown to be standard operating procedure in macroeconomic model building since 1970.¹ In the wage-price blocks of the standard large-scale macroeconomic models, for example, prices depend upon wages, and wages depend upon workers' inflation expectations, which, in turn, are invariably modelled as long-tailed weighted averages of previous inflation.

The popularity of autoregressive models is principally due to (1) their mathematical tractability, and (2) the widespread tendency among economists, at least until recently, to view economic agents as rather docile and unsophisticated creatures with only limited abilities to perceive the complex workings of the markets in which they earn their living.²

The dominance of the autoregressive assumption in empirical models has had very unfortunate effects on government policy making, for it has been responsible for creating the illusion that inflation can somehow be "built into" the structure of economy. In the standard models, inflation projections—through wages and the AR expectations term—are little more than extrapolations of previous inflation trends with allowance made for the effects of changes in unemployment rates, capacity utilization and other "short-term" market conditions. In order to have any lasting effect on the inflation rate, monetary and fiscal policy must restrict demand, i.e., raise unemployment rates, and thereby depress current observed inflation rates, for a very long time in order for the lower inflation rates to pass through the parameters of the AR process and significantly alter the inflationary momentum.

As a result, policy makers have been advised by economists that the unemployment and output costs which accompany reduced inflation are too high for a society to bear.³ This has created an all too apparent bias in macro policy toward higher inflation in most Western countries. Worse yet, the use of AR models mistakenly gives the analyst the impression that stopping inflation is merely a matter of keeping observed inflation rates down—through direct price and wage controls—for a period of time sufficient to "break" the psychology of inflation. This has led to misguided stop-and-go attempts at incomes policies as well as insufficient doses of monetary and fiscal restraint. To date, all such mechanical approaches to inflation control have ended in failure.

To summarize these arguments, AR models represent a distinct improvement over static expectations as hypotheses about expectations formulation, but AR models remain extremely restrictive. By disregarding all non-momentum sources of information from economic agents' information sets, AR models lead researchers to *overstate*

¹ By "standard" models, I refer to the general class of successors to the Klein-Goldberger model (1948), including the FMP, Brookings, Wharton, DRI, Chase and UCLA models of the U.S. economy.

² Surprisingly, economists' superior insights into the determination of future market conditions have not shown up as higher relative earnings. My most recent (informal) job survey suggests that the average business executive, whose expectations the economist is presumably modelling, sports annual earnings which are more than three standard deviations higher than average economist earnings. This is true in spite of our superior insights.

³ Arthur Okun's sample of the standard macroeconomic models, for example, found that the estimated "cost" of 1 percentage point reduction in permanent inflation varied between 6 percent and 16 percent of that year's total output. In my view, these estimates are solely the product of the assumed AR expectations models; such grossly exaggerated estimates fly totally in the face of human experience.

the importance of momentum in the inflation process. This overstatement has had unfortunate effects on policy formation.

RATIONAL EXPECTATIONS

Rational expectations (RE) models of expectations formation represent an attempt to replace AR models with less restrictive hypotheses about economic agents' behavior. Very simply, RE imposes the consistency requirement that the economic agents whose expectations are being modelled know just as much about the structure of the market in which they are operating as does the model builder himself, i.e., RE robs the modeller of the comforting "pretense of superior knowledge"⁴ which makes large-scaling model building using AR models so easy.

While the concept of RE can be found in many earlier writers,⁵ and John Muth (1961) was the first to formally define and discuss the application of RE to economic models, the take-off point for the modern RE literature must be set at 1976 with the publication of "Econometric Policy Evaluation: A Critique" by Robert Lucas. In that paper, Lucas showed that if expectations are rational, then the parameters of standard macroeconomic models will not be invariant to policy change; hence even though standard models might serve as a useful summary of the way things have been in the past, and may provide useful projections about the path the economy would take if policy maintains its historical course, standard models are of no value in assessing the likely course of the economy if policy were to be altered. Choosing economic policies based on comparisons of simulations from standard models, Lucas argued, is a misleading exercise. Subsequent contributions by Lucas and his collaborators, Thomas Sargent, Neil Wallace, Robert Barro, and others, have shaken the foundations of received macroeconomic theory and raised serious doubts about the usefulness of large-scale macroeconomic models.

The rise of RE during the past five years has been so rapid and has been accompanied by such controversy that RE is sometimes misinterpreted as assuming that economic agents know "everything", i.e., that RE is equivalent to the assumption of perfect foresight. This view is incorrect. RE begins with the notion that there is no sound theoretical reason for restricting economic agents' information sets to historical values of the "own" series, as in AR, or to any other *ad hoc* subset of information. Instead, RE leaves the choice of the economic agents' information sets to the modeller subject to the proviso that, *ex ante*, economic agents' possess the same information about the structure of the model as does the modeller. This severely limits the options open to the modeller.

With AR, or other *ad hoc* expectations assumptions, the modeller is free to assume any level of detail about the structure of the overall model, without disturbing the assumed expectations process. For example, a researcher could create a model of the corn market in which corn prices are determined by the joint interaction of consumer incomes and rainfall, while still requiring that

⁴ With due apologies to Prof. Friedrich von Hayek.

⁵ Especially Locke, Marshall, Wicksell, and Keynes. See Chapter 2 of Rutledge, "A Monetarist Model of Inflationary Expectations" (1974), for a historical view.

economic agents in the model (here, corn farmers) forecast future corn prices by simply extrapolating recent corn prices.

With RE, the modeller makes only one choice for the structure of the model which is chosen by the researcher and also represents the information set of economic agents within the model. In the corn market model, for example, expected corn prices depend on anticipations about consumer income and expected rainfall during the coming market period, as well as on the parameters of the equations representing supply and demand behavior.

For example, equations (2) and (6) can be used to represent two alternative models of the corn market. Equations (2), (3), (4), (5) can be solved for the AR representation of equilibrium price shown in (7).

(2)	$Q^D = -aP_T + by_T$	Demand
(3)	$Q^S = cP_T^e + dR_T$	Supply
(4)	$Q^D = Q^S$	Equilibrium
(5)	$P_T^e = \sum_{i=1}^n e_i P_{T-i}$	AR
(6)	$P_T^e = E(P_T)$	RE
(7)	$P_T = \frac{b}{a} Y_T - \frac{d}{a} R_T - \frac{c}{a} \sum e_i P_{T-i}$	AR solution
(8)	$P_T = \frac{b}{a} Y_t - \frac{d}{a} R_T - \frac{c}{a} \frac{b}{c+a} Y_T^e + \frac{c}{a} \frac{d}{c+a} R_T^e$	RE solution
(9)	$P_T^e = \frac{b}{c+a} Y_T^e - \frac{d}{c+a} R_T^e$	RE price expectation
(10)	$P_T = \frac{b}{a} (Y_T - Y_T^e) - \frac{d}{a} (R_T - R_T^e) + \frac{b}{c+a} Y_T^e - \frac{d}{c+a} R_T^e$	Equivalent RE solution

Alternatively, equations (2), (3), (4), (6) can be solved for the RE representation of equilibrium shown in (8), and for the RE price expectation shown in (9). Equation (10) expresses the RE solution in (8) to highlight the fact that in a RE model, the reduced form "multipliers" for changes in the driving variables (here, income and rainfall) take on different values—in this case smaller values—when those changes are expected than when they are unanticipated, and that in the absence of unanticipated shocks, actual and expected price are equal.

In spite of the dramatic impact which RE has made on economic theory in the past five years, RE has had little impact on economic model building, policy simulation and forecasting practices to date. RE's slow progress on the empirical side⁶ is largely due to the formidable mathematical problems of solving and estimating RE models of more than modest proportions combined with the en-

⁶ RE has had, of course, a substantial empirical literature of its own, as best illustrated by the work of Barro. In addition, we have used a small-scale, general equilibrium RE model of the U.S. economy for commercial forecasting service since 1975 at the Claremont Economics Institute. The point here is, though, that the RE literature has not made a dent in the structure of the "standard" models.

trenched position of the large-scale macroeconomic models in economic policy making. The result has been an uncomfortable half-way house in which belief in the usefulness of policy simulation from the large-scale macro models has been mortally wounded, but the profession has not yet settled on a generally accepted alternative. I believe that the large-scale models *cannot* be adapted to meet the RE theoretical challenge, and that, instead, the *users* of policy analysis must learn to accept less detailed and disaggregated responses from econometric models than they have been used to, in return for higher quality and more reliability.

EXPECTATIONS AND ECONOMIC POLICY

Changes in economic policy affect the economy by altering the incentives and constraints which face individual decision makers. Since many decisions take the form of current commitments which have effects on an individual's welfare which reach far into the future, the expected future policy environment is crucial to current decisions. In general, we would expect policy changes which are perceived to be relatively permanent to evoke larger changes in economic behavior than those which are perceived to be relatively temporary. For example, we would expect long-term interest rates to decline more sharply in response to a widely held belief that there had occurred a permanent shift in policy toward lower money growth and reduced spending, than in response to a sharp drop in a monthly CPI measure widely viewed as a statistical aberration.

Unfortunately, long-term inflation expectations are extremely difficult to change after the dismal record of the past fifteen years. Favorable changes in long-term expectations must be *earned* by policy makers in one of two ways, either (a) over a long period of time by creating a track record of stable noninflationary policies or (b) by creating an irreversible policy regime in which future policy makers would be *forced*—say, by constitutional mandate—to keep monetary and fiscal policy variables at steady noninflationary levels. Discussions of a monetary constitution, return to the gold standard, and of a balanced budget amendment are all examples of the second course; we have yet to see an example of the first course.

TAX POLICY

Tax policy represents an especially useful example of the importance of expectations. The success of revisions in tax rates designed to encourage saving and capital investment depends largely on whether savers and investors view the changes as temporary or as relatively permanent. Saving and capital investment decisions represent multi-period commitments of resources. The more nearly certain is the future economic and policy environment, the more likely people are to be to devote resources toward future, as opposed to current, consumption. Capital investment decisions involve calculations in which investors evaluate the discounted present value of expected future after-tax returns during the life of a given project. The greater the degree of uncertainty surrounding future tax rates, the larger the margin for error that investors

must build into expected future after tax returns: this can force investors to increase the discount rate applied to future income streams, and cause them to delay or cancel otherwise profitable investment projects.

The principle that steady and predictable tax schedules, set in advance for a long horizon, are beneficial to savings and investment is not new, as shown in the following remarks by former Treasury Secretary Andrew Mellon.⁷

A permanent tax system should be designed not merely for one or two years not for the effect it may have on any given class of taxpayers, but should be worked out with regard to conditions over a long period and with a view to its ultimate effect on the prosperity of the country as a whole.

These arguments suggest that Congress should give priority to making tax schedules as simple and predictable as possible, and that Congress should opt for longer, as opposed to shorter, horizons when setting tax rates for the future. In the context of the current legislative agenda, these arguments suggest that it would be preferable to adopt the full three year tax bill submitted by President Reagan, rather than the "two years and we'll see" approach favored by Congressman Rostenkowski. Furthermore, I believe that indexing tax schedules to the price level—that is, adopting a permanent set of tax rates rather than the current system of ad hoc changes whenever bracket creep gets too heavy to bear—would do more to encourage saving and investment than any other single revision in the tax code.

SPENDING POLICY

Expectations of economic agents about both the level of government spending, and the structure of government spending—that is, the precise mix of goals which the government plans to purchase or subsidize—play an important role in the economy.

The overall level of government spending has long been viewed as an important source of aggregate demand for goods and services. In general equilibrium models, an increase in the level of government spending leads to an increase in the general price level. This suggests that expectations regarding the future path of government spending should play an important role in the determination of inflation expectations which, in turn, will impact the course of the price and wage levels, interest rates, output, employment and exchange rates.

In addition to aggregate demand effects, government spending can also have important effects on the mix of goods produced in the economy. In the real world, the government budget is an estimate of impending government outlays on particular goods and services. A sharp restructuring of the types of goods and services purchased by the government implies a corresponding change in the structure of resource use in the economy; firms whose products are now in higher demand will tend to grow larger, hire additional workers and add capital, firms whose products are now in lower demand will tend to shrink in size, reduce work force and sell off capital. The incentive in each case will be the change in relative

⁷ Taken from "Taxation, the Peoples' Business," pp. 9-10.

prices which is triggered by the change in relative demands for goods.

The upshot of this discussion is that the government budget contains a great deal of information which can help the owners and managers of firms adjust to an impending change in government policy. Government spending expectations are likely to have important effects on the general structure of inflation expectations, as well as on the prices of particular goods and services and on the prices of particular production inputs.

Firmly held, and relatively accurate spending expectations of both the level and structure of government spending should result in more efficient resource allocation as well as faster adjustments in the private sector to a change in government priorities. Moreover, firmly held expectations that real government spending will be held in check over the long term would have immediate payoffs in terms of reduced inflation expectations; this would help to improve inflation and unemployment performance and would put downward pressure on interest rates.

The problem is, how can policy makers create an environment in which the economy's savers and investors confidently expect firm control over future government outlays. My perception is that people are quite skeptical about government promises to rein-in runaway government spending; in short, policy makers suffer from the "boy who cried wolf" syndrome. In order to have a significant effect on spending expectations, therefore, I believe that policy makers would have to demonstrate to people that they have embarked on an essentially irreversible path toward spending control. This is why I strongly support the government spending limitation amendment to the Constitution which has recently cleared the Senate Judiciary Committee. It will take that sort of bold action to have any meaningful impact on long-term spending and inflation expectations.

MONETARY POLICY

Since the late 1960's, there has been no meaningful constraint on the course and conduct of U.S. monetary policy. Over this same period the record shows a tendency toward stop-and-go policy, as the pendulum of public pressure varies between concern over inflation and concern over unemployment, with a definite trend toward higher average growth rates for the monetary aggregates and the unavoidable result, higher inflation rates. The erratic course of monetary policy has made it extremely difficult for price and wage setters, savers and investors to separate the "signal"—that is, the overall direction of aggregate demand for the foreseeable future—from the "noise". I believe that the resulting reduction in the information content of the structure of prices and wages has contributed to reduced productivity and lower real output.

Since variations in monetary aggregates are widely viewed as important sources of swings in aggregate demand, it follows that the expected path of monetary policy should be an important deter-

minant of inflation expectations. Research by RE modellers⁸ supports this view.

Unfortunately, as with government spending, the record of the past decade has made savers and investors appropriately skeptical about the ability and/or willingness of the Federal Reserve to follow through on repeated promises to deliver stable noninflationary monetary policy. This makes it extremely difficult for policy makers to engineer an abrupt drop in long-term money growth expectations. At the same time, the growing recognition of the link between money and prices among the public has made it more important to do so, for a firmly held conviction on the part of the public that future money growth will be held in check would certainly have a favorable and immediate impact on long-term inflation expectations. For this reason, I believe that recent proposals designed to constrain the money creation activities of the Federal Reserve over the long-term, including a return to gold-backing for the Federal Reserves' liabilities, should be given serious consideration.

⁸See, for example, Chapter 4 of Rutledge (1974), "A Monetarist Model of Inflationary Expectations," and various papers by Barro.

STATEMENT OF F. THOMAS JUSTER*

THE ROLE OF EXPECTATIONS IN ECONOMICS

INTRODUCTION

Expectations are a bit like the weather when it comes to assessment of its role in economics: everybody talks about it, it plays a key role in most theoretical models, but when it comes to empirical implementation, it is rare to find a genuine expectational variable in use. A reasonable description of the way in which economists have typically recognized expectational phenomena is that the theory always sounds as if decisions are based on forward-looking variables, as indeed they must be, but the empirical representation of the world usually finds a way to finesse the actual measurement of expectational phenomena—typically by assuming expectations come out of some lag structure relating to past history. Thus past history becomes a substitute for expectations. In real life, as in behaviorally-relevant theory, that procedure simply will not work, and it may account in some part for the relatively poor record of existing empirical models of the economy.

Why have economists given a great deal of lip service to expectations and then essentially eliminated them from most serious empirical work? That question has no simple answer, but probably results from a combination of factors.

First, there really isn't a great deal of genuine expectational data that can be used to estimate empirical models, hence incorporating expectational phenomena into models in a relatively rich way suffers from the absence, over a time period long enough to be interesting, of relevant expectational measures.

Second, most econometric models are based on time-series data, and are thus concerned with trying to assess relationships between the average or mean values of a set of economic time-series. I suspect that a crucially important part of the way in which expectations affects economic behavior is not the way in which the mean of an expectation series relates to mean behavior, but the way in which different parts of a distribution of expected outcomes interact with different parts of the distributions of other variables to produce results that cannot be inferred from the relationships between the mean values themselves. In short, it matters who holds what kind of expectation. That complication basically means that expectational phenomena cannot be adequately handled in conventional time-series models, but must be embedded in a much more micro-oriented model.

Third, I think it is partly true that dealing seriously with expectations means losing some of the elegance that mathematically

*Director, Institute for Social Research, University of Michigan.

NOTE.—This paper draws heavily on work supported by the National Science Foundation, NSF Grant No. SOC 74-22104 (Savings Study). The opinions expressed are solely those of the author.

based models are apt to have, and elegance is *per se* a property of models that economists prefer, other things equal.

And finally, there has not been a great deal of effort, imagination or ingenuity expended on the question of how best to measure expectations. Most economists know very little about measurement techniques, have only peripheral or occasional interest in data-related problems, do not have any institutional capacity at their university "home base" to implement any serious work on measuring expectations, and have typically felt that somebody else was supposed to generate the expectational data that could form a serious basis for studying expectational phenomena. Part of the problem here is undoubtedly little more than a financial constraint on research resources: given the option of spending a couple of million dollars on attempting to generate some interesting and valuable data relating to expectational phenomena, or spending the same sum on a large number of theoretical and econometric exercises in which expectations are inferred in various subtle and elegant ways, the choice of the profession has almost always been to spend the money on theory and modeling and not on measurement. If more resources were available, it would be possible to do both.

A policy of attempting to redesign economic models to enhance the role of expectational phenomena would convey significant benefits, but would involve significant costs. The principal benefit would be the prospect of greater realism, a closer relation between the model (the idealized world) and the real world, and a greater capacity both to explain the real world and to predict it. My guess is that the development of such models would represent a major departure from existing models, and could not be easily accommodated by "band-aid" adjustments—i.e., adding a few expectational series to a conventional time-series modeling effort. Rather, I would judge that expectational phenomena can only be introduced effectively in a model with a micro basis rather than a macro basis, and that probably means some version of a microanalytic simulation model.

If that is true, the costs would be considerable. Not only would one have to begin development of an expectational data base, which exists for the household sector but hardly at all for the enterprise sector, but one would have to begin the development and testing of appropriate micro models, with a resultant need to generate an extensive micro data base for the enterprise sector. Thus the resource costs would be very large, and the benefit potentially very large but highly uncertain. Moreover, one could not expect to generate benefits without a significant period of investment in both data base construction and modeling.

POLICY RELEVANCE OF EXPECTATIONAL MODELS

Assuming that we were to undertake the task of creating a set of models with heavy reliance on expectational phenomena, where would one expect to find the principal payoff? My best guess is that the most useful results would be obtained in models of saving, capital formation, and the behavior of financial markets.

We know from relatively recent empirical work with existing expectational data that saving decisions are significantly impacted by both expectational and attitudinal phenomena. For example, the

response of savings to inflationary expectations has been documented in a number of studies, as is the fact that the same objective phenomena leads to sharply different expectational responses: in the U.S. economy during the 1970's, for example, the response to expected inflation during the early part of the 1970's was one of caution, retrenchment and thus an increase in the saving rate, but the response to roughly the same inflationary expectations in the latter part of the 1970's was exactly the reverse—an acceleration of purchases, an expansion of debt, and a reduction in the saving rate. A concerted effort to create a saving rate model with important dependence on expectational phenomena has excellent prospects of being successful.

In the area of capital formation, while we have some evidence that expectational phenomena make a difference to investment decisions (e.g., the demonstrated dependence of investment rates on sales and sales expectations), we do not really have the appropriate data base with which to develop that model fully. Theory tells us that it is crucially important to understand the character of business expectations, since decisions to invest in plant and equipment must have a basis in expectations about the markets in which the resulting output will be sold. Moreover, theory also tells us that the timing of investment decisions must be related to expectations about the costs of funds.

In the financial markets, although we have little direct evidence because expectational measures are lacking, the indirect evidence is overwhelming that expectational phenomena exerted dominant influence: for example, it is not possible to explain the current level of interest rates without reference either to expectations about rates of price inflation in the future or to the uncertainty with which price and other expectations are currently held.

THE MEASUREMENT AND ANALYSIS OF EXPECTATIONS

In some general sense, expectations must be formed out of past experience. While it is hard to quarrel with that statement, it does not imply that the way in which expectations are formed out of past experience is susceptible to some simple form of extrapolation of past levels or rates of change. In fact, the evidence suggests otherwise: we know that in the household sector expectations are formed both by extrapolation from recent events and by inferences from events that are quite distant in the past. For example, models of expectation formation among consumers give significant weight both to forecast errors in recent expected values and to a much longer run notion of normality. Further, it is reasonable to suppose that expectations can be influenced by beliefs about future policies and developments which have little or no relation to the past because they represent new departures. The issue here is not whether expectations are influenced by the prospect of changes with no historical counterpart, but the degree to which expectations about such events are firmly enough held to form the basis for behavior. Thus credibility about what future policy will actually consist of, as opposed to what policy-makers say they plan to do, must play an important role in the relation between expectations and behavior. More generally, the evidence that we have suggests that, while expectations are formed out of past experience, they are

often formed in such a way as to preclude reliance on simple and straightforward extrapolations of the recent past. Moreover, we really need to concern ourselves with the distribution of expectations, not just their average or mean value, and about which economic factors hold which kinds of expectations and with what degree of certainty.

If one accepts that argument, it follows that indirect measurement of expectations will not be sufficient to capture the impact of expectations on behavior. If not just the mean but the distribution matters, inferring expectations from observable market phenomena (e.g., inferring interest rate expectations from the yield curve) simply will not suffice: at best, the yield curve says something about the nature of mean expectations, and does not convey any direct information about dispersion.

Thus one is forced back on the proposition that measures of expectations needed to model behavior in various markets need to be obtained directly from the actors themselves, and cannot be inferred from observable market phenomena. Obtaining data from the actors themselves is of course easier said than done. One has to decide what kind of expectations should be measured, how the measurement can be obtained, what measures of uncertainty should accompany the expectational data, and what nonexpectational phenomena need to be obtained in order to begin the process of modeling both how expectations are formed and how expectations are related to behavior.

At the present time, virtually none of relevant data are available. The richest source of data relates to the expectations of consumers, and is represented by the Surveys of Consumer Attitudes conducted for over three decades by the Survey Research Center at the Institute for Social Research at The University of Michigan. These data contain consumer expectations about prices, interest rates, income, business conditions, etc., for periods of up to several decades, although the precision with which these expectations have been measured varies a good deal over that time span. There is a little data available from the SRC survey on the uncertainty attached to various expected outcomes, although the work there is barely in its infancy and has never been a major thrust of the program.

In addition to the SRC data on households, there are several other sources of household survey data which contain expectation measures. The Conference Board has obtained data for some years on a set of consumer expectations, as well as on purchase plans, although the data are substantially less complete and cover a shorter time span than the SRC data. The Gallup Poll has been collecting such data for several years now, although these data are highly derivative of the SRC series. And there are of course numerous market research surveys which contain elements of expectational measurements.

In the area of business expectations, the available data are much less satisfactory. The most extensive data relate to plans for plant and equipment investment, which have been obtained by the U.S. Department of Commerce (previously in conjunction with the Securities and Exchange Commission) for several decades. These data are obtained twice a year, they concentrate on expected outlays for

plant and equipment, and they contain a body of related expectational data that could be used to model either actual investment or investments plans. Perhaps the longest time-series on business expectations is that published by McGraw-Hill, which not only go back for several decades but also contain substantially more data on expectations that can be related to plant and equipment spending decisions—sales expectations, profit expectations, etc. Although I am not intimately familiar with either the Commerce Department or the McGraw-Hill surveys, it is my general impression that they are strongest on plant and equipment expenditures, relatively weak on associated expectations; this is especially true for the Commerce survey.

There are other sources of data on business expectations in the U.S., and there is of course a very substantial body of material dealing with business expectations that originates in Western Europe and Japan. The other important U.S. surveys that I know of are a survey conducted for many years by the Conference Board which deal with capital appropriations and orders, a survey started recently by the Gallup Organization in conjunction with the U.S. Chamber of Commerce, and a very recently initiated survey, still in the experimental/pilot stage, started by the Survey Research Center at Michigan.

If one asks the question, what kind of expectational data should we obtain, who should obtain it, and what are the likely costs, a few tentative thoughts can be suggested.

As I indicated earlier, it is my firm conviction that one needs to obtain not only estimates of the mean values of expectations for relevant phenomena like wage rates, prices, interest rates, sales, profits, etc., but also some measure of dispersion around those best estimates. In addition, in order to model the way in which expectations are formed and may change, one needs to know what explains the expectations, both in terms of actual values of variables within the control of the decision-maker, and in terms of perceived links between the actions of others (e.g., policy-makers) and the expectations. There is a major job to be done here, not simply a minor addition to existing efforts.

I do not think that the state of the art is sufficiently well-defined at present so that one could turn over the job of measuring expectational phenomena to governmental agencies; their strength lies in collecting data whose usefulness is clearly defined and whose characteristics are well-understood. Rather, we are very much at the experimental/pilot stage here, suggesting that reliance on non-governmental groups, who have both greater flexibility and the technical and professional staff needed to design and test potential measures, would represent a more productive arrangement.

There are a number of issues and alternatives that would arise even if one decides that nongovernmental research and development activity is the preferred strategy. Absent a better-defined agenda and some sense of available resources, about all that can be said is that the design of such an effort ought not to be left exclusively to the institution or institutions asked to undertake the work, but should reflect input from both the scholarly and policy communities about what kinds of measures have highest priority,

what kind of sample design is needed, what topics are most important and most likely to yield useful results, etc.

CURRENT PUBLIC EXPECTATIONS

Leaving aside the question of what we need to know about expectations and how those data might best be used in modeling and forecasting, it is still useful to ask: what do we know about the nature of public expectations presently, as they relate to prospective economic policies?

Although the information here is sparse, as already indicated, it is by no means nonexistent. In the area of tax and budget policy, we do know several useful and important things from Survey Research Center data on public expectations:

(1) It is widely believed by consumers that the future rate of price inflation will be in the single digit range; that expectation has prevailed for about a year.

(2) We also know that price expectations are distributed in a bimodal fashion: a significant proportion of the population expects prices either not to rise at all or actually to decline, while another significant proportion of consumers expect prices to grow at rates in excess of 10 percent annually.

(3) We know there is little difference between people's short-term expectations about price movement (12 months in the future) and their longer-term expectations about price movements (5-10 years into the future): it appears that long-term expectations are little more than an extrapolation of short-term expectations, at least at the present time.

(4) We know that people widely expect the proposed tax and expenditure policies of the administration to have favorable effects both on rates of price inflation and on rates of unemployment. That is, a common expectation among Americans is that the administration's economic policy proposals will have favorable effects on most of the important macroeconomic variables.

(5) We know that people generally have more confidence in the formulation of economic policy now than they had previously—that is, people apparently perceive that economic policy is under "better management" now than has been true for the last several years.

What these data suggest is that the expectations of the public are not such as to thwart the objectives of the administration. That is, given what the administration would like to accomplish with proposed policies, the current set of expectations held by the public is about as favorable as could be expected. For example, the public is not expecting escalating inflation, hence current policy does not have to be concerned about combating a widely held expectation of higher inflation rates; public expectations do not see any inconsistency in current policies achieving both lower inflation rates and lower unemployment rates, hence policy-makers do not have to be concerned with a credibility gap. And so on.

Suggesting that public expectations are relatively favorable to the proposed policy initiatives does not of course suggest that the proposed policies will yield the results that are desired by the administration. My own view is that the policies will be partly

successful, partly unsuccessful. I think there is good reason to believe that the administration will be relatively successful in making some real headway on reducing the inflation rate over the next several years, although whether it can be brought down as low as the administration target seems doubtful. On the other side, I see much less likelihood that the administration will realize its real growth target, and correspondingly, its unemployment rate targets. Here, it seems to me that the most likely scenario is that the combination of very tight monetary policy essentially unchanged fiscal policy will be to bring down inflation slowly but at the cost of a period of extensive sluggishness in real growth rates and rising unemployment rates.

EXPECTATIONS AND POLICY

One issue that many pay a good deal of attention to can be framed by asking: should policy-makers enact policies because they are presumed (or hoped) to have favorable effects on expectations? As a generalization, my feeling is that such attempts are likely to do as much harm as good, and that attempts to influence expectations independently of influencing those factors that determine expectations is a very chancy business. It seems to me that the right strategy for policy-makers to follow is twofold:

(1) Try to formulate policies that can be understood by decision-makers in the private sector, and which will give them a reasonable basis for making economic and economic plans and decisions; and

(2) Try to understand the way in which private decision-makers form their expectations, so that it will become possible to model the way in which public policy is likely to impact on private expectations, and hence on private behavior.

Neither of these objectives focuses very sharply on direct attempts to influence expectations themselves, although they do suggest trying to create an environment in which it will be easier to understand how expectations are formed, and easier to understand the links between expectations and behavior.

THE IMPORTANCE OF DISPERSIONS AND DISTRIBUTIONS

One of the most important aspects of the study of expectational phenomena, in my judgment, is ensuring that we gain an understanding of how expectations are distributed among the population. One reason for the importance of such a study is that differences over time in the dispersion of expectations are quite likely to be associated with differences in uncertainty—in fact, the dispersion of expectations itself is a good measure of uncertainty. That is one of the most important reasons, though by no means the only one, why I have argued above that inferring expectations from observable market phenomena (e.g., the term structure of interest rates as a way to infer interest rate expectations) is not a very satisfactory way to model expectational phenomena. At best such an approach can tell us something about the relationship among means, but is inevitably silent about distribution or dispersion issues.

It is hard to tell a priori just what kind of payoffs would ensue from better knowledge about distributions and a more fully devel-

oped set of models which explicitly take account of the fact that expectations differ among economic actors. At the present time, for example, it seems to be reasonably clear that certain kinds of expectations have extremely wide dispersions. As noted earlier, we can document the fact that this is true for expected price changes—large numbers of households expect zero or declining rates of price inflation, and even larger numbers expect inflation rates of 10 percent or more. The same phenomenon appears to exist (although the evidence is not so clear) with regard to expectations about interest rates: it is my impression from casual conversations among business acquaintances that the best estimates of the financial community about future interest rates divide almost evenly between those expecting single digit rates and those expecting rates over 20 percent. So far as I can tell, that seems to be a consequence of the fact that the financial community divides into those who believe the administration's program to reduce inflation rates will be successful and will be maintained, and those who believe otherwise.

The potential importance of dispersion creates both problems and opportunities. The problems arise because a great deal of dispersion seems to suggest that different economic actors have different economic models in mind, and that expectations are being formed on quite different bases. The usual assumption in economic analysis is that everybody is somehow or other using what is generally accepted to be the best model, or at least that there is a good bit of commonality in the elements that go into the formation of expectations. The opportunity arises because accounting for dispersion is likely to provide insights that would be missed by simply trying to understand the behavior of means or averages. For example, in analysis of the personal saving rate in the U.S., it turned out to be true for some years that a quantitative representation of the dispersion of expectations plays a very important role in determining the saving rate—the reason is that the dispersion of expectations is a proxy for uncertainty, and uncertainty has a potent influence on saving behavior.

SUMMARY

The principal thrust of this statement is that the role of expectations is crucial to understanding decisions in both the household and business sectors, that direct measurement of expectations, and especially of its probabilistic nature, cannot be dispensed with by the use of indirect or inferential measures, that modeling of economic phenomena with expectational content may best be done by models that have more of a micro than a macro flavor, and that a major investment both in data base construction and theoretical work is needed before we can hope to obtain an adequate understanding of the role of expectational phenomena.

By way of a final note, it is interesting to observe the difference between the U.S. and Western Europe with regard to the importance given to expectational phenomena. In the U.S., especially when it comes to an understanding of decisions in the business enterprise sector, the concentration has long been on measuring real and financial flows and ignoring expectational data. The reverse has tended to be true of Western Europe, where expectation-

ally-oriented series exist for many countries over a good many years. The usual arguments advanced by U.S. economists to explain that phenomenon are that the Europeans have tended to concentrate on expectations because they did not have good measures of real and financial flows, which are costly to obtain. That may or may not be true, but the fact remains that the U.S. is probably the most laggard country in the western world when it comes to the availability of data relating to expectational phenomena in the business sector. For the household sector, that is much less true, since there has been a long tradition of concern over expectations and attitudes in the consumer sector—largely attributable to the pioneering work of George Katona and various colleagues at the Survey Research Center at Michigan.

STATEMENT OF LEON W. TAUB*

THE ROLE OF EXPECTATIONS IN ECONOMIC POLICY

THE ROLE OF EXPECTATIONS

Traditionally, the adjustment paths of the economy, and hence expectations, have played a relatively meager role in economic theory. Before Keynes, most economists concerned themselves in large part with the indefinite future. Often, the future was even confused with the present. Relatively little effort was given to discovering how one moved from the present to the future. This approach, generally referred to as "comparative statics" is now used primarily for pedagogical purposes. Part of the reason for this transition was the recognition of the validity of Keynes' now famous comment that "In the long run, we are all dead." Part of the reason for this transformation was the advent of econometrics.

Econometric models, by their very nature, are concerned not with the final state of the economy, whatever that may be, but with the transition from one state of temporary disequilibrium to another. Because the time dimension is so important in econometrics, economists using these tools have spent a great deal of effort in tracking the speed at which individuals and institutions in our society adjust to changing economic stimuli. Expectations naturally play a significant role in that adjustment mechanism.

Three types of objections have been raised to the use of expectations by econometric modelers. The first recognizes the contribution of models to the integration of expectations in economic theory, but argues that more needs to be done both to incorporate expectational effects which are consistent and quantifiable and to develop systems of adjusting models for types of events which have never occurred and whose impact must therefore be speculative. Most econometricians would heartily agree with this criticism, as it implies expanding the sophistication of existing tools rather than discarding them, and it emphasizes well known limits to the capabilities of mathematical techniques when not augmented by judgmental analyses.

The second type of criticism of the use of expectations in econometric models is basically an indeterminateness argument founded on the view that expectations are volatile and capricious. If this view is correct, past changes in expectations will tell you nothing about future changes and history would provide no more of a guide to the future than the use of a lottery. Thus, econometric estimates (as well as almost all judgmental analyses) are futile. Most economists believe that this view is incorrect. They believe that although expectations are often influenced by transitory events, the main

*Vice president and chief economist, Washington, Chase Econometrics. The views expressed are those of the author and do not necessarily represent the views of the Chase Manhattan Bank, N.A., the parent company of Chase Econometrics.

thrust of expectational changes will be both consistent and in accord with the existing body of economic knowledge in our society.

The third type of criticism in the use of expectations is basically a "My expectations are correct and yours are wrong" type of argument. While no one will ever know just whose expectations are correct, it is reasonable to assume that most persons will base their reactions upon the more conventional economic theories for three reasons.

First, the "conventional" theories have been the subject of the most rigorous empirical testing. Second, it is unreasonable to assume that most people will have expectations different from most economists who: (a) are people; and (b) have not been exactly timid in presenting their views to the general public. Third, few people pay attention to, much less act upon, overly complex economic theories. Therefore, they are most likely to be influenced by consensus conclusions than erudite points of analysis.

HOW CAN EXPECTATIONS BE MEASURED?

Expectations can rarely be measured directly. However, there are cases in which the collective decisions of millions of Americans provide clear evidence of some types of expectations. These types of evidence generally appear in the financial markets, where people are betting their income and assets against alternative views. Certainly these markets are not always right. However, they do provide an unambiguous measure of what people collectively "expect." For example, in the month following the passage of the 1981 tax cut legislation, long term interest rates rose dramatically. During the same period, short term interest rates fell. These divergent movements provide a clear indication that during that period, Americans became increasingly concerned about inflationary pressures in the mid-1980's while simultaneously becoming less concerned about the prospects for high inflation, tight monetary policy and buoyant economic conditions in the short term.

Some measures of expectations can be found in other types of economic data. For example, the savings rate provides some indication of how Americans' value present consumption as opposed to future consumption. However, once we leave the futures markets these measures are notoriously difficult to interpret. Is the savings rate low because it is measured incorrectly in that it fails to incorporate housing appreciation? Is the savings rate low because current poor economic conditions are perceived as being temporary? Is the savings rate low because people are expecting high rates of inflation?

A final means for measuring expectations is through surveys. Survey data is sometimes useful. Some types of survey data however have been shown to be of only little value. The major demarcation appears to be dependent upon whether or not the surveys ask questions relating to past decisions, or whether they require the respondent to anticipate decisions or react to artificial questions or hypothetical situations. For instance, if a firm has already established a budget for the coming year, questions relating to the level of anticipated plant and equipment investment can be meaningful. However, questions of the type "What would you do if * * * ?" are almost always useless. Similarly, most people have not formulated

consistent answers to questions such as "What will the inflation rate be next year?" As a result, their answers to questions of this type are not likely to be an accurate predication of their behavior, or even of their actual expectations.

CAN EXPECTATIONS BE PREDICTED?

Predicting expectations is one of the most important challenges in economics. The difficulty arises from two sources. First, as we have already noted, expectations are extremely difficult to quantify and hence, little historical data exist. Second, expectations incorporate an extremely wide variety of events and can be shaped by many outside factors. In general, econometric modelers have been moderately successful in predicting changes in behavior, and presumably the underlying expectations that influence that behavior by examining the course of economic events over a long period of time. For example, consumer purchase equations which incorporate weighted averages of "misery index" type variables are usually not further improved by adding consumer confidence survey data, except in the case of temporary aberrations of a brief duration caused by some overwhelming political event.

A second major technique used by economists of all persuasions to estimate expectations is to quantify theory and assume expectations are "correct," or at least in accord with the majority of data which have been gathered. This technique does not always work since the average expectations of persons may be based upon other evidence; however, this approach often provides a useful approximation. For example, theory suggests that if one reduces taxes, work incentives and savings will increase. It has even been suggested that the increased labor force participation and productivity will increase tax revenues sufficiently to increase total savings. If market participants expect this to happen, tax cuts will lead to lower interest rates.

Before relying upon tax cuts to increase revenue however, we can examine the evidence on the impact of these relationships. Data from a variety of sources, including the negative income tax studies in Princeton, Detroit, Gary, and Seattle suggest that for the range of tax changes which have been under consideration, the incentive impacts will be small. Studies of consumer purchasing behavior indicate that most increases in disposable income are eventually spent. Armed with this information, we can conclude that most market participants will view tax cuts as tending to increase, rather than decrease the size of the budget deficit. Thus, expectations will be perverse in that people will expect large deficits, interest rates will increase, and with higher interest expenses there will be a larger budget deficit in need of financing. (Notice, it does not matter that the policy may eventually prove correct. If the weight of presently available evidence opposes it, expectations will act against the policy.)

USING EXPECTATIONS IN FORMULATING POLICY

Expectations can be used as an aid in the formulation of economic policy in several ways. One of the most important, although least interesting of ways is simply to establish clear consistent sets of

economic goals and to take repeated actions to achieve them. If people believe the Government is serious about achieving a certain mix of policy objectives, expectations will speed the process. For example, the Fed can peg the Federal funds rate at least in the short run, simply by announcing its decision to do so. When current law calls for the virtual elimination of both unemployment and inflation without any basis for determining a trade-off, members of society can perhaps be excused from skepticism about the consistency of economic policy.

Expectations can be used as a policy aid in a variety of other ways. For example, the announcement of a future reduction in corporate tax rates would raise the perceived return to capital without costing the Government a dime in the initial years. By contrast, accelerated depreciation increases promised for a future date would reduce the value of present investment. Certainly in policymaking, the former approach would seem to have some advantages relative to the latter.

Expectations can be changed through current policy actions. However, this process is painful. If tight monetary policies were continued throughout the current recession despite economic hardship and bankruptcies, market participants might be convinced that the Fed was serious about controlling inflation. However, this process is painful. Furthermore, it might even lead to a change in the makeup or powers of the Fed or a consensus that the Fed had "erred." Thus, this route is a difficult one.

Another less painful way of changing expectations is to change existing laws and processes of government. Even if the government were to follow tight fiscal and monetary policies during several recessions, market participants might fear a reversal in a subsequent recession, simply because the incentives are so great and the means are available. However, making it more difficult to over-inflate the economy might change expectations in a favorable direction. For example, if a constitutional amendment were passed requiring some sort of super-majority for annual budgets which exceeded some percentage of GNP or which resulted in a deficit, inflationary expectations might be changed in a favorable direction. The problem of course is that a change in the process of government does not come entirely cost free. One consequence is that government flexibility is reduced. Current debate on the return to a gold standard revolves around the same question. A return to a full gold standard, with the price of gold fixed at current levels, would certainly impose severe automatic discipline on the United States. The questions facing policy makers are, "How badly do we need that discipline?" "What alternatives are available?" and "Would that discipline result in less economic distress than the current situation?"

Less dramatic changes in current laws can also change expectations. The decoupling of taxes and the Consumer Price Index after 1984, a change in the tax law making the 1983 and subsequent tax cuts contingent upon the achievement of a specific budget margin, and less than 100 percent Social Security indexing, might all change expectations and hence interest rates in a favorable direction.

During the past year, some have argued that policies which appear not to be correct can be justified on the basis of presumed changes in expectations. My view is that this argument is inconsistent. Expectations are almost always formulated based upon conventional views of the economy held by American citizens. If a certain set of policy objectives is desired, expectations will be helpful only if conventional mechanisms are tried. For example, as noted earlier, even if one believes that cutting taxes will help to balance the budget, one should expect "expectations" to be perverse. The fact that expectations will be perverse does not mean the policy will not work. If the new theory is correct, expectations will change in a favorable direction once the impact of the policy has been demonstrated. However, the argument that expectations will help rather than hinder the process is, I believe, inconsistent.

Perhaps the best way to use expectations in aiding policy is for the Congress to make every effort to support a bipartisan economic policy. The situation is not very different from foreign policy, where excessive bickering leads to expectations of a weak national will. Certainly, some policy differences will remain. However, if a consensus can be reached that most Congressmen feel is in the best interests of the nation, it is likely that a majority of Americans will feel the same way and will react accordingly. Budget cuts that are narrowly approved and/or perceived to be excessive will not change expectations as much as bipartisan changes since some people will believe the actions to be temporary and perhaps even leading to large programmatic changes in the opposite direction later. The situation in the United States in which it is traditional for the "loyal opposition" to exploit efforts by the majority to raise the debt ceiling, establish a long term solution to the Social Security crisis, or undertake other actions widely regarded as necessary, certainly lead to fears that economic policy may not be consistent.

APPENDIX

QUESTIONNAIRE ON THE ROLE OF EXPECTATIONS IN ECONOMICS

1. How important is the role of expectations in each of the following:

- (a) the construction of theoretical arguments in economics?
- (b) the structure of existing empirical econometric models?
- (c) real life?

Is it true that in recent years forecasts and policy analysis based on models have failed to keep pace with the increasing role of expectations in economic theory? From a practical standpoint, is this failure a significant liability?

What are the benefits and the costs of assigning a greater role to expectations in economic models? Can past deficiencies, if any, be remedied by adjusting old models, or is an entirely new approach necessary? How should an approach be designed?

2. What do you believe to be the significance of expectations in each of the following areas:

- (a) responses to tax and spending policy?
- (b) responses to monetary policy?
- (c) decisions to consume and save?
- (d) decisions to undertake capital formation?
- (e) work/leisure decisions?
- (f) labor market settlements?
- (g) anticipatory pricing decisions?
- (h) financial markets?
- (i) foreign exchange markets?

3. In principle, how should expectations be measured? What data relating to expectations is currently available? Is it adequate? If not, what additional data is needed, and by whom should such data be gathered?

4. How are expectations formed—primarily in response to past occurrences, or to belief about future policies and developments?

5. At the present time, what are public expectations about the future effects of current and proposed economic policies? On what do you base this evaluation? What specific effects will these expectations have on the results of these policies?

6. What are your expectations about the future effects of current and proposed economic policies? How were they arrived at?

7. Should Congress attempt to enact tax and spending policies for several years into the future because of allegedly favorable effects on expectations? Should the Federal Reserve base monetary policy on such alleged effects? In the current state of economic science, can such effects be determined with sufficient reliability to base policy judgments on them? By what procedures? What specifically would these favorable effects be? To what degree would alleged benefits from such a change in approach be offset by the reduction in short-term flexibility?

8. In some cases, the theoretical effects of expectations on behavior may be ambiguous; in others, the same actions may generate expectations which yield beneficial behavior in some respects and adverse behavior in others. For the following hypothetical cases, please indicate which expectations effect is likely to be the stronger, and why.

(a) A multi-year tax cut may generate expectations of higher future-year returns to work, and hence immediate increases in work effort, presumably in order to gain the current experience necessary to secure higher future income. It may also generate expectations of higher future income at current work levels, and hence discourage current savings and current work effort. Which effect is more likely, and why?

(b) Short-run deviations from previously announced monetary growth targets could generate any of three expectation responses in the financial markets. Such deviations might be viewed as statistically insignificant changes, in which case there would be no effects. Or the deviations could be taken to indicate changes in the targets. Or they could be considered indicative of the Federal Reserve's inability or unwillingness to meet preannounced targets in the short

run, in which case a rebound would be expected. Of these, is any more plausible than any other? Why?

9. At any given time there is a dispersion of expectations about inflation and other aspects of the course of the economy. Is this important or not? Is sufficient data available about this dispersion? Is it adequately accounted for in econometric models? Is this dispersion stable or variable over time and, if variable, what determines the degree of dispersion?

10. Comments on any issues relating to the role of expectations in economics which are not covered above are encouraged.

