188

87th Congress
1st Session

JOINT COMMITTEE PRINT

HIGHER UNEMPLOYMENT RATES, 1957–60: STRUCTURAL TRANSFORMATION OR INADEQUATE DEMAND

SUBCOMMITTEE ON ECONOMIC STATISTICS

OF THE

JOINT ECONOMIC COMMITTEE

CONGRESS OF THE UNITED STATES

Printed for the use of the Joint Economic Committee

U.S. GOVERNMENT PRINTING OFFICE

77197 WASHINGTON : 1961

For sale by the Superintendent of Documents, U.S. Government Printing Office
Washington 25, D.C. - Price 25 cents

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LETTERS OF TRANSMITTAL

NOVEMBER 29, 1961.

To the Members of the Joint Economic Committee:

Transmitted herewith for the use of the Joint Economic Committee, other Members of Congress, and the general public, is a study paper entitled "Higher Unemployment Rates, 1957–60: Structural Transformation or Inadequate Demand," which has been prepared for the Subcommittee on Economic Statistics.

It is hoped that this paper will be especially useful to the members of the subcommittee and the witnesses who will be testifying before the subcommittee later this year.

This study paper does not necessarily reflect the views of the committee or any of its members.

Sincerely,

WRIGHT PATMAN,
Chairman, Joint Economic Committee.

NOVEMBER 29, 1961.

Hon. WRIGHT PATMAN,
Chairman, Joint Economic Committee,
U.S. Congress, Washington, D.C.

DEAR MR. CHAIRMAN: Transmitted herewith is a study paper entitled "Higher Unemployment Rates, 1957–60: Structural Transformation or Inadequate Demand," which has been prepared for the Subcommittee on Economic Statistics in connection with its study of employment and unemployment.

Mr. James W. Knowles of the committee staff has been responsible for the preparation of this study. In addition, Mr. Edward D. Kalacheck has provided technical assistance throughout the study and Mr. Anderson B. Bartlett, a senior at Dartmouth College, gave valuable assistance during the 6-month period in which he was assigned to the committee staff as an "intern" under the Dartmouth College "Class of 1926 Fellowship Program."

I believe that this study paper will be extremely valuable for the consideration of the subcommittee and the witnesses who will testify later this year, as well as other Members of Congress and the general public. This is not to imply, however, that anything contained in this paper necessarily reflects the views of the subcommittee or its members.

Sincerely,

WILLIAM PROXMIRE,
Chairman, Subcommittee on Economic Statistics.

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CHAPTER I

INTRODUCTION

The unemployment experience of the American economy since the passage of the Employment Act of 1946 has been relatively favorable by historical standards. The unemployment rate for nonfarm workers has averaged lower than in 1900–13 or 1919–29, the two other periods during the 20th century which were not marred by world war or catastrophic depression.[1] This record testifies to the vigor and dynamic enterprise of the private economy, and to the successful implementation of the Employment Act of 1946. In this act, the Congress resolved—

> that it is the continuing policy and responsibility of the Federal Government to use all practicable means consistent with its needs and obligations * * * for the purpose of creating and maintaining * * * conditions under which there will be afforded useful employment opportunities, including self-employment, for those able, willing, and seeking to work, and to promote maximum employment, production, and purchasing power.

Despite the relatively superior performance of the postwar era as a whole, public concern with the social and economic waste of unemployment has grown more intense in recent years. Intensified public awareness of the unemployment problems is due both to the growing recognition that there are many unnecessary and costly inefficiencies in the operations of the labor market and to the fact that unemployment rates have been higher since 1957 than earlier in the postwar era. This concern has expressed itself in a series of major congressional investigations, in fiscal and monetary action, and in three important pieces of legislation designed to remedy or alleviate specific unemploy-

[1] The table below shows the unemployment rate for relevant periods. The proportion of farm owners and managers in the work force has dropped substantially over time. Farmers are relatively invulnerable to unemployment. Their declining importance has given the unemployment rate for the civilian labor force an upward bias over time. This has been counteracted during the 20th century by shifts in the occupational composition of the nonfarm employee labor force. However, the lower average unemployment rate for the nonfarm employee labor force during 1947-60 is only partially explained by these shifts.

Unemployment rate during selected peacetime periods in the 20th century

Period	Number of years	Unemployment rate	
		Civilian labor force (percent)	Nonfarm employee labor force (percent)
1900–13	14	4.2	6.7
1919–29	11	4.7	6.8
1923–29	7	3.8	5.5
1947–60	14	4.2	4.9

Source: The data for 1900–29 are designed to be consistent with household survey estimates, but were not derived from monthly population samples See Stanley Lebergott, "Annual Estimates of Unemployment in the United States, 1900–54," in "The Measurement and Behavior of Unemployment," National Bureau of Economic Research, Princeton University Press, 1957, pp. 205–216, and "Long-Term Factors in Labor Mobility and Unemployment," in Employment, Growth, and Price Levels, hearings before the Joint Economic Committee, 86th Cong., 1st sess., pp. 583–585.

The estimates for 1947–60 are from the U.S. Department of Labor, Bureau of Labor Statistics, and have been adjusted to conform with the unemployment definition in use before 1957.

ment problems: The Temporary Unemployment Compensation Act of 1958, the Temporary Extended Unemployment Compensation Act of 1961, and the Area Redevelopment Act.

Some unemployment exists even during the most prosperous of years. The type of unemployment which occurs during full employment periods, when the number of jobs looking for workers is equal to the number of workers looking for jobs, is often referred to as "frictional unemployment." It is the inevitable byproduct of the operation of free and dynamic labor markets. The seasonal nature of many activities, shifts in the composition of final demand, technological change, the geographic migration of industry, the freedom of workers to change jobs, and of women, teenagers, and elderly persons to enter and leave the labor market—all result in some unemployment. The worker once unemployed requires time in which to obtain information about alternative opportunities and to secure a new job. The time-consuming nature of labor market adjustments is one of the major reasons for the unemployment totals being as high as they are during periods of adequate overall demand.

The matching of unemployed workers and unfilled jobs does not proceed as efficiently as it might, or even as efficiently as in some Western European countries. There is a continuous migration of unemployed and underemployed workers to areas of expanding job opportunities, and when other conditions are propitious, capital flows toward areas of surplus labor. However, these movements do not occur with sufficient rapidity to prevent the development and perpetuation of pockets of high unemployment. The level of unemployment is adversely affected by discriminatory hiring practices against Negroes, older workers, and other groups, and by the frequent lack of adequate information about job opportunities. The labor force has adjusted with exceptional rapidity to the continuing changes in the occupational composition of the demand for labor. These adjustments would have been even smoother but for the low educational level of many rural migrants and premature dropouts from high school.

These labor market inefficiencies are longstanding problems. Increased attention has been directed to them by a newly developed problem—since mid-1957 unemployment rates have averaged considerably higher than earlier in the postwar period. Measuring from cyclical peak to peak, the unemployment rate averaged 4.2 percent during the 18 quarters of the 1948–53 cycle, 4.4 percent during the 17 quarters of the 1953–57 cycle, and 5.9 percent during the 11 quarters of the 1957–60 cycle. This adverse development was highlighted by the persistence of high levels of unemployment during the expansion phase in 1959 and 1960. During the 2 years of peak activity in 1947–48, the unemployment rate averaged less than 4 percent. During the final 10 quarters of the 1948–53 cycle, the unemployment rate averaged 3 percent; in the 2 years between mid-1955 and mid-1957, it averaged slightly less than 4.2 percent. Experience during 1959 and 1960 stands in sharp contrast. Except for 1 month, the unemployment rate never dropped below 5 percent. Its best performance was 5.1 percent during one quarter in 1959 and 5.2 percent during two quarters in 1960. Higher levels of unemployment have been accompanied by an increased average duration of unemployment, with consequent depletion of family financial resources. The average dura-

tion of unemployment was over 11.5 weeks in the 1953–57 cycle, and over 13.5 weeks in the 1957–60 cycle.

It is important to place the unemployment problem in proper perspective. Some observers have interpreted the fact that unemployment rates were successively higher in the prosperity periods following 1951–53 as indicative of progressive deterioration in labor market conditions. Is this analysis correct or is the problem one of high unemployment rates during the past 4 years? Either situation would point to the need for vigorous policies directed toward lowering the level of unemployment. Nevertheless, the difference in interpretation has considerable significance. If there were signs of a long-continuing uptrend in unemployment, it would suggest the existence of structural maladjustment in the economic system, growing worse as time elapsed, and would consequently call for action to remedy the structural faults.

In reality, there was little or no trend in unemployment rates between 1948 and 1957. The deterioration has occurred since 1957, as can be seen from the following:

(1) The unemployment rate was at about the same level during the expansion phase of the cycle in both 1948 and 1955–57, averaging 3.8 percent in 1948 and slightly less than 4.2 percent in mid-1955 to mid-1957.[2] During both periods, the unemployment rate remained stable over protracted stretches of time despite substantial employment advances. Employment rose by 1.2 million between the fourth quarter of 1947 and the fourth quarter of 1948; it increased by 3 million between the second quarter of 1955 and the second quarter of 1957. In both instances, the expansion in employment was accompanied by a rate of growth in the labor force faster than the long-run trend. There was considerable turnover among the unemployed, but no reduction in their total number. Real gross national product increased by 3.5 percent between the fourth quarters of 1947 and 1948. Between mid-1955 and mid-1957, productivity gains were unusually small for a prosperity period and real gross national product increased at the relatively slow annual rate of 2.6 percent.

(2) The unemployment rate was considerably lower during 1951–53 than in any other period since World War II, but this was due to the exceptional influence of the Korean war. These years witnessed the strongest demands and the fastest rate of growth in output seen in the postwar period, along with the smallest increase in the civilian labor supply. Military requirements were superimposed upon already strong civilian demands for goods and services—demands probably strong enough to have brought about relatively full employment in the absence of the rearmament program. Constant dollar gross national product increased at an annual rate of 4.7 percent between 1948 and 1953, a rate well above the long-run trend. At the same time, the size of the Armed Forces was increased to 3.5 million, about 2 million persons more than in 1948 and about a million more than in 1957–60. Expansion in the Armed Forces limited growth in the civilian labor force. The annual average increase in the size of the civilian labor force between 1948 and 1953 was 550,000 smaller than in 1953–57, and 300,000 smaller than in 1957–60. This combination of events led to widespread labor shortages and to the relaxation of

[2] This difference in part may reflect "errors of measurement, which have been diminished with the great strengthening of the labor force survey sample which took place in 1954 and 1956." See Albert Rees, "The Measurement of Unemployment" in Special Committee on Unemployment Problems, U.S. Senate, 86th Cong., 2d sess., *Studies in Unemployment*, U.S. Government Printing Office, Washington, 1960.

hiring standards, and again showed that the labor market frictions can be overcome by sufficiently strong demand pressures, though at some costs in terms of inflationary pressures.

(3) Unemployment of 5 percent or more of the civilian labor force has prevailed since November 1957, or over a continuous span of 4 years. This is the longest period of such high unemployment rates since the 1930's. The recovery of 1959–60 was the first since 1936–37 to end before the unemployment rate fell to or below the 4-percent level.

(4) During the recession and recovery of 1960–61, the unemployment rate and the amount of long duration unemployment have remained at high levels for an extended period of time. However, these levels have not been as high as in the most severe months of 1957–58.

Explanation of the higher unemployment rates prevailing since mid-1957 has revolved around two major theoretical approaches [3] which, for simplicity of exposition, we will refer to as the aggregate demand and the structural transformation theories. The aggregate demand theory maintains that recent unemployment rates are explainable by traditional supply and demand analysis. In a dynamic economy, the population of working age, the stock of capital, and the technical efficiency of production all show year-to-year increases. Hence, the economy's potential output at full employment of productive resources rises from year to year. At times, aggregate demand for goods and services may not grow as rapidly as the economy's output potential. Then, demand will not be large enough to provide jobs for the annual increment in labor resources. Inadequate demand for labor is most apparent during recessions, when employment actually declines. It also characterizes those recovery and expansion periods during which the rate of growth in demand does not keep pace with the expansion of potential supply. The unemployment rate has been quite high since mid-1957, because the rate of growth in final demand has been low relative to the actual and normal rates of growth in potential supply made possible by increases in capital stock, labor force, and productivity.

The structural transformation theory maintains, to the contrary, that higher unemployment has been due not to inadequate final demand—and its concomitant in the labor market, an insufficient number of job opportunities—but, rather, to technological changes which are currently reshaping the American economy at an unusually rapid pace. The crux of the transformation is the continued rise in importance of white-collar occupations and service-rendering industries, and the decline in importance of blue-collar occupations and goods-producing industries as sources of job opportunities. In capsulized form, the explanation of higher unemployment since 1957 is as follows: (1) A faster rate of technological change has led to a higher rate of displacement of labor; (2) the average worker, once displaced, experiences a number of weeks of unemployment while hunting for a

[3] There is a third possible explanation of the rise in unemployment. Regardless of overall labor market conditions, unemployment rates vary considerably among age-sex, color, occupational, and industrial groups. The composition of the labor force might have shifted in the direction of those groups with the highest unemployment rate. However, standardization of the labor force shows that such shifts have had only a minor effect. See: "The American Economy in 1961: Problems and Policies," in "January 1961 Economic Report of the President and the Economic Situation and Outlook," hearings before the Joint Economic Committee, 87th Cong., 1st sess., pp. 386–390.

new job; (3) most of the displaced workers possess blue-collar backgrounds. Automation has reduced the demands for workers with this type of skill and experience. Consequently, blue-collar workers who have lost jobs in recent years have, on the average, experienced longer spells of unemployment than similar workers earlier in the postwar period.

The structural transformation theory should not be confused with the concept of "structural unemployment." The unemployment of workers displaced from particular jobs by technological change, or the geographic migration of industry, or by some other long-run influence is sometimes referred to as "structural unemployment" to distinguish it from other types of frictional unemployment. This distinction, unfortunately, is a source of confusion rather than of clarity. The concept of structural unemployment as applied to particular workers or groups of workers is theoretically meaningless and defies empirical measurement. There is no way to determine whether a particular worker has lost a specific job because of technological change, or the shift of demands away from the product his industry produces, or inadequate aggregate demand, or some other cause. On the other hand, it is possible to identify the concomitants of a rise in unemployment due to structural changes. The existence of these accompanying symptoms can be tested for empirically. We can then determine whether or not structural changes have been causing more unemployment since mid-1957, without knowing the total amount of unemployment for which they are responsible.

The structural transformation and the aggregate demand hypotheses will result in somewhat different policy recommendations for periods of expanding economic activity. A test of the validity of these theories is consequently a prerequisite to the framing of an effective policy for coping with high unemployment rates. If the capital stock and the supply of raw materials are adequate, the stimulation of aggregate demand will lead primarily to increases in employment and output, so long as activity is below the full employment level. Once full employment is reached, further stimulation of the economy will primarily result in rising prices, while output will rise less than proportionately, if at all. The two theories differ sharply over where in fact this crucial zone is reached.

Aggregate demand theorists maintain that the full employment position—the unemployment rate at which the number of unfilled jobs is equal to the number of unemployed workers—has not changed significantly since 1948 or 1955–57, though, of course, the output possible at full employment has risen year by year. The vigorous implementation of expansionist monetary and fiscal policies in 1958, 1959, and 1960 would have stimulated the private economy and would have resulted in the creation of enough job opportunities to have reduced the unemployment rate to the neighborhood of 4 percent. Changes in the labor market would not have made this feat appreciably more difficult than in 1948 or 1955–57. During the current expansion, monetary and fiscal policy should maintain an expansionist posture until it is clear that the growth of demand is sufficiently high to permit us to reduce unemployment to this level. Unemployment can be reduced beyond this point, without inflationary results, but only by instituting improvements in the efficiency of labor market organiza-

tions, and by adopting measures which will spur the flow of capital to labor surplus areas.

Advocates of the structural transformation theory, on the other hand, insist that full employment now occurs at a higher unemployment rate than it did earlier in the postwar period. They argue, therefore, that efforts to reduce the unemployment rate by expansionary fiscal and monetary policy will lead to inflation long before the unemployment rate approaches 4 percent. Encouraging the mobility of labor, stimulating the movement of capital to labor surplus areas, making the Employment Service even more effective, retraining unemployed workers—these improvements in the efficiency of labor market organization are necessary if an unemployment rate of 4 percent is to be attained once more, without endangering the stability of the price level.

CHAPTER II

ALTERNATIVE EXPLANATIONS OF THE RISE IN UNEMPLOYMENT

The assumptions and logical implications of both theories must be spelled out in some detail before they can be tested to determine which provides a better explanation of the high unemployment rates prevailing since mid-1957. Both theories may be necessary for an adequate explanation. On the other hand, one theory may explain events quite satisfactorily and the other may be demonstrably inapplicable.

Structural Transformation Hypothesis

BASIC ASSUMPTIONS

The structural transformation hypothesis maintains that unemployment has remained, at relatively high levels in the period since mid-1957 in the face of adequate overall demand forces and despite the availability of a sufficient number of job opportunities. Proponents of this view have cited one or more of the following factors as explanations:[1] Acceleration in technological change; the increased concentration of technological change in a select group of industries, without any acceleration of the overall rate; the changing impact of technological progress on the demand for blue collar workers; and a decline in the mobility of unemployed workers.[2]

(*1*) *An acceleration of the overall rate of technological change*

A "technological change" is a new manner for combining capital, labor, and raw materials, either to produce an existing product or one hitherto not on the market. The concept of technological change, per se, is not as relevant for the present analysis as the concept of improvements in output per man-hour. Technological change can economize significantly on the use of capital or raw materials, without having much impact on output per man-hour or on the demand for labor. On the other hand, the substitution of capital for labor can result in significant increases in output per man-hour without any change in technology. Finally, the phrase technological change is popularly used to connote various stages of progress—a breakthrough in technical knowledge, the construction of a pilot plant to test the technical and economic feasibility of a new idea, or the incorporation of a new idea into plant and equipment producing for the market. Each of these can affect labor requirements per unit of output in a different way. The development of atomic energy, for instance, represents a significant technical breakthrough. So far, it has resulted

[1] Theories have been evolved to explain changes in structural unemployment in underdeveloped countries where capital is an extremely scarce resource or where the cadres of managerial, professional, and skilled personnel are inadequate for a large-scale industrialization effort. However, up till now there has been no generalized model explaining how a rise in structural unemployment could occur in a highly industrialized society with adequate capital resources. The presentation above draws together causal factors cited by different commentators, restates them in a formal and consistent manner, and derives their logical implications.

[2] An increase in the pace of the geographic migration of industry is also cited sometimes, but as a contributory rather than a primary cause.

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in some increase in employment, but has had only a negligible impact on output. In other words, it has tended to reduce the level of output per man-hour for the economy as a whole. Some of the major technical advances and most interesting new products of the past two decades have come from our defense and space exploration programs. Outside of the aircraft industry, the impact of these sweeping advances on employment is largely a matter of speculation. Attention will be directed toward the consequences of an acceleration in output per man-hour, rather than in technological change. This shift in focus will enable us to analyze events which have already had an impact on employment opportunities, rather than speculate on the potential future implications of technical advances.[3]

Greater than average productivity increases in a particular establishment or industry will lead to the displacement of labor, if demand for its product or service is inelastic with respect to price, or if reductions in relative costs per unit are not passed on to the consumer in the form of quality improvements or commensurate declines in relative price. Employment will rise in establishments or industries with greater than average productivity increases if demand is price-elastic, and if prices are reduced. However, labor displacement may then occur in less technologically progressive industries producing substitute products. Workers losing specific jobs will experience a certain number of weeks unemployment while hunting for a new job. Consequently, taking all possible combinations of these events into account, it is often assumed that all other things being equal, the higher the increase in output per man-hour, the higher the unemployment rate.

(2) *An increased concentration of gains in output per man-hour, without any acceleration of the overall rate*

Increases in output per man-hour at the aggregate level of manufacturing or the nonfarm economy are the summation of changes in a myriad of smaller industries, which themselves are the aggregation of the changes which actually occur at the establishment level. Modern industrial economies are highly interdependent and the effect of any significant technological change is frequently widely diffused. Take, for example, the widespread application of mass-production techniques, the spread of self-service through the retail sector, or the growing number of industries and activities in which electronic computers are being utilized.

Nonetheless, during any particular period, increases in output per man-hour, measured at the aggregate level, may reflect relatively widely diffused gains in more narrowly classified industry categories or, on the contrary, may be an average of relatively small gains in some industries and relatively large gains in others. A greater than normal concentration of productivity gains in recent years would have led to higher unemployment, provided that the large gains were concentrated in industries where: (1) Demand was not sensitive to price changes or where the benefits of productivity gains were not being passed along to the customer in the form of lower relative prices, while the small gains were occurring in industries where demand was

[3] The observed year-to-year changes in output per man-hour are, however, not an unbiased measure of the increasing technical efficiency with which the economy utilizes labor resources. Annual data are significantly affected by changes in the rate of capacity utilization. Regardless of the time period under consideration, an index of output per man-hour for the economy as a whole or for major sectors is influenced by the movement of labor between low- and high-productivity activities.

price-elastic, or (2) demand was sensitive to changes in price, but increases in output occurred at the expense of a small number of closely competitive industries producing substitute products.

Under either of these situations, the concentration of productivity gains will probably lead to more persons becoming unemployed, and to their experiencing a longer average duration of unemployment. More displacement may occur, because the concentration may make it less feasible to adjust the work force to declining demands for labor via attrition. The displaced workers may experience a relatively high average duration of unemployment, since: (1) Layoffs in affected establishments will be larger than if productivity increases had been more widely dispersed. The layoffs will affect more older, high-seniority workers, who tend to be less mobile, less easily retrained, and less reemployable. (2) The layoffs will be more concentrated geographically and occupationally. The need for geographic mobility among displaced workers will be higher, and the possibility of finding a job in a closely related occupation will be lower than if productivity gains had been spread more evenly throughout industry.

Variability in demand may affect unemployment just as much as variability in output per man-hour. Shifts in the composition of demand lead to employment increases in some industries, and to the displacement of labor in others. Some time interval elapses before workers displaced from declining industries find employment in growing industries. If consumers, producers, and governmental units have been shifting the composition of their demands at a more rapid rate since 1957 than in earlier years, this increased fickleness may also have contributed to higher unemployment.

(3) A change in the qualitative impact of productivity increases

In the past, technological change has led to the specialization of function and to the division of the production process into simplified individual operations which could be performed by semiskilled blue-collar workers (referred to in Census classification terminology as operatives and kindred workers). In consequence, the number of nonfarm blue-collar workers rose throughout the first half of the 20th century. Recent technological changes have tended more toward the reintegration of the production process and consequently seem to have reduced the absolute demand for semiskilled blue-collar workers.

These blue-collar workers, once displaced from industrial employment find their skill, color, education, or temperament an impediment to finding jobs in the more rapidly growing trade, government or services sector.[4] Blue-collar workers remain unemployed, not because they are unwilling to accept jobs, but because employers are unwilling to hire them. This imbalance between the skills and attainments of unemployed blue-collar workers and the requirements of employers is the factor most frequently cited as a cause of higher "structural unemployment."

[4] Shifts in the occupational composition of the demand for labor could reduce the number of job opportunities actually available, if the following conditions held: New work techniques required a fixed ratio of skilled and less skilled labor. The supply of skilled workers was inadequate, and it was not possible to substitute the services of unskilled workers. Under these rigorous assumptions, the demand for final product would not be translated into jobs for unskilled workers, until the requisite number of skilled workers were trained. However, with rare exception, it is possible to vary the proportion of workers at different occupational levels who are used in the production process. If, for instance, the growth in the supply of engineers is less rapid than the growth in demand at going wage rates, the use of engineers is economized, by providing the average engineer with a greater number of less skilled assistants.

(4) *The propensity of unemployed workers to seek jobs in other occupations, industries, and geographic areas has declined*

The increased number of homeowners, the growth of unvested pension plans, seniority programs, and vacations graduated by years of service, along with unemployment compensation and supplementary unemployment benefits, are often cited as reasons for the decreased willingness of workers to change employers, or to undertake geographic moves. This decreased mobility results in a longer average duration of unemployment for displaced workers. It does not affect the number of persons experiencing unemployment. The pertinent factor here is the immobility of unemployed workers rather than immobilities among all labor force members. A decrease in mobility among employed workers would tend to lower rather than raise the unemployment level.

Structural Transformation Hypothesis

CONSEQUENCES

The logical implications of a heightening in labor market frictions due to structural transformations can easily be pursued. If structural transformations have led to higher unemployment, then the time path of employment and unemployment in a post-1957 business cycle should be considerably different than earlier. During the expansion phase in both 1948 and 1955–57, the unemployment rate remained in the neighborhood of 4 percent for protracted periods of time. Assume that in a post-1957 cycle, demands for labor are sufficiently high so as to reduce the unemployment rate to 4 percent during the expansion phase, except for the fact that occupational imbalances have worsened since 1955–57. The following sequence of events will occur: Unemployment during the early stages of the expansion will be higher than in other prosperity periods. The additional unemployment will be heavily concentrated in particular industries, occupations, and areas. More specifically, it will be concentrated among workers attached to blue-collar occupations and goods-producing industries. The rate of unemployment among these workers will be higher relative to the overall unemployment rate than it was earlier.

The weak demand for workers attached to goods-producing industries or blue-collar occupations must be compensated for by exceptionally strong demands for all other types of workers, since the basic assumption is that final demands are strong enough to insure full employment but for the existence of occupational imbalances. These demands will manifest themselves through some combination of larger than normal increases in unfilled job vacancies, in average hours worked, and in the size of the labor force. The exact manner in which these three factors are combined will depend on the composition of the demand for labor in expanding industries.

If the major increment in demand is for professional or other highly skilled workers, and demand is growing more rapidly than is the supply of appropriately educated or trained personnel, efforts will be made to economize on the services of these workers. Professional personnel will obtain more technical, clerical, and secretarial assistance. The workweek of professional personnel will be lengthened, if institutional arrangements and the nature of the work process permits. Employers

probably will still not be able to fully satisfy their demand for professional and highly skilled labor. There consequently will be a rise in the number of unfilled job vacancies, the volume of which will be greater than in the comparable phase of earlier cycles.

However, many of the jobs in expanding activities like trade, services, and Government do not require extensive training but can be filled by individuals possessing only moderate amounts of formal education and skill. Former industrial workers are generally capable of performing many of these jobs, though employers may prefer to lengthen the workweek of those already employed or to hire new entrants or reentrants into the labor force. So long as they do not require highly skilled workers, employers should be able fully to satisfy their manpower requirements at going wage rates, by recourse to one of these alternatives. Man-hours worked should consequently not be too markedly different than they would have been if the occupational composition of the labor force had been in better balance.

If employers do prefer teenagers or women, displaced industrial workers will find themselves at the back of the hiring queue. If growth in the labor force is primarily determined by growth in the population of working age and by long-run social and institutional influences, displaced industrial workers will obtain jobs as the expansion continues and employers are deprived of alternative sources of labor. In an expansion period of any duration, the unemployment rate should eventually approach the earlier full employment neighborhood of 4 percent. This target will be approached at a later stage in the cycle than if there had been no occupational maladjustments, but it will be approached. The distance by which the target is missed will be appreciable only if (1) the strength of demand is localized among highly skilled occupations and consequently results in a sharp rise in unfilled job vacancies, (2) the workweek is lengthened well above trend levels, or (3) former industrial workers are unwilling to accept jobs in other activities because many of these jobs pay relatively low wages.

Let us relax the assumption of a trend rate of expansion in the labor force and see what will happen if rapid growth in employment in trade, services, and Government results in an accelerated influx of teenagers and women. Displaced industrial workers will find themselves at the back of a much longer hiring queue. It will take a larger increase in real gross national product and a longer period of time than otherwise to reach full employment. However, so long as final demands and the existing capital stock are adequate, the 4-percent unemployment rate can still be approached. Inflationary pressures will be generated only if full utilization of capital resources in the expanding industries is attained first and bottlenecks develop.

The logical argument developed here applies with equal force to the consequences of an acceleration in output per man-hour, an increased concentration of productivity gains in specific industries, or a decline in the geographic mobility of unemployed workers. If unemployment rates have been high because of these factors, and not because of inadequate demand, the proof will be found in some combination of lengthening of the workweek, larger than normal gains in the size of the labor force, and a higher than usual level of unfilled job vacancies.

AGGREGATE DEMAND HYPOTHESIS

The basic assumptions underlying the aggregate demand explanation can be simply stated. Unemployment has risen because the rate of growth in demand for goods and services has slowed, relative to the rate of increase in supply at full employment. Acceleration or slackening in the rate of growth in aggregate demand need not and will not have an equal effect on the observed rate of growth of output and employment in all industries. The long-term trend in output and employment will be rising in some industries, and falling in others. Long-term rates of change will be accelerating in some industries and decelerating in others. Special developments may favorably or adversely affect output and employment in particular industries for brief periods of time, and be followed by reactions back to trend levels.

Divergences in output and employment trends by industry can be quite extreme. A change in the overall rate of economic advance will have a multiplicative or partially offsetting impact on these trends. A faster rate will lead to larger employment gains in growing industries, and to smaller declines in industries where the level of employment is being contracted. Contrariwise, a slower rate will lead to smaller employment gains in growing industries, and to larger declines in industries where employment levels are in a downtrend. Regardless of the rate of growth, however, divergences in trend will persist.

In the face of employment trends more divergent than earlier, a faster rate of growth in aggregate demand would have reduced the unemployment rate to the 4 percent level without appreciably more difficulty than was encountered in 1948 or 1955–57, only if the labor force were quite mobile—occupationally, industrially, and geographically. If the labor force were sufficiently mobile, expanding industries would have been able to fill their labor requirements by hiring new entrants to the labor force and workers displaced from other activities. In industries where employment was declining, the labor force would also have contracted, as displaced workers and new entrants sought employment in other activities.

The aggregate demand hypothesis does not deny the theoretical possibility of structural changes occurring so abruptly and so rapidly as to leave behind an appreciable residue of hard core unemployment. It does deny that any of the changes which have occurred since 1957 are of this character.

The explanation of higher unemployment rates afforded by the aggregate demand theory can be expressed in arithmetic form. Between 1948 and 1953, constant dollar gross national product increased at an annual rate of 4.7 percent. Output per person employed increased by 3.7 percent per year, and total employment rose at an annual rate of 0.9 percent. The total labor force grew at a rate of 1.4 percent per year but the Armed Forces absorbed part of the rise, so that the civilian labor force grew at the relatively slow rate of 0.8 percent. The unemployment rate, therefore, declined from 3.8 percent in 1948 to 2.9 percent in 1953.

A much smaller increase in gross national product and a considerably larger increase in the civilian labor force between 1953 and 1957 resulted in a rise in the unemployment rate—to 4.3 percent in 1957.

The annual rate of growth of constant dollar gross national product slowed to 2.6 percent between 1953 and 1957 and the annual rate of increase in output per person employed to 1.5 percent. Employment rose at an annual rate of 1.2 percent. The total labor force increased at an annual rate of 1.2 percent, but since the size of the Armed Forces was reduced, the civilian labor force increased at a 1.6 percent rate.

The unemployment rate rose further to 5.6 percent in 1960, since the growth in output after 1957 was again inadequate in light of expansion in the civilian labor force and continuing improvement in productivity. Constant dollar gross national product increased at an annual rate of 2.6 percent between 1957 and 1960, and output per employed person rose at a 1.5-percent rate. Employment rose at a 0.7 percent annual rate. The size of the Armed Forces was again reduced, and so the 1.2 percent annual rate of increase for the civilian labor force was somewhat higher than the 1 percent per year rate shown by the total labor force.

CHAPTER III

THE DESIGN OF A TEST FOR THE TWO THEORIES

On the basis of the analysis in chapter II, it is now possible to determine what evidence will confirm or refute the two alternative explanations of higher unemployment. Tests of the creditability of the aggregate demand and the structural transformation hypotheses will be designed in this chapter.

Structural Transformation Hypothesis

BASIC ASSUMPTIONS

(1) *Have increases in output per man-hour shown any signs of acceleration?*

This question will be approached from several perspectives.

The postwar period as a whole will be compared with the trend in output per man-hour since 1909 to see whether this recent period represents any historically unique break with the long-term trend. The long-term trend is a composite summary of a past which has included two World Wars, the great depression of the 1930's, and the two post-World War periods of prosperity. During periods of depression or acute recession, when the level of capacity utilization was being reduced and investment expenditures were curtailed, the productivity index has dipped below trend levels and at times has shown actual declines. The dislocations associated with the conversion to wartime production also have had an adverse impact on productivity levels. On the other hand, productivity gains have been sizable and generally well above trend levels during peacetime periods of relatively high level activity. This is hardly an accident. A high level of investment expenditures is normally a prerequisite to sustained prosperity, and high levels of investment will also result in larger than average increases in productivity. In addition, sustained and sharp advances in activity are possible, in the absence of large pools of unemployed and underemployed persons or of a wartime stimulus to expansion in the labor force, only if increases in output per man-hour are relatively large.

The postwar period, then, should be evaluated not only against the long-term trend but also against earlier periods of peacetime prosperity. The official statistics cover only one such period, the 1920's. Luckily, the 1920's are ideal for comparison, also being a postwar period and being marked by such significant changes as the electrification of industry, the spread of the mass-production technique, and the rise to maturity of the automobile and chemical industries.

This historical analysis will enable us to obtain some perspective on whether the 1950's represent a new era in technological progress. For the analysis of why unemployment rates have averaged higher since 1957 than in the preceding 9 years, it is also necessary to compare productivity changes during different segments of the postwar period. The unemployment rate was at approximately the same level

in 1948 and 1955–57. Were increases in output per man-hour during the 1957–60 cycle larger or smaller than in 1948–57? During the expansion phase of the 1948–53 cycle, unemployment reached its lowest level since World War II. Were productivity increases in 1957–60 larger or smaller than in the 1948–53 cycle?

These questions can be answered in large part by inspecting official Department of Labor statistics on output per man-hour. Series covering the total private, farm, and nonfarm sectors are available for the years since 1909. A series on output per man-hour in railroad transportation is available since 1919. Series for manufacturing and nonmanufacturing are available for the postwar period. Supplementary indexes of output per man-hour for manufacturing, mining, and utilities have been constructed using Federal Reserve indexes of production, Department of Labor series on man-hours, and other sources.

(2) *Would an acceleration of increases in output per man-hour necessarily lead to higher levels of unemployment?*

This question also will be viewed from several perspectives.

The impact of productivity changes on specific industries will be tested by cross-sectional correlations of changes in productivity and changes in man-hours. The correlations will reveal whether large productivity increases in particular industries have tended to depress or to raise the level of employment in those industries—both in the short run and over longer periods of time.

So long as increases in aggregate demand are commensurate with the rise in the supply potential of the economy, advances in output per man-hour will not lead to a net destruction in jobs or in employment opportunities—except in the beneficial sense that productivity increases lead to higher real income; and at a higher standard of living, workers may desire an increased ratio of leisure to material goods and services. Productivity change is considered a cause of high unemployment not because it reduces the total number of jobs, but rather because it leads to the displacement of labor from particular jobs. However, the assumption that faster rates of increase in productivity will necessarily lead to more displacement of labor, and consequently to higher unemployment, holds true only under certain stipulated conditions. The realism of these conditions will be investigated.

(3) *In recent years, have increases in productivity become more concentrated in a select group of industries? Have consumers, producers, and Government agencies become more fickle in their purchasing patterns?*

These two questions can be answered, if treated as a composite, by analyzing the variability of the annual rate of change in employment at the three-digit-industry level.[1] The test of variability has been confined to the manufacturing sector because sufficiently detailed data are not available for major nonmanufacturing industries.

Continuous series on production worker employment in 89 three-digit manufacturing industries, accounting for about 90 percent of total production worker employment, are available for the years between 1948 and 1951. Continuous series for 132 manufacturing

[1] Changes in variability could be offset by differential changes in the length of the workweek If so, changes in variability would affect man-hours but not employment or unemployment

industries, accounting for all production worker employment are available for the years between 1951 and 1960. Continuous series for 100 three-digit manufacturing industries, accounting for virtually all production-worker employment, were constructed for the years 1919, 1921, 1923, 1925, 1927, and 1929, by aggregating 309 adjusted employment series derived from Census of Manufacturing data.[2] The aggregation was based primarily on the classification system used in the "1945 Standard Industrial Classification" Manual. In some instances, however, it was necessary to utilize the 1939 SIC procedure, and a small number of industry groups were classified in an essentially arbitrary manner. The employment series for 1919–29 are thus internally consistent but not completely comparable with later data.

The weighted standard deviation of the logarithm of the index of the annual rate of change in employment in 3-digit manufacturing industries was computed. The size of the standard deviation is, of course, dependent on the size of the annual rate of change in employment. All other things being equal, the larger the absolute value of the rate of change, the larger will be the standard deviation. Given the absolute value of the annual rate of change in employment, the standard deviation provides a measure of the uniformity of changes. The smaller the standard deviation, the more uniform are employment changes; the larger the standard deviation, the less uniform. A rise over time in the size of the standard deviation would indicate that employment changes in specific industries were showing greater divergence from the average rate of change. The years since 1957 will be compared with the 1948–57 period and the entire postwar era will be compared with the 1920's, to see if such a rise has occurred.

(*4*) *Have changes in the occupational composition of the labor force been more marked in recent years than earlier? More specifically, how significant has been the downtrend in employment among workers in blue-collar occupations and goods-producing industries?*

Employment changes since 1957 will be compared with the earlier portion of the postwar era and with long-run trends.

(*5*) *Have unemployed workers become more immobile over time?*

Strong impressions on this subject can be obtained from an inspection of the annual Bureau of the Census estimates of the proportion of unemployed persons who changed residence across county and State lines during the preceding year. For our purposes, these estimates have some limitations. Unemployment status pertains to the survey week. The change in residence may have occurred at any time during the preceding year. The data provide no indication of how many employed workers were unemployed during some part of the year, and secured jobs as the result of migration. However, the fact that rates of migration among unemployed males are consistently higher than among employed males indicates the existence of some causal relationship between unemployment and migration. The relationship could run in either direction. Unemployed workers could have high migration rates or migrants could experience high unemployment rates. Despite these limitations, the migration series should reflect any strong trend toward greater immobility among unemployed workers.

[2] Solomon Fabricant, "Employment and Manufacturing, 1899–1939," National Bureau of Economic Research, New York, 1942, pp. 179–214.

Structural Transformation Hypothesis

CONSEQUENCES

An investigation of the basic assumptions underlying the structural transformation hypothesis is necessary for an understanding of the forces which have been shaping the labor market during the past decade. The results of such an investigation are necessarily limited. The theory could be rejected as an explanation of higher unemployment rates during recent years if none of the assumed processes had in fact occurred. After all, whatever the logical merits of the argument, an acceleration in technological change can cause higher unemployment only if in fact there has been such an acceleration. On the other hand, a verification of the assumptions does not establish the theory as a useful explanatory mechanism. The theory can be accepted only if its logical consequences are in accord with labor market developments during the period under review. Tests of these consequences are outlined below.

(*1*) *Has unemployment among workers attached to declining industries and occupations risen relative to unemployment among workers attached to expanding industries and occupations?* [3] *More specifically, have employment declines among workers in blue-collar occupations and goods-producing industries been the cause of any unusual concentration of unemployment?*

This question will be answered from several different perspectives. On the aggregative level, indexes of dispersion will be constructed, enabling us to determine whether differential changes in employment have caused the incidence of unemployment to become more unequal since 1957. These indexes are designed to summarize the situation in one statistic. Conclusions based on an analysis of the indexes will be reinforced by an investigation of unemployment trends in specific industries and occupations.

(*a*) The incidence of unemployment in the American economy is and always has been strikingly unequal. In 1960, for instance, the overall unemployment rate for experienced workers was 5 percent. An average unemployment rate of 1.4 percent for farmers, nonfarm proprietors, managerial, and professional personnel demonstrated the relative immunity of these groups to unemployment. Workers attached to clerical and sales occupations are the next most favored group, with an average unemployment rate of 3.7 percent. The unemployment rate averaged 5.4 percent among service workers, farm laborers, and craftsmen. The incidence of unemployment was most severe among unskilled and semiskilled blue-collar workers, who experienced an average unemployment rate of 9.1 percent. These workers accounted for only 25 percent of the civilian labor force, but for 45 percent of total unemployment. The probability of a worker becoming unemployed is also significantly affected by the industry of most recent attachment. In 1960 the probability of a worker attached to the construction industry being unemployed was 4.7 times greater than that of a worker attached to the finance, insurance, and real estate industry. A miner was 3.7 times more likely to be unemployed than someone whose industrial attachment was to public administration.

[3] Unemployed workers are classified according to the industry or occupation of last employment. Unemployed persons who have not at any time had 2 weeks full-time employment are classified as inexperienced.

It is easily demonstrated that the incidence of unemployment, measured absolutely, is most unequal during recessions and other periods of relatively low utilization of labor resources. The pertinent question then is whether the incidence of unemployment has been more unequal in the years since 1957 than in earlier years, when the unemployment rate was at approximately the same level. In order to answer this question, an index of the dispersion of unemployment among workers classified according to industrial attachment will be constructed. The unemployment rate for workers attached to specific industries will be subtracted from the unemployment rate for all experienced wage and salary workers. The absolute value of the difference will be multiplied by the average labor force in the industry during the year. The computations for each industry will be summed and the total divided by the experienced wage and salary worker labor force. The resulting index will be regressed against the unemployment rate for all experienced wage and salary workers. A similar index will be constructed for unemployed workers classified by the occupation of their most recent job. These indexes can be summarized symbolically, as follows:

Dispersion of unemployment by industry of most recent attachment $= \frac{\sum |U_i - U_w| LF_i}{LF_w}$

Dispersion of unemployment by occupation of most recent attachment $= \frac{\sum |U_o - U_e| LF_o}{LF_e}$

Where "U" is the unemployment rate; "LF" is labor force; "i" is any industry; "o" is any occupation; "w" is experienced wage and salary workers; and "e" is experienced workers.

These dispersion indexes will be unaffected by fluctuations in the level of unemployment, so long as the absolute change in the unemployment rate is the same for all occupations or industries. The dispersion indexes will rise or fall, however, when the percentage changes are the same for all occupations or industries. If the unemployment rate had increased by 20 percent in all industries between 1960 and 1961, the rise in construction would have been 2.5 percentage points, while in public administration it would have been only 0.5 percentage point. The dispersion index would have risen under these circumstances, indicating a greater inequality in the incidence of unemployment. If technological progress and differential trends in employment have resulted in any sharp changes in the incidence of unemployment in recent years, then the dispersion indexes will be considerably higher in 1959 and 1960 than in past years when the unemployment rate was at approximately the same level.

(*b*) The unemployment rate by industry and occupation will be regressed against the experienced worker unemployment rate for the years 1948–57. The industrial and occupational distribution of unemployment will then be predicted for the years 1958–60, on the basis of the overall unemployment rate and the 1948–57 relationships. If unemployment among workers attached to blue-collar occupations

and goods-producing industries is underpredicted, while unemployment among workers attached to white-collar occupations and service-type activities is overpredicted, then we have proof that differential changes in employment and productivity since 1957 have led to a growing concentration of unemployment. On the other hand, a close harmonization between actual and predicted unemployment rates would conclusively establish that structural changes had not appreciably affected the distribution of unemployment since 1957.

(*c*) The increased concentration of unemployment among workers in specific occupations and industries may have occurred not abruptly after 1957, but gradually and cumulatively. In order to test for this, the unemployment rate by industry and occupation of most recent attachment will be regressed against the experienced worker unemployment rate and time. If employment declines in manufacturing, mining, and railroads, and among blue-collar workers, have led to any continuing rise in unemployment in these industries relative to all others, we will obtain a significant, positive correlation with time. All other industries and occupations would then show on net a negative partial correlation with time.

A positive correlation for, say, manufacturing would indicate that the unemployment rate in manufacturing was higher relative to the overall unemployment rate, the further one progressed in time from 1948. On the other hand, the absence of a significant positive time trend would demonstrate that continuing declines in employment have not resulted in an appreciable concentration of unemployment.

The findings of these three tests of changes in the occupational and industrial distribution of unemployment will implicitly reveal the extensiveness of interindustry and interoccupational mobility. If unemployment has shown an increased concentration among workers attached to specific industries and occupations, it is because a considerable number of displaced workers have been unwilling to seek or unable to find employment in other industries and occupations. The absence of any newly developed concentration of unemployment will indicate the porousness of industrial barriers.

The degree of mobility is the key factor determining how the labor force in specific industries and occupations reacts to changes in employment. Had we known at the outset how mobile or immobile industrial workers were, we could easily have anticipated the findings of the investigation of the concentration of unemployment. A review of independent sources of information on the ease or difficulty with which workers cross industry lines should then serve as a check on these findings.

(*2*) *The other implications can be tested by a simple comparison of changes during the 1957–60 cycle with changes during the two preceding postwar cycles. During 1957–60, was expansion in the size of the labor force sharper than earlier? Was the workweek in nonmanufacturing industries lengthened appreciably? Was the number of unfilled job vacancies at a higher level?*

Some combination of these three developments should be found if higher unemployment after 1957 was due to structural transformations.

There is of course no statistical series specifically designed to measure the absolute number of unfilled job vacancies. If such a

series did exist, it would be possible to answer the major question posed in this study simply by comparing the composition and total number of unfilled job vacancies with the composition and total number of unemployed persons before and after 1957. However, some indication of trends in the unmet demands for labor are provided by the Bureau of Employment Security's series on Nonagricultural Job Openings in Clearance and the Help-Wanted Index of the National Industrial Conference Board. The first series is an inventory of job openings which local employment offices are unable to fill and which they consequently refer to all other employment offices within their State and to all other State Employment Services. Jobs are listed if there is not an adequate local supply of labor, employers are willing to recruit out-of-area applicants, and wages and working conditions are in line with similar activities. The second series is based on the number of help-wanted ads published in the classified section of a selected leading newspaper in each of 33 leading labor market areas. These areas account for 44 percent of nonfarm employment.

THE AGGREGATE DEMAND HYPOTHESIS

If higher unemployment in the 1957–60 cycle had resulted solely from an inadequate rate of growth in aggregate demands, the following conditions would have prevailed:

(1) The number of unfilled job vacancies in 1959 and 1960 would have been lower than in 1948 or 1955–57, after taking growth in the labor force into account. This condition is relatively stringent. Some of the increase in unemployment after 1957 could be explained by an inadequate level of aggregate demand, even if the number of unfilled jobs had actually risen, so long as this rise was proportionately smaller than the increase in unemployment.

(2) The index of the dispersion of unemployment should have shown no autonomous rise between 1955–57 and 1959–60. The industrial and occupational composition of unemployment, at any given unemployment rate, should have been approximately the same before and after 1957. The rise in unemployment between 1957 and 1960 should have been relatively pervasive, affecting all groups of workers, regardless of their most recent industrial and occupational attachment. These factors would demonstrate that there had been no significant structural transformations since mid-1957, or if there had been, that labor was sufficiently mobile so as to prevent the development of any unusual concentration of unemployment.

CHAPTER IV

FINDINGS: BASIC ASSUMPTIONS

OUTPUT PER MAN-HOUR: COMPARISON WITH LONG-RUN DEVELOPMENTS

Increases in output per man-hour during the postwar period have exceeded the long-term average rate of increase, computed over those years in the 20th century for which official statistics are available. Increases have proceeded at faster than average rates in manufacturing, railroad transportation, the private nonfarm sector, and agriculture, the major areas covered by continuous time series. These faster rates of increase are observable for the postwar period as a whole, and for each of its component cycles, as can be seen in table 1.

An acceleration in productivity increase—a tendency for the average annual rate of change to rise over time—is apparent, however, only in agriculture and railroad transportation. The acceleration in farm productivity, together with the inelasticity of demand for farm products and higher levels of income in urban occupations, has been the major factor in the continuing migration of farmworkers to urban centers. In manufacturing and in the nonfarm sector, on the other hand, productivity increases have been large during the postwar period but not unprecedentedly so, and there is no evidence of any upward shift in trend.

TABLE 1.—*Annual rates of change in output per man-hour during the 20th century (computed between terminal years)*

[Percent]

Period	Household survey estimates			Manufacturing (production workers)	Railroad transportation
	Total, private	Agriculture	Nonagriculture		
1909–60	2.2	2.4	2.0	3.1	----------
1919–60	3.6	2.9	2.2	3.5	3.5
1920–23	5.0	2.5	4.6	7.5	3.0
1920–26	4.0	.6	4.0	6.4	3.4
1920–29	3.1	1.4	3.0	5.6	3.0
1929–45	2.5	1.7	2.4	2.0	3.9
1948–53	4.3	5.1	3.7	4.1	3.8
1953–57	2.7	4.9	2.3	4.3	5.6
1957–60	2.6	5.0	2.3	4.6	[1] 6.1
1948–60	3.3	5.0	2.9	4.3	[1] 4.8

[1] Rates of change are computed for 1948–59 and 1957–59, since 1960 data are not available.

Sources: Estimates of output per man-hour in the total private economy, agricultural and nonagricultural sectors are from U.S. Department of Labor, "Output Per Man-Hour in the Private Economy," Release, Aug. 18, 1961, and BLS Bulletin No. 1249, December 1959, "Trends in Output Per Man-hour in the Private Economy, 1909–58." Estimates of output per man-hour in manufacturing are from table 4.

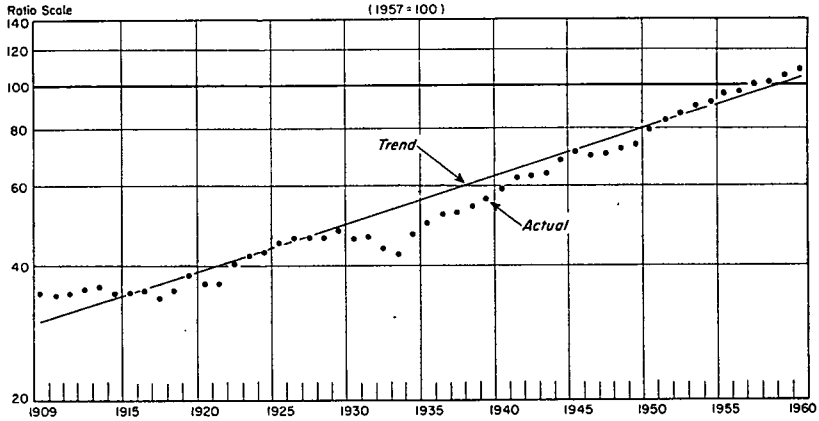
These relationships can be seen by inspecting charts 1 through 4. In each chart, the dots represent actual levels of output per man-hour. A least squares trend line calculated from the logarithms of the data for all years has been drawn on the charts for the private

economy, the nonfarm sector and manufacturing. The trend is a straight line indicating constancy in the underlying long-run rate of change. Actual observations for the nonfarm sector and manufacturing lie somewhat above the trend line in recent years, but no more so than in the 1920's.[1] Observations for the private economy show a more marked tendency to depart from the trend line, reflecting the acceleration in farm productivity.

CHART 1

OUTPUT PER MANHOUR

Private Economy, 1909-1960

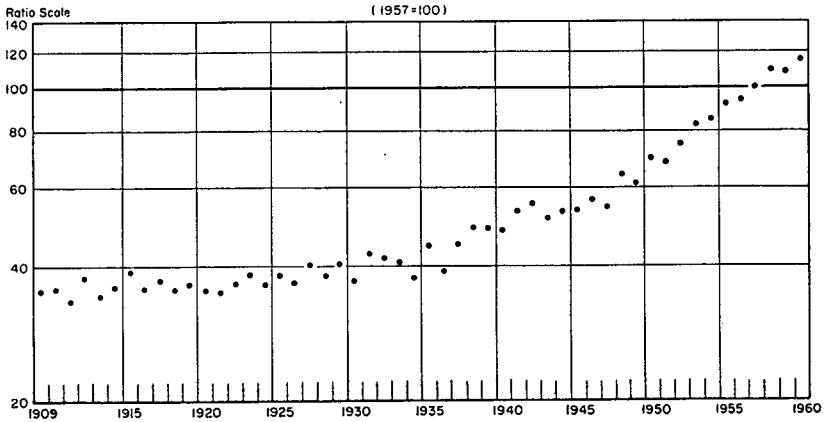


Source: U.S. Department of Labor, Bureau of Labor Statistics.

CHART 2

OUTPUT PER MANHOUR

Agriculture, 1909-1960



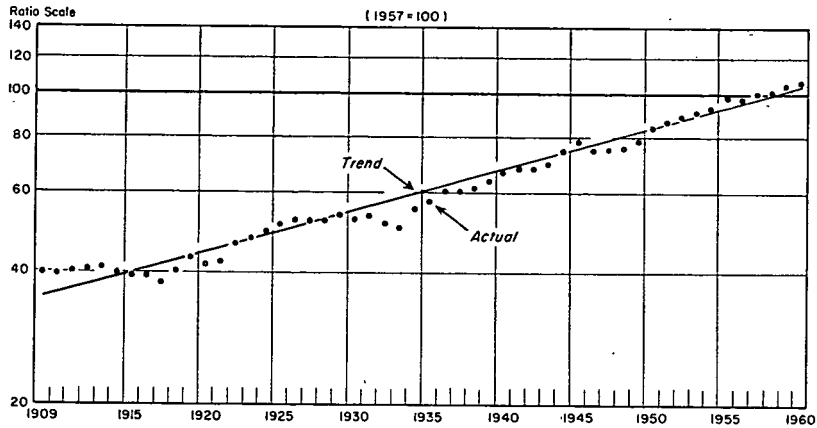
Source: U.S. Department of Labor, Bureau of Labor Statistics.

[1] There is some degree of curvilinearity in the output per man-hour data for the nonfarm sector. It results from the small gains in productivity during the 1909–19 period and from fluctuations in economic activity. The curvilinearity is eliminated for the period from 1919 on by adjusting for the degree of capacity utilization. See: U.S. Department of Labor, Bureau of Labor Statistics, "Trends in Output per Man-hour in the Private Economy, 1909–58," Bulletin No. 1249, December 1959, p. 27.

CHART 3

OUTPUT PER MANHOUR

Private Non-Farm Sector, 1909–1960

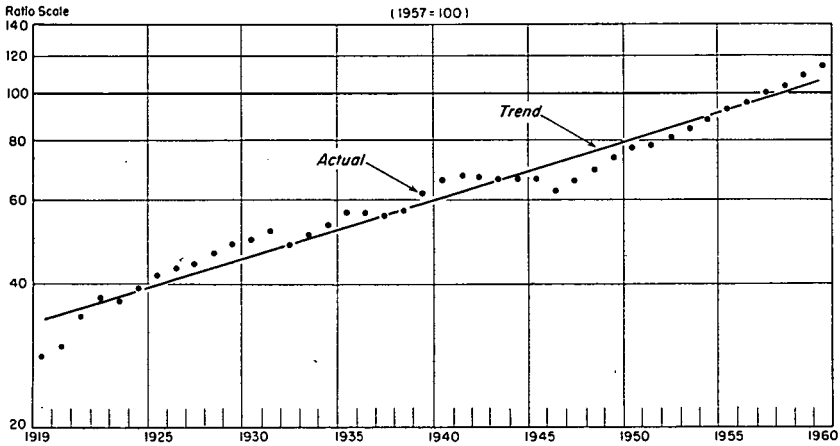


Source: U.S. Department of Labor, Bureau of Labor Statistics.

CHART 4

OUTPUT PER MANHOUR

Manufacturing Production Workers, 1919–1960



Source: See table 4.

Comparison with the 1920's, also an extended peacetime period of relatively high level activity, quickly dispels any illusions about the uniqueness of the last dozen years, insofar as productivity increases are concerned. In the 1920's, changes in productivity varied considerably between cycles, as they have in the more recent era. Then, too, increases were largest during the first full cycle following the reconversion period. Productivity gains were smaller during the 1920's in railroads and farming, but larger in manufacturing, and virtually the same in the private economy and the nonfarm sector.

Increases in productivity were larger during the 1920's, however, in the private economy and the nonfarm sector than they have been in the years since 1953.

The annual rate of increase in output per man-hour for manufacturing production workers during the 1920's was 5.6 percent, whereas between 1948 and 1960 it was only 4.3 percent. The output per man-hour series for manufacturing, based on all employee man-hours, has not been extended back to 1919 because of difficulties in estimating the length of the workweek for nonproduction workers. Employment of nonproduction workers has risen more rapidly since 1948 than it did in 1920–29. Consequently, an output per man-hour series based on all employee man-hours would show an even wider gap between the size of the increases in the two periods.

Nonfarm productivity has increased at about the same rate during the past dozen years as in the 1920's even though gains in manufacturing productivity have been smaller. The obvious inference is that a step-up has occurred in productivity increases in nonmanufacturing industries since the 1920's, very probably in services and trade where so much of the recent expansion in private employment has been centered.[2]

The conclusion that the rate of change in output per man-hour in manufacturing and in the nonfarm sector since 1948 does not mark any significant break with the historic rate of advance echoes similar findings by the two organizations which have played the leading role in the development and analysis of productivity statistics—the U.S. Department of Labor and the National Bureau of Economic Research, Inc. Solomon Fabricant, in an effort to place recent productivity changes in perspective, wrote:

> It may surprise those people who have heard of the new technological age that output per man-hour * * * rose during the period after the war at an average rate that, though high, was within the range of experience for earlier periods of similar length.[3]

The Bureau of Labor Statistic's Division of Productivity and Technological Development reported:

> Analysis of the various short-term movements within the long-term period points up the fact that there have been previous subperiods as well as the post-World War II period which have shown higher than average increases in output per man-hour. In this sense, the experience of the post-World War II period is not unique.[4]

OUTPUT PER MAN-HOUR: POSTWAR PERIOD

Two alternative sets of estimates of output per man-hour for the farm and nonfarm sectors, and for the total private economy, are available for the postwar period. One series is based on household survey estimates of hours worked; the other is derived primarily from establishment payroll reports on hours paid. The household survey

[2] John Kendrick's exhaustive investigation of productivity trends yields a similar finding: "* * * manufacturing and mining showed pronounced acceleration of productivity advance after 1919; but this lasted for only a decade in manufacturing and until 1937 in mining. Beginning around 1937, productivity advance accelerated in farming and in the residual service area, offsetting lower rates of advance elsewhere." For mining, Kendrick concludes: "* * * the 1919–37 acceleration was widespread. Deceleration after 1937 was most marked in the metal group, which showed an absolute drop in total productivity in the 1948–53 subperiod. Only in bituminous coal was the rate of efficiency gain higher in the last subperiod than in any preceding." John W. Kendrick, "Productivity Trends in the United States," a study by the National Bureau of Economic Research, Princeton University Press, 1961, pp. 140–144.

[3] Solomon Fabricant, "Basic Facts on Productivity Change," National Bureau of Economic Research, Inc. Occasional Paper 63, 1959, p. 38.

[4] Op. cit., BLS Bulletin 1249, "Trends in Output per Man-hour in the Private Economy, 1909–58," p. 22.

series is conceptually preferable for an analysis of the relationship between technological change and the demand for labor. Due to the growth over time in paid vacations and holidays, the use of hours paid as a measure of labor input tends to result in some downward bias in output per man-hour.[5]

TABLE 2.—*Annual rates of change in output per man-hour in the private economy, agricultural and nonagricultural sectors for the postwar period (computed between terminal years)*

[Percent]

Period	Establishment payroll estimates			Household survey estimates		
	Total private	Agriculture	Nonagriculture	Total private	Agriculture	Nonagriculture
1948–53	3.7	5.3	3.0	4.3	5.1	3.7
1953–57	2.5	4.6	2.1	2.7	4.9	2.3
1948–57	3.2	5.0	2.6	3.6	5.0	3.1
1957–60	3.0	4.9	2.8	2.6	5.0	2.3

Source: U.S. Department of Labor, "Output Per Man-hour in the Private Economy in 1960," Release Aug. 18, 1961.

Both series show that the largest increases in output per man-hour, for the farm and nonfarm sectors and for the private economy, occurred during the 1948–53 cycle. Productivity advances slackened considerably after 1953. Output per man-hour for the nonfarm sector and the private economy increased at approximately the same annual rate during the 1953–57 and 1957–60 cycles, according to household survey estimates. The rate of productivity increase during 1957–60 was thus well below the average for 1948–57, as can be seen in table 2. The establishment payroll series tells a somewhat different story. Productivity increases during 1957–60 in the nonfarm sector were well above the 1953–57 level, and somewhat above the 1948–57 average, though still not as high as in the earliest postwar cycle. However, these statistics have not yet been adjusted to accord with improvements in coverage of the establishment payroll estimates of employment and with the revision to the 1959 benchmark level. The average annual rate of increase in employment between 1957 and 1960, shown by the revised series, was over 60 percent larger than the increase shown in the monthly series on which the productivity estimates were based, or about 0.8 percent per year versus 0.5 percent per year for the unrevised data. Virtually the entire change was centered in nonmanufacturing industries. The period before 1957 was also affected but only moderately. Consequently, the revised series on output per man-hour, based on establishment payroll estimates of labor input, when finally prepared, will probably show a slower rate of increase for the 1957–60 period than for 1948–57.

The analysis of changes in manufacturing and nonmanufacturing industries must rely on output per man-hour indexes which were derived by using establishment payroll estimates of man-hours paid as the measure of labor input. These industry output per man-hour series, in sum, possess the same limitations and the same upward biases, particularly for the period since 1957, as the establishment payroll estimates of output per man-hour for the nonfarm sector.

[5] Differences between the two man-hour series reflect differences in statistical methodology and measurement errors, as well as conceptual differences.

Increases in output per man hour in nonmanufacturing industries were largest during the 1948–53 cycle, as can be seen in table 3. Gains were successively, but moderately smaller during the next two cycles. Gains during 1957–60 thus averaged lower than in 1948–57. Separate output per man-hour series are also available for three nonmanufacturing industries, which together, however, account for only a small proportion of nonmanufacturing employment. Productivity gains in railroads and mining averaged considerably higher during 1957–60 than in the earlier two postwar cycles, while public utilities show the opposite pattern.

TABLE 3.—*Annual rates of change in output per man-hour for major nonfarm sectors for the postwar period (computed between terminal years)*

[Percent]

Period	Manufacturing [1]		Manufacturing [2]	
	All employees	Production workers	All employees	Production workers
1948–53	3.4	4.0	3.5	4.1
1953–57	1.9	3.1	3.1	4.3
1948–57	2.7	3.6	3.3	4.2
1957–60	3.9	4.9	3.7	4.6
	Nonmanufacturing [1]	Railroads [3]	Mining [2]	Public utilities [3]
1948–53	2.7	3.8	5.9	8.3
1953–57	2.4	5.6	4.8	8.0
1948–57	2.6	4.5	5.5	8.2
1957–60	2.2	6.1	7.3	7.3

[1] Based on real product estimates of the Departments of Commerce and Labor. See U.S. Department of Labor, "Output Per Man-Hour in the Private Economy in 1960," Release, Aug. 18, 1961.
[2] Based on Federal Reserve indexes of production, and Department of Labor series on man-hours paid.
[3] Rates of change are computed for 1957–59, since 1960 data are not available.

Four different productivity series can be constructed for manufacturing industries. Output can be measured by the Federal Reserve index of manufacturing production, or by the Department of Labor series on real private product in manufacturing.[6] Labor input can be measured by production worker man-hours or by all employee man-hours. Regardless of the series chosen, annual rates of increase in output per man-hour were higher in 1957–60 than in either of the two preceding cycles. The productivity series based on the Federal Reserve index shows a rate of increase during 1957–60 which is only moderately higher than the average rate of advance in 1948–57. The Department of Labor series, on the other hand, indicates that the rate of productivity advance during 1957–60 was considerably higher than average experience during the earlier part of the postwar period. The magnitude of the increase shown by the two series is quite similar during the 1948–53 and 1957–60 cycles. The Federal Reserve series, however, shows a much faster rate of increase in output, and consequently in output per man-hour during 1953–57.

[6] Real private product in manufacturing plus real private product in nonmanufacturing sum to real nonfarm private product. Department of Labor estimates of real private product per man-hour in manufacturing and nonmanufacturing industries, when properly weighted, sum to real private nonfarm product per man-hour.

TABLE 4.—*All manufacturing: Indexes of production, employment, and productivity, 1909–60*

[1957=100]

Year	Production	Production workers			All employees		
		Employment	Man-hours	Output per man-hour	Employment	Man-hours	Output per man-hour
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1909	16.2	47.8	65.9	24.6	(1)	(1)	(1)
1914	19.0	50.5	67.3	28.2	(1)	(1)	(1)
1919	22.7	65.7	80.7	28.1	62.8	(1)	(1)
1920	24.7	66.0	83.0	29.8	62.8	(1)	(1)
1921	19.8	50.5	57.9	34.2	48.5	(1)	(1)
1922	25.1	55.9	66.9	37.5	53.5	(1)	(1)
1923	28.6	64.0	77.4	37.0	60.5	(1)	(1)
1924	27.1	59.4	68.8	39.4	56.7	(1)	(1)
1925	30.5	61.4	72.6	42.0	58.3	(1)	(1)
1926	32.3	62.7	74.8	43.2	59.6	(1)	(1)
1927	32.4	61.3	73.2	44.3	58.6	(1)	(1)
1928	33.8	61.4	72.5	46.6	58.3	(1)	(1)
1929	37.2	65.4	76.7	48.5	62.8	(1)	(1)
1930	31.6	56.9	63.6	49.7	56.0	(1)	(1)
1931	26.8	48.0	51.6	51.9	47.8	(1)	(1)
1932	20.1	40.8	41.6	48.3	40.5	(1)	(1)
1933	23.3	45.2	45.9	50.8	43.2	(1)	(1)
1934	25.9	52.7	48.5	53.4	49.7	(1)	(1)
1935	30.8	56.3	54.6	56.4	53.1	(1)	(1)
1936	35.9	61.1	63.6	56.4	57.5	(1)	(1)
1937	38.4	67.1	68.7	55.9	63.2	(1)	(1)
1938	30.1	57.0	53.0	56.8	55.1	(1)	(1)
1939	38.2	63.3	61.5	62.1	60.1	(1)	(1)
1940	43.9	68.1	66.6	65.9	64.2	(1)	(1)
1941	59.0	84.1	87.5	67.4	77.3	(1)	(1)
1942	73.1	99.4	109.0	67.1	89.7	(1)	(1)
1943	88.4	116.2	132.8	66.6	103.6	(1)	(1)
1944	86.4	113.0	129.7	66.6	102.0	(1)	(1)
1945	73.1	99.5	109.2	66.9	91.2	(1)	(1)
1946	59.8	93.7	95.5	62.6	86.2	(1)	(1)
1947	66.1	98.9	100.6	65.7	91.1	92.3	71.6
1948	68.6	98.4	99.1	69.2	91.3	91.9	74.6
1949	64.8	89.8	88.4	73.3	84.5	83.6	77.5
1950	75.5	95.3	97.0	77.8	89.2	90.6	82.3
1951	81.5	101.8	104.1	78.3	96.0	97.8	83.3
1952	84.8	101.7	104.1	81.5	97.3	99.2	85.5
1953	92.1	107.0	109.1	84.4	102.7	104.2	88.4
1954	85.8	97.4	97.1	88.4	95.3	95.2	90.1
1955	96.7	101.0	103.4	93.5	98.7	100.5	96.2
1956	99.4	102.1	103.8	95.8	100.7	101.9	97.5
1957	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1958	92.4	90.3	88.9	103.9	92.2	91.2	101.3
1959	105.3	94.8	95.9	109.8	96.3	97.2	108.3
1960	108.2	95.0	94.6	114.4	97.3	97.1	111.4

[1] Not available.

Source: The production index for 1909, 1914, and the odd-numbered years 1919–39 is from "Employment in Manufacturing, 1899–1939," by Solomon Fabricant. The index for the even years 1920–38 was derived by interpolation, using the Federal Reserve index for manufactures. The latter source was also used to extend the production index to 1960.

The index of man-hours was derived from an employment index, based on Census and BLS figures and a series for average weekly hours including BLS figures for 1909, 1914, 1919, and 1923–39 and estimates for 1920–22 based on BLS data for average weekly earnings and data for average hourly earnings as shown in "Employment, Hours and Earnings in Prosperity and Depression, United States, 1920–22," by W. I. King. The man-hour index in the period 1939 through 1947 is constructed from the BLS series on production worker employment which was adjusted to the 1939 and 1947 production-worker data from the "1947 Census of Manufactures" and a BLS series for average weekly hours. The man-hour index was extended through 1960 by the published BLS man-hour index.

The index of total manufacturing employment and man-hours was derived from published BLS data.

The choice between production worker and all employee man-hours as the measure of labor input does not significantly affect the ranking of productivity increases in 1957–60, relative to the two earlier cycles. Throughout the period, productivity increases are considerably smaller, when computed on the basis of all employee man-hours. This more inclusive series is the relevant one to use, when comparing productivity advances in manufacturing with gains in other industries, or for evaluating the increased efficiency of labor utilization in manufacturing. There has been a continuing substitution of nonproduction workers for production workers. Nonproduction workers accounted for 17 percent of all manufacturing employees in 1948 and for 25 percent in 1960. This shift in occupational composition has been due to increased emphasis on research and development, and to changes in technology which have resulted in additional needs for professional, technical, and clerical workers, and reduced requirements for production workers.

OUTPUT PER MAN-HOUR AND EMPLOYMENT

Changes in production worker man-hours and in output per man-hour do not show a strong or consistent relationship in the short-run, as can be seen in tables 5 and 6. A moment-of-time correlation between changes in productivity and changes in man-hours in 20 two-digit manufacturing industries reveals a positive relationship in 1948–53, and a negative relationship in the two subsequent cycles, but none of the correlations are statistically significant. The absence of any statistically significant short-run relationship between productivity and employment has previously been established—by Solomon Fabricant [7] for the periods 1899–1909, 1909–19, 1919–29 and 1929–39, and by Harold Levinson [8] for annual changes during the 1947–58 period.

The inability of economists to establish any significant short-run relationship between changes in productivity and changes in man-hours is probably due to one or both of the following factors. First, higher-than-average increases in productivity have led to employment increases in some industries and to employment declines in others. In the short run, these differential impacts may have offset each other. Second, the level of productivity in any specific industry or for the economy as a whole, is significantly influenced by the rate of capacity utilization. Correlating rates of change between years of peak activity partially adjusts for changes in the economy-wide capacity utilization ratio, but provides no adjustment for differential changes in capacity utilization ratios in specific industries. A productivity series, so adjusted, might reveal the existence of a significant short-run relationship between changes in output per man-hour and changes in man-hours.

[7] Solomon Fabricant, "Employment in Manufacturing, 1899–1939," National Bureau of Economic Research, Inc., New York, 1942, pp. 87–90.

[8] Joint Economic Committee Study of Employment Growth and Price Levels, Study Paper No. 21, "Post-war Movement of Prices and Wages in Manufacturing Industries," 86th Cong., 2d sess., January 1960, pp. 49–50.

TABLE 5.—*Simple correlation coefficients between changes in production worker man-hours, output per man-hour, and output in 20 manufacturing industries*

	Production worker man-hours	Output per man-hour	Output
1948–53:			
Production worker man-hours	1.00	0.17	0.90
Output per man-hour	.17	1.00	.53
Output	.90	.53	1.00
1953–57:			
Production worker man-hours	1.00	−.12	.64
Output per man-hour	−.12	1.00	.69
Output	.64	.09	1.00
1957–60:			
Production worker man-hours	1.00	−.09	.73
Output per man-hour	−.09	1.00	.62
Output	.73	.62	1.00

Source: Computed by the staff of the Joint Economic Committee from data provided by the Board of Governors of the Federal Reserve System and the U.S. Department of Labor.

TABLE 6.—*Changes in production workers employment and output per man-hour, during 3 postwar business cycles*

Manufacturing industries ranked according to size of increase in output per production worker man-hour	Changes in production worker employment	Percent of total employment change	Percent of production worker employment accounted for in base year
	Thousands		
1948–53:			
Highest 5	+958	85.6	19.2
Second highest 5	−200		20.0
Lowest 11	+360	32.2	60.8
1953–57:			
Highest 5	−294	31.9	20.5
Second highest 5	−316	34.3	25.5
Lowest 11	−311	33.8	54.0
1957–60:			
Highest 5	−221	34.1	24.4
Second highest 5	−25	3.9	15.3
Lowest 11	−402	62.0	60.3

Source: Computed by the staff of the Joint Economic Committee from data provided by the Board of Governors of the Federal Reserve System and the U.S. Department of Labor.

Table 5 does reveal two significant relationships, both also well established. Changes in production worker man-hours are very highly correlated with changes in output, demonstrating that the composition of final demand is the major factor influencing differential trends in employment. Changes in output and in output per man-hour are also highly correlated. Industries with the most rapid growth in output have experienced the sharpest increases in productivity. The causal relationship here operates in both directions. Gains in productivity by increasing the quality, or reducing the relative price of the product, have resulted in a widening of markets. At the same time, growth in output has permitted economies of scale and the specialization of function while encouraging technical change and a high level of investment.

Appreciation of this correlation between output and output per man-hour is necessary for a proper understanding of the relationship between technological change and employment. Productivity increases are both an accompaniment and a spur to the process of growth. In rapidly expanding industries, productivity increases do not lead to the displacement of labor, but rather permit an expansion

of output, without a proportional expansion in labor input. Nor do productivity increases in these instances lead to an elimination of potential jobs, since in the absence of cost-reducing changes there would not have been sufficient reduction in relative price or improvement in quality to stimulate the growth in demands.

Output and output-per-manhour are highly correlated. So are output and man-hours. It is consequently reasonable to expect that output-per-man-hour and man-hours would also be highly correlated, given a period of time sufficiently long to minimize differential changes in capacity utilization ratios, and to permit the cost-reducing impact of productivity increases to cumulate, and the resulting lower relative prices to exert an influence on the pattern of consumer expenditures. National Bureau studies, in fact, have found a significant positive correlation between output-per-man-hour and labor input for the periods 1899–1937 [9] and 1899–1953.[10] The findings were summarized as follows:

> The industries whose productivity advanced more rapidly than productivity in industries generally, were more often than not also those that expanded their output and employment of labor and capital more than industry at large. Industries in which productivity lagged usually had a smaller growth in output and employment of labor and capital than industry at large, or even a decline.[11]

The relationship between productivity change and employment in a specific industry can often be obscured by shifts in demands resulting from secular rises in income, technological progress in other industries, and changes in taste. Popular reaction to changes in productivity and employment in manufacturing, coal mining and railroads in recent years illustrates this point. In railroads and in coal mining, sizable gains in productivity during the postwar period have been accompanied by sizable declines in man-hours. The installation of new machinery embodying technical advances and requiring less labor per unit of output has been popularly accepted as the prime cause of job declines in these industries. It should be recognized, however, that at the end of the war both coal mining and railroads were confronted with highly competitive situations which threatened the eventual extinction of a considerable segment of the two industries. The only hope for competitive survival lay in the improvement of product quality and in the reduction of relative price. In the bituminous coal industry, rapid technical adaptation has resulted in a a 19-percent reduction between 1948 and 1960 in unit labor costs computed on the basis of production worker hourly earnings. In contrast, unit labor costs would have risen by 4 percent, had gains in output per man-hour been no higher than in manufacturing. Prices would have been considerably higher under this hypothetical situation, and higher prices would have adversely affected output. The resulting loss of markets would have made sizable reductions in employment inevitable regardless of the rate of technical advance. In this type of situation, rapid productivity increases, although they do eliminate some jobs, represent the best hope for maintaining a sizable number of job opportunities in the industry over the long run.

Manufacturing has declined in relative importance as a source of nonfarm job opportunities since 1948 despite the fact that output has

[9] Solomon Fabricant, "Employment in Manufacturing, 1899-1939," op. cit., pp. 87-90.
[10] John W. Kendrick, "Productivity Trends in the United States," op. cit., pp. 209-216.
[11] Solomon Fabricant, "Basic Facts on Productivity Change," National Bureau of Economic Research, Inc., New York, 1959, Occasional Paper 63, p. 23.

grown as rapidly in manufacturing as in private nonmanufacturing industries. The fact that productivity has been increasing at a more rapid rate in manufacturing than in the nonmanufacturing sector is frequently advanced as the explanation of this divergence. Here, again, the relationship betwen productivity and employment seems to have been obscured. In a society with a high and rising level of income, consumers could be expected, over time, to devote a growing proportion of their expenditures to various types of services. On an a priori basis, rates of growth in manufacturing output could then be expected to lag rates of growth in nonmanufacturing output. All other things being equal, this would result in a shift in the industrial composition of the workforce.

Any such tendency toward the deceleration of growth in manufacturing output has been offset by heavy Government expenditures for defense goods and by a higher-than-average rate of increase in productivity in manufacturing. Increases in output per man-hour have resulted in a lowering of relative costs and have permitted manufacturing firms to tap previously unexplored segments of the demand curve. There has consequently been a continuing transference of functions from the home, the farm, and the shop to the factory. Examples include the dramatic increase in the amount of factory processing of foods, the prefabrication of housing and house components, the home permanent kit, the replacement of the pinboy in bowling alleys by the automatic pinsetter, and the replacement of clerks by digital computers. In each instance, some technical advance has lowered the cost of factory processing relative to the cost or inconvenience of onsite work, and consequently has resulted in an increase in factory output and employment.

VARIABILITY IN EMPLOYMENT

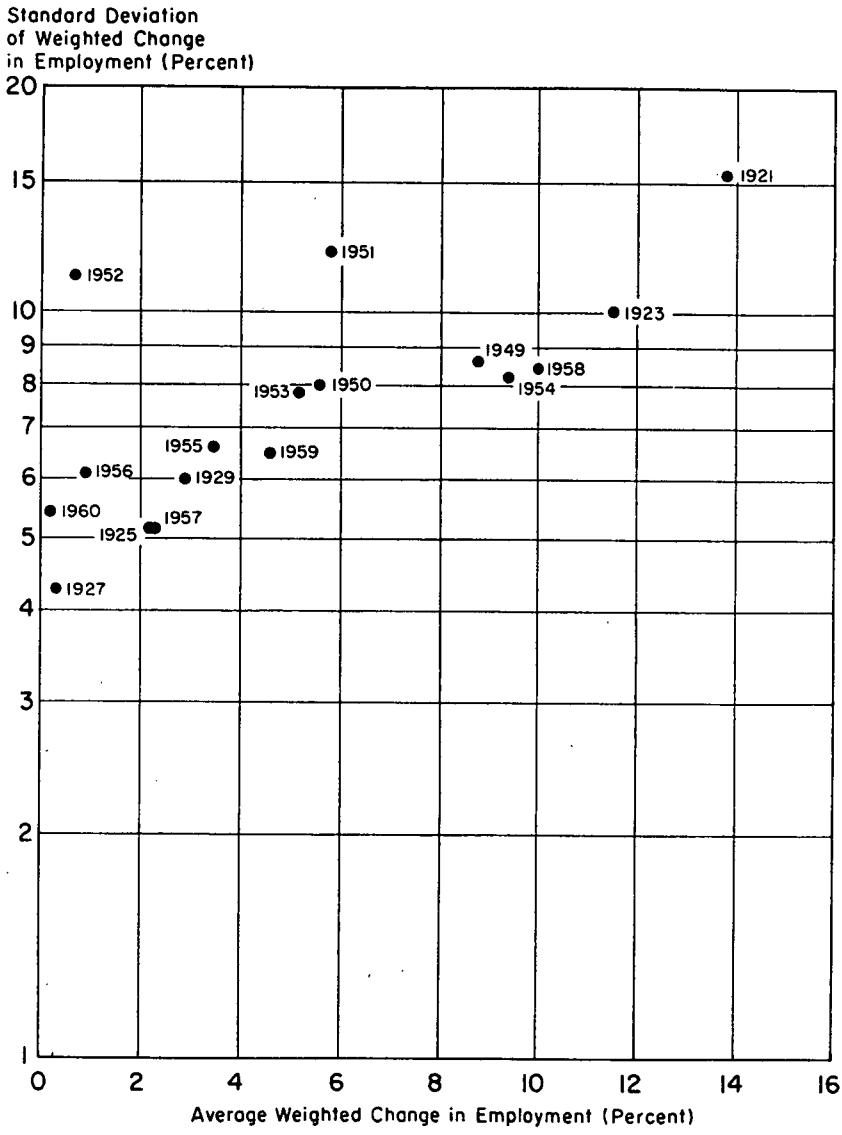
The weighted standard deviation of year-to-year changes in employment among three-digit manufacturing industries is relatively high during years when the overall level of manufacturing employment is stable.[12] The standard deviation rises, but not proportionately, during years when employment is showing significant increases or decreases.[13] In other words, employment changes are most variable (least uniform among industries) when the average level of employment is most stable, and individual industry trends are not being counteracted or reenforced by strong expansionary or recessionary forces. These forces, when they are operative, overshadow, to a considerable extent, influences specific to particular products and industries.

[12] The amount of employment variability is quite high at all times. Retrenchment in employment and industrial capacity in "sick industries" and expansion in "growth industries" is a continuing process. Employment series for 89 3-digit manufacturing industries accounting for almost 90 percent of production worker employment are available for 1948–53. During this period, total production worker employment was increasing at an average annual rate of 1.7 percent. Nonetheless, employment declned in 40 of the 3-digit industries.

[13] The coefficient of variation is extremely high when the overall employment level is stable. Its value declines rapidly whenever the overall level of employment undergoes significant change.

CHART 5

Variability of Change in Employment for MANUFACTURING PRODUCTION WORKERS



NOTE.—The absolute value of the observations has been plotted.

Source: See table 7.

TABLE 7.—*Variability of change in employment for manufacturing production workers*

Year	Average weighted change in employment [1]	Standard deviation of weighted change in employment [2]	Year	Average weighted change in employment [1]	Standard deviation of weighted change in employment [2]
	Percent	*Percent*		*Percent*	*Percent*
1921	−13.8	15.3	1953	5.2	7.8
1923	11.5	10.0	1954	−9.4	8.2
1925	−2.2	5.2	1955	3.5	6.6
1927	−.3	4.3	1956	.9	6.1
1929	2.9	6.0	1957	−2.3	5.2
1949	−8.8	8.6	1958	−10.0	8.4
1950	5.6	8.0	1959	4.6	6.5
1951	5.8	12.0	1960	.2	5.4
1952	−.7	11.1			

[1] More precisely, the antilogarithm minus 100 of the weighted mean of the logarithm of the indexes of the annual rate of change in employment among 3-digit manufacturing industries. The indexes are weighted by employment in the base year.

[2] More precisely, the antilogarithm minus 100 of the weighted standard deviation of the logarithm of the indexes of the annual rate of change in employment among 3-digit manufacturing industries.

Source: Computed by the staff of the Joint Economic Committee on the basis of data from the U.S. Department of Labor, "Employment and Earnings"; and Solomon Fabricant, "Employment in Manufacturing."

Chart 5 shows that the rate of change in employment is the major determinant of the size of the standard deviation. Most year-to-year changes can be adequately explained on this basis. In addition, the level of variability in particular years has been influenced by developments specific to those years. The amount of variability was quite high in 1960, after allowance for the stability of the overall employment levels, but variability in 1958 and 1959 was in line with earlier experience. The chart indicates clearly that there has been no autonomous shift in variability since 1957 and no significant shift since the 1920's. Given the overall change in manufacturing employment, there has been no tendency over time for large increases or decreases to become increasingly concentrated in a small number of industries.[14]

COMPOSITION OF EMPLOYMENT

The occupational composition of the labor force has been undergoing a continuing revolution, as can be seen in table 8. During the first five decades of this century, the most significant aspects of this revolution were the urbanization of the labor force, the growth in importance of white-collar activities, and the decline in the demand for unskilled labor. The 1950's are distinguished from earlier decades by the very rapid growth in the number of professional workers, and by the comparatively slow rate of growth in the nonfarm blue-collar (manual workers) labor force. The slackening during the 1950's was mainly centered among semiskilled workers. The number of laborers actually increased, after declining during the two preceding decades. The number of craftsmen increased at about the same rate as in the 1920's.

[14] Kendrick does find a secular decline in the variability of total factor productivity. For the covered sector of the private economy, variability in 1948–53 was considerably less than in 1919–29 and at an alltime low for the century. For 33 manufacturing industries, variability in 1948–53 was greater than in 1919–29, but less than in any other subperiod since the beginning of the 20th century. Unfortunately, Kendrick's computations only extend through 1953. See Kendrick, op. cit., pp. 142–143. We find the average coefficient of variation of changes in employment to be higher in the 1948–53, 1957–60 and 1948–60 periods than in 1919–29. However, this relationship is reversed when years in which the average weighted change in employment is less than 1 percent are excluded from the computations.

Blue-collar employment rose appreciably during the Korean war years. Gains slackened between 1953 and 1956, and after 1956 declines occurred. Changes in the size of the blue-collar labor force were strongly influenced by the availability of job opportunities. The labor force increased during the years of expanding blue-collar employment, and began to decline when the number of blue-collar jobs was reduced.

TABLE 8.—*Decade-to-decade percent change in labor force by major occupation group 1900–60*

Major occupation group	1950–60	1940–50	1930–40	1920–30	1910–20	1900–10
Total	+11	+14	+6	+15	+13	+28
White-collar workers	+28	+34	+12	+36	+32	+56
Professional, technical, and kindred workers	+65	+31	+17	+45	+30	+42
Managers, officials, and proprietors, except farm	+9	+37	+4	+29	+14	+45
Clerical and kindred workers	+28	+45	+15	+28	+70	+127
Sales workers	+13	+20	+13	+49	+17	+34
Manual workers	+5	+18	+7	+14	+19	+37
Craftsmen, foremen, and kindred workers	+12	+35	−1	+14	+27	+41
Operatives and kindred workers	0	+26	+24	+17	+21	+46
Laborers, except farm and mine	+6	−20	−9	+9	+10	+24
Service workers	+26	+2	+27	+44	−7	+36
Private household workers	+16	−36	+21	+42	−24	+17
Service workers, except private household	+31	+27	+32	+46	+11	+63
Farmworkers	−26	−23	−13	−9	−1	+6
Farmers and farm managers	−36	−18	−11	−6	+5	+7
Farm laborers and foremen	−12	−29	−15	−13	−8	+5
Farm and nonfarm laborers	−2	−24	−12	−2	+1	+13

NOTE: Percentage changes pertain to the economically active civilian population for the period 1900 to 1950 and to the civilian labor force for the period 1950–60.

Source: U.S. Department of Commerce, Bureau of the Census, Working Paper No. 5, "Occupational Trends in the United States 1900–1950;" and the Monthly Report on the Labor Force.

Changes in the occupational composition of the labor force have been associated with changes in its industrial distribution. During both the 1953–57 and the 1957–60 cycles, employment declined in goods-producing industries and railroads, and rose in all other activities, as can be seen by table 9. Employment of manufacturing production workers declined at about the same rate in both 1953–57 and 1957–60, but employment of nonproduction workers grew at a slower pace during the latter period. The annual rate of decline in employment was somewhat larger in mining and railroads during 1957–60 than in 1953–57. Employment also declined during 1957–60 in construction, a goods-producing industry which had previously shown a very high rate of growth. In contrast, employment in trade, services, and finance expanded during 1957–60 at about the same rate as in 1953–57, while Government employment grew even more rapidly.

TABLE 9.—*Average annual change in employment in nonfarm establishments during 3 postwar business cycles, 1948–53, 1953–57, and 1957–60*

[Absolute changes in thousands]

Nonfarm employment	1948–53	1953–57	1957–60
Total	1,068	668	481
Manufacturing	393	−94	−137
Production worker	229	−217	−209
Nonmanufacturing	675	762	618
Mining	−26	−10	−40
Construction	91	75	−14
Transportation, communications, and public utilities	20	−12	−75
Railroads	−24	−55	−68
Trade	195	160	175
Finance and services	196	304	273
Government	199	245	299

NOTE.—The average annual change in employment between 1957 and 1960 is overstated by slighly more than 80,000 because of the inclusion of Alaska and Hawaii in the data for the first time.

Source: U.S. Department of Labor, Bureau of Labor Statistics.

Changes in employment in goods-producing industries and in other activities have been sharply divergent in recent years, but this is not an unprecedented phenomenon. Manufacturing employment and man-hours declined during the first two cycles in the 1920's. In 1929, manufacturing employment was at the same level as in 1919, whereas in 1960, it was well above the levels of 1948 and 1950. Employment in mining and railroads also declined during most of the 1920's.

GEOGRAPHIC MOBILITY

The migration rate for unemployed males between March 1957 and April 1959, the last periods for which data are available, was in line with the postwar average, as can be seen in table 10. During this recent period, 11.2 percent of all unemployed males had moved their residence across county lines during the preceding year, as compared with an average migration rate of 10.8 percent for the postwar era. The proportion of unemployed males moving their residence across State boundaries—6.2 percent—was also in line with the postwar average. Migration rates have been decidely higher since 1952 than earlier. Otherwise, there has been no perceptible trend during the postwar period. Migration rates of unemployed males have consistently been higher than those of employed males, as can be seen by a comparison of tables 10 and 11. For the postwar period as a whole, the likelihood of an unemployed male being a migrant was 80 percent higher than the likelihood of an employed male.

TABLE 10.—*Mobility status of unemployed males age 14 and over*

[Percentage distribution]

Period	Total	Same house (nonmovers)	Different house in the United States					Abroad at beginning of period
			Total	Same county	Different county (migrants)			
					Total	Within a State	Between States	
March 1949 to March 1950	100	73.6	24.9	17.4	7.6	3.1	4.4	1.5
April 1950 to April 1951	100	73.4	25.7	15.9	9.8	4.0	5.8	1.0
April 1951 to April 1952	100	76.1	23.3	14.5	8.8	2.9	5.9	.6
April 1952 to April 1953	100	66.3	31.2	18.7	12.5	5.8	6.7	2.5
April 1953 to April 1954	100	67.6	27.6	14.9	12.5	5.5	7.1	5.0
April 1954 to April 1955	100	73.5	23.7	13.5	10.2	4.3	5.9	2.8
March 1955 to March 1956	100	64.1	33.2	19.4	13.8	6.3	7.6	2.8
April 1956 to April 1957	100	68.0	29.7	19.3	10.4	4.1	6.3	2.4
March 1957 to March 1958	100	67.0	31.7	20.0	11.7	5.2	6.5	1.3
April 1958 to April 1959	100	69.7	28.5	17.8	10.7	4.8	5.9	1.7

Source: U.S. Department of Commerce, Bureau of the Census, Current Population Reports, Series P-20, Mobility of the Population of the United States.

Migration rates for unemployed workers are not available prior to 1949–50. It is possible, however, to make some comparison of the migration rate for the civilian population during the postwar and earlier periods. Information is available on the proportion of persons who reported in 1947 that they had changed residence across county lines during the preceding 7 years, and on the proportion who in 1940 had reported similar type changes in residence during the preceding 5 years. The 1940–47 proportion was 20.8 percent and the 1935–40 proportion was 13.1 percent, as can be seen in table 12. Both proportions seem comparatively small, considering that between 1947 and 1959, 6.4 percent of the civilian population, on the average, reported a change in residence across county lines during the preceding year. The number of persons reported as having moved during a 5-year period will, of course, be smaller than the summation of the number of persons reported as having moved each year, since many families will move more than once during a 5-year period. The chances for response error are also much greater when individuals are asked to remember back across long spans of time. Nonetheless, the differences are sufficiently great to suggest that there has been at least as much geographic mobility during the postwar period as in the immediately preceding timespans.

TABLE 11.—*Mobility status of employed males age 14 and over*

[Percentage distribution]

Period	Total	Same house (nonmovers)	Different house in the United States					Abroad at beginning of period
			Total	Same county	Different county (migrants)			
					Total	Within a State	Between States	
March 1949 to March 1950	100	81.8	17.9	12.9	5.0	2.8	2.3	0.3
April 1950 to April 1951	100	78.9	20.9	14.3	6.6	3.6	3.1	.2
April 1951 to April 1952	100	79.1	20.2	13.7	6.5	2.9	3.6	.7
April 1952 to April 1953	100	78.5	20.4	13.8	6.6	2.8	3.8	1.1
April 1953 to April 1954	100	80.8	18.3	12.5	5.7	2.8	2.9	.9
April 1954 to April 1955	100	80.0	19.3	13.4	5.9	3.1	2.7	.7
March 1955 to March 1956	100	79.3	19.9	13.3	6.6	3.7	2.9	.7
April 1956 to April 1957	100	80.4	19.0	13.1	5.9	3.1	2.8	.6
March 1957 to March 1958	100	80.6	18.8	12.7	6.1	3.2	2.9	.6
April 1958 to April 1959	100	80.8	18.7	12.9	5.8	3.1	2.7	.5

Source: U.S. Department of Commerce, Bureau of the Census, Current Population Reports, Series P–20, Mobility of the Population of the United States.

TABLE 12.—*Mobility status of the civilian population*

[Percentage distribution]

Period	Total civilian population	Same house (nonmovers)	Different house in the United States					Abroad at beginning of period
			Total	Same county	Different county (migrants)			
					Total	Within a State	Between States	
April 1935 to 1940	100.0	(1)	(1)	(1)	13.1	7.7	5.4	0.3
April 1940 to 1947	100.0	42.5	57.0	36.2	20.8	10.7	10.1	.5
April 1947 to 1948	100.0	79.8	19.9	13.6	6.4	3.3	3.1	.3
April 1948 to 1949	100.0	80.8	18.8	13.0	5.8	2.8	3.0	.3
March 1949 to 1950	100.0	80.9	18.7	13.1	5.6	3.0	2.6	.3
April 1950 to 1951	100.0	78.8	21.0	13.9	7.1	3.6	3.5	.2
April 1951 to 1952	100.0	79.7	19.8	13.2	6.6	3.2	3.4	.4
April 1952 to 1953	100.0	79.4	20.1	13.5	6.6	3.0	3.6	.5
April 1953 to 1954	100.0	80.7	18.6	12.2	6.4	3.2	3.2	.6
April 1954 to 1955	100.0	79.6	19.9	13.3	6.6	3.5	3.1	.6
March 1955 to 1956	100.0	79.0	20.5	13.7	6.8	3.6	3.1	.6
April 1956 to 1957	100.0	80.1	19.4	13.1	6.2	3.2	3.1	.5
March 1957 to 1958	100.0	79.7	19.8	13.1	6.7	3.4	3.3	.5
April 1958 to 1959	100.0	80.3	19.2	13.1	6.1	3.2	3.0	.5

[1] Not available.

NOTE.—For 1935 to 1940, data are for persons 5 years of age and over; for 1940 to 1947, data are for persons 7 years of age and over; for subsequent years, data refer to persons 1 year of age and over.

Source: U.S. Department of Commerce, Bureau of the Census, "Current Population Reports," Series P–20, Mobility of the Population of the United States.

APPENDIX TO CHAPTER IV

ACCELERATED PRODUCTIVITY CHANGE AND UNEMPLOYMENT

The introduction of new machinery into a plant, the closing of facilities because they have become obsolete, the competitive inroads which new products may make on established markets, or new efficient plants on old less efficient ones—all lead at times to the severance of employment relationships for some workers. Job opportunities are continuously being curtailed in technologically unprogressive industries, and in those technologically advancing industries, the demand for whose product is inelastic with respect to price.

At the same time, job opportunities are being created in industries blessed with the junction of rapid productivity increases and price-elastic demands, and in other industries whose demands are highly elastic with respect to income. Employment growth in these industries results in the termination of periods of joblessness for some workers and also provides jobs for new labor force entrants who otherwise might have experienced a spell of unemployment. Automobiles, chemicals, rayon, transistors, and television provide dramatic illustrations of how technological change has resulted over time in the substantial lowering of costs, the opening of new mass markets, the stimulation of consumer and producer demand, and the widespread expansion of employment in the industry where the technological change occurred, in the industries which supply it with machinery and raw materials, and in the industries which service its products.

Technological change is continuously transferring job opportunities between establishments and industries. Workers displaced from one activity do not instantaneously find jobs in another. Consequently, the transference of job opportunities inevitably results in some frictional unemployment (defined as the amount of unemployment existing when the number of unfilled job vacancies equals the number of unemployed workers). An acceleration of productivity increases, it is argued, will expose more workers to unemployment and result in a higher unemployment rate. A slackening of productivity increases will lead, on the other hand, to less unemployment. This argument generally will hold true only under highly restricted circumstances.[1] An industrial economy experiencing absolutely no technological change would have lower levels of frictional unemployment than an economy

[1] The average number of persons experiencing unemployment will rise, if the rate of labor displacement is increased, even though the total number of job opportunities remains unchanged. It is likely but not certain that the average level of unemployment (the number of unemployed persons times the average duration of unemployment) will also rise. Assume the existence of a certain amount of unemployment due to voluntary quits, entrance into the labor force, shifts in demands, and other causes. A series of technological changes occur, creating new job opportunities in some establishments and industries, and destroying job opportunities in others, but having no effect on the total number of jobs. The new job opportunities resulting from technological change will reduce the average duration of unemployment for persons who were already jobless. The destruction of job opportunities will result in a new group of displaced workers experiencing unemployment. Since job-hunting is a time-consuming process, it is normally assumed that the second effect will outweigh the first. However, this is not inevitable. It depends on the geographic and occupational locus of the new job opportunities, and on the skill, location, and job preferences of unemployed workers. If the new job opportunities are sufficiently accessible and desirable, the reduction in the average duration of unemployment may more than counterbalance the wider incidence of unemployment, and the total level may decline.

n which change was occurring, providing that its consumption and investment patterns had adjusted to this total absence of change. Also, given two economies, both operating at full employment levels, the one with the lower rate of technological change would again probably have the lower rate of frictional unemployment.

We live, however, in a modern industrial economy, which frequently operates at below full employment levels, and whose institutions are geared to change. In such an economy, the stimulating effect of accelerated technological progress on levels of output and on the demand for labor should more than offset any induced rise in the number of persons experiencing frictional unemployment. There is a large discretionary component in the expenditure pattern of most consumers. In addition, credit is readily available to many. Expenditures on consumption goods, consequently, are not a fixed proportion of income, but instead vary from year to year, depending on the price and the attractiveness of the goods currently being offered in the market. Under such conditions, the ability of the economy to reach and maintain a full employment posture will frequently depend upo whether consumer demands are being stimulated by newly develop products or by older products greatly improved in quality and reduc in relative price, as the result of some technological advance.

Equally important is the fact that most productivity increases occur as the result of a prior act of investment. The rising education, skill, and inventiveness of the population, together with economies of scale, constitute the basic cause of increases in productivity. However, most of the technical ideas which result in reductions in labor requirement per unit of output come to fruition only when embodied in new and improved plant and equipment. The education and skill of the work force, and particularly of the managerial and professional workers, are the catalytic element in productivity change, but investment expenditures are necessary to translate potential productivity increases into actuality.

The cost-reducing or market-expanding promise of technical advances provides a major stimulus for investment expenditures. A sustained high rate of technical advance is a prerequisite for the maintenance of full employment in peacetime years, since the American economy at full employment, with the Federal budget balanced or providing a surplus, will generate more savings than are required for replacement of wornout plant and equipment, housing, and consumer durables, and for equipping the annual increase in population with the requisite stock of capital equipment, housing, and consumer durables. The validity of this point is easily demonstrated. It is only necessary to ask how much of the annual expenditure on plant and equipment represents simply the expansion of productive capacity for long-established and unimproved products or the replacement of facilities which have physically deteriorated through use or time, and how much represents expansion to meet growing demand for new or improved products, the modernization of existing facilities to take advantage of new low-cost techniques, and the replacement of existing plant which may be technically efficient, but have been made economically obsolescent by the development of lower cost technology.

Over the space of a full business cycle, then, high rates of productivity increase will generally be associated with and reflect high levels

of investment. The investment or consumption demand which is associated with large productivity increases will also lead to tight labor markets and low unemployment rates. It has been frequently stated that "technological unemployment is the price we pay for progress." The price is illusory, for in the absence of sufficient sustained technological progress, we will experience high rates of cyclical unemployment. The slowing down of technological change may lead to more unemployment than its acceleration, and may do so without yielding any of the advantages which flow from a rapid rate of technological improvement.

INCREASES IN OUTPUT PER MAN-HOUR, CAPACITY UTILIZATION RATIOS, AND THE DISPLACEMENT OF LABOR

The secular rise in output per man-hour has largely been due to the increasing average technical efficiency of the stock of plant and equipment. The level of efficiency of the capital stock can be increased by the construction of new plant and equipment, by the modernization of existing facilities, and by the closing down of obsolete facilities. The mix of these three processes is a major determinant of the amount of labor displacement which will result from any given increase in output per man-hour. Productivity increases resulting from the construction of new industrial capacity will lead to less displacement of labor than productivity increases which occur as the result of modernizing existing facilities. The closing of obsolete facilities will lead to the maximum amount of labor displacement. Capacity expansion is a major contributor to productivity advances during periods when capacity utilization ratios are high and aggregate demand is growing at a rapid rate. Modernization and the closing of obsolete facilities become more significant contributors during periods when capacity utilization ratios are low and aggregate demand is growing at a slow rate. Consequently, an advance in output per man-hour, of any specified magnitude, will lead to less displacement of labor during periods like 1948–53 when economic activity is expanding at a rapid rate, and to more displacement of labor during periods like 1957–60 when aggregate demand is growing at a slower rate than potential supply.

Capacity expansion

New plant is constructed and equipment is put in place in order to expand productive capacity to meet growing demands. Regardless of economic conditions, there are always some industries with high capacity utilization ratios. Given the available capital stock, the number of such industries will be largely determined by the level and rate of change in aggregate demand. New plant and facilities erected for the purpose of expanding capacity have the following highly desirable qualities: they raise the average level of output per man-hour, result in an expansion of employment, and lead to no immediate displacement of labor. This can be illustrated by a simple example. Assume that all industries in the economy decided in period 1 to expand capacity by 5 percent in anticipation of a 5-percent increase in demand during period 2. The new facilities installed require, on the average, 40 percent less labor per unit of output than do already existing facilities. In period 2, expectations are fulfilled and output for

each industry rises by 5 percent. Output per man-hour in period 2 will then be 2 percent higher than in period 1, and employment will be 3 percent higher. There will have been no displacement of labor.

In the actual world, the expansion of capacity will result in some displacement of labor along with increases in productivity and employment. Displacement will occur, usually after some time lag, because part of the increase in output secured by growing industries will be at the expense of already established products, while aggressive firms in relatively stable industries will expand their capacity and output at the expense of less dynamic competitors.

Modernization

Plant is modernized and equipment is reconstructed or replaced in an effort to reduce costs of production. Capital expenditures tend to decline when final demand is not growing at a sufficiently rapid rate to maintain a satisfactory level of capacity utilization. At such times, the proportion of investment funds devoted to modernization will rise. It may be less profitable than earlier to build new facilities, but competitive pressures necessitate the reduction of costs in existing facilities. The McGraw-Hill survey estimates that about half of all capital spending in manufacturing in 1957 was for modernization or replacement; by 1959–60 this ratio had risen to two-thirds. Productivity increases resulting from the modernization of existing facilities will generally result in more persons being separated from employment than will productivity increases which occur as the byproduct of an expansion in capacity. Some displacement is inevitable unless the lowering of costs enables the plant to sell an expanded output. This displacement should lead to relatively little protracted unemployment, so long as job opportunities are amply available. Layoffs will affect only a fraction of the plant's work force, usually young, low-seniority workers, who are best situated to find alternative jobs. They will not be affected by employer hiring restrictions against older workers, and they will also be more able and willing, because of their age, to move to areas of expanding employment opportunities.

The construction of new plant and facilities to replace obsolete productive capacity falls midway between capacity expansion and modernization in its impact. If the new plant is constructed in the same general geographic locale as its predecessor, the resulting displacement should be no greater than that occasioned by modernization (provided that modernization resulted in a plant of equivalent technical efficiency). Frequently, however, new plants are constructed in different geographical locations—in order to take advantage of wage, tax, or transportation cost differentials which have developed over time. The new plant will employ approximately the same number of workers regardless of its location. However, if the plant is located in a new area, its construction will lead to the displacement of the entire work force of the original plant.

The effect of a shift in geographic location on the level of unemployment depends on the sources of labor for the new plant. The unemployment level will not be affected if the new work force is recruited exclusively from the ranks of the unemployed. The unemployment level will rise to the extent that workers are recruited from other industries, and nonworkers are induced to enter the labor market. If labor is recruited from other industries, the rise in un-

employment will gradually dissipate itself, as the vacated jobs are filled. In the case of most manufacturing establishments, it can be assumed that workers will be recruited mainly from among those already in the labor force or about to enter on a full-time basis. Consequently, after allowing some period of time for necessary adjustments, the major impact of a geographic change will be on the incidence of unemployment, rather than on its level. This is true even if the plant shutdown in the original location leads to induced declines in service or trade activities, since these should be compensated for by induced increases in the new location. Some of the secondary effects may lead, however, to more protracted unemployment. The average age of the discharged work force at the old location will probably be higher than the average age of the newly engaged work force. Consequently, the category of unemployed persons will now contain a higher proportion of less mobile and less reemployable individuals.

Closing of obsolete facilities

Marginal or obsolete facilities are closed down. The capital stock can be visualized as forming a continuum. At one end are the newest, most modern facilities incorporating the best available technology. At the other end are aging facilities, containing the technology of an earlier era and requiring considerably more labor per unit of output than their more modern counterparts. Older plants are frequently moved along this continuum by modernization expenditures.

The closing of facilities with below average technology will raise the average level of productivity as effectively as the construction of capital equipment with above average technology. However, this type of change will result in the maximum amount of labor displacement. The plant's entire work force will be affected, including older, high seniority workers who will face the greatest difficulties in securing reemployment.

The phasing out of obsolete facilities is a necessary process historically predetermined by changes in taste, in technology, and in the comparative advantage of specific locations. Its pace, however, is very much a function of the level of capacity utilization and of the rate of change in aggregate demand. In an economy operating at near capacity levels, only a small proportion of plants will be phased out of production each year. The number of plant closings will increase rapidly as the rate of capacity utilization declines. The development of excess capacity will not result in proportionate cutbacks in all establishments. Output will be maintained at high levels in low cost establishments and reduced drastically in higher cost establishments. Some facilities which might have been maintained in operation for years to come if high output-capacity ratios had persisted will be permanently closed. The output of other plants will be needed at cyclical peaks, but can be profitably dispensed with at other stages of the cycle. These plants will be kept in operation, but with reduced staffs.

In many industries most productive facilities were concentrated in a small number of geographic centers during the early stages of growth. It eventually became advantageous to either diversify the location of establishments or to shift the geographic concentration of the industry elsewhere. Thus, the trek of the textile industry from New England

and the Middle Atlantic States, of the rubber industry from Akron, of the meatpacking industry from Chicago, and of automobiles and automobile parts from Detroit and the general Michigan area. The first plants to be closed when excess capacity develops are the older ones, concentrated in the original geographic locations of the industry.

A reduction in aggregate demand for goods and services, or a slowing down of its rate of growth, consequently may show up in very high rates of unemployment among workers in a limited number of geographic areas. If plants accounting for a substantial portion of the employment opportunities of a particular labor market are permanently closed, the area may enter the depressed category and remain there for a protracted period of time. On the other hand, if a substantial number of plants are maintained in operating condition so as to meet cyclical peaks in demand, then the area will enter the depressed category early in the recession and emerge only when the recovery is well underway.

CHAPTER V

FINDINGS: UNEMPLOYMENT

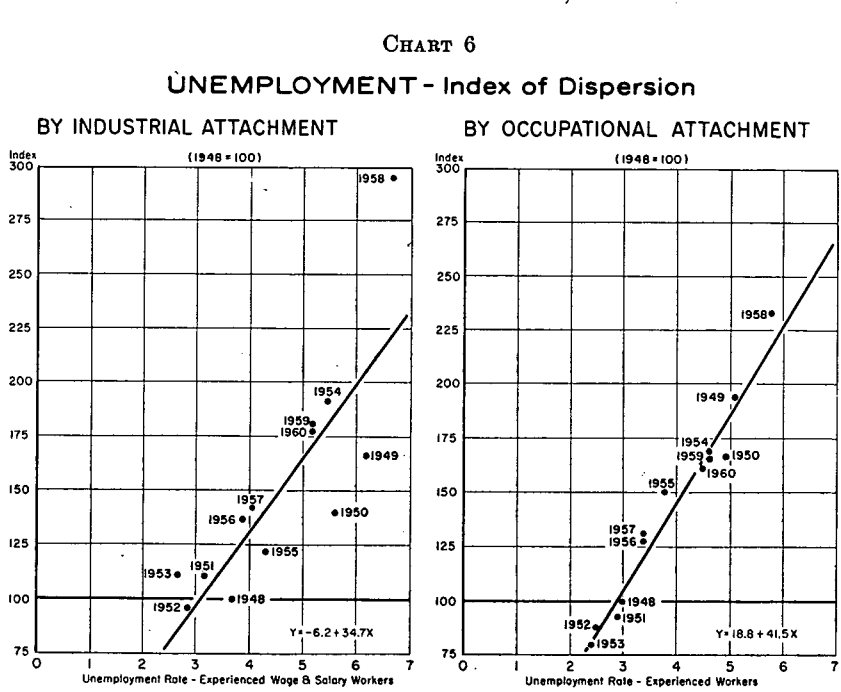
INDEXES OF DISPERSION

Dispersion indexes for unemployed workers classified according to the industry and occupation of most recent attachment are plotted on chart 6.[1] These indexes measure the absolute inequality of the incidence of unemployment. The higher their value, the more unequal is the incidence of unemployment and the more concentrated are unemployment experiences among workers with select types of occupational and industrial attachments.

The amount of absolute inequality in the incidence of unemployment clearly varies with the stages of the business cycle. Unemployment becomes more concentrated among select groups of workers as the unemployment rate rises. The value of the index of dispersion has shown an average rise of 82 percent during recession years on an industrial basis and of 95 percent on an occupational basis. Unemployment is highly concentrated when the unemployment rate is at a high level regardless of whether the high level is due to the economy being in a recession or to aggregate demands being inadequate during the recovery and expansion phases of the cycle.

[1] Published estimates of unemployment among workers attached to specific industries and occupations do not constitute a continuous series, comparable over time. The concept of unemployment was broadened in 1957 to include persons on layoff awaiting recall, and individuals waiting to report to a new wage or salary job within 30 days. This change in definition raised the annual level of unemployment by about ¼ of a million. It also introduced a discontinuity since unemployment in specific occupations and industries was differentially affected. A 1-year overlap between the new and old definition series was obtained from the Department of Labor: 1957 was the overlap year for industries and 1956 for occupations. Unemployment estimates for subsequent years were adjusted to the level of the pre-1957 series on the assumption that the industrial and occupational distribution of the change in definition group remained constant. The analysis of changes in unemployment is *based throughout on the adjusted series*.

CHART 6



Solid line is fitted by least squares to annual observations.

Source: See tables 13 and 14.

TABLE 13.—*Index of the absolute dispersion of unemployment by occupations, 1948–60*

Year	Index of dispersion (1948=100)	Experienced worker unemployment rate (percent)	Year	Index of dispersion (1948=100)	Experienced worker unemployment rate (percent)
1948	100	3.0	1955	150	3.8
1949	195	5.1	1956	128	3.4
1950	167	4.9	1957	132	3.4
1951	94	2.9	1958	234	5.8
1952	88	2.5	1959	167	4.6
1953	80	2.4	1960	162	4.5
1954	169	4.6			

NOTE.—Data are annual averages of monthly observations for January, April, July, and October.

Source: Computed by the staff of the Joint Economic Committee on the basis of data from the U.S. Department of Labor, Bureau of Labor Statistics.

TABLE 14.—*Index of the absolute dispersion of unemployment by industries, 1948–60*

Year	Dispersion index (1948=100)	Experienced wage and salary worker unemployment rate (percent)	Year	Dispersion index First 8 months of year (1957=100)	Experienced wage and salary worker unemployment rate (percent)
1948	100	3.7	1957	100	4.4
1949	167	6.2	1958	230	7.6
1950	140	5.6	1959	129	5.8
1951	112	3.2	1960	129	5.6
1952	96	2.9	1961	185	7.2
1953	112	2.7			
1954	192	5.5			
1955	123	4.3			
1956	137	3.9			
1957	142	4.1			
1958	295	6.7			
1959	180	5.2			
1960	179	5.2			

NOTE.—The dispersion index and the unemployment rate for the years 1948–60 are based on the definition of unemployment in use before 1957. The series for the first 8 months of the years 1957–61 are based on the current definition of unemployment and are not seasonally adjusted. Agricultural wage and salary workers are included in the annual series, but not in the monthly one.

Source: Computed by the staff of the Joint Economic Committee on the basis of data from the U.S Department of Labor, Bureau of Labor Statistics.

Fluctuations in the unemployment rate in fact provide the major explanation for changes in the degree of concentration of unemployment. The regression of the dispersion index by occupation against the unemployment rate for experienced workers yields a correlation coefficient of 0.98. A similar regression, by industry,[2] yields a coefficient of 0.83 percent. The dispersion index by occupations has shown no tendency to rise over time, independent of the level of the unemployment rate. The dispersion index by industries showed some tendency to rise with time between 1948 and 1956, but not since then. These indexes demonstrate that there has been no continuing trend during the postwar period toward greater concentration of unemployment.

On the scatter diagram of the dispersion index by industry, against the experienced worker unemployment rate (chart 6) the years 1959 and 1960 lie about the same distance above the regression line as do 1956 and 1957. On the scatter diagram of the dispersion index by occupation, the years 1959 and 1960 lie almost on the regression line, while 1956 and 1957 lie above it. In other words, the rise in the concentration of unemployment, by occupation or by industry of most recent attachment, between the prosperity period in 1956–57 and the one in 1959–60, is adequately explained by the weakening in general labor market conditions between these two periods.

The indexes raise three problems, not pertinent to our test, but still deserving of some attention:

(1) The years 1948, 1949, and 1950 show considerably less concentration of unemployment, by industry of most recent attachment, given the experienced worker unemployment rate, than do any other

[2] Throughout this study the unemployment rate among workers attached to specific occupations will be compared with the experienced worker unemployment rate. The unemployment rate for workers attached to specific industries will be compared with the experienced wage and salary worker unemployment rate. In order to avoid cumbersomeness, this will also be referred to as the experienced worker unemployment rate.

Unemployment rates by industry are the annual average of 12 monthly observations. Unemployment rates by occupation are the annual averages of observations for January, April, July, and October.

years. The unemployment rate was virtually the same in 1948 and 1956, but the value of the dispersion index was more than one-third higher in 1956. The years 1948–50 also show less concentration of unemployment, by occupation of most recent attachment, given the experienced worker unemployment rate, than do the years 1955–57. Otherwise, the index of dispersion by occupation shows a different pattern than does the index of dispersion by industry. As can be seen on chart 6, the year 1950 is the only exceptionally low observation for the index of dispersion by occupation. The amount of concentration in 1948–49 seems to be in line with the 1959–60 experience.

The rise in the concentration of unemployment between 1948 and 1956 has been explained, in a different context, as being due to an increase in "structural unemployment."

> * * * there is some evidence that these changes did not occur without some disequilibrium in labor resource allocation, possibly figuring prominently in the trend in total unemployment * * * a fundamental transformation such as is involved in the goods to services shift poses many obstacles to smooth adjustments. Differences in skill, rates of pay and hiring systems as between workers in goods-producing industries and the service-rendering activities reduce the mobility of the displaced worker and impede their desire and ability to find equivalent places for themselves in faster expanding alternatives.[3]

It is true, as can be seen in tables 15 and 16, that the unemployment rate rose between 1948 and 1956 among workers attached to blue-collar occupations and goods-producing industries, and fell among other workers. However, structural changes do not provide an adequate explanation of this one-shot rise. The structural change theory cannot be reconciled with the following facts: The unemployment rate rose in construction and declined in transportation, communications and public utilities between 1948 and 1956, although employment was expanding throughout the period in construction, and was declining in transportation. Employment in manufacturing, which accounts for most of the workers in nonfarm goods-producing industries, rose significantly between 1948 and 1956. Employment did decline between 1953 and 1956, as can be seen in table 17 but this decline was smaller than the one which occurred between 1956 and 1960. It is difficult to understand why the employment decline between 1953 and 1956 would lead to an autonomous increase in the concentration of unemployment when the larger decline after 1956 had no such effect. Most important of all, a close inspection of chart 6 suggests that the shift in the dispersion index did not occur during the 1955–56 expansion, but rather took place during the Korean war period when employment in goods-producing industries was rising sharply.

[3] U.S. Department of Labor, Bureau of Labor Statistics, "The Extent and Nature of Frictional Unemployment," Study Paper No. 6, Joint Economic Committee, Study of Employment, Growth, and Price Levels, 86th Cong., 1st sess., pp. 64–69.

TABLE 15.—*Changes in unemployment between 1948 and 1956, by major industry group of wage and salary workers*

Industry division	Unemployment rate		Changes in unemployment due to—		
	1948	1956	Total	Change in unemployment rate	Labor force changes
Wage and salary labor force	----------	----------	+379	+113	+266
Goods-producing industries	4.1	5.0	+298	+215	+83
Agriculture	4.7	6.5	+30	+32	−2
Mining	2.3	6.4	+26	+30	−4
Construction	7.4	8.3	+80	+33	+47
Manufacturing	3.5	4.1	+162	+120	+42
Service-rendering industries	3.4	3.1	+81	−102	+183
Transportation	3.0	2.4	−27	−29	+2
Trade	4.3	4.1	+35	−21	+56
Service, including private household	3.2	2.9	+81	−37	+118
Forestry and fisheries	10.8	7.0	−1	−3	+2
Public administration	2.0	1.6	−7	−12	+5

Source: U.S. Department of Labor, Bureau of Labor Statistics, "The Extent and Nature of Frictional Unemployment," Study Paper No. 6, Joint Economic Committee, Study of Employment, Growth, and Price Levels, 86th Cong., 1st sess., p. 65.

TABLE 16.—*Changes in unemployment between 1948 and 1956, by major occupational group*

Major occupation group	Unemployment rate		Change in unemployment due to—		
	1948	1956	Total	Change in unemployment rate	Labor force changes
Experienced labor force	3.0	3.4	+425	+210	+215
White-collar and service workers	2.5	2.4	+99	−64	+163
Professional, technical, and kindred	1.7	1.0	−9	−45	+36
Managers, officials, and proprietors	1.0	.8	−15	−17	+2
Clerical and kindred workers	2.3	2.4	+43	+9	+34
Salesworkers	3.4	2.7	−14	−30	+16
Private household workers	3.2	4.2	+34	+21	+13
Service workers	4.8	4.8	+60	−2	+62
Manual workers	3.5	4.4	+326	+274	+52
Farmers and farm managers	.2	.4	+6	+8	−2
Craftsmen, foremen, and kindred workers	2.9	3.2	+44	+26	+18
Operatives and kindred workers	4.1	5.4	+198	+173	+25
Farm laborers	2.3	3.7	+35	+42	−7
Laborers, except farm and mine	7.5	8.2	+43	+25	+18

Source: U.S. Department of Labor, Bureau of Labor Statistics, "The Extent and Nature of Frictional Unemployment," Study Paper No. 6, Joint Economic Committee, Study of Employment, Growth, and Price Levels, 86th Cong., 1st sess., p. 66.

The occupational pattern is even more perplexing. Employment rose in every major nonfarm blue-collar occupation between 1948 and 1956, and also between 1953 and 1956, as can be seen in table 17. The increase in the concentration of unemployment among blue-collar workers might be explained by growth in the size of the labor force since employment increased by only one-quarter of 1 percent between 1953 and 1956. However, there was no autonomous increase in concentration between 1956 and 1960, despite a decline of three-quarters of 1 percent in blue-collar employment.

TABLE 17.—*Average annual absolute changes in employment in goods-producing industries and blue-collar occupations*

[In thousands]

	1948–56	1953–56	1956–60
INDUSTRY			
Manufacturing	208	−102	−120
Production workers	66	−206	−219
Mining	−22	−15	−28
Construction	104	125	−29
Total	290	8	−177
OCCUPATION			
Operatives and kindred workers	53	23	−181
Craftsmen, foremen, and kindred workers	133	35	−14
Laborers, except farm and mine	25	5	10
Total	211	63	−185

Source: U.S. Department of Labor, Bureau of Labor Statistics.

In brief, the post-1950 shift cannot be adequately explained by differential changes in employment or by any other economic developments. However, the increased concentration of unemployment among blue-collar workers and those attached to goods-producing industries was quite moderate in magnitude as can be seen in tables 15 and 16. The indexes of dispersion register a large rise because they are highly sensitive. The shift in the observed incidence of unemployment was probably due to response error, sampling error, random occurrences, and the fact that the reconversion to peacetime patterns of consumption, production and labor force activity was not yet completed in 1948.

(2) There has been no tendency since 1957 toward the increased concentration of unemployment during prosperity years. However, the concentration of unemployment among workers last attached to durable goods manufacturing was unusually heavy during the 1958 recession. The year 1958 is completely out of line with other observations on chart 6. Has there been a tendency toward increased concentration during recession years, or is 1958 a special instance? Unemployment rates by industry of most recent attachment are shown in table 18 for the first 8 months of 1958 and 1961. The unemployment rate was 7.6 percent in 1958 and 7.2 percent in 1961. Unemployment was significantly lower in 1961 among manufacturing workers and somewhat higher among workers in trade and services. The value of the dispersion index for 1961 was consequently well below the 1958 level, as can be seen in table 14. There has been no recent tendency toward increased concentration of unemployment during recession years.

TABLE 18.—*Unemployment rates of experienced nonfarm wage and salary workers, first 8 months of year, 1957–61*

[Percent]

Industry	1957	1958	1959	1960	1961
Experienced nonfarm wage and salary workers	4.4	7.6	5.8	5.6	7.2
Mining	5.6	12.4	10.1	9.5	12.4
Construction	10.4	15.1	13.2	13.2	16.3
Durable goods manufactures	4.4	11.5	6.1	5.9	9.5
Nondurable goods manufactures	5.5	8.3	6.2	6.0	7.1
Transportation	3.0	6.0	4.3	4.2	5.4
Trade	4.7	7.1	6.2	6.0	7.5
Finance and services	3.2	4.3	4.1	3.8	4.8
Public administration	2.0	3.2	2.4	2.5	2.9

Source: U.S. Department of Labor, Bureau of Labor Statistics.

(3) The dispersion index by occupation shows considerably less random fluctuation than does the index by industries. Virtually all of the fluctuation in the occupational index is explained by changes in the level of unemployment. The greater stability of the occupational index is probably due to the fact that past occupational experience has a more significant influence on the availability of job alternatives and on the decisionmaking process of the worker than does prior industrial attachment. In consequence, the movement of unemployed workers between occupations will follow a more circumscribed and persistent pattern than will the flow between industries.

PREDICTED DISTRIBUTION OF UNEMPLOYMENT

The unemployment rate by industry and by occupation was regressed against the experienced worker unemployment rate for the years 1948–57. The regressions were used to predict the industrial and occupational distribution of unemployment for the years 1958–60, given the experienced worker unemployment rate. The results are shown in tables 19 through 22.

The predictive model provides an exceptionally close approximation to the actual distribution of unemployment, taking into consideration the sampling error, the possibility of response error, and the fact that 1958 witnessed the sharpest recession of the postwar era. The sum total of plus and minus errors in allocating unemployment by industry amounted to only 9 percent of total unemployment in 1958, and to less than 7 percent in 1959 and 1960. The predicted distribution of unemployment by occupation differed from the actual by only 8 percent in 1958, 3 percent in 1959, and 6 percent in 1960. For the years 1959 and 1960, only 4 of the 22 predictions by occupation and 9 of the 20 predictions by industry differed from the actual occurrence by as much as 1 standard error of estimate.

TABLE 19.—*Unemployment rates by occupation, 1958–60, actual and predicted, from 1948–57 regressions*

[Percent]

Major occupational group	1958			1959			1960			Standard error of estimate
	Actual	Predicted	Difference	Actual	Predicted	Difference	Actual	Predicted	Difference	
Professional, technical, and kindred workers	1.7	2.1	−0.4	1.5	1.7	−0.2	1.5	1.7	−0.2	0.3
Farmers and farm managers	.6	.3	.3	.2	.3	−.1	.3	.3	0	.1
Managers, officials, and proprietors, except farm	1.6	1.6	0	1.2	1.3	−.1	1.2	1.3	−.1	.2
Clerical and kindred workers	3.8	4.1	−.3	3.3	3.3	0	3.6	3.2	.4	.1
Sales workers	3.4	4.1	−.7	3.5	3.4	.1	3.3	3.4	−.1	.4
Craftsmen, foremen, and kindred workers	6.4	6.7	−.3	4.9	5.1	−.2	4.8	5.0	−.2	.2
Operatives and kindred workers	10.1	9.1	1.0	7.0	7.1	−.1	7.2	7.0	.2	.4
Private household workers	4.8	6.2	−1.4	4.9	5.0	−.1	4.1	4.9	−.8	.3
Service workers	7.2	7.1	.1	6.0	6.0	0	5.6	5.9	−.3	.4
Farm laborers and foremen	5.7	5.3	.4	4.8	4.2	.6	4.5	4.1	.4	.4
Laborers, except farm and mine	13.9	14.5	−.6	11.8	11.4	.4	11.8	11.1	.7	.6

NOTE.—Data are annual averages of monthly observations for January, April, July, and October.

Source: Computed by the staff of the Joint Economic Committee on the basis of data from the U.S. Department of Labor, Bureau of Labor Statistics.

TABLE 20.—*Unemployment by occupation, 1958–60, actual and predicted, from 1948–57 regressions*

[In thousands]

Major occupational group	1958			1959			1960			Average difference for 3-year period
	Actual	Predicted	Difference	Actual	Predicted	Difference	Actual	Predicted	Difference	
Professional, technical, and kindred workers	118	146	−28	109	123	−14	109	124	−15	−19
Farmers and farm managers	19	10	9	6	9	−3	7	7	0	2
Managers, officials, and proprietors	111	111	0	83	90	−7	85	92	−7	−5
Clerical and kindred workers	366	395	−29	322	322	0	362	322	40	4
Sales workers	143	173	−30	160	156	4	149	153	−4	−10
Craftsmen, foremen, and kindred workers	586	613	−27	445	463	−18	439	457	−18	−21
Operatives and kindred workers	1,307	1,178	129	896	909	−13	931	905	26	47
Private household workers	113	146	−33	114	116	−2	96	114	−18	−18
Service workers	437	431	6	380	380	0	364	384	−20	−5
Farm laborers and foremen	154	143	11	132	116	16	126	115	11	13
Laborers, except farm and mine	595	621	−26	507	490	17	495	466	29	7
Total	3,946	3,967	-------	3,154	3,174	-------	3,163	3,139	-------	-------

NOTE.—See table 18.

Source: Computed by the staff of the Joint Economic Committee on the basis of data from the U.S. Department of Labor, Bureau of Labor Statistics.

TABLE 21.—*Unemployment rates by industry, 1958–60, actual and predicted, from 1948–57 regressions*

[Percent]

Industry	1958			1959			1960			Standard error of estimate
	Actual	Predicted	Difference	Actual	Predicted	Difference	Actual	Predicted	Difference	
Agriculture	9.5	8.6	0.9	8.4	7.0	1.4	7.7	7.0	0.7	0.8
Mining	9.6	10.7	−1.1	8.6	8.0	.6	8.5	8.0	.5	1.8
Construction	12.9	12.9	-------	11.3	10.3	1.0	11.4	10.3	1.1	.5
Durable goods manufacturing	9.8	7.7	2.1	5.5	5.6	−.1	5.7	5.6	.1	.4
Nondurable goods manufacturing	6.7	7.1	−.4	5.1	5.6	−.5	5.3	5.6	−.3	.3
Transportation, communications, public utilities	5.2	5.6	−.4	3.8	4.1	−.3	4.0	4.1	−.1	.3
Trade	6.4	6.4	-------	5.5	5.1	.4	5.6	5.1	.5	.2
Finance	2.9	2.1	.8	2.6	1.9	.7	2.4	1.9	.5	.2
Services	4.2	5.4	−1.2	4.0	4.3	−.3	3.8	4.3	−.5	.3
Public administration	2.7	3.0	−.3	2.1	2.3	−.2	2.4	2.3	.1	.2

Source: Computed by the staff of the Joint Economic Committee on the basis of data from the U.S. Department of Labor, Bureau of Labor Statistics.

TABLE 22.—*Unemployment by industry, 1958–60, actual and predicted, from 1948–57 regressions*

[In thousands]

Industry	1958			1959			1960			Average difference for 3-year period
	Actual	Predicted	Difference	Actual	Predicted	Difference	Actual	Predicted	Difference	
Agriculture	177	160	17	155	129	26	157	142	15	19
Mining	71	79	−8	60	56	4	59	56	3	----------
Construction	512	511	1	453	411	42	454	406	48	30
Durable goods manufacturing	973	765	208	554	560	−6	568	558	10	71
Nondurable goods manufacturing	508	535	−27	386	420	−34	419	443	−24	−28
Transportation, communications, public utilities	237	257	−20	173	186	−13	188	194	−6	−13
Trade	677	672	5	590	552	48	610	558	52	35
Finance and services	596	716	−120	575	593	−18	563	609	−46	−61
Public administration	86	95	−9	67	75	−8	79	78	1	−5
Total	3,837	3,790	-------	3,013	2,982	-------	3,097	3,044	-------	----------

Source: Computed by the staff of the Joint Economic Committee on the basis of data from the U.S. Department of Labor, Bureau of Labor Statistics.

Systematic divergences between predictions and the actual unemployment totals occurred only in the following occupations and industries. Unemployment in agriculture, construction, finance, and trade was underestimated in each year. Unemployment was overestimated each year in nondurable goods manufacturing and service industries,[4] and among professional workers, craftsmen, and domestic servants.

In 1958 unemployment was significantly overestimated for workers most recently attached to service industries and significantly underestimated for durable goods manufacturing worker and operatives

[4] Service industries include hotels, laundries, repair shops, legal and medical services, educational institutions, and amusement enterprises. Service industries should be distinguished from service occupations which are defined to include persons providing protective, personal, or institutional services.

(semiskilled workers). However, unemployment among blue-collar workers and workers most recently attached to goods-producing industries was not significantly underestimated in either 1959 or 1960. The predicted rate for durable goods manufacturing differed from the actual by only 0.1 percentage point in 1959 and 1960. The amount of unemployment was underestimated in construction during these 2 years but overestimated in nondurable goods manufacturing. The average annual underestimate of unemployment in all goods-producing industries, including agriculture, was 92,000 or 5 percent in the 1958–60 period. For 1959 and 1960, it averaged 42,000 or 2.6 percent.

The predictions for nonfarm blue-collar workers were even more accurate. Unemployment among operatives was overestimated in 1959 and underestimated in 1960. Unemployment was underestimated among laborers and overestimated among craftsmen in both years. For the 1958–60 period, unemployment among the three nonfarm blue-collar groups was underestimated by an average of 33,000 or 1.6 percent. In 1959–60, the underestimate averaged 12,000 or seven-tenths of 1 percent. Given the unemployment rate for experienced workers, the chance of workers attached to blue-collar occupations or goods-producing industries becoming unemployed has not been significantly different since 1957 than it was in the 1948–57 period.

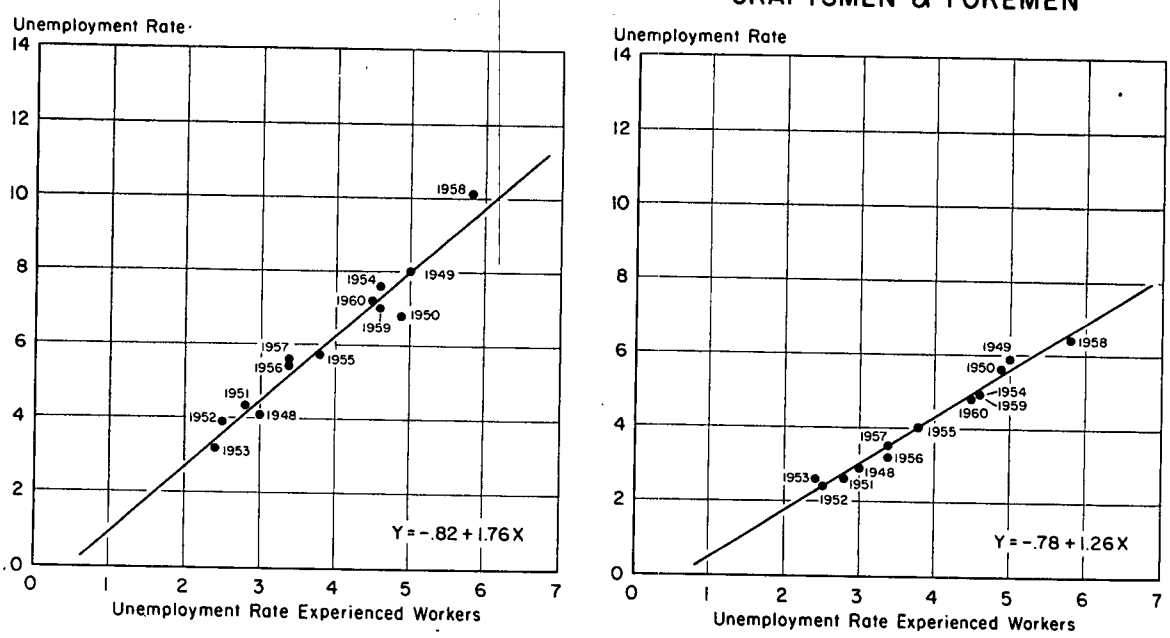
TIME TRENDS IN UNEMPLOYMENT RATES

Charts 7 through 14 show the scatter of unemployment rates in specific occupations and industries against the experienced worker unemployment rate for the years between 1948 and 1960. The solid line on each chart is the regression relationship between the unemployment rate in that occupation or industry and the experienced worker unemployment rate. The annual observations cluster closely around the regression line in most instances. Changes in unemployment rates among workers attached to specific industries or occupations are highly correlated with fluctuations in the experienced worker unemployment rate. The unemployment rate for farm managers and owners is not plotted. They are the only labor force group whose unemployment experiences are relatively independent of general economic conditions.

If declines in employment in goods-producing industries and blue-collar occupations have led in recent years to any unusual concentration of unemployment among workers attached to these categories, then observations for 1959 and 1960 will be well above the regression lines. No such systematic pattern is observable. Observations lie well above the regression line for construction workers, miners, and nonfarm laborers, about on the line for farm laborers, craftsmen, and operatives, and below the line for workers attached to manufacturing industries.

CHART 7

UNEMPLOYMENT RATES, By Occupation 1948-1960

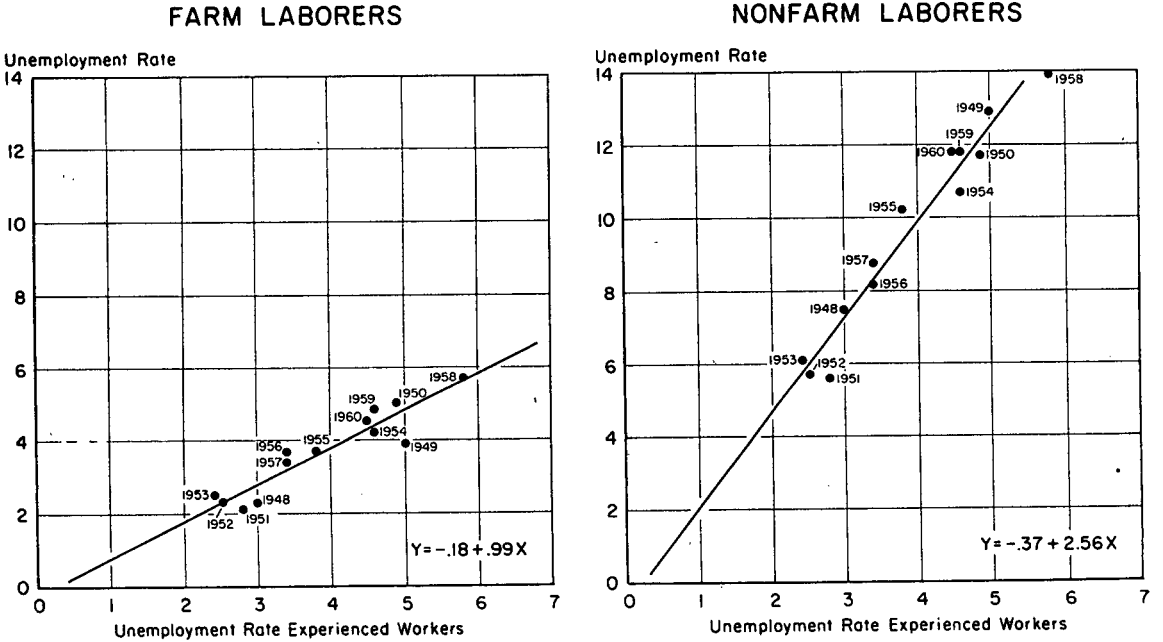


Note: Solid line is fitted by least squares to annual average of monthly observations for January, April, July and October.

Source: U.S. Department of Labor. Data have been adjusted for comparability by the staff of the Joint Economic Committee.

CHART 8

UNEMPLOYMENT RATES, By Occupation 1948-1960

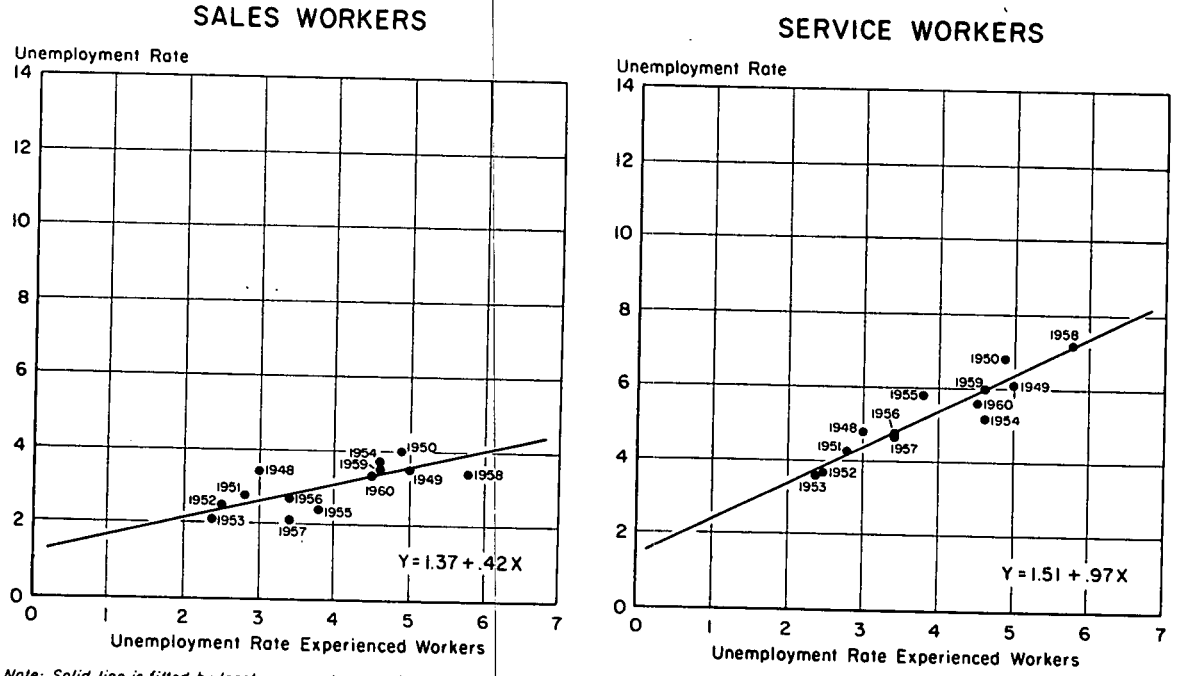


Note: Solid line is fitted by least squares to annual average of monthly observations for January, April, July and October.

Source: U.S. Department of Labor. Data have been adjusted for comparability by the staff of the Joint Economic Committee.

CHART 9

UNEMPLOYMENT RATES, By Occupation 1948–1960



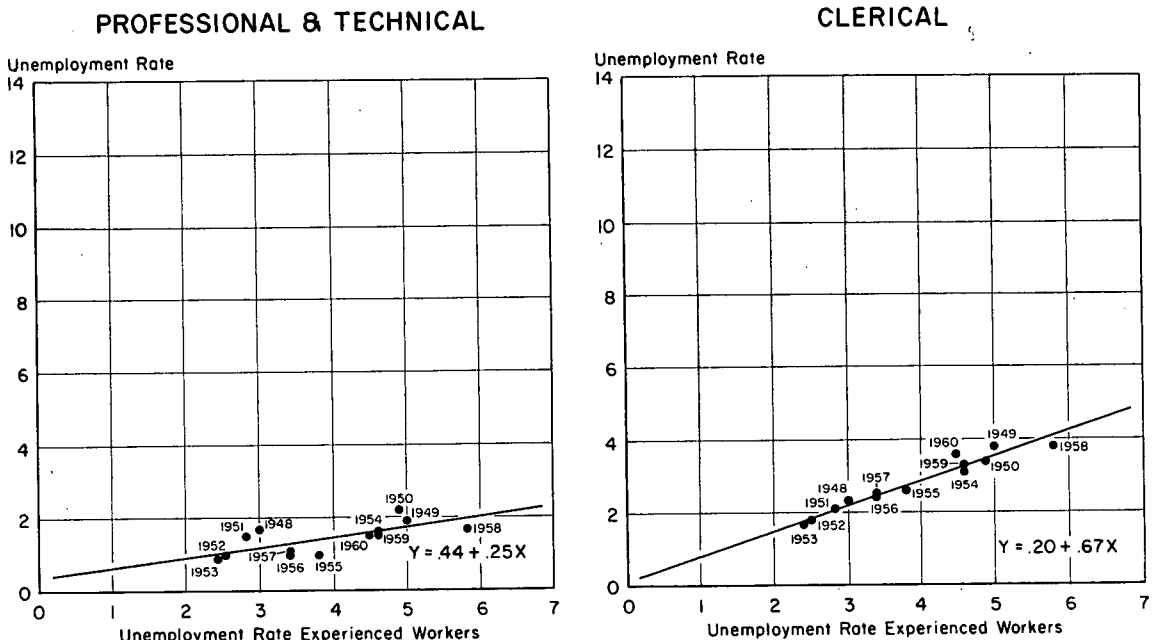
Note: Solid line is fitted by least squares to annual average of monthly observations for January, April, July and October.

NOTE.—The service worker category excludes those engaged in private household work.

Source: U.S. Department of Labor. Data have been adjusted for comparability by the staff of the Joint Economic Committee.

CHART 10

UNEMPLOYMENT RATES, By Occupation 1948–1960

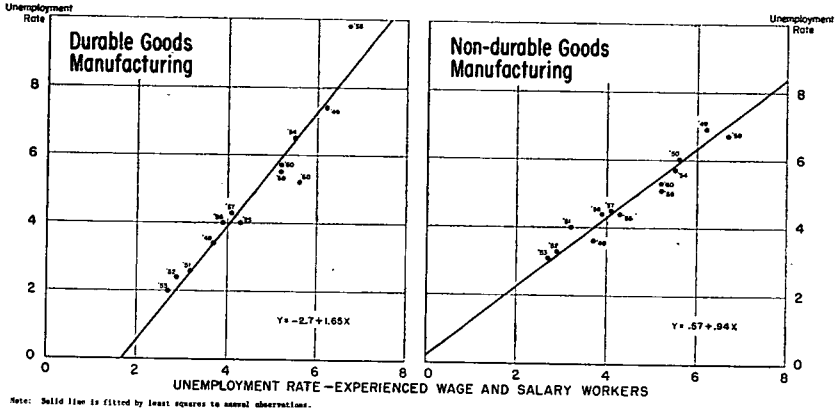


Note: Solid line is fitted by least squares to annual average of monthly observations for January, April, July, and October.

Source: U.S. Department of Labor. Data have been adjusted for comparability by the staff of the Joint Economic Committee.

CHART 11

UNEMPLOYMENT RATES, By Industry, 1948-1960

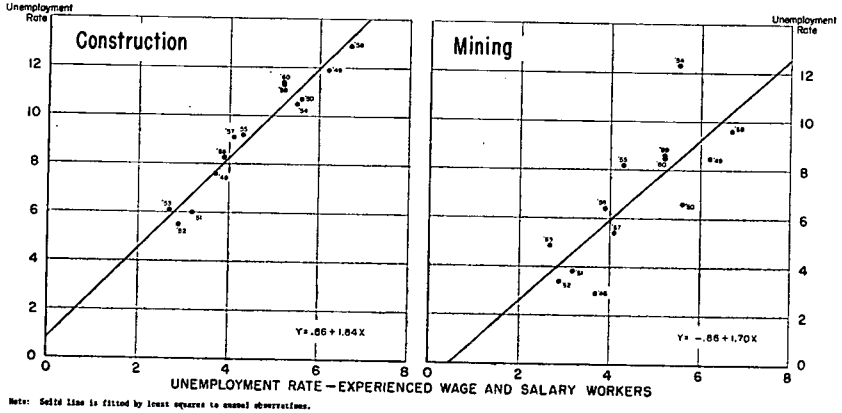


Note: Solid line is fitted by least squares to annual observations.

Source: U. S. Department of Labor. Data have been adjusted for comparability by the staff of the Joint Economic Committee.

CHART 12

UNEMPLOYMENT RATES, By Industry, 1948-1960

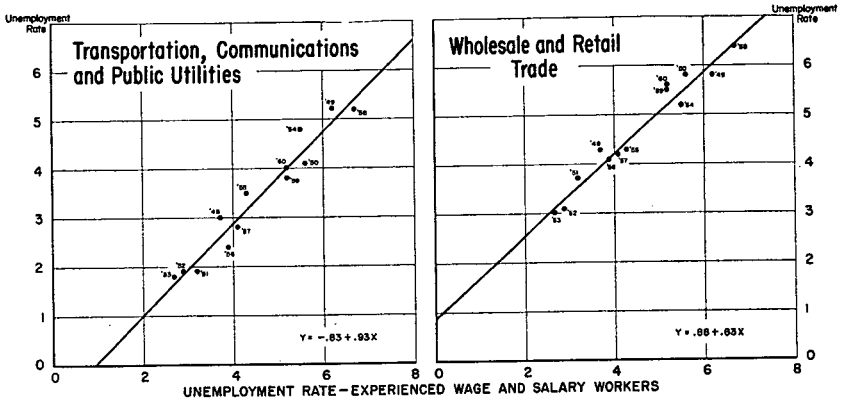


Note: Solid line is fitted by least squares to annual observations.

Source: U. S. Department of Labor. Data have been adjusted for comparability by the staff of the Joint Economic Committee.

CHART 13

UNEMPLOYMENT RATES, By Industry, 1948-1960

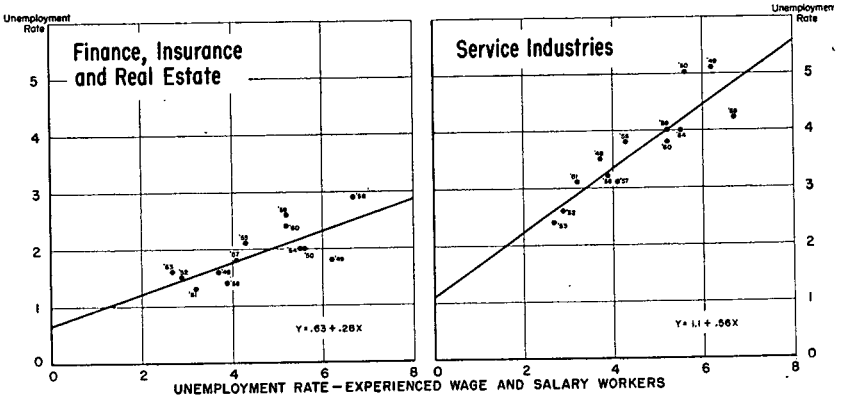


Note: Solid line is fitted by least squares to annual observations.

Source: U. S. Department of Labor. Data here been adjusted for comparability by the staff of the Joint Economic Committee.

CHART 14

UNEMPLOYMENT RATES, By Industry, 1948-1960



Note: Solid line is fitted by least squares to annual observations.

Source: U. S. Department of Labor. Data here been adjusted for comparability by the staff of the Joint Economic Committee.

Railroads and mining, two industries in which employment has been declining throughout the postwar period, merit special attention. The household survey does not provide a separate published series on unemployment among railroad workers. They are subsumed in the transportation, communications, and public utilities group. Annual observations for this group lie on or below the regression line for all years since 1957. Mining is the only industry, for which data are available, in which employment declines, independent of general economic conditions, appear to have resulted in an appreciable residue of unemployment. Employment declines caused a sharp upward shift in the unemployment rate, beginning during the Korean war period. High unemployment rates have prevailed since then. However, mining accounted for only 2 percent of total experienced unemployment in 1960.

An increase in the unemployment rate among workers in specific occupations and industries relative to the experienced worker unemployment rate may have occurred gradually and cumulatively over time, rather than being an abrupt post-1957 development. This hypothesis can be tested by an inspection of the scatter diagrams, or more formally by regressing the unemployment rate in each occupation and industry against the experienced worker unemployment rate and time. The partial correlation coefficient for time will be positive and statistically significant in those occupations and industries where the unemployment rate has shown a continuing upward trend relative to all other activities. It will be negative in those occupations and industries where unemployment experience has shown a tendency toward continuing improvement relative to the rest of the economy.

As can be seen in tables 23 and 24, statistically significant positive coefficients are found only in construction, finance, and among farm wage and salary workers; significant negative coefficients only in service industries and among professional, managerial, and sales workers. None of the time trends among workers attached to nonfarm blue-collar occupations or to manufacturing industries are statistically significant.

TABLE 23.—*Correlation of unemployment rates by occupation, with the experienced worker unemployment rate and time*

Major occupation group	Simple correlation		Partial correlation		Multiple correlation
	Experienced worker unemployment rate	Time	Experienced worker unemployment rate	Time	
Professional, technical, and kindred workers	[1] 0.67	−0.33	[2] 0.87	[2] −0.77	[2] 0.88
Farmers and farm managers	.52	.37	.46	.25	.56
Managers, officials, and proprietors, except farm	[2] .87	−.05	[2] .94	[1] −.70	[2] .94
Clerical and kindred workers	[2] .97	.29	[2] .97	−.03	[2] .97
Sales workers	[2] .73	−.15	[2] .82	[1] −.57	[2] .83
Craftsmen, foremen, and kindred workers	[2] .99	.23	[2] .99	−.48	[2] .99
Operatives and kindred workers	[2] .97	.40	[2] .98	.44	[2] .98
Private household workers	[2] .87	.06	[2] .89	−.43	[2] .89
Service workers, except private household	[2] .94	.22	[2] .94	−.22	[2] .94
Farm laborers and foremen	[2] .93	.52	[2] .95	[1] .70	[2] .97
Laborers, except farm and mine	[2] .98	.36	[2] .97	.29	[2] .98

[1] Significant on the 95-percent level.
[2] Significant on the 99-percent level.

Source: Computed by the staff of the Joint Economic Committee on the basis of data from the U.S. Department of Labor, Bureau of Labor Statistics.

TABLE 24.—*Correlation of unemployment rates by industry, with experienced wage and salary worker unemployment rate and time*

Industry	Simple correlation		Partial correlation		Multiple correlation with experienced wage and salary worker unemployment rate and time
	Experienced wage and salary worker unemployment rate	Time	Experienced wage and salary worker unemployment rate	Time	
Agriculture	[2] 0.88	0.55	[2] 0.92	[2] 0.74	[2] 0.95
Mining	[2] .78	.47	[2] .78	.46	[2] .84
Construction	[2] .97	.41	[2] .98	[2] .72	[2] .99
Durable goods manufacturing	[2] .96	.32	[2] .96	.31	[2] .96
Nondurable goods manufacturing	[2] .97	.16	[2] .98	−.38	[2] .98
Transportation, communications, and public utilities	[2] .97	.15	[2] .97	−.37	[2] .98
Trade	[2] .98	.26	[2] .98	.11	[2] .98
Finance	[2] .75	.63	[2] .80	[1] .70	[2] .88
Services	[2] .88	−.11	[2] .95	[2] −.73	[2] .95
Public administration	[2] .91	.01	[2] .94	−.56	[2] .94

[1] Significant on the 95-percent level.
[2] Significant on the 99-percent level.

Source: Computed by the staff of the Joint Economic Committee on the basis of data from the U.S. Department of Labor, Bureau of Labor Statistics.

INDUSTRIAL AND OCCUPATIONAL MOBILITY

Do unemployed workers remain firmly attached to the industry or occupation of their last job, or do they move with relative freedom across industrial and occupational categories in a hunt for alternative employment? The absence of any unusually heavy concentration of unemployment among workers in blue-collar occupations and goods-producing industries provides prima facie evidence that the size of the labor force in any occupation or industry will decline if employment opportunities contract. The degree of mobility is, of course, circumscribed by the availability of job opportunities in other occupations and industries.

Differential changes in employment and unemployment during recessions indicate that there is a moderate amount of interoccupational mobility and an exceptional amount of interindustry mobility even during periods when most displaced workers expect to be eventually recalled and when the demands for labor are generally weak.

Declines in employment are usually concentrated in the blue-collar occupations, and in three industries—manufacturing, mining, and transportation. As can be seen in table 25, blue collar employment showed an average decline of 1¼ million during the 1949 and 1958 recessions. Unemployment rose by only 1 million. In 1954, the rise in unemployment did exceed the decline in employment, possibly because of reductions in the size of the Armed Forces. All other occupations, taken together, showed an average rise of approximately 250,000 in employment and of 440,000 in unemployment during the 3 recessions.

TABLE 25.—*Changes in employment and unemployment by occupation during 3 recessions*

[In thousands]

Occupation	1948–49		1953–54		1957–58	
	Employment	Unemployment	Employment	Unemployment	Employment	Unemployment
Operatives and kindred workers	−616	491	−494	593	−1,055	572
Craftsmen, foremen, and kindred workers	−494	238	−277	197	−174	275
Laborers, except farm and mine	−108	205	−53	196	−8	240
Subtotal	−1,268	934	−774	986	−1,217	1,087
Clerical and kindred workers		120	177	125	−26	132
Sales workers	96	7	155	68	−21	55
Private household workers	3	39	−90	45	113	42
Service workers, except private household	223	77	−104	84	39	162
Farmers and farm managers	35	3	11	6	−203	13
Farm laborers and foremen	−97	49	113	48	−201	57
Professional, technical, and kindred workers	51	8	140	42	426	49
Managers, officials, and proprietors, except farm	89	30	−195	17	25	58
Subtotal	400	333	207	435	152	568
Total	−868	1,267	−567	1,421	−1,065	1,655

NOTE.—Data are averages for January, April, July, and October.

Source: U.S. Department of Labor, Bureau of Labor Statistics.

TABLE 26.—*Changes in employment and unemployment of experienced wage and salary workers during 3 recessions*

[In thousands]

Changes in—	Manufacturing, mining, transportation, communication, public utilities	Construction	Trade, services, finance, Government
1948–49			
Employment:			
Establishment payroll report	−1,393	−4	284
Household survey	−1,434	−32	682
Unemployment	704	149	772
1953–54			
Employment:			
Establishment payroll report	−1,516	−11	317
Household survey	−1,000	−254	236
Unemployment	831	161	437
1957–58			
Employment:			
Establishment payroll report	−1,571	−145	235
Household survey	−1,493	55	694
Unemployment	845	176	344

Source: U.S. Department of Labor, Bureau of Labor Statistics.

Employment in manufacturing, mining, and transportation showed an average decline of 1.5 million during the three recession periods, according to establishment payroll estimates. Unemployment among workers attached to these industries rose on the average by only 800,000, as can be seen in table 26. Employment in all other industries rose by 225,000 and unemployment by 680,000. Various factors account for these discrepant changes in employment and unemployment in major industry groups. Some workers losing jobs in manufacturing, mining, and transportation may not appear in the unemployment totals, because they have a secondary job in some other industry. Others may simply leave the labor force. Neither of these factors can be very important since most of these workers are adult men who have little recourse but to remain in the labor force, and since only 4 percent of the workers in manufacturing are multiple jobholders.[5] Many laid-off workers obviously must seek employment in other industries or become temporarily self-employed. The fact that household survey estimates of employment changes during recession years are so much more sanguine than establishment payroll estimates suggests that many laid-off workers find jobs in activities not covered by the payroll sample.

All of the displaced workers who cross industry lines do not seek permanent employment in other activities. As long as there is expectation of eventual recall, workers laid off from manufacturing or related activities may hunt only for temporary jobs in other industries. If such workers experience a second spell of unemployment, after a pre-Christmas job with the post office or a job on a highway construction crew, they will be classified as unemployed workers attached to the public administration or construction industries.

Evidence of a more direct sort is available on the mobility of industrial workers. There have been a number of studies of interindustry mobility based on work experience records, and on sampling the same group of workers at different moments of time. These studies indicate rather conclusively that industry classifications offer no substantial barrier to the movement of workers. Some workers are highly immobile under any circumstances, but they seem to afford the exception, rather than the rule.

The pattern of interindustry movement during recession periods was outlined in a study of two medium-sized Massachusetts cities during the late 1930's:

> Of the 11,200 [manufacturing] workers who either were laid off or left voluntarily, about 1,500 moved to another one of the 37 [manufacturing] firms in the sample. This meant that in proportion to the total movement in and out of employment, and between jobs, only a small amount took place between the principal factories in the community. Following separation from a job in one of the 37 [manufacturing] firms, the most common employment experience for a worker was to find odd jobs in retail trade, on a farm, driving a truck, etc., rather than to get work in another factory in this community. Factory jobs were the most sought after but when a layoff came many employees did not have another such opportunity until they were called back to their previous work.[6]

A study of labor mobility in a New England town in the 1940's concluded:

> The evidence suggests that the walls around particular industries are quite porous. Few workers remain in the same industry throughout their working lives, and some show an amazing variety of movement. * * *

[5] Jacob Schiffman, "Multiple Jobholding in December 1960," U.S. Department of Labor, Special Labor Force Report No. 18.

[6] W. Rupert MacLaurin and Charles A. Myers, "Wages and the Movement of Factory Labor," in The Quarterly Journal of Economics, February 1943, p. 245.

Industry influences are not negligible. A worker leaving a company is somewhat more likely to go to another company in the same industry; * * * If he leaves the industry, he is more likely to go to certain "neighboring" industries than to others. This tendency, however, is not very strong and seems capable of being overridden by war emergencies or other drastic shifts in the demand for labor.[7]

Information on interindustry mobility is also provided by gross change data from the household survey of the Bureau of the Census for selected months in the 1949–53 period. This information must be interpreted cautiously because of the possibility of sampling and response error. However, it also testifies to the ease with which many workers move across industry lines. Pairing the results of successive monthly enumerations of particular individuals, the following conclusions were obtained: Of the manufacturing workers unemployed in one month who found a job in the next month, one-third found jobs in some industry other than manufacturing; of the workers employed in manufacturing in a given month, 5 to 7 percent had been employed in some other industry in the preceding month; of the persons employed in manufacturing during a given month, 5 to 7 percent were employed in some other industry in the following month. The statistical findings were summarized, as follows:

Appreciable numbers of workers are, of course, virtually wholly dependent on a particular industry for their livelihood, unless they are willing to make a major occupational or geographic change. For example, locomotive engineers are almost completely dependent on the railroad industry for employment, because few locomotive engineers are hired by other industries. The other classic type of dependency exists where the worker lives in a "one-industry" town. For the locomotive engineer to leave the railroad industry normally means giving up the occupational skill which he spent many years to acquire. For almost any worker in a one-industry town to change jobs means moving his family to a different place, and perhaps learning a new trade. Prime economic motives, as well as human inertia, tend to keep such workers tied to a single industry, even though unemployed for a substantial period of time.

These are certainly significant illustrations, but are they representative of the great mass of workers or only vivid exceptions to the general rule? * * * seems to indicate quite clearly that, at least over the 1949–53 period, the industrial attachment of unemployed workers was not very firm.[8]

Interindustry and interoccupational mobility among experienced workers has been only one of the processes by which the labor force has adjusted to the shifting locus of employment opportunities. Changes in the industrial and occupational orientation of young people entering the labor market have been another powerful equilibrating factor, helping to adjust the size of the labor force in specific occupations and industries to the demand for labor. Forty-five percent of the men employed in manufacturing were under 35 years of age in 1948, as can be seen in table 27. As the postwar period progressed, and as manufacturing declined in importance as a source of job opportunities, young workers increasingly sought employment in other activities. The proportion of employed men who were under

[7] Lloyd G. Reynolds, "The Structure of Labor Markets," Harper & Bros., New York, 1951, p. 41. Conclusions are based in part on analysis of a 10-percent sample of workers covered by unemployment compensation during 1941, 1943, and 1946 who had changed jobs one or more times during the year. Data were obtained from an accession and separation file for individual covered workers maintained by the unemployment compensation system. Reynolds found that between 18 and 40 percent of the workers separated from metalworking industries and between 12 and 27 percent of those separated from transportation, communications, and public utilities found their next job in trade or services.

[8] David L. Kaplan, "Unemployment by Industry—Some Comments on its Measurement and Behavior," in The Measurement and Behavior of Unemployment, National Bureau of Economic Research, Princeton University Press, Princeton, 1957, pp. 282–284.

35 years of age dropped to 39 percent by 1957 and to 37 percent by 1959.[9] In 1951, 66 percent of males under age 25 employed in nonfarm occupations were blue-collar workers; by 1960 the proportion had dropped to 59 percent.[10]

TABLE 27.—*Age distribution of employed males by industry (percentage distribution)*

Industry by age distribution	February 1948	February 1950	February 1957	February 1958	February 1959
Manufacturing:					
14 to 19 years	5.7	4.5	3.4	3.4	3.4
20 to 24 years	12.2	11.1	8.8	8.1	8.6
25 to 34 years	27.6	26.6	26.8	25.9	24.7
35 to 44 years	22.2	23.0	26.6	26.8	26.5
45 to 54 years	17.2	18.6	19.3	20.6	21.6
55 to 64 years	11.4	12.2	12.3	12.6	12.9
65 years or over	3.8	3.9	2.9	2.6	2.3
Total	100.0	100.0	100.0	100.0	100.0
Services:					
14 to 19 years	4.7	5.3	5.2	5.0	5.5
20 to 24 years	7.6	9.6	6.4	6.8	7.4
25 to 34 years	22.9	22.9	21.5	22.2	22.8
35 to 44 years	24.1	22.5	21.7	21.1	21.3
45 to 54 years	19.4	19.9	21.1	20.9	20.5
55 to 64 years	14.0	12.4	15.8	15.5	15.1
65 years or over	7.3	7.5	8.3	8.5	7.3
Total	100.0	100.0	100.0	100.0	100.0
All employed males:					
14 to 19 years	5.8	5.5	5.3	5.2	5.4
20 to 24 years	10.2	9.9	7.3	7.3	7.6
25 to 34 years	24.3	24.2	23.7	23.1	22.9
35 to 44 years	22.5	22.9	24.1	24.1	24.2
45 to 54 years	18.6	18.7	20.3	20.8	20.8
55 to 64 years	13.3	13.1	13.9	14.1	14.1
65 years and over	5.4	5.6	5.4	5.4	4.9
Total	100.0	100.0	100.0	100.0	100.0

NOTE.—Detail will not necessarily add to totals because of rounding.

Source: U.S. Department of Labor, Bureau of Labor Statistics.

The sharp rise in the educational attainment of the work force and particularly of young persons, has facilitated industrial and occupational shifts. An increased level of formal education and rising skill requirements have been continuously interacting factors, with a growing need for more complex skills encouraging further education, and increased education fostering the upgrading in the skill levels of the labor force. Blue-collar workers may exhibit considerable mobility within the blue-collar occupations, and between them and some of the less skilled white-collar and service occupations. The growth in employment in professional and technical occupations, however, has been possible only because of the rising level of formal education. This rise has occurred along all points of the educational spectrum, with significant increases in the proportion of persons finishing grammar school, high school, and college.

The median number of school years completed by labor force members, 18–64 years old, has risen by one-third since 1940, as can be seen in table 28. The number of years completed by men has risen by

[9] The average age of the entire male labor force was rising throughout most of the postwar period, but at a much slower rate than in manufacturing. Forty percent of all employed males were under age 35 in 1948, and 36 percent in both 1957 and 1959.

[10] Carol Barry, "White-Collar Employment: Characteristics," in U.S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, February 1961, vol. 84, No. 2, p. 141.

one-half. In 1940, the median educational attainment of a male labor force member was slightly less than grammar school graduation; by 1959 it had risen to slightly less than high school graduation. Young labor force entrants, on the average, have considerably more education than their elders. In 1959, 58 percent of the men in the 25 to 34 age bracket had completed high school, as compared with 27 percent of those in the 55 to 64 age bracket.[11] Growth in the number of college trained persons has been particularly dramatic. The number of college graduates in 1957 was 80 percent greater than in 1940, with the number of persons receiving doctorates or equivalent degrees being 265 percent greater.

TABLE 28.—*Percent distribution, by years of school completed, for the labor force 18 to 64 years old, 1940–59, selected months*

Years of school completed	April 1940 [1]	October 1948	March 1957	March 1959
Total	100.0	100.0	100.0	100.0
Elementary:				
Less than 5 years	8.7	7.3	5.6	4.7
5 to 8 years	39.4	32.4	26.2	24.2
High school:				
1 to 3 years	18.1	19.7	19.8	20.2
4 years	20.3	26.5	30.5	31.7
College:				
1 to 3 years	7.0	7.4	8.8	9.4
4 years or more	6.4	6.7	9.2	9.7
Median school years completed	9.3	10.6	11.8	12.0

[1] 1940 Census of Population figures revised for comparability with current labor force estimates.

NOTE.—Excludes Alaska and Hawaii. Excludes persons for whom years of school completed was not reported.

Source: U.S. Department of Commerce, Bureau of the Census, Statistical Abstract of the United States, 1960, p. 109.

The level of educational attainment is expected to rise further. The Bureau of Labor Statistics estimates that seven-tenths of the young workers entering the labor force in the 1960's will have a high school education, or better, compared with 6 out of 10 who entered in the 1950's. At the other end of the scale, the proportion of new labor force entrants with less than a completed grammar school education is expected to drop from 18 to 9 percent.

[11] Arnold Katz, "Educational Attainment of Workers," U.S. Department of Labor, Bureau of Labor Statistics, Special Labor Force Report No. 1.

CHAPTER VI

FINDINGS: OTHER LABOR MARKET SYMPTOMS

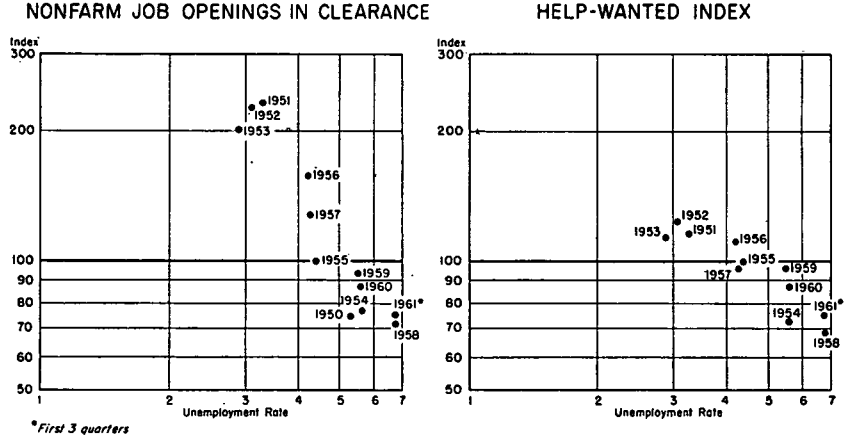
UNFILLED JOB VACANCIES

Scatter diagrams of the number of nonfarm job openings in clearance and of the help-wanted index plotted against the unemployment rate are shown in chart 15. The series on nonfarm job openings and the help-wanted index do not provide measures of the total unmet demand for labor, nor were they designed for this purpose. However, they are the only available indicators of the trend in unfilled job vacancies. The two series show different degrees of volatility, and in some instances have moved in opposite directions. Both series, however, are quite cyclically sensitive. Both were at peak values during the 1951–53 expansion, and then averaged lower in 1955–57 and still lower in 1959–60. The number of nonfarm job openings was 30 percent lower in 1959–60 than in 1955–57, while the value of the help-wanted index was 15 percent lower.

CHART 15

UNFILLED JOB VACANCIES

As a Percent of the Labor Force - Index (1955 = 100)



Source: U.S. Department of Labor and National Industrial Conference Board.

The Bureau of Employment Security commented in the following manner on the uneven but pervasive weakening in the demand for labor as indicated by the series on nonfarm job openings after 1957:

A review of trends in demand for key occupations over the past several years indicates that demand never fully recovered from the recession of 1957–58. From the high levels shown in the early months of 1957, demand for engineers and for selected metal working occupations (machinists, tool and die makers,

and machine shop and related occupations) dropped sharply, reaching a low during the early months of 1958. Recovery during the latter half of 1959 failed to attain the 1957 levels; throughout much of 1960, demand in these key occupations continued to decline.[1]

TABLE 29.—*Nonagricultural job openings in clearance, 1950–60*

Year	Total	Professional and managerial	Clerical and sales	Services	Skilled	Semi-skilled	Unskilled
1950	14,744	3,138	1,774	886	6,168	1,876	902
1951	45,653	10,163	6,046	1,922	19,119	4,320	4,082
1952	44,486	10,971	4,338	1,181	19,358	4,496	4,142
1953	39,964	9,683	3,488	1,301	14,352	5,404	5,736
1954	15,542	6,217	1,871	741	4,987	1,165	561
1955	20,520	9,415	2,814	815	5,420	1,563	493
1956	33,320	14,069	3,959	1,792	9,696	2,713	1,090
1957	27,354	11,565	3,316	1,553	7,795	2,340	785
1958	15,324	8,658	1,472	1,323	2,885	658	328
1959	20,024	10,939	1,795	1,519	4,411	1,194	163
1960	18,145	10,249	1,908	1,106	3,951	890	40

Source: U.S. Department of Labor, Bureau of Employment Security.

As can be seen in chart 15, the number of nonfarm job openings was higher in 1959 and 1960 than in 1950 or 1954. The value of the help-wanted index was also higher in 1959 and 1960 than in 1954. The unemployment rate was at virtually the same level during all of these years. This rise over time in the series on nonfarm job openings, and presumably also in the help-wanted index, is accounted for by changes in the demand for professional and managerial workers. The number of job openings available for all other workers was actually somewhat smaller in 1959 and 1960 than in 1950 or 1954. Demand for professional workers has thus shown some independence of general labor market trends. The number of job openings for professional and managerial workers increased by about 15 percent between 1951–53 and 1955–57, while the total number of job openings declined by over 35 percent, as can be seen in table 29. Demands for professional and managerial workers did decline between 1955–57 and 1959–60, but not as sharply as did demands for clerical, sales, service, and blue-collar workers. The peculiar strength of demands for professional workers in part reflects the specialized needs of the missile and space program.

As has been true over most of the past few years, workers with scientific and engineering backgrounds—particularly the latter—continued in relatively strong demand. Electrical and electronic engineers were most frequently mentioned as needed in the area reports. However, job openings for these, as well as for other engineers and professional workers, were largely—but not entirely—confined to persons with the specialized training and experience required for the development and experimental and production phases of missiles and communication and electronic data-processing equipment.[2]

HOURS

The average annual rate of increase in man-hours has been successively smaller in each of the three postwar business cycles, as can be seen in table 30. The utilization of labor input in the private economy has been growing at a slower rate since 1953 than before 1953, and

[1] U.S. Department of Labor, Bureau of Employment Security, "The Labor Market and Employment Security," April 1961, p. 16.
[2] Ibid., p. 14.

at a still slower rate since 1957. The slackening between 1953 and 1957 was due to a decline in man-hours in manufacturing industries. The further slackening between 1957 and 1960 was due primarily to a slower rate of growth in man-hours in nonmanufacturing industries.

The average length of the workweek for employed persons in both manufacturing and nonmanufacturing industries has also declined between the successive cyclical peaks in 1953, 1957, and 1960. The manufacturing workweek has shown no time trend during the postwar period. Changes in its length have been due to fluctuations in the rate of change in manufacturing output. The decline in average hours in manufacturing between 1957 and 1960 is adequately explained on this basis.[3]

The length of the workweek in private nonmanufacturing industries has shown a distinct downward trend. It declined at an annual rate of 0.5 percent in 1948–53, 0.4 percent in 1953–57, and 0.3 percent in 1957–60. This downward trend has been due to the reduction of the standard workweek to 40 hours in many industries during the earlier part of the postwar period and to the growing utilization of women in part-time jobs. Changes in the rate of growth of nonmanufacturing output do not seem to have had a significant impact on year-to-year changes in the length of the workweek.[4]

TABLE 30.—*Average annual rate of increase in man-hours during 3 postwar business cycles*

[Percent]

Period	Total civilian	Nonfarm	Private nonfarm
1948–53	0.6	1.4	1.2
1953–57	.5	1.0	.5
1957–60	.3	.7	.3

NOTE.—Columns 1 and 2 are based on annual averages of monthly household survey estimates of man-hours worked. Column 3 is based primarily on household survey data.

Source: U.S. Department of Labor, Bureau of Labor Statistics.

LABOR FORCE

The civilian labor force participation rate has been comparatively stable during the postwar period, as can be seen in table 31. The long-run trend toward greater participation among married women whose children are in school or grown has been largely offset by the trend toward lessened participation among younger and older males. Changes in the size of the civilian labor force have primarily reflected growth in the population of working age and changes in the size of the Armed Forces.

There have been only two shifts of any significance in the level of the civilian labor force participation rate during the postwar period. Both shifts apparently reflected the response of the labor force to the changing availability of job opportunities. The participation rate rose in 1955 and 1956 when women entered the labor force in greater

[3] An index of the length of the average workweek for all manufacturing employees was derived by dividing an index of manufacturing man-hours by an index of manufacturing employment. See, U.S. Department of Labor, "Output Per Man-hour in the Private Economy in 1960," Aug. 18, 1961. The percentage change in average hours was regressed against the percentage change in manufacturing real gross national product. The correlation coefficient was 0.90. The regression equation was: $Y=-0.70+0.16x$.

[4] A regression of the percentage change in nonmanufacturing hours on the percentage change in nonmanufacturing output yields a correlation coefficient of only 0.37.

than normal numbers. These new entrants found jobs, often part-time ones, in trade, services, and government—activities which were then expanding at a rapid pace. The participation rate then declined in 1957, 1958, and 1959, and was unchanged in 1960. Women continued to enter the labor market, but at a much slower pace than in 1955–56.

The slackening in labor force growth between 1956 and 1960 may be related to the increased difficulties confronting new workers in their hunt for employment. Unemployment has risen more sharply among new entrants than among experienced workers. This sharper rise is only partially explained by the faster rate of population growth experienced in recent years in the younger working ages. Unemployment among experienced workers rose by 32 percent between 1957 and 1960; among individuals with no previous work experience it rose by 54 percent. Persons with no previous work experience accounted for 8.5 percent of total unemployment in 1948, for 7.5 percent in 1953, for 10 percent in 1957, and for 11.5 percent in 1960.

TABLE 31.—*Labor force participation rates, 1948–60*

[Percent]

Year	Total labor force	Civilian labor force		
		Total	Male	Female
1948	57.8	57.3	84.2	31.9
1949	58.0	57.4	84.1	32.4
1950	58.3	57.7	84.0	33.1
1951	58.8	57.7	84.0	33.8
1952	58.7	57.4	83.6	33.8
1953	58.5	57.2	83.3	33.5
1954	58.4	57.1	82.9	33.7
1955	58.7	57.6	82.7	34.8
1956	59.3	58.3	82.9	35.9
1957	58.7	57.8	81.9	35.8
1958	58.5	57.5	81.2	36.0
1959	58.3	57.4	80.9	36.1
1960	58.3	57.4	80.4	36.6

Source: U.S. Department of Labor, Bureau of Labor Statistics.

CHAPTER VII

CONCLUSION

Relatively high levels of unemployment have persisted in the American economy since late 1957. The unemployment rate has remained over 5 percent for 4 years. Two alternative approaches—for convenience referred to as the *structural transformation* and the *aggregate demand* theories—have been advanced to explain this adverse development. The two theories were outlined in some detail in chapter II. A series of empirical tests were constructed in chapter III, involving comparisons of the 1957–60 cycle with its predecessors, on the basis of which the theories could be confirmed or refuted. The results of these empirical investigations (chs. IV through VI) can now be summarized, and the two theories evaluated in light of the facts of the post-1957 period.

SUMMARY OF FINDINGS

(1) Output per man-hour has increased during the postwar period as a whole at a rate faster than the average for the past 50 years. The postwar rates, however, are not particularly high when compared with other periods of expanding employment and mild recessions such as the 1920's. In manufacturing, the rate of advance has been slower during the postwar period than in the 1920's; while some nonmanufacturing industries have shown faster rates of advance than in the 1920's. The evidence for 1957–60 is ambiguous, but, on balance, indicates no acceleration compared to the 1948–57 period.

(2) The assertion that faster rates of increase in output per man-hour necessarily will lead to higher levels of unemployment is debatable. A faster rate of productivity increase may lead to more displacement of labor, but at the same time result in lower levels of unemployment, because of the stimulating interaction between technical progress and consumer and producer demands. Factually, over short periods of time there is no statistically significant relationship between changes in productivity and changes in man-hours. Over long periods of time, the relationship is positive.

(3) There has been no autonomous increase in the variability of employment changes in manufacturing, either since the 1920's or since 1957.

(4) Unemployed workers have been at least as geographically mobile since 1957 as earlier in the postwar period.

(5) The occupational and industrial composition of the labor force has been undergoing a continuing transformation during the 20th century. The very rapid growth in the number of professional workers and the comparatively slow rate of growth in the nonfarm blue-collar labor force were the distinguishing features of this transformation during the 1950's. Divergent trends in employment in goods-producing industries and service-rendering industries are not a new phenomenon, having also occurred, for example, during the 1920's.

If any of the above-mentioned factors had led to the higher unemployment rates experienced after mid-1957, an unusually heavy concentration of unemployment should have developed among workers attached to blue-collar occupations and goods-producing industries. This unusual concentration of unemployment should have been accompanied by some combination of higher levels of unfilled job vacancies, more rapid than usual increases in the size of the civilian labor force, and unusually long workweeks in nonmanufacturing industries. The increase in man-hours between the cyclical peaks in 1957 and 1960 should have approximated the longer run trend unless the level of unfilled job vacancies was considerably higher than in earlier years. Instead, the following was found:

(*a*) Unemployment rose among all groups of workers between 1957 and 1960, regardless of industrial or occupational attachment.

(*b*) Changes in unemployment between 1957 and 1960 duplicated the patterns which have occurred during recession periods.

(*c*) Independent investigations indicate the existence of an extraordinary amount of interindustry mobility. Many workers cross the barrier of industrial classifications with comparative ease. A sharply rising level of educational attainment has facilitated the flow of younger workers into white-collar occupations and service-rendering industries. Higher educational levels among young labor force entrants, together with mobility among experienced workers, permit the labor force in specific occupations and industries to adjust to differential changes in the demand for labor, provided sufficient job opportunities are available.

(*d*) Available evidence indicates that the number of nonfarm job openings was lower in 1959–60 than in 1955–57 in every major occupational category.

(*e*) The overall labor force participation rate declined between 1957 and 1960. The participation rate for women continued to rise but at a slower rate than in 1953–57.

(*f*) The increase in man-hours was noticeably smaller than in 1948–53 or 1953–57. The average length of the workweek in nonmanufacturing industries was shortened, but not as appreciably as in the 1948–57 period. However, average hours worked in nonmanufacturing industries appear to be influenced by institutional changes more than by fluctuations in output.

EVALUATION OF THE ALTERNATIVE THEORIES

A careful canvass of post-1957 developments produced little evidence for the structural transformation hypotheses. Those labor market symptoms which would indicate that higher unemployment has been due to structural causes are almost totally absent. In rejecting the theory as an adequate explanation of the high unemployment levels which have prevailed since late 1957, we should not ignore the social problems involved in the transference of labor between industries and occupations. Job declines in goods-producing industries and blue-collar occupations have not been a significant independent cause of higher total unemployment, but they have led to severe problems for the workers and families concerned. Workers displaced from jobs in manufacturing, mining, and railroads have lost years of accumulated seniority rights and have often found that their acquired skills are of

lesser value elsewhere. The new jobs which these workers have acquired in expanding sectors frequently have paid considerably lower wages, and have necessitated a permanent downward revision in family standards of living. In addition, workers migrating from depressed industrial areas often suffer substantial asset losses when disposing of their homes.

The evidence adverse to the structural transformation theory confirms the contentions of the aggregate demand theory. Indications of inadequate demand are present in a host of economic time series. Real gross national product increased at a considerably slower rate in 1957–60 than in 1948–57, though the growth of productive capacity did not slow, and in fact probably accelerated. The low level of nonfarm job openings and of the help-wanted index in 1959–60 testify to the inadequate availability of jobs. Unemployment rose among workers attached to every occupational and industrial group. The rise in unemployment was particularly sharp among inexperienced workers, the group subject to the fewest wage and mobility constraints. The absence of any unusual concentration of unemployment in 1957–60, studies of interindustry mobility, and the high level of geographic mobility shown by the Census survey—all of these factors indicate that if an adequate number of jobs had been available, workers would have sought them out, regardless of their geographic or industrial concentration.

The above evaluation of the two theories represents the best judgment that can be made on the basis of presently available evidence. However, the period 1957–60 does not provide an altogether ideal test of the structural transformation theory. The shifts in the occupational and industrial composition of the labor force, though clearly not of sufficient magnitude to bring about persistent, large increases in the levels of unemployment, independent of changes in aggregate demand, might have caused some small increase in labor market frictions. This heightened friction might have raised the unemployment rate, attainable at a noninflationary level of activity, by a few tenths of 1 percent, or might have prevented unemployment from being reduced to a 4-percent rate as early in the expansion as otherwise might have occurred. The expansion in economic activity during 1959–60, however, was too weak and too short-lived to provide a full test of these possibilities.

In summary, if it is agreed that a 4-percent unemployment rate was readily attainable without inflation during the period prior to 1957, then it should have been possible during 1957–60, and should be possible during the current expansion, to reduce the unemployment rate at least to 4.5 percent, and more probably to 4.0–4.2 percent, before running into structural resistance to further expansion of output and employment. The amount of labor market friction is excessive, whether or not it has intensified in recent years. However, labor market frictions appear to be subject to progressive reduction in the future by public and private policies, such as those directed toward the retraining of workers, increasing the mobility of labor and capital, and encouraging the redevelopment of labor surplus areas.

○