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The Business Cycle Today: An Introduction

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I

The National Bureau of Economic Research has been engaged in studying business cycles almost from its beginning fifty years ago. The intensive concern with the major problem of economic instability reflected the need of the times as well as the central scientific interests of several of the main contributors to the Bureau's work. Foremost among these was Wesley Mitchell, the director of research of the National Bureau in the first quarter-century of its history. Mitchell's close associates and principal coworkers, Arthur F. Burns, Solomon Fabricant, and Geoffrey H. Moore, successively guided the Bureau's progress in the two decades after his death in 1948. Basic research on the nature, causes, and indicators of pervasive fluctuations in economic activity continued to mark this phase of the Bureau's growth.

This long-standing involvement in studies relating to business cycles made the subject a fitting choice for the first in a series of six colloquia that the Bureau organized to celebrate its fiftieth anniversary. This colloquium, entitled "The Business Cycle Today," was held at the Hotel Pierre in New York City on September 24, 1970. Its program included papers by members of the Bureau's research staff: Ilse Mintz, Geoffrey H. Moore and Solomon Fabricant in the morning session; and Victor Zarnowitz and Yoel Haitovsky and Neil Wallace in the afternoon session. There were opening remarks by

John Meyer, president of the National Bureau, and invited comments on the presentations by Otto Eckstein, Harvard University; Bert G. Hickman, Stanford University; Arthur M. Okun, The Brookings Institution; and Henry C. Wallich, Yale University. Paul A. Samuelson, of the Massachusetts Institute of Technology, was chairman of the conference in the morning; and F. Thomas Juster of the National Bureau, in the afternoon; the discussion they led included audience participation. Herbert Stein, member of the President's Council of Economic Advisers, gave a luncheon address. The present volume is based on the proceedings of the two working sessions of the meeting.

II

A widely accepted conception of business cycles of historical experience includes recurrent (but nonperiodic) cumulative expansions and contractions, which are diffused over a multitude of economic processes and involve such major aggregates as national income and product. This is consonant with the well-known working definition by Burns and Mitchell.[1] In the period after World War II, fluctuations have clearly become much milder than they were during most of the recorded business history of the nineteenth and first four decades of the twentieth century. In the industrial countries of western Europe and Japan, they took predominantly the form of accelerations and decelerations in the rates of economic growth; sustained declines in aggregate economic activity occurred but sporadically. In the United States and Canada, the moderation of the cycle when compared with the prewar patterns is also apparent, although four recessions are generally recognized to have interrupted economic growth between 1948 and 1961; so, the survival of business cycles conforming to the older, "classical" concept was still not seriously questioned. As the long expansion of the U.S. economy in the 1960's persisted beyond most economists' expectations, such questioning did begin to spread, however. Indeed, the basic question "Is the Business Cycle Obsolete?" was explicitly raised by an international conference held in April 1967.[2] The answer was, in general, negative but importantly qualified by the acknowledgment that absolute declines in aggregate economic activity have become smaller and shorter; that in fact, in many countries, the cycle came to be largely limited to fluctuations in positive growth rates; and that some of

[1] A.F. Burns and W.C. Mitchell, *Measuring Business Cycles,* New York, National Bureau of Economic Research, 1946, p. 3.

[2] Martin Bronfenbrenner, ed., *Is the Business Cycle Obsolete?,* New York, Wiley-Interscience, 1969.

the fluctuations may be due mainly to lags and excesses of alternating economic policies aimed at combating inflation and unemployment.

Looking ahead, Burns in 1968 noted the possibility that a "recession" may come to mean "merely a reduced rate of growth of aggregate activity instead of an actual and sustained decline" but added that "there is as yet insufficient ground for believing that economic developments will generally conform to this model in the near future."[3] He called for continuation of basic research on business cycles and of efforts to improve forecasting and policies for economic stabilization. The contributions to this colloquium agree with the spirit of these recommendations.

As suggested by its title, the colloquium focused on the analysis of the economic fluctuations of recent times rather than on the long historical record of cyclical movements as compiled and examined in NBER studies. But the reports and discussion proceeded on the basis of that record: Understanding the new developments and their implications presupposes a tested knowledge of facts and relationships that must rely on data of the past. Furthermore, our title presumes that a "business cycle" is still going on at the present time, the thesis here being that the central process and many of its attendant phenomena are not "obsolete" but that they did and do undergo important changes. The evolution of the economic system and of its institutions and of economic policies requires that observations of a new type be made and new analytical tools developed and applied in business cycle research. This is the particular theme of Mintz and Fabricant, who believe that the time has come to attempt a revision of the National Bureau definition of business cycles; both consider alternative concepts, though they differ in some important respects on methods and terminology. Moore warns in the discussion against premature adoption of new and untested methods but does not contest the need for their thorough consideration; in fact, he too uses a new (and still different) approach in his report on the cyclical behavior of prices.

That the concepts and tools of research in business cycles must be reappraised and if need be revised by "economists of each generation" was early recognized by Mitchell.[4] Cumulative changes in the organization of the economy affect the nature of the economy's motion over time. The very

[3]Arthur F. Burns, "Business Cycles," in *International Encyclopedia of the Social Sciences,* 1968, Vo. 2, p. 244, reprinted as "The Nature and Causes of Business Cycles," in Burns, *The Business Cycle in a Changing World,* New York, NBER, 1969, pp. 50–51.

[4]See Wesley C. Mitchell, *Business Cycles.* Berkeley, University of California Press, 1913, pp. 582–583, reprinted in *Business Cycles and Their Causes,* Berkeley, University of California Press, 1941, p. 168.

attempts to reduce economic instability in the large (of which business cycles, broadly defined, are a primary manifestation) may alter the structure of the economy and thereby change the character of its cyclical fluctuations; and such effects are not necessarily limited to successful attempts only. Much has been written about the progress toward economic stability made here and abroad since the depression of the 1930's, and there is indeed abundant evidence of some real gains on this front. In the morning session of the colloquium, Paul Samuelson contrasted the business cycles of the pre-World War II era with those of the last quarter-century by comparing them with a dinosaur and a lizard, respectively. But some others doubted that the battle against cyclical instability had been so decisively won; even if the old beast is indeed extinct (a major depression is widely regarded as unlikely), the new one is still in many ways recognizable as its offspring and is, though much tamer, by no means innocent. The developments of 1969–70 can be read as a lesson that broad declines in the nation's productive activities with associated increases in unemployment are not yet a thing of the past and that our knowledge of how to achieve and maintain prosperity without inflation is far from adequate. Dealing with this latest episode in the United States experience, Fabricant concludes that the different course of today's business cycles "does not of itself compel us to stop thinking of them as members of the same species" [as the cycles 'of earlier days']. "The causes of business cycles have not vanished. . . . A tiger caged is not the same as a tiger loose in the streets, but neither is it a paper tiger. There are good reasons for not forgetting that important fact."[5]

In brief, it is the old but ever-changing problem of economic instability, conceived in evolutionary and comprehensive terms, that in one form or another engages the attention of all reports and comments in this colloquium. Forecasting economic conditions is a response to the uncertainty generated by this instability and a requirement of government and business policies. In my paper I deal with predictions of recent economic developments, their main sources, characteristics, and accuracy; I try to evaluate the performance of those who regularly forecast the course of the economy and of some econometric forecasting models. Haitovsky and Wallace report on their experiments with stochastic simulations of the effects of selected monetary and fiscal policies as carried out with three quarterly econometric models of the U.S. economy in the periods after World War II or the Korean War. Thus perhaps the main general purpose of the colloquium can be described as an

[5] Solomon Fabricant, "The 'Recession' of 1969–1970," p. 135, below. As it happens, the world of animals provided the colloquium participants with subjects for a few rather different metaphors.

attempt to approach current problems in cyclical analysis, forecasting, and policy in ways that vary and are partly new, so as to stimulate discussion and learn in the process.

III

Developments following the depression of the 1930's and World War II are now widely believed to have altered the nature of business cycles and reduced the importance of economic instability relative to other major economic and social problems of the nation. Some reflections upon this process and its sources are prompted by the present occasion.

National Bureau studies identify four recessions in the U.S. economy between 1948 and 1961, with durations varying from nine to thirteen months and averaging ten. Over the preceding period of nearly one hundred years (since 1854), twenty-two recessions are counted, which lasted twenty months on the average and more than ten months in all but three cases. There is no precedent in the past for a sequence of contractions so brief and mild as those observed in the last quarter-century (including the 1969–70 episode as it appears at the present time, in January 1971).

Moreover, business cycle expansions seem to have become longer in recent times. Their length varied from 25 to 45 months in 1949–61, averaging 36 months. If the last expansion is counted as lasting 105 months (!), from February 1961 to November 1969 (Fabricant's tentative peak date), the average increases to 49 months. The twenty-two expansions between 1854 and 1945 varied from 10 to 80 months and averaged 29 months.

Conceivably, differences of this kind could be due to differences in the intensity of external disturbances to which the economy is exposed, but it is not at all clear that such "shocks" were weaker (or stronger) in the post-World War II period than in the preceding century (allowing for the growing size of the economy). Probably the strongest shocks are caused by major wars; wartime expansions, for example, are particularly long.[6] U.S. history before 1945 includes, of course, three large-scale armed conflicts—the Civil War and World Wars I and II—but the later times were plagued by the wars in Korea and Vietnam as well as by the often high tensions of the Cold War and the associated growth and fluctuations in

[6]The 1938–45 expansion lasted 80 months; the 1861–65, 1914–18, and 1949–53 expansions, 44–46 months each. (These episodes correspond to the Civil War, World Wars I and II, and the Korean War. The very long expansion of the 1960's includes the period of the protracted conflict in Vietnam.)

defense expenditures. When the wartime cycles are excluded, recent contractions still appear shorter and more moderate, and recent expansions longer if not always more vigorous, than their historical counterparts.[7]

Nevertheless, one cannot so simply refute the hypothesis that shocks of different kinds and lesser intensities account to some extent for the observed moderation of cyclical fluctuations. The distinction between what constitutes external disturbances and their effects and what is properly attributable to the pattern in which the economy reacts to and propagates such impulses is in practice rather vague and arbitrary. Erik Lundberg illustrates this with references to the role of balance of payments changes in some countries of Western Europe and notes that the problem is "especially pertinent with regard to government policy reaction."[8]

If weaker disturbances in the years since World War II were the whole answer, one could speak of a period of greater stability but not of progress toward greater stability. The latter implies improvements in the operational characteristics of the economy or in economic institutions or policies, as a result of which the system became less vulnerable to the variety of shocks experienced in the past.

Most of the explanations of the relative shortness and mildness of recent recessions stress the stabilizing impact of structural, institutional, and policy changes. The principal factors in this development include the great increase in public revenue from personal and corporate income taxes and the introduction of the pay-as-you-go system of income tax collection; the expansion of unemployment insurance and other social security programs and transfer payments; and the rising importance of private pension plans and corporate policies of stable dividend distribution. The effect of each of these "built-in-stabilizers" is to loosen the once close link between the fluctuations in aggregate output and those in total personal income and consumer spending. The upward trend in the proportion of the labor force accounted for by the cyclically more stable sectors, notably the service industries and the "white-collar" (overhead labor) types of occupation, has similar stabilizing

[7]The average duration of "peacetime" contractions, for example, was over 21 months in the period before World War II and a little less than 10 months in the period 1948–61 (these measures exclude the contractions immediately following the Civil War, the two world wars, and the Korean War). The corresponding figures for the peacetime expansions are 25 and 32 months, respectively.

[8]See Erik Lundberg, *Instability and Economic Growth*, New Haven and London, Yale University Press, 1968, p. 95. Lundberg continues: "The actual postwar instability patterns in the various countries may be heavily influenced by policy changes, taken as exogenous factors or regarded as responses to actual or expected deviations from certain targets or norms."

implications. The insurance of mortgages, savings and loan accounts, and (most important) bank deposits are postdepression reforms that have undoubtedly strengthened confidence in the financial system and continue to prevent crises.[9]

Stabilization of the economy at high levels of activity (promotion of "maximum employment, production, and purchasing power") was declared, in the Employment Act of 1946, to be a continuing policy goal of the federal government. The postwar period saw a growing acceptance of the view that the government has both the responsibility and the ability to prevent prolonged large-scale unemployment. This position repeatedly received support from the events, beginning with the fact that, contrary to many forecasts, no major depression materialized during and after the demobilization. There was then even less surprise at the brevity and moderation of the successive business contractions. Expectations of a high and rising level of economic activity became predominant during the 1950's and 1960's, and this itself is believed to have had stabilizing effects in the sense of favoring strong consumer and business demand for goods and services.[10]

By the same token, however, it often appeared that government policies were oriented more toward checking any developing recession than toward checking any developing inflation, an observation which tended to impart an inflationary bias to the public's expectations. To the extent that such expectations induce pressures which contribute to actual inflation and impede anti-inflationary policies, they can clearly be destabilizing, and this has indeed become a recurring problem in the postwar era.

Apart from their effects *via* expectations, have the discretionary economic policies been stabilizing, that is, have they made a significant net contribution to the moderation of business cycles? Not surprisingly, the question does not have a simple, generally accepted answer. Probably many, perhaps most

[9]The foregoing summary draws upon A.F. Burns, "Progress Towards Economic Stability," *American Economic Review,* March 1960, reprinted in *The Business Cycle in a Changing World,* Chap. 3.

[10]Growth of confidence in future economic stability has been tentatively interpreted as a major cause of the shift to a rising trend in the velocity of circulation of money in the postwar period; see Milton Friedman and Anna Jacobson Schwartz, *A Monetary History of the United States, 1867–1960,* Princeton University Press for NBER, 1963, Chap. 12. Alternative explanations of this trend (seen as a decline in the demand for money relative to income) stress mainly the prevalence of upward movements in interest rates (Henry A. Latané, "Income Velocity and Interest Rates: A Pragmatic Approach," *Review of Economics and Statistics,* November 1960, pp. 445–449) and the growth of nonbank financial intermediaries whose liabilities are viewed as close substitutes for money (J.G. Gurley and E.S. Shaw, *Money in a Theory of Finance,* Washington, D.C., The Brookings Institution, 1960).

economists would affirm that monetary policy has on the whole been more successful in the postwar than in the interwar period and that several fiscal policy measures (mainly tax reductions in times of sluggish demand) have also made positive contributions. But all serious attempts to appraise the effectiveness of stabilization policies suggest a mixed record and demonstrate that it is exceedingly difficult to reach conclusive results in this area. I shall return to this subject in the next section of this essay.

IV

An important but difficult question that may now be raised concerns the contribution of economic theory and research to the observed moderation of the business cycle. The answer is bound to depend on the analysis of the causes of that moderation. For example, to the extent that weaker external disturbances are to be credited, advances in economic knowledge and its applications would seem rather immaterial. The institutional and structural changes whose importance can hardly be questioned are prima facie attributable largely to such broad historical developments as the growth of the governmental sector (which was particularly fostered by wars and defense-related programs). It appears difficult to link many of these changes directly and importantly to the progress in economics and other social sciences. Thus, records going back to the 1870's "show that even before World War I federal revenues tended to move in loose harmony with the business cycle, while expenditures ordinarily rose during contractions as well as expansions. In other words, 'built-in' fiscal stabilizers are not an invention of recent years, although their importance has gained immensely with the growth of the federal budget."[11]

To be sure, some of the changes that proved beneficial started as conscious innovations prompted by the pressure of events. Federal insurance of bank deposits and the pay-as-you-go basis for income taxation may serve as examples. Certainly these and some other institutional improvements have been informed by economic logic. But they cannot be credited to the great advances in economics that have been made since the depression experiences and the appearance of Keynes' *General Theory* in the 1930's. Among the main concerns of that time, of course, was widespread unemployment, its causes, and effective ways to combat it. The problem is to a large extent a cyclical one, associated with business contractions or slowdowns, as shown

[11] A. F. Burns, *Business Cycle Research and the Needs of Our Times,* Thirty-third Annual Report of the NBER, May 1953, reprinted in A. F. Burns, *The Frontiers of Economic Knowledge,* Princeton for NBER, 1954, p. 182. The evidence referred to comes from John M. Firestone, *Federal Receipts and Expenditures During Business Cycles, 1879–1958,* Princeton for NBER, 1960.

recurrently by the course of the Unites States economy after World War II. One would therefore expect the latter period, which witnessed an enormous increase in economists' output and presumably a substantial increase in tested economic knowledge, to result in the development and application of effective stabilization policies, particularly the discretionary monetary and fiscal policies now chiefly in use.

As already noted, however, the record of such policies is mixed. Almost any observer's scorecard would contain a sufficiently large proportion of failures to make it appear doubtful that governmental measures to stabilize the economy are about to eliminate fluctuations in aggregate business activity and bring within our reach the ideal of sustained prosperity without inflation.

In this context, some of the most serious deficiencies in our knowledge relate to the magnitude, timing, and interaction of the effects of different policies. Economic theory and research made considerable progress in identifying the signs of important policy parameters, so that in many cases the direction in which a single specific policy change would work can be fairly well predicted. But much more than a model that can provide such qualitative information is required for a successful choice and application of economic policies. It is widely recognized that discretionary policies operate with distributed lags that may be complex and variable, but dependable measurements of such lags are not yet available. There is much controversy among American economists about the relative effectiveness of monetary vs. fiscal policy, but these policies interact and are carried out simultaneously in various combinations which makes it very difficult to estimate their separate consequences. A further complication is that a policy's immediate impact may differ greatly from its longer-term effects, even qualitatively. Still another problem is presented by what appears to be at least a partial and short-term conflict between the full-employment and the stable-price-level objectives of policy. And, last but not least, considerations of domestic politics or foreign policy may sometimes inhibit governmental action required for economic stabilization or indeed motivate destabilizing action.

The outlook for our ability to maintain a satisfactory rate of growth while keeping economic fluctuations small can be evaluated more realistically and reliably when account is taken of all the problems just listed. One is then inclined to take a longer and broader view of the entire subject: just as the cumulation of economic knowledge is a gradual and laborious process, not without some setbacks and probably inevitable limitations, so are the advances in the application of that knowledge to such practical tasks as the reduction of economic fluctuations. The progress toward economic stability is itself likely to prove slower and less "linear" than we might wish it to be. Yet to expect less of the stabilization policies in the near future need not

mean to be less hopeful in the long run; and furthermore this attitude should generate more rather than less appreciation for the progress already made.

In this connection, it is important to note the discussion of postwar "policy cycles" in Western Europe. Government intervention is believed to have succeeded in limiting fluctuations in output and employment to a narrower range at higher levels, but also to have induced setbacks (interruptions of the generally strong growth trends) through the introduction of restrictive, anti-inflationary measures.[12] In the United States, some critics complained about the instability of federal spending, particularly on defense, while others stressed that the monetary policy moves were at times destabilizing, by being too late and too strong, even if in the right direction.[13] (However, even these economists would tend to agree that the postwar policies were an improvement upon the interwar policies.)

V

I think that most students of the subject would accept, though agreeing it is difficult to prove, that the development of modern macroeconomics contributed importantly to the potential of economic policy by teaching the profession about the probable directional effects of different policy measures. Such lessons are usually applied with lengthy lags, but men of affairs and the interested sections of the public showed rather more receptiveness to them than many would have expected. Beyond that, great advances in economic statistics and econometrics gave increasingly powerful analytical tools to those concerned with quantitative economic research and its applications to questions of policy. Both the quantity and quality of economic data have increased immensely in what has been termed "the statistical revolution" that in most countries started during the Second World War.[14]

[12] See Angus Maddison, "The Postwar Business Cycle in Western Europe and the Role of Government Policy," *Banca Nazionale del Lavoro Quarterly Review,* June 1960, especially pp. 114–125; and Milton Gilbert, "The Postwar Business Cycle in Western Europe," *American Economic Review, Papers and Proceedings,* May 1962, pp. 93–109. For an appraisal of these views, see Lundberg, *Instability* [fn. 8], pp. 135–140; and Lundberg, "Postwar Stabilization Policies," in Bronfenbrenner, ed., *Is the Business Cycle Obsolete?* [fn. 2], Chap. 15.

[13] See Bert G. Hickman, *Growth and Stability of the Postwar Economy,* Washington, D.C., The Brookings Institution, 1960, p. 215; and R.A. Gordon, "The Stability of the U.S. Economy," in Bronfenbrenner, ed., *Is the Business Cycle Obsolete?* p. 23. For the most comprehensive critique of discretionary monetary policies, see Friedman and Schwartz, *A Monetary History* [fn. 10]; also, Milton Friedman, "The Role of Monetary Policy," *American Economic Review,* March 1968, pp. 1–17.

[14] Lundberg, *Instability* [fn. 8], pp. 16–18.

No attempt can be made here to trace all these lines of progress, of course, but this is an appropriate occasion for recalling at least some of the more important contributions of the National Bureau. These are by no means limited to the research classified specifically (and somewhat narrowly) as "studies in business cycles." At the Bureau, and elsewhere, inquiries in various fields have resulted in new materials and knowledge that proved helpful in dealing with the problem of economic instability.

That this is so can be seen most readily in the case of the massive studies that have led to the development of systematic national income accounting and its worldwide diffusion. Thanks in a large measure to these time series data, "there now exists in all Western counties a relatively well-organized statistical universe to which our notions of development and stability refer. . . . Economic reality is a product of systematic statistical observations in a more serious sense today than it was during earlier decades."[15] The pioneering National Bureau work in this area goes back to the earliest NBER publication, by Mitchell, W. I. King, F. R. Macaulay, and O. W. Knauth,[16] but the main contributions here are those by Simon Kuznets and his associates, which appeared in the years 1937–46.[17] The great influence this research had on the development of economics since the 1930's is today generally recognized.[18]

Other basic measures developed in National Bureau studies concern business and household capital formation, consumption, and financing (Kuznets, Fabricant, Goldsmith, Lipsey, Becker, Juster and Shay); output, employment, labor force, productivity, prices, and wages (Fabricant, Kendrick, Wolman, Long, Easterlin, Mincer, Mills, Stigler, Rees, Kravis and Lipsey); money flows, interest rates, and the stock of money (Copeland, Macaulay, Durand, Braddock Hickman, Conard, Guttentag, Cagan, Friedman and Schwartz); government, business, and consumer financing (Seltzer,

[15] *Ibid.*, p. 16.

[16] Wesley C. Mitchell et al., *Income in the United States: Its Amount and Distribution, 1909–1919, I, Summary,* New York, NBER, 1921; and Mitchell, ed., *II, Detailed Report,* 1922.

[17] Simon Kuznets, *National Income and Capital Formation, 1919–1935,* New York, NBER, 1937; *National Product in Wartime,* 1945; S. Kuznets assisted by L. Epstein and E. Jenks, *National Income and Its Composition, 1919–1938,* 1941; *National Product Since 1896,* 1946.

[18] For example, Harry G. Johnson observes that Keynes' "original concept of the propensity to consume was very strongly influenced by national income accounting (in fact, the development of the Keynesian theory can be related fairly closely to the development of national income accounting)." See H.G. Johnson, *Essays in Monetary Economics,* Cambridge, Mass., Harvard University Press, 1967, p. 86.

Holland, Kahn, Saulnier, Haberler, Moore); etc.[19] Without the groundwork laid by these investigations, much of the recent economic research, particularly of a quantitative nature, would have been seriously impaired if not frustrated. This includes studies dealing with business cycle problems, some of them undertaken by the authors who developed the materials just listed (e.g., Friedman and Schwartz and Cagan[20]).

Of course, in large part the Bureau's efforts in data collection and measurement originated directly in the program of research on business cycles initiated by Wesley Mitchell. Gradually, a uniquely rich library of well over two thousand time series on almost every aspect of economic activity was built up, with full annotations, seasonal adjustments, measures of cyclical timing, amplitude, conformity, etc. These data were assembled and used in the course of many studies, including, in addition to those mentioned above, the massive investigations by Mitchell and Burns of how to define, measure, and analyze business cycles; research on cyclical movements in transportation by Hultgren, in inventories by Abramovitz and Stanback, in personal income by Creamer, in consumption by Mack, in exports by Mintz; and studies of business cycle indicators by Moore, Shiskin, Hultgren, Bry, and Zarnowitz.[21] I believe it is fair to say that the materials assembled and analyzed in all these reports add up to a large proportion of our factual knowledge of how the various economic activities and aggregates behaved during the historically observed sequence of business expansion, downturn, contraction, and upturn——that is, in each phase of the uneven but pervasive fluctuations that

[19]This recital is very incomplete, yet it is already so long that references would take up too much space here. Each of the annual reports of the National Bureau includes a full list of the NBER publications.

[20]Phillip Cagan, *Determinants and Effects of Changes in the Stock of Money, 1875–1960,* New York, NBER, 1965; Cagan, *Changes in the Cyclical Behavior of Interest Rates,* New York, NBER, 1966; Friedman and Schwartz [fn. 10].

[21]Let me add to this sentence an abbreviated list of references (all are volumes in the NBER series of Studies in Business Cycles; a more complete list of the Bureau's business cycle publications is given at the end of this book): W. C. Mitchell, *Business Cycles: The Problem and Its Setting,* 1927; A. F. Burns and W. C. Mitchell, *Measuring Business Cycles,* 1946; W. C. Mitchell, *What Happens During Business Cycles,* 1951; Thor Hultgren, *American Transportation in Prosperity and Depression,* 1948; Moses Abramovitz, *Inventories and Business Cycles,* 1950; Thomas M. Stanback, Jr., *Postwar Cycles in Manufacturers' Inventories,* 1962; Daniel Creamer assisted by Martin Bernstein, *Personal Income During Business Cycles,* 1956; Ruth P. Mack, *Consumption and Business Fluctuations,* 1956; Geoffrey H. Moore, ed., *Business Cycle Indicators,* 1961; Ilse Mintz, *Cyclical Fluctuations in the Exports of the United States Since 1879,* 1967.

marked the process of the economy's growth. To be valid, the theoretical explanations of economic growth and fluctuations must conform to the major facts disclosed by these largely empirical studies; to be useful, they will also have to incorporate the more important and durable of the findings of this research.

Those engaged in the study of economic fluctuations at the National Bureau placed their hope in the cumulation of economic knowledge: that their "quest of the lessons of experience will aid other students, as well as laymen who must wrestle practically with business cycles."[22] Their work has been primarily in the nature of basic research——on how business cycles come about, vary, and interact with structural and operational changes in the economy——because this strategy promised to contribute most in the long run to the improvement of the analysis of current business conditions, economic forecasting, and policies. There is evidence in support of this strategy in the wide use made of various tools and results of this research, e.g., the reference chronology of business cycle peaks and troughs, the identification of mild and severe contractions, systematic amplitude differences among individual economic processes, the classification of the latter by characteristic cyclical timing, etc. Serious criticism also appeared, but it centered on the methodology of the Bureau's cyclical analysis rather than on the substantive findings of this analysis.[23]

Recent literature on the behavior, determinants, and influence of such key economic variables as consumption, types of investment, prices, and money

[22]A. F. Burns, *Economic Research and the Keynesian Thinking of Our Times,* Twenty-sixth Annual Report of the NBER, June 1946, reprinted in Burns, *Frontiers* [fn. 11], p. 24. Having illustrated some problems in business cycle research that are of great importance to men concerned with economic policy ("Whether a cyclical downturn can be recognized promptly enough to permit immediate governmental intervention, whether cost-price relations are of slight consequence in the termination of a boom, whether inflationary tendencies become important only as 'full employment' is approached. . ."), Burns continues: "True, the most painstaking studies of experience will not always lead to conclusive answers; but they should at least narrow the margins of uncertainty, and thus furnish a better basis than now exists for dealing with grave issues of business cycle theory and policy."

[23]Tjalling C. Koopmans, "Measurement without Theory," *Review of Economic Statistics.* August 1947; Rutledge Vining, "Koopmans on the Choice of Variables to be Studied and of Methods of Measurements," *ibid.,* May 1949; T. C. Koopmans, "A Reply," *ibid.*; R. Vining, "A Rejoinder," *ibid.* This debate, with an "Additional Comment" by Koopmans (1957), is reprinted in R. A. Gordon and L. R. Klein, eds., *Readings in Business Cycles,* Homewood, Ill., Irwin, for the American Economic Association 1965, pp. 196–231.

shows continuing concern with a number of economic relationships explored in the National Bureau reports. For example, fixed-investment functions in most of the major aggregate econometric models employ profit variables that have long been stressed in these reports.[24] The accelerator variables appear to be working with rather long distributed lags in these functions, which is consistent with the view that they explain long-run tendencies much better than short-run behavior.[25] In the determination of inventory investment, the accelerator has a role to play and an important nexus exists involving new and unfilled orders, shipments, production, and price changes; this theme has received much attention in the work of Abramovitz, Stanback, Mack, and Zarnowitz and increasing recognition in more recent econometric studies.[26]

In the theory of consumption, formulations that are consistent with observation of both the short-term instability and the long-term stability and higher values of the proportion of income consumed have in effect superseded Keynes' simpler concept of a stable relationship between consumer expenditures and current income. The failure of early postwar

[24]Cyclical changes in actual and prospective profits have a strategic part in Mitchell's *Business Cycles* (1913). Mitchell viewed the encroachment of unit costs on prices as one of the main factors limiting the boom and, correspondingly, the improvement in the price-cost ratios and profit margins as one of the main factors limiting the contraction and stimulating the revival. Reports by Hultgren on cyclical changes in labor costs and the diffusion of profits and by Kendrick on productivity changes provide evidence that is generally favorable to this hypothesis; Edwin Kuh, "Profit, Profit Markups, and Productivity," *Employment, Growth, and Price Levels,* Study Paper 15, Joint Economic Committee, 86th Cong. lst sess., 1960, is similarly informative. For further references and a concise account of the cyclical role of profits, see G. H. Moore, *Tested Knowledge of Business Cycles,* Forty-second Annual Report of the NBER, June 1962; reprinted in Gordon and Klein, eds., *Readings,* pp. 496–502.

[25]This view is well represented in the literature on the determinants of investment in capital goods. See A.F. Burns, "Hicks and the Real Cycle," *Journal of Political Economy,* February 1952, pp. 1–24 (reprinted in Burns, *Frontiers,* pp. 236–267), where tests by Kuznets, Tinbergen, and Hultgren are cited in support of this position. (These tests, however, refer to the simple old version of the "accelerator principle," which is now in disuse; recent and current studies employ instead the "flexible" or distributed lag forms of the accelerator.) The econometric models of Tinbergen, Klein and associates, and Suits use primarily profits in their investment equations; some newer efforts such as the massive SSRC-Brookings model rely more on the modern stock adjustment (accelerator) formulations. For references, see two survey articles: Marc Nerlove, "A Tabular Survey of Macro-Econometric Models," *International Economic Review,* May 1966, pp. 127–175, and Bert G. Hickman, "Dynamic Properties of Macroeconometric Models: An International Comparison," in Bronfenbrenner, ed., *Is the Business Cycle Obsolete?* [fn. 2], Chap. 13.

[26]The Bureau reports include, in addition to the studies by Abramovitz, Stanback, and Mack listed in footnote 21 above, Victor Zarnowitz, "The Timing of Manufacturers' Orders During Business Cycles," in Moore, ed., *Business Cycle Indicators,* Chap. 14; Zarnowitz, *Unfilled Orders, Price Changes, and Business Fluctuations,* 1962 and Ruth Mack, *Information, Expectations, and Inventory Fluctuations,* 1967. The other studies

forecasts and Kuznets' data showing a rough constancy of the share of capital formation in U.S. output[27] led to doubts about the validity of Keynes' concept, at least as an explanation of the long-run savings-income relation, and to the emergence of the "relative income," "permanent income," and "lifetime income" hypotheses of Duesenberry, Friedman, and Modigliani and Brumberg and Ando.[28] In empirical work, lagged consumption or income terms and measures of assets or wealth are now commonly included in the consumption equations. The National Bureau was actively involved in these developments.[29]

In their massive work on money, Milton Friedman and Anna Schwartz have forcefully argued that changes in the supply of money act as a major causal factor in business cycles. This position, which has important implications for economic policy, is in the center of one of the most intensive controversies in the history of economic thought. Both these studies and the debate they touched off promise to advance economic knowledge substantially.[30]

include the contributions of Paul G. Darling, Michael C. Lovell, and Gary Fromm to *Inventory Fluctuations and Economic Stabilization,* Joint Economic Committee, 87th Cong. 1961–62; and M.C. Lovell, "Determinants of Inventory Investment," in *Models of Income Determination,* Studies in Income and Wealth, Vol. 28, Princeton for NBER, 1964 (see *ibid.* for further references). Also, Otto Eckstein and Gary Fromm, "The Price Equation," *American Economic Review,* December 1968, pp. 1159–1183; T.J. Courchene, "Inventory Behavior and the Stock-Order Distinction," *Canadian Journal of Economics and Political Science,* August 1967, pp. 325–357; and Courchene, "An Analysis of the Price-Inventory Nexus with Empirical Application to the Canadian Manufacturing Sector," *International Economic Review,* October 1969, pp. 315–336.

[27] S. Kuznets, *National Income: A Summary of Findings,* New York, NBER, 1946, pp. 52–54.

[28] J.S. Duesenberry, *Income, Saving, and the Theory of Consumer Behavior,* Cambridge, Mass., Harvard University Press, 1949; F. Modigliani and R.E. Brumberg, "Utility Analysis and the Consumption Function: An Interpretation of Cross-section Data," in K.K. Kurihara, ed., *Post-Keynesian Economics,* New Brunswick, N.J., Rutgers University Press, 1954; M. Friedman, *A Theory of the Consumption Function,* Princeton for NBER, 1957; A. Ando and F. Modigliani, "The 'Life Cycle' Hypothesis of Saving: Aggregate Implications and Tests," *American Economic Review,* March 1963, pp. 55–84.

[29] In addition to Friedman's *A Theory of the Consumption Function* [fn. 28], the NBER publications in this area include: Dorothy S. Brady and Rose D. Friedman, "Savings and the Income Distribution," in *Studies in Income and Wealth,* Vol. 10, 1947; Franco Modigliani, "Fluctuations in the Saving–Income Ratio: A Problem in Economic Forecasting," in *Studies in Income and Wealth,* Vol. 11, 1949; and Robert Ferber, *A Study of Aggregate Consumption Functions,* 1953. For a critical review of the pre-1952 contributions, see A.F. Burns, *The Instability of Consumer Spending,* Thirty-second Annual Report of the NBER, May 1952, reprinted in *Frontiers* [fn. 11], pp. 152–169.

[30] This is not the place to argue these issues, but some attention will be given later to related points. For references, see footnotes 10 and 20 above.

Studies of business cycle indicators, diffusion indexes, anticipations data, and short-term economic forecasting all grew out of the Bureau's basic program of cyclical research, but their results are much more directly applicable to the practical problems of decision makers in government and business. The selection of the indicators was based on studies of hundreds of economic time series and successive reviews of the results, most recently in 1965 by Moore and Shiskin;[31] since 1961, up-to-date charts, tabulations, and various analytical measures for these data are published in a monthly report by the Bureau of the Census.[32] The literature and the data on economic forecasts collected from a variety of sources indicate clearly that the materials and techniques developed in these studies have become important and widely used tools in the analysis and prediction of business conditions.[33] Here the story of the Bureau's efforts has a linkage with the broader subject of the development and present state of economic forecasting which has recently become something of a "growth industry," reflecting the growth of both the economy and the concern with economic instability.

As noted before, it is proper to take a broad view in trying to evaluate any advance in economics, for we are dealing essentially with gradual processes of increased understanding, not without occasional setbacks, rather than with a definite progress measurable directly in terms of the resulting improvements in dealing with current economic problems (e.g., of inadequate growth, instability, inequity, etc.). Thus viewed in this brief and very incomplete survey, the work of the National Bureau is believed to have resulted in many important and potentially useful contributions.

[31] G. H. Moore and J. Shiskin, *Indicators of Business Expansions and Contractions*, New York, NBER, 1967. For references to earlier lists of indicators in NBER publications by Mitchell and Burns, Moore, and Shiskin, see *ibid.*, p. 1.

[32] *Business Conditions Digest* (formerly *Business Cycle Developments*). This publication brings together a large number of economic time series found useful by business analysts and forecasters, classifying them by topic, as national income and product, cyclical indicators, anticipations and intentions, etc. It is prepared under the guidance of a committee established by the Bureau of the Budget and headed by Julius Shiskin.

[33] Thus, most forecasts of the economy's course in the near future use the framework of the national income accounts, but business cycle indicators are consulted by a large majority of the forecasters in the samples we have reviewed and are ranked along with the "GNP models" as the principal approaches actually employed. See Victor Zarnowitz, "New Plans and Results of Research in Economic Forecasting," paper presented at the annual meeting of the American Economic Association and the American Statistical Association, December 30, 1970; published in *Fifty-first Annual Report* of the NBER, 1971.

VI

Theories of business cycles deal with the effects and interaction of two sets of factors, the exogenous disturbances (e.g., variation in weather, inventions, wars, political and perhaps economic policy changes) and the endogenous components of the economic system (quantities demanded and supplied, prices, etc., usually collected in large aggregates by major categories of markets or spending). There are some hypotheses that rely primarily on the first set, attributing the cyclical movements of the economy to cycles in the external disturbances (such as weather-induced harvest cycles). More common are theories that stress the second set, trying to identify endogenous causes of instability in the economic system:

> [But virtually] all serious explanations are neither purely exogenous nor purely endogenous. . . . Even if one assumes a weather cycle, the peculiar response of the business system, which converts harvest variations into a general alternation of prosperity and depression, has still to be explained. On the other hand, a purely endogenous theory is hardly satisfactory. It is not likely that, without outside shocks, a cyclical movement would go on forever: and, even if it did go on, its course would certainly be profoundly influenced by outside shocks—that is, by changes in the data (however these may be defined and delimited by economically explained variables).[34]

Most business cycle theories, old and new, are dynamic in the sense of being designed to "explain how one situation grows out of the foregoing."[35] Dynamic models incorporate lags in response, that is, relationships among variables whose magnitudes pertain to different points of time.[36] Such models with lags can generate growth and cycles endogenously, that is, even without changes in the parameters, in the exogenous variables or in the disturbances. More generally, however, changes in these outside "data,"

[34]Gottfried Haberler, *Prosperity and Depression,* 1937; new ed., Cambridge, Mass., Harvard University Press, 1957, p. 9. It may be added, however, that Haberler suggests that methodologically "For various reasons, it seems desirable, in the explanation of the business cycle, to attach as little importance as possible to the influence of external disturbances" (*ibid.*, p. 10).

[35]Ragnar Frisch, "Propagation Problems and Impulse Problems in Dynamic Economics," *Economic Essays in Honor of Gustav Cassel,* London, 1933, reprinted in Gordon and Klein, eds., *Readings* [fn. 23], pp. 155–156.

[36]Other dynamic devices closely related to lags include uses of differences or derivatives, expressing rates of change over time, and of cumulated variables (see Carl F. Christ, "Aggregate Econometric Models," *American Economic Review,* June 1956, reprinted in Gordon and Klein, eds., *Readings* [fn. 23], p. 309).

which may be either random or systematic-autonomous, are included in the analysis, and the models are then used to show how the cyclical response system in the economy converts such changes into recurrent, pervasive fluctuations. In this view, external impulses as well as the internal propagation mechanism are required for the cyclical movements in economic activity to persist; nevertheless, some writers who accept this type of theory still interpret business cycles as "self-generating," that is, having their essential traits determined primarily by the economy's organization and *modus operandi*, not by the nature of any disturbing causes "outside" the economic system.

It is probably this broad conception of self-generating cyclical fluctuations that best describes the core of the theory accepted by Wesley Mitchell, although his comprehensive "analytic description" of business cycles includes some very different elements as well, in subsidiary roles.[37] Exogenous forces and accidental events can accelerate or retard an expansion, alleviate or aggravate a contraction. These movements, which are basically endogenous, may also sometimes run into barriers, e.g., an expansion may be halted by the upper limit on the supply of money under the gold standard. But there is no evidence that the business cycle peaks (troughs) are caused typically by a concentration of unfavorable (favorable) external disturbances. Also, the expansionary and contractionary processes, while "cumulative," are usually self-limiting due to the stresses and imbalances that they themselves create; they are rarely terminated by any identifiable barriers. Thus, the economy is definitely not viewed as fundamentally unstable in the sense of generating potentially "explosive" fluctuations which are constrained by some limiting factors.[38]

The National Bureau studies in business cycles show no commitment to any particular cyclical theory but rather deal with aspects of various theories and their empirical validity. This is probably to a large extent a reflection of the strong influence of Mitchell's work, in which business cycles are treated as a set of complex phenomena with a plurality of causes and which is itself in effect a synthesis of elements of several theories, old and new.[39] There are

[37] See Milton Friedman, "The Economic Theorist" in A.F. Burns, ed., *Wesley Clair Mitchell, The Economic Scientist,* New York, NBER, 1952, pp. 252–257.

[38] The best-known theory of such fluctuations, based on a "strong" accelerator-multiplier interaction, was advanced much later by John R. Hicks in *A Contribution to the Theory of the Trade Cycle,* London, Oxford University Press, 1950. For a critique of this theory, with particular reference to the related evidence from the business cycle studies of the National Bureau, see Burns, "Hicks and the Real Cycle" [fn. 25].

[39] See Haberler, *Prosperity* [fn. 34], p. 13.

distinctive concepts here, notably of the differential responses in the price system, the lag of selling prices behind buying prices or costs, and the effects of the consequent changes in profit margins (and the totals and diffusion of profits) on investment and business activity in general. But there are also other important components such as the lags of induced expenditures behind receipts and of investment outlays and deliveries behind investment decisions and orders, the responses of the monetary and banking system, the resulting changes in the cost and availability of credit, in expectations, etc.[40] Evidence collected and evaluated by the National Bureau indicates that these processes, despite their diversity and complexity, displayed a substantial degree of consistency over the successive cycles. This is shown by the diffusion indexes that reveal the pervasiveness and early timing of the fluctuations in the *scope* of expansions and contractions, which are hidden behind the movements of economic aggregates. It is seen, too, in the persistence of timing sequences of different activities: orders, production, shipments, inventory change; investment commitments, expenditures, and realizatons; labor market adjustments; interest rates, bond and stock prices; industrial prices, costs, and profit margins.[41]

It seems fair to say that research of this kind and scope serves directly the purpose of analyzing the complex system of processes that are involved in business cycles rather than the purpose of constructing the simplest acceptable theory that could account for the basic features of business cycles. It works toward the latter objective but indirectly, in ways resembling a "roundabout" method of production, which seeks to be more efficient at the cost of being very time-consuming. Substantial contributions to the "tested knowledge of business cycles" have thus been made, but they do not add up to an integrated theory with demonstrated capacity to explain the past and predict the future phenomena in question. To be sure, this ultimate scientific goal may seem rather elusive in the context of dealing with complex processes

[40] In his essay on Mitchell, Friedman [fn. 37] writes (p. 271): "The business-cycle theory I have constructed from Part III of Mitchell's 1913 volume contains practically every element that is significant in the business-cycle theories that are currently prominent. Here are the multiplier process, the acceleration principle, the Pigovian cycles of optimism and pessimism, the Marshallian and Hawtreyan drain of cash from the banking system and the resultant tightening of the money market, a decline in the expected yield from new investment at the peak that is the counterpart of the Keynesian 'collapse of the marginal efficiency of capital' except that it is a continuous decline rather than a discontinuous 'collapse', the Keynesian changes in liquidity preference. Here, too, is an attempt at a reasoned explanation and integration of these phenomena."

[41] See the paper by Moore [fn. 24] for a report on the pre-1962 work of the National Bureau on the diffusion indexes, timing sequences, and other aspects of business cycles. Some of the later studies in these areas are included among the references in footnotes 20, 21, 26, and 31.

of economic change which are themselves subject to subtle historical alterations as are, also, the structure and institutions of the economy and the targets and tools of economic policy.

VII

More direct attempts to formulate "the" theory of business cycles, mainly by means of speculative thinking, deductive logic, and more or less abstract models, account for a large part of the literature on the economics of cyclical change and growth. There are intellectually attractive problems in economic dynamics, and some ingenious cyclical models have been constructed. It is, however, primarily by being confronted with historical evidence that such models can contribute to our understanding of the "real" business cycles, and not all of the models are testable. When the work of testing and synthesizing is outdistanced by model construction, this tends to result in a proliferation of different (but typically overlapping) theoretical constructs, not in progress toward a unified, validated theory. The latter clearly requires that both empirical and theoretical studies be pursued so as to profit from the quasi-symbiotic interaction of selective fact and disciplined thought.[42]

The decade of the 1930's saw the beginning of three important developments: (1) the formulation and interpretation of explicit and complete mathematical models of business cycles in highly aggregative form (Frisch, Kalecki, Samuelson);[43] (2) the reformulation of macroeconomic theory (Keynes);[44] and (3) the construction of econometric models of business cycles (Tinbergen).[45] These were originally rather distinct approaches to the study of the economy and its movements, but their evolution soon came to be shaped by strong cross-influences, both between the theoretical and the econometric models and between either type of models and the post- or neo-Keynesian analysis.

[42]To quote a pertinent passage from Burns' "Nature and Causes" [fn. 3], pp. 12–13: "The investigations that economists have currently under way focus on speculative model building, econometric model building, statistical studies of fluctuations in individual processes or in the economy at large, experiments with forecasting techniques, and studies of business-cycle policy. This variety of approaches sometimes leads to methodological controversies. But no serious student of business cycles any longer questions that empirical research must be guided by an analytic framework or that speculative theorizing must be tested by an appeal to experience."

[43]M. Kalecki, "A Macroeconomic Theory of Business Cycles," *Econometrica*, 1935, pp. 327–344; Paul A. Samuelson, "Interactions Between the Multiplier Analysis and the Principle of Acceleration," *Review of Economic Statistics*, 1939, pp. 75–78, reprinted in G. Haberler, ed., *Readings in Business Cycle Theory*, Homewood, Ill., Irwin for the American Economic Association, 1944, pp. 261–269; Frisch, "Propagation Problems" [fn. 35].

The mathematical models include a dynamically stable system, in which a given disturbance sets off fluctuations of an ever smaller amplitude, that is, a *damped* movement toward a new equilibrium. Frisch's linear model is of this mixed exogenous-endogenous type; it is essentially stochastic, but the external shocks which keep alive the fluctuations of this system in spite of dampening need not be entirely or necessarily random. Frisch notes that the shocks may be autonomous and more continuous and sees one of their sources in the innovations whose role in the economic process of growth and cycles was stressed by Schumpeter.[46] Another source of such autonomous impulses, which may be of increasing importance, is the public sector of the economy whose rapid growth in recent times is a well-known matter of record.

Kalecki's 1935 theory illustrates an attempt to construct a linear endogenous model with constant amplitude of fluctuations; but this system is unrealistically constrained to the thin line between stability (dampening) and instability (antidampening or explosive behavior) and, moreover, it is stable only in the nonstochastic case: if subjected to random disturbances, its expected motion would be swings with amplitudes increasing over time.[47] Subsequent work by Kalecki[48] is "Keynesian" in stressing the combined effects of the multiplier and the investment demand function, but it introduces interesting dynamic elements, notably the lag between investment decisions and realizations; it treats economic activity as *tending* toward the level equating savings and investment. Similarly, the trade cycle theories by Harrod[49] and Kaldor[50] have a basically Keynesian orientation, but different dynamic features, Harrod stressing the acceleration principle, and Kaldor,

[44]John Maynard Keynes, *The General Theory of Employment, Interest and Money,* London, Macmillan, 1936.

[45]Jan Tinbergen, *Statistical Testing of Business-cycle Theories,* 2 vols., Geneva, League of Nations, 1939.

[46]See Frisch, "Propagation Problems" [fn. 35], section VI, "The Innovations as a Factor in Maintaining Oscillations." Also see Joseph A. Schumpeter, *The Theory of Economic Development,* Cambridge, Mass. Harvard University Press, 1934 (first published in German in 1911) and *Business Cycles: A Theoretical, Historical, and Statistical Analysis of the Capitalist Process,* 2 vols., New York, McGraw-Hill, 1939.

[47]Paul A. Samuelson, *Foundations of Economic Analysis,* Cambridge, Mass., Harvard University Press, 1947, pp. 336–337.

[48]M. Kalecki, "A Theory of the Business Cycle," *Review of Economic Studies,* February 1937, pp. 77 ff, reprinted in Kalecki, *Essays in the Theory of Economic Fluctuations,* London, G. Allen & Unwin, 1939.

[49] R.F. Harrod, *The Trade Cycle,* Oxford, Clarendon Press, 1936.

[50]N. Kaldor, "A Model of the Trade Cycle," *Economic Journal,* March 1940, pp. 78–92.

investment and saving as nonlinear functions of the levels of output and capital.

Samuelson (1939) has shown how combining the multiplier with the accelerator results in a model which can produce cycles that are either damped or constant or explosive, depending on the numerical values of the two interacting parameters. A later model by Hicks[51] specifies the values that would produce explosive fluctuations. In this system, the boom is limited by a "ceiling" due to a shortage of resources and the slump by a "floor" due to the nonnegativeness of gross induced investment. This endogenous model, furthermore, generates the cycles around an upward equilibrium trend in national output (which basically reflects the growth in autonomous investment geared, not to the demand for output, but to continuing technological changes). Another endogenous model based on a nonlinear version of the accelerator principle was presented at nearly the same time by Goodwin.[52] Earlier Metzler[53] developed an endogenous linear accelerator-multiplier theory of "minor" business cycles in which the driving force comes from investment in inventories rather than in "longer-lived" capital goods (equipment and structures).

These models, in showing how the interaction of simple relationships determining investment and consumption can generate sustained fluctuations in output without any dependence on "outside" factors, illustrate ingeniously some interesting problems in economic dynamics. They are, however, likely to be more useful for the (somewhat circular) purpose of studying certain types of cyclical theories than for the really important purpose of studying the essential elements and causes of the observed fluctuations of the economy. Their explanatory or predictive power has not been demonstrated. Indeed, they may well be hiding much more than they reveal, since they pay little or no attention to the monetary and financial factors, the formation and influence of expectations, the variation in innovations and "autonomous" investment, the cyclical changes in the cost-price-profit relations, and so on. The heavy emphasis on induced investment, with high values for the accelerator, makes these models highly unstable, a feature others found difficult to reconcile with the historical (particularly, recent) course of the economy.

[51] See *A Contribution* [fn. 38].

[52] R.M. Goodwin, "The Non-Linear Accelerator and the Persistence of Business Cycles," *Econometrica*, January 1951, pp. 1–17.

[53] Lloyd Metzler, "The Nature and Stability of Inventory Cycles," *Review of Economic Statistics*, August 1961, pp. 113–129; "Business Cycles and the Modern Theory of Employment," *American Economic Review*, June 1946, pp. 278–291.

Reactions against the limitations of the endogenous accelerator models can be found, in various explicit or implicit forms, in both theoretical and applied work. Hansen[54] argued that the major fluctuations in aggregate demand are due primarily to movements in autonomous investment generated by invention, population growth, and the exploitation of frontier areas; the multiplier-accelerator process amplifies the resulting cycles in income, but its role is secondary. In Duesenberry's comprehensive theory,[55] which employs a relatively complex and disaggregated model, business cycles are ascribed to a "combination of exogenous factors working on the system" which include variations in innovations and autonomous investment; the effects of speculative booms associated with rapidly growing industries, the stock market, or actual and expected wage-price spirals; monetary disturbances; and random changes reflecting the effects of political events or expectations, changes in exports and the foreign balance, or shifts in economic policies. In Duesenberry's view, the historically observed variety of business cycles and structural changes in the economy are such as to preclude any monistic explanation of economic growth and fluctuations. His model is stable; it explains growth by the interaction of a capital-adjustment process with autonomous investment, downturns by the operation of the exogenous factors, and the recovery by corrective forces inherent in the system.[56]

The emphasis on the plurality of causes and diversity of elements in the individual business cycles will remind the reader of Mitchell's analysis and the evidence presented in the National Bureau studies. The similarities extend to several important components of the theory, notably the role of construction costs and profits in the explanation of investment.[57] There is certainly much

[54] Alvin Hansen, *Business Cycles and National Income*, New York, W.W. Norton and Co., 1951.

[55] James S. Duesenberry, *Business Cycles and Economic Growth*, New York, McGraw-Hill, 1958.

[56] For example, Duesenberry argues that "every shock which produces a depression tends ultimately to produce conditions which are favorable to recovery. But whether a recovery actually occurs (without a long period of capital decumulation) depends on what happens during the downswing" (*ibid.*, pp. 252–253).

[57] See *ibid.*, Chap. 5 and 7. Important antecedent models featuring profits in the investment functions are found in the studies by Tinbergen, *Statistical Testing* [fn. 45]; Lawrence R. Klein, "Studies in Investment Behavior," in *Conference on Business Cycles*, New York, NBER, 1951; Lawrence R. Klein and A.S. Goldberger, *An Econometric Model of the United States, 1929–1952*, Amsterdam, North-Holland, 1955; and John R. Meyer and Edwin Kuh, *The Investment Decision*, Cambridge, Mass., Harvard University Press, 1957.

less affinity between the Bureau's approach and those endogenous models which depend principally and rather rigidly on the acceleration principle.[58]

The construction of aggregate econometric models was originally (as in the pioneering work by Tinbergen in the 1930's) strongly oriented toward business cycle research.[59] In the postwar period, work on such models intensified and broadened, and its results are now being widely used for various purposes including forecasting, tests of macroeconomic hypotheses, and simulation of the likely effects of alternative policies. The models for the U.S. economy progressed from annual to quarterly units; they vary greatly in size and complexity; but the evolution so far appears to be in the direction of ever larger systems. The models, for the United States as well as for the other countries, generally utilize the structure of national income accounts and are for the most part of Keynesian persuasion. Many have similar features. This similarity in part reflects the importance and influence in this area of the work by Lawrence R. Klein and his associates.[60]

Since the views about the nature and causes of business cycles are quite diverse, as illustrated by the preceding brief survey of the different theories and models, it is important to ask what light the econometric studies throw upon the relation of the exogenous and endogenous factors that may be involved. The question must be raised in the context of two recent developments: (1) the increasing emphasis on exogenous factors among which

[58]See Burns' critique of Hicks' trade-cycle theory [fn. 25]. It is true that self-generating cycles are the central concepts in the work of Mitchell and others at the National Bureau and that the role of exogenous factors, though by no means disregarded, is treated as secondary. But the argument seems persuasive that the main ideas in this approach (that the nature of the cycle is determined primarily by the structure and institutions of the economy and that both prediction and control of the cycle must be sought in the understanding of the "processes which run regularly within the world of business itself") would not be substantively changed even if the role of the "disturbing causes" were more explicitly involved. See Friedman, "The Economic Theorist" [fn. 37], pp. 253–254.

[59]See Tinbergen, *Statistical Testing* [fn. 45]. Also see Jan Tinbergen, "Econometric Business Cycle Research," *Review of Economic Studies,* 1940, pp. 73–90, reprinted in Haberler, ed., *Readings* [fn. 43],pp. 61–86.

[60]See L. R. Klein, *Economic Fluctuations in the United States, 1921–1941,* New York, J. Wiley and Sons, 1950; Klein and Goldberger, *An Econometric Model* [fn. 57]; L. R. Klein, "A Postwar Quarterly Model: Description and Applications," in *Models of Income Determination,* Studies in Income and Wealth, Vol. 28, Princeton for NBER, 1964; M. K. Evans and L. R. Klein, *The Wharton Econometric Forecasting Model,* Studies in Quantitative Economics No. 2, Economic Research Unit, University of Pennsylvania, Philadelphia, 1967. See the survey articles by Nerlove and B. G. Hickman [fn. 25] for references to other U.S. and foreign econometric models.

are included political and economic policy changes, and (2) the challenge to certain tenents and applications of Keynesian theory raised in writings of several monetary economists, particularly Milton Friedman. In what follows, some attention will be given to these topics.

VIII

In a study of the Klein-Goldberger econometric model of the U.S. economy, Irma Adelman and Frank Adelman concluded that nonstochastic simulations based on smooth extrapolations of the exogenous variables do not enable that model to generate cyclical movements resembling the historically observed fluctuations nor do "type I" stochastic simulations, with random shocks superimposed upon the extrapolated values of the exogenous variables. They found, however, that "type II" stochastic simulations, with random shocks introduced into each of the fitted equations, do result in cycles whose average duration, conformity, and timing characteristics agree broadly with the measures developed by the National Bureau.[61] They interpreted these results as consistent with the Frisch hypothesis that highly developed capitalistic economies react to random impulses so as to convert them into the pervasive and recurrent fluctuations described as the business cycle. Similarly, in his survey of sixteen U.S. and foreign aggregate econometric models, Bert Hickman reported that "the weight of their evidence suggests strongly that modern mixed enterprise systems are characterized by stable response mechanisms and small dynamic multipliers. If that be so, then the cycles of experience must be kept alive by exogenous stimuli."[62]

In a comprehensive investigation of econometric model simulations, a team of National Bureau researchers, aided by the active cooperation of the builders of several quarterly U.S. models, found that nonstochastic sample-period simulations produce strongly damped cyclical movements.[63] Only the first one or two recessions covered are, in some attenuated form, reproduced in such simulations; beyond that the declines in the over-all aggregates tend to disappear. In simulations extending for a hundred quarters

[61] Irma Adelman and Frank L. Adelman, "The Dynamic Properties of the Klein-Goldberger Model," *Econometrica*, October 1959, pp. 596–625, reprinted in Gordon and Klein, eds., *Readings* [fn. 23], pp. 278–306.

[62] Hickman, "Dynamic Properties" [fn. 25], p. 429.

[63] Victor Zarnowitz, Charlotte Boschan, and Geoffrey H. Moore, with the assistance of Josephine Su, "Business Cycle Analysis of Econometric Model Simulations," *Econometric Models of Cyclical Behavior*, Studies in Income and Wealth, Vol. 36, New York, NBER, forthcoming.

into the future, the projected series are in general smooth and trend-dominated, indicating that these models do not generate cyclical movement endogenously. When shocks are applied to these long *ex ante* simulations, many fluctuations do occur, but they are in large part too short to qualify as cyclical, according to comparisons with the NBER reference-cycle measurements. It is only when these stochastic simulations are expressed as deviations from the trendlike deterministic ("control") solutions for the corresponding variables and models that they reveal characteristics closer to those of the historically observed cycles. The simulations based on autocorrelated shocks are much smoother and often appear more plausible than those with serially uncorrelated shocks. A somewhat updated summary version of the Zarnowitz-Boschan-Moore study, prepared by one of the authors, is included in this volume.[64]

The models examined in these simulation studies are in general stable. If it could be assumed that they are correctly specified, these experiments would provide some support for the Wicksell-Slutsky–Frisch theory of a dynamically stable (damped) response mechanism, with fluctuations being renewed and "kept alive" by erratic shocks. The support would appear strong in the case of the Adelmans' study and some of the models examined by Hickman. It must be viewed as much more limited and qualified, however, as far as the more recent and comprehensive reports of the 1969 NBER conference at Harvard are concerned.[65] Here the evidence suggests that random disturbances alone produce only weak fluctuations, visible in deviations from trends rather than in the stochastically simulated series proper. Smoother and longer (but similarly weak) fluctuations appear when the shocks to the equations are serially correlated. The cyclical aspects of the simulations would probably be strengthened by application of autocorrelated shocks not only to the equations with endogenous equations but also to

[64] V. Zarnowitz, "Econometric Model Simulations and the Cyclical Characteristics of the U.S. Economy," paper presented at the Second World Congress of the Econometric Society, Cambridge, England, September 1970. This paper includes some simulations of the Brookings model in addition to those of the Wharton, OBE, and FRB-MIT-PENN models included in the full NBER report.

[65] These include, in addition to the NBER study cited in footnote 63: M. K. Evans, L. R. Klein, and M. Saito, "Short-Run Prediction and Long-Run Simulation of the Wharton Model"; G. R. Green, in association with M. Liebenberg and A. A. Hirsch, "Short- and Long-Term Simulations with the OBE Econometric Model," and E. P. Howrey, "Dynamic Properties of a Condensed Version of the Wharton Model," all in *Econometric Models* [fn. 63]. See also the Introduction by Bert G. Hickman in *ibid.*

exogenous variables.[66] There are reasons to expect that wars, policy actions, technological change (innovations), etc., would indeed frequently result in autocorrelated, "autonomous" shocks to the economy.

However, the econometric models in question may not be correctly specified. If so, then the autocorrelations observed in the sample residuals for many equations in these models may in the main reflect these misspecifications. Frequent caveats on this score are expressed in the work on econometric model simulations.[67]

It is not easy to document specification errors in the models; economic theory provides broad guidelines, but it does not prevent arguments among economists with different views about what the correct formulations ought to be. Large-scale, complex models, in particular, pose many detailed specification problems that theory and empirical research have not yet been able to resolve with the existing information. The best tests available here are indirect, based on the predictive value of the model.[68]

The *ex ante* forecasts with econometric models typically invoive judgmental elements: predictions of the exogenous inputs, modifications of the constant terms, and revisions of the model. After allowing for the "fine tuning," i.e., with the same adjustments of the intercepts (same guesses about the joint impact of the disturbances and model and data errors in the particular forecast period), the *ex ante* forecasts are often found superior to the *ex post* forecasts, even though the former include and the latter exclude the errors in exogenous variables. When the *ex ante* forecasts are recalculated without any constant-term adjustments, they are still frequently more accurate than the corresponding *ex post* predictions. These results come from a comprehensive study of the Wharton-EFU and OBE models by M.K. Evans, Y. Haitovsky, and G. I. Treyz.[69] In "Forecasting Economic Conditions: The Record and the Prospect," the survey of the NBER studies of economic

[66] A few such simulations were run for the OBE model by Green et al., with the result that cycle declines were increased in amplitude and duration. But the effects of shocks or fluctuations in exogenous variables were not given adequate attention in the 1969 conference studies.

[67] See Adelman and Adelman, [fn. 61], p. 301; Hickman, "Dynamic Properties" [fn. 25], pp. 428–429; and remarks by deLeeuw, Hickman, and Zarnowitz et al., in *Econometric Models* [fn. 63].

[68] See Carl F. Christ, "Econometric Models, Aggregate," *International Encyclopedia of the Social Sciences,* 1968, Vol. 4, pp. 346–347.

[69] "An Analysis of the Forecasting Properties of U.S. Econometric Models," in *Econometric Models* [fn. 63].

forecasting which is included in this volume, I interpret these findings as indicative of offsetting errors. Indeed, in the cases where the *ex post* forecast errors exceed the *ex ante* ones without adjustments, the single most plausible explanation left is that the model contains misspecifications which are more than offset by errors in the exogenous variables.[70]

IX

According to many critics, a major source of specification errors in recent econometric models is the neglect or inadequate handling of the monetary and financial factors. This view is stressed particularly by those economists who take a "monetarist" approach (as opposed to the "Keynesian" approach) to macroeconomics; the writings by Milton Friedman and his associates were most influential in the recent development of this line of thought.[71] However, some economists basically sympathetic to the so-called neo-Keynesian concepts have also urged that greater attention be given to the monetary and financial sectors in econometric models, and efforts in this direction are apparent in the latest models.[72]

Evidence assembled by Friedman and Schwartz leads them to conclude that "there is an extremely strong case for the proposition that sizable changes in the rate of change in the money stock are a necessary and sufficient condition for sizable changes in the rate of change in the money income."[73] For the minor U.S. economic fluctuations, "the case for a monetary explanation is not nearly so strong. . .," but "it is plausible to suppose that changes in the stock of money played an important independent role, though certainly the evidence for these minor movements does not rule out other interpretations." The mechanism whereby monetary changes are

[70] Zarnowitz, "New Plans and Results" [fn.33].

[71] These writings include, in addition to those cited in footnotes 10, 13, and 20, the following: M. Friedman, *The Demand for Money: Some Theoretical and Empirical Results,* New York, NBER, 1959 (reprinted from the *Journal of Political Economy,* August 1959, pp. 327–351); M. Friedman and D. Meiselman, "The Relative Stability of Monetary Velocity and the Investment Multiplier in the United States, 1897–1958," in *Stabilization Policies,* Englewood Cliffs, N.J., Prentice-Hall for the Commission on Money and Credit, 1964, pp. 165–268; M. Friedman and A. J. Schwartz, "Money and Business Cycles," *Review of Economics and Statistics; Supplement;* February 1963, pp. 32–64; M. Friedman, "A Theoretical Framework for Monetary Analysis," *Journal of Political Economy,* March-April 1970, pp. 193–238; M. Friedman and A. J. Schwartz, *Monetary Statistics of the United States: Estimates, Sources, Methods,* New York, NBER, 1970.

[72] For example, H. P. Minsky in his "Comment" on Friedman and Schwartz, "Money and Business Cycles" [fn. 71] writes: "The belief that money is important is not inconsistent with acceptance of the basic validity of the modern income-expenditure approach to business cycles. To one holding such a view, the nonexistent or primitive

transmitted in ways that can produce cyclical fluctuations in income is viewed as a series of reciprocal adjustments of stocks to flows, which involve variable but often lengthy lags. Absorption of newly injected money, for example, requires alteration of yields and prices of different assets, which creates discrepancies between the actual and desired portfolios and prompts the banks and the public to reshuffle their balance sheets in the effort to reduce such discrepancies. The first impact of an increase in the monetary growth that usually occurs early in contraction is on the financial markets (bonds, then equities), but eventually the stimulus spreads to the markets for goods and services, causing rises in investment and in payments for real resources at large. In the process, interest rates first decline and then rise, the reversal being due to the increase in spending, income, and prices. The process will tend to overshoot and involve cyclical, presumably damped, adjustments to each monetary "shock." Moreover, the shocks are likely "to take the form of an unusually high or low rate of growth of the stock of money for some time, with a reversion to a previous level . . . equivalent to two shocks . . . in opposite directions. Hence the shock itself gives rise to a cyclical movement in addition to the cyclical adjustment to each shock separately."

This hypothesis envisages a "partly self-generating cyclical mechanism," in which disturbances in the growth of money supply induce cyclical adjustments and recur frequently enough to prevent the fluctuations from dying out. The stock of money is subject to large changes that are autonomous, i.e., not directly attributable to contemporary changes in income and prices. It is recognized that changes in business activity do affect money, but this is considered a "reflex influence" or a secondary "feedback." Thus, the monetary changes are here treated as a mainly exogenous and "causal" factor in a narrow but important sense.[74]

monetary and financial system incorporated in income and expenditure models such as those of Duesenberry, Eckstein, and Fromm, of Klein, and of Suits is a defect that should be corrected" (*Review of Economics and Statistics; Supplement,* February 1963, pp. 65–66). The increased concern about the role of the monetary-financial factors and their interaction with the "real" factors can be seen in the reports on the structure and performance of the large-scale Brookings-SSRC model and especially of the more recent FRB-MIT-PENN model. See Frank deLeeuw, "A Model of Financial Behavior," in J. S. Duesenberry, G. Fromm, L. R. Klein, and E. Kuh, eds., *The Brookings Quarterly Econometric Model of the United States,* Chicago, Rand-McNally, 1965, pp. 464–530. Also see F. deLeeuw and E. Gramlich, "The Federal Reserve–M.I.T. Econometric Model," *Federal Reserve Bulletin,* January 1968, pp. 11–40, and A. Ando and F. Modigliani, "Econometric Analysis of Stabilization Policies," *American Economic Review,* May 1969, pp. 296–314.

[73]The quotations in this paragraph are from Friedman and Schwartz, "Money and Business Cycles" [fn. 71], pp. 63 and 55.

[74]*Ibid.*, pp. 48–56, 63–64 *passim.*

Formally, the model of the economy that is conveyed by these studies is dynamically stable, converting random or systematic disturbances into cyclical fluctuations in major economic variables. Substantively, it is the monetary factor——changes in the rate of growth of the money stock——that is the major source of these disturbances. In particular, this factor is regarded as basically responsible for the major economic fluctuations; the evidence for the minor ones, taken alone, would not be inconsistent with the alternative view "that the close relation between money and business reflected primarily the influence of business on money."[75] In most applications, however, especially by others who have adopted Friedman's basic position, the distinction between the major and minor fluctuations plays no operational role and monetary changes are treated generally as the main independent force determining the movements in money income that are associated (sometimes identified) with business cycles. Friedman and Schwartz have emphasized that their account is tentative and not preclusive;[76] but the other factors that "no doubt . . . play a role" attract very little of their attention and are presumed secondary. The main rival theory, namely, that "real" rather than monetary factors are critical, with investment being the main motive force in business cycles, is explicitly rejected, but the monetary hypothesis is also sharply distinguished from the earlier "credit" theories of the cycle. This conception of business cycles as essentially a monetary phenomenon (resembling the "dance of the dollar" view of Irving Fisher) is also clearly different from the much broader conception of Mitchell.[77]

X

The monetary disturbances to which a crucial role is assigned in the current "monetarist" theory of business fluctuations need not be all directly associated with changes in monetary policy. Thus changes in the division of money holdings between currency and bank deposits, which depend on the public's decisions, have often acted as an important determinant of changes in the quantity of money. This fact, established by Cagan, may signify, in keeping with the monetarist position, a feedback effect related to prior autonomous shifts in policy and subject to potential offsets by subsequent

[75] *Ibid.*, p. 55. Friedman and Schwartz identify six deep depressions or major cycles among the twenty-one reference cycles between 1867 and 1960.

[76] *Ibid.*, pp. 55 and 64.

[77] This statement is, of course, entirely consistent with the fact that Mitchell attached great importance to the role of money in the structure and cyclical movements of contemporary industrial economies in the Western world.

shifts; but it is as such a manifestation of the business-to-money chain of influence which is stressed in other interpretations.[78] Moreover, major disturbances in the economic system may and do arise from other, nonmonetary sources, and the potential of monetary policy to counterbalance such forces is limited.[79]

Nevertheless, there is a marked tendency in recent discussions of problems of inflation and recession to emphasize the power of economic policy to do both good and evil—to stabilize and disturb. According to one view, the economy is rather unstable, in need of being stimulated by fiscal policies at some times and of being restrained by fiscal and perhaps monetary policies at other times. According to the monetarist view, the economy is fundamentally stable, and major business cycle movements are primarily attributable to "inappropriate movements in the money stock"; economic instability can therefore be minimized by controlling the rate of monetary expansion.[80] These are opposite positions, yet they have one important point in common, namely, that economic policy is potent enough to be, if correct, a major force working to promote or restore economic stability; and also to be, if erroneous, a major cause of, or at least contributor to, economic instability. It all depends only on the choice of the right policies at the right time, provided that the choice is defined broadly to include self-imposed institutional rules and automatic stabilizers as well as discretionary policies.

As usual, such positions are often exaggerated and vulgarized in popular debate. Also, extreme views on the powers of stabilization policies are not new.[81] But the increasing emphasis on exogenous and particularly policy factors in the analysis of business fluctuations is so manifest in recent professional writing as to merit serious attention. Is this emphasis based on new evidence or a revival of some old beliefs? Has it increased too much or too little or just about right?

[78]See Phillip Cagan, *Determinants and Effects of Changes in the Stock of Money, 1875–1960,* New York, NBER, 1965; Allan H. Metzler, "Money Supply Revisited: A Review Article," *Journal of Political Economy,* April 1967, pp. 169–182; Richard G. Davis, "Discussion," *American Economic Review,* May 1969, pp. 316–317.

[79]See Friedman, "The Role of Monetary Policy" [fn. 13], p. 14.

[80]Leonall C. Andersen and Keith M. Carlson, "A Monetarist Model for Economic Stabilization," *Federal Reserve Bank of St. Louis Review,* April 1970, p. 8.

[81]Thus Friedman reminds us that in the 1920's "it came to be widely believed that a new era had arrived in which business cycles had been rendered obsolete by advances in monetary technology.... The Great Contraction destroyed this naive attitude. Opinion swung to the other extreme." He expresses the fear that "now as then, the pendulum may have swung too far, that, now as then, we are in danger of assigning to monetary policy a larger role than it can perform...." See his "The Role of Monetary Policy" [fn. 13], pp. 1 and 5.

The evidence from econometric models and related simulation studies tends to support the view that exogenous factors play a major role.[82] Policy changes are generally treated as exogenous in these models. In a recent monetarist model, changes in total spending depend entirely (except for the error term only) on current and past changes in two exogenous policy variables.[83] But it must again be recognized that all these models represent only different ways of combining fragments of uncertain knowledge and outright hunches; they certainly contain serious errors of commission and omission, are implemented with very imperfect data, and are valuable primarily as vehicles of a continuing search for more and firmer understanding of the economy in motion. The models differ not only with respect to the underlying theories or intuitions, i.e., in specification, but also in size and complexity, sample periods, and methods of estimation and application to forecasting. With so many sources of incomparability, which cannot be eliminated, neutralized, or fully allowed for (without removing the distinctive properties of the models), conclusive discrimination among the models is very difficult. However, predictive and dynamic simulation tests, which are probably more convincing than the others, suggest at least a few broad propositions, as follows: (1) Both monetary and fiscal policy variables have significant effects on aggregate spending; neither set should be treated as dominant at all times or as negligible, and improvements in dealing with both sets pay off in better performance of the model.[84] (2) The combined influence of both sets of policy variables is far from sufficient to account for

[82] As noted by Hickman, Introduction to *Econometric Models,* [fn. 63], "... some classes of shocks may generate cycles when acting upon the models studied in this conference. It should be emphasized, however, that broadening the class of shocks to include perturbations in exogenous variables and to allow for serial correlation in the disturbances to equations and exogenous variables, diminishes the role of model structure as a cycle maker."

[83] See Andersen and Carlson, "A Monetarist Model" [fn. 80], p. 11. Here quarterly changes in nominal GNP are related to dollar changes in money stock (demand deposits and currency outside banks) and in high-employment federal expenditures with lags of zero to four quarters.

[84] See *ibid.* and, also, L. C. Andersen and Jerry L. Jordan, "Monetary and Fiscal Actions: A Test of Their Relative Importance in Economic Stabilization," *Federal Reserve Bank of St. Louis Review,* November 1968, pp. 11–23; F. deLeeuw and J. Kalchbrenner, "Monetary and Fiscal Actions: A Test of Their Relative Importance in Economic Stabilization––Comment," *ibid.,* April 1969, pp. 6–11, and Andersen and Jordan "Reply," *ibid.,* pp. 12–16. The St. Louis model in its present version (April 1970) indicates that the fiscal effects, though weaker and more temporary than the monetary effects, are significant. See also the references to the analysis of the FRB-MIT model [fn. 72]; in this larger and more elaborate model, both monetary and fiscal policy variables have pronounced effects on GNP.

the systematic component of changes in total spending (let alone for other important elements in economic fluctuations).[85] (3) Business cycle analysis and forecasting can benefit from econometric studies of structural models of various degrees of complexity, but inadequate knowledge and data, and perhaps also problems of coordinating the work of a large group of experts, impose definite limits upon the size of potentially useful models at the present time.[86]

There are, of course, good and easily understandable reasons why changes in economic policies attract much greater and more general attention now than in times past (but not so long ago) when both the weight of the government and the extent of its intervention in the economy were much smaller. But precisely because this is so, the chances have also increased that the potency of governmental policies would often be overestimated. Policy changes soon tend to become a matter of public record, although not all receive prompt and wide publicity, whereas the changes wrought by forces within the economy are more diffuse and subtle, hence often difficult to discern. Moreover, policy changes interact with other "outside disturbances" and endogenous forces so that the task of isolating and evaluating the effects of these factors on the movement of national income and other aggregates is very arduous, even conceptually and a fortiori in empirical applications. The policy variables can be exogenous only in the sense that they do not respond to *current* movements in the endogenous variables. They certainly do respond to earlier developments in the economy as policy makers try to counteract undesirable trends due either to internal causes or external disturbances (including the influence of past policies). These corrective efforts must frequently concur with the more "autonomous" policy initiatives, and both

[85] For example, the St. Louis equation "explains" nearly two-thirds of the variance of changes in GNP with changes in money stock and high-employment federal expenditures alone. This is a rather high R^2 considering the first-difference form of the model, but contemporaneous values of the policy variables as well as short-lag values are included, and there can be little doubt that there is some bias in this single-equation approach: the influence is not entirely from money to GNP but also in the opposite direction. Other formulations designed to reduce this basic and much-debated problem have led to lower correlations (see the deLeeuw-Kalchbrenner comment [fn. 84].

[86] These limitions are stressed by several reviewers of the largest of the U.S. models, the Brookings-SSRC model, which contains several hundred equations (see E. Mosbaek in *Econometrica,* January 1968, pp. 194–196, and Z. Griliches in the *Review of Economics and Statistics,* May 1968, pp. 215–234). On the other hand, the single-equation or reduced-form models such as the St. Louis model may be used to study the influence of certain exogenous policy factors but they are much too "underdeveloped" and structurally undetermined to be helpful in business cycle research.

affect aggregate spending, income, etc., only with lags which may be substantial and variable. When these lagged effects are cumulated and attributed fully to policy changes, the influence of these changes may often be significantly overestimated.

This way of looking at economic policies has however, other implications as well, namely, that the governmental actions may at times tend to cancel each other or have net destabilizing effects.[87] One explanation of the latter centers on the difference between the immediate and the delayed consequences of a policy, as in Friedman's analysis of the monetary authority's attempts to peg either interest rates or the rate of unemployment.[88] Another explanation would have policies alternate between the immediate goals of fighting inflation and of fighting unemployment, with the efforts to contain the rise in prices leading to a business recession or slowdown and efforts to reduce unemployment leading to renewed inflationary pressures, as in some analyses based on the Phillips curve.[89] The two hypotheses are not logically inconsistent and could both be valid. There is evidence to support the view that reactions to discretionary policy shifts involve patterns of lengthy and varying lags, although measurements of the distributed lags in the effect of monetary policy vary considerably and are far from conclusive. There is also evidence to support the relationship between wage changes and unemployment as summarized by the Phillips curve, although it is plausible that in the long run no stable trade-off would exist between unemployment and *anticipated* inflation.[90]

It is clear that we know much less about the working of economic stabilization policies than we need for both an objective appraisal of the past and as a guide to such conduct of current affairs as would command wide professional agreement. It is certainly difficult, even with the benefit of hindsight, to decide such questions as whether any of the postwar U.S. recessions could have been avoided by better policies and, if so, how, and at what alternative costs. But underlying such questions is the central problem of business cycle theory to which frequent reference was made here: What are the relative roles of exogenous factors and endogenous processes in

[87]This brings us back to the "policy cycles" noted early in this paper, as an extreme case of destabilizing action.

[88]See Friedman, "The Role of Monetary Policy" [fn. 13], pp. 5–11.

[89]See M. Bronfenbrenner and F. D. Holzman, "Survey of Inflation Theory," *American Economic Review,* September 1963, particularly pp. 626–628.

[90]See Friedman, "The Role of Monetary Policy" [fn. 13]; also, E. S. Phelps, "Money-Wage Dynamics and Labor-Market Equilibrium," *Journal of Political Economy,* July-August 1968, Part II, pp. 678–711 (with extensive references to the numerous Phillips curve studies of the recent years).

determining the course of the economy? There is great need for well-designed research on this subject, the eventual results of which could contribute much to a better understanding of current policy issues.

One approach to the study of how stabilization policies work is through simulation experiments with different econometric models and "policy rules." The paper by Haitovsky and Wallace included in this volume examines stochastic and nonstochastic simulations with various combinations of discretionary and nondiscretionary monetary and fiscal policies. The policy rules incorporate different assumptions about the monetary and fiscal responses to developments in the economy. The novel feature of the study is the wide range of stochastic elements considered: Not only the additive disturbances but also the coefficients and the noninstrument exogenous variables are random. The nonstochastic simulations are found to give poor estimates of the distributions of outcomes of the corresponding stochastic simulations. (Investigators should, therefore, rely on the latter, not on the former, lest they overstate the stability of the models and misjudge the relative effects of different policies.) This is an exploratory, experimental study which attempts to move onto new ground, and its main contribution is therefore methodological. Some of its substantive results have been questioned in the discussion and may be viewed as tentative and as an invitation to further research.

XI

I have tried to survey a wide area of fact and thought rather briefly and selectively so as to provide a background for the reports that follow. The topics included the apparent moderation of business cycles in recent times—some facts on the progress toward economic stability and some reflections on its possible causes; the role of economic theory and research in this development, with particular reference to National Bureau studies and their interaction with other work; the conception of business cycles and its evolution in the literature as influenced by the historical changes in the cycle; recent growth-cycle models and the "monetarist" view of economic fluctuations in the context of that evolution; the functions and relation of exogenous and endogenous factors in theoretical and econometric models of cyclical behavior; and some relevant evidence from forecasting, simulation studies, analyses of how monetary and fiscal policies work, etc. In reviewing these matters, several references were made to the papers prepared for the present occasion.

Having thus traveled over a varied terrain, it is well to come back to the starting place for another look and an afterthought: What are the main

lessons of the colloquium reports as seen against the background provided here?[91]

1. Economic fluctuations have definitely become milder in the post-World War II period, here and in other highly developed market economies; slowdowns in the rate of growth of total spending and income have largely replaced sustained declines in these measures of aggregate economic activity. However, many features of the "classical" business cycle reappear, though perhaps in modified forms, in the recent "growth cycles." Thus downturns in the leading indicators predict either a decline (recession) or a marked retardation in economic activity, and upturns in these sensitive series predict either a recovery or a pronounced general speedup (Mintz). Comprehensive price indexes have never conformed very well to business cycles, but cyclical fluctuations in their *rates of change* how a one-to-one correspondence with the U.S. cycles of the postwar period, when both recessions and slowdowns are recognized (Moore).[92] In the 1969–70 period, too, the timing sequence and diffusion of business cycle indicators resembled well the economic changes characteristic of past recessions (Fabricant).

2. Structural changes in the economy have been given a large share of credit for the observed progress toward economic stability, but claims could also be raised here on behalf of such potential factors as increased knowledge about how to avoid destabilizing policy changes and how to offset other disturbances. However, we have yet to learn what the relative contributions of these factors are. The whole problem of the interaction of exogenous and endogenous forces, including any major historical changes in their relationship, requires much further study. Much of the material for these investigations is likely to come from simulation and forecasting tests of various econometric models of cyclical behavior. Simulation studies suggest a high degree of dynamic stability in the systems intended to represent the U.S. economy in recent years; outside disturbances play an apparently important role, but the cyclical responses to them in these models are weak. The latter feature, however, may apply much more to the models in question than to the realities of the economy. The major role of judgmental inputs into, and

[91] In what follows, the reports are occasionally referred to by the author's name given in parentheses. It should be noted that these references, along with those made earlier, are only intended as a brief guide: more complete summaries are not needed, since they are provided in the text of each essay. In particular, problems of forecasting have received little attention in this introduction because my paper, "Forecasting Economic Conditions: The Record and the Prospect," is itself in part a survey of this area of study.

[92] It is interesting to recall similar findings by Friedman and Schwartz, who showed that rates of change in money stock conformed much better and more uniformly to business cycles than did the levels ("Money and Business Cycles" [fn. 71], pp. 34–36).

the structural shortcomings of, the models obscure the validity of the evidence from the available simulation and forecasting studies (Zarnowitz). But this is not at all to argue against the usefulness of such studies, but only for the need to widen and deepen them considerably. This research needs to be extended simultaneously in three directions, to study the effects of fluctuations and disturbances in exogenous factors, learn more about the specification errors in the models, and include a greater variety of models.[93] Also greatly needed are stochastic simulation studies of the effects of specific economic policies treated as partly endogenous in the sense of being a response to certain economic developments (Haitovsky and Wallace).

3. Whatever their causes, the moderation and modification of business cycles in recent times require that the methods of cyclical analysis be altered in some respects. New tools of research are needed, particularly a more complete reference chronology which, ideally, should integrate the "classical" cycles as dated and analyzed in the Bureau's studies and the speedup-slowdown concept discussed at the colloquium of which this book is a product. The work by Ilse Mintz makes a major contribution to this end, but much further study is necessary.[94] This would probably include cyclical analyses of many rate-of-change series, similar to Moore's study that concentrated on price indexes, and could eventually result in considerable improvement of both the data and their interpretation.[95]

4. The 1969–70 developments disclose not only important similarities but also important differences when compared with earlier recessions. In particular, inflation persisted amidst a decline in production and a rise in unemployment more strongly than was ever previously recorded. This clearly has major implications for stabilization policies and also for further research, for it prompts a reconsideration of the criteria of severity of recessions.

[93]The last of these desiderata implies that particular attention should be paid to the most recent and as yet not well explored models that represent efforts to develop certain sectors or aspects of the economy which were previously rather neglected. The FRP-MIT-PENN model and the St. Louis Federal Reserve model would fall in this category. Similarly important here would be further work on the incorporation into an econometric model of major results of the NBER cyclical studies—a major task initiated by Gregory C. Chow and G. H. Moore in "An Econometric Model of Business Cycles," in *Econometric Models* [fn. 63].

[94]In this connection, some earlier work on minor or short fluctuations might prove helpful, including Ruth Mack's emphasis on "subcycles," in particular in the analysis of inventory movements and their implications.

[95]If the promise of such improvements became apparent, further work with data along these lines might be undertaken and the results included in the *Business Conditions Digest* [fn. 32].

Considerable debate on these criteria developed at the colloquium, centering upon the relative significance of real vs. pecuniary measurements of aggregate economic activity (Fabricant, Mintz, Moore). Further study is needed to help resolve this issue.

Finally, let me express the belief that the reports here presented, as well as the discussion they stimulated, will have contributed to the development of a fruitful research strategy in dealing with the phenomena that are summed up in the phrase "the business cycle today." It seems clear once more that these phenomena are still really important, despite the changes in their complexion due to the welcome advance toward greater economic stability. The pressure of other "new" socioeconomic problems does not mean that the old problem of instability no longer requires much attention. Indeed, in one sense, that pressure adds to the seriousness of this problem because it reduces society's tolerance for even mild economic declines, especially in the face of persistent inflationary developments.