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Chapter Author: Robert J. Gordon

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Introduction: Continuity and Change in Theory, Behavior, and Methodology

Robert J. Gordon

> For well over a century business cycles have run an unceasing round. They have persisted through vast economic and social changes; they have withstood countless experiments in industry, agriculture, banking, industrial relations, and public policy; they have confounded forecasters without number, belied repeated prophecies of a "new era of prosperity" and outlived repeated forebodings of "chronic depression."
>
> Arthur F. Burns (1947, 27)

> Analyzing business cycles means neither more nor less than analyzing the economic process of the capitalist era. . . . Cycles are not like tonsils, separable things that might be treated by themselves, but are, like the beat of the heart, of the essence of the organism that displays them.
>
> Joseph A. Schumpeter (1939, 5)

The postwar era has not surprised Arthur Burns, for business cycles have continued their "unceasing round." Although the United States recession of 1981–82 was the eighth since World War II and the deepest postwar slump by almost any measure, the 1983–84 recovery displayed an upward momentum sufficient to befuddle forecasters and delight incumbent politicians. Nor would a reincarnated Joseph Schumpeter be disappointed in the current status of business cycle research in the economics profession. To be sure, interest in business cycles decayed during the prosperity of the 1960s, as symbolized in the 1969 conference volume, *Is the Business Cycle Obsolete?* and in Paul Samuelson's re-

Robert J. Gordon is professor of economics at Northwestern University.

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mark the same year that the National Bureau of Economic Research "has worked itself out of one of its first jobs, namely, the business cycle."[1] But business cycles as a subject for study have enjoyed a revival for at least a decade now, stimulated in part by the severity of the 1974–75 and 1981–82 recessions and in part by the intellectual ferment surrounding the development of the "equilibrium business cycle model" and the attention paid to the seminal work of Robert E. Lucas, Jr., contained in his book *Studies in Business Cycle Theory* (1981). Indeed, there is no longer any need to lament the passing of economics courses explicitly carrying the title "Business Cycles," since the topic of business cycle behavior and analysis has so infiltrated courses carrying the title "Macroeconomics" that the two subjects have become almost interchangeable.[2] In this light it is fitting that the major research program of the NBER in this area is called "Economic Fluctuations" rather than "Macroeconomics."

During the relatively brief period in the late 1960s when economists were pondering the possible obsolescence of business cycles, the scholarly discipline of macroeconomics showed signs of becoming fragmented into speciality areas devoted to components of the then popular large-scale econometric models—for example, consumption, investment, money demand, and the Phillips curve. But more recently the revival of severe real world business cycles, together with the revolutions associated with Milton Friedman's monetarism and Lucas's classical equilibrium models, has brought about a revival of interest in economic analysis that focuses on a few broad aggregates summarizing activity in the economy as a whole—nominal and real income, the inflation rate, and the unemployment rate. There seems now to be little dispute that "Understanding Business Cycles," to use the title of a famous Lucas article, is the central preoccupation of theoretical and applied macroeconomics in the mid-1980s. We seem to be experiencing just the latest in "the cycle of interest in cycles," with troughs in the 1920s and 1960s and peaks in the 1930–40s and 1980s.

Definition of Cycles and Scope of the Volume

The best definition of business cycles is still that of Burns and Wesley Mitchell:

1. The 1969 conference volume is listed in the references as Bronfenbrenner 1969. The Samuelson quotation is from a 1969 conference remark that appears in Zarnowitz 1972, 167.

2. Michael Lovell's comment in this volume recalls a course in business cycles given at Harvard in 1955 by Otto Eckstein and Gottfried Haberler as being "one of the last of its breed."

> Business cycles are a type of fluctuation found in the aggregate activity of nations that organize their work mainly in business enterprises: a cycle consists of expansions occurring at about the same time in many economic activities, followed by similarly general recessions, contractions, and revivals which merge into the expansion phase of the next cycle; this sequence of changes is recurrent but not periodic; in duration business cycles vary from more than one year to ten or twelve years; they are not divisible into shorter cycles of similar character with amplitudes approximating their own. (Burns and Mitchell 1946, 3)

This definition encapsulates several of the basic features of business cycles that make them so intriguing an object for economists to study, and yet so elusive a phenomenon to capture in a simple economic model. First, the economy spends most of its time in recessions, recoveries, or expansions rather than in the steady-state condition of "full-employment equilibrium" favored by economic theorists. Subject to cycles lasting as long as ten years, with an average length of about four years, neither workers nor firms can realistically adopt the convenient competitive assumption that they will be able to sell all the labor or commodities they desire at the existing vector of wages and prices. That cycles are "recurrent but not periodic" makes decisions risky and creates an exposure to unemployment and bankruptcy, since workers cannot predict when a layoff may eliminate the extra income needed to pay a consumer loan or mortgage, and firms cannot predict whether the needed extra sales to support a plant expansion will be forthcoming through continued prosperity or will evaporate through the onset of another recession. Finally, the pervasive character of business cycles, "occurring at about the same time in many economic activities," means, even neglecting the fixity of labor skills and physical capital, that workers and firms cannot effortlessly shift into another occupation or industry when business in their own turns sour.

Confronted by the difficulty of developing a single theory that encompasses major features of business cycles, including their irregular timing and varying amplitudes, economists usually find it fruitful to apportion the study of cycles among smaller and more digestible units. These include research on particular components of expenditure—for example, consumption and investment—and their relation to aggregate economic activity, monetary and fiscal policy, and institutional aspects of the economy. Some studies focus only on aggregate activity—that is, real or nominal income—and relate this empirically to a small subset of the factors that might be involved in the generation of business cycles, such as changes in the growth rate of the money supply. Others limit their concern to a particular phase of the business cycle during a relatively limited period of time, such as the role of "disintermediation"

and "credit crunch" in the upper turning point of postwar cycles between 1957 and 1979.

This volume contains twelve papers by distinguished economists on substantive aspects of business cycle behavior, and a thirteenth paper by Geoffrey Moore and Victor Zarnowitz (appendix A) that presents the history and role of the NBER business cycle chronology as well as a rich assemblage of tables tracing the timing of business cycles back to the year 1700.[3] The last element of the volume is a data appendix containing a wide variety of historical time series, including a newly created set of quarterly data on components of expenditure for 1919–41 and new quarterly data series on nominal and real GNP extending back to 1875.

The substantive papers were commissioned to address separate and well-defined topics within the framework of the common theme "Has the Business Cycle Changed?" Seven of the twelve papers address specific components of economic activity—consumption, investment, inventory change, fiscal policy, monetary behavior, open-economy issues, and aspects of labor-market behavior. The remaining five focus on aggregate economic activity. Two of these, by Otto Eckstein and Allen Sinai and by Oliver Blanchard and Mark Watson, attempt to identify the "impulses" or "shocks" that give rise to business cycles. The other three, by Victor Zarnowitz and Geoffrey Moore, by John Taylor, and by J. Bradford DeLong and Lawrence Summers, take a broad view of the overall conference theme, changes in cyclical behavior. All the authors of the twelve papers were asked to investigate a longer historical horizon than the overworked post-1946 data so frequently studied by time series econometricians. As a result the coverage of every paper but two extends before World War II, and for several it extends before World War I.[4]

Several limitations of coverage and treatment were imposed to control the size and scope of the volume. The papers are exclusively concerned with the business cycle in the United States and not (excepting a few tables in the Moore/Zarnowitz chronology appendix) with other countries. Some topics receive scant coverage because no paper was commissioned to cover them, including theories of the political business cycle and theories of "real cycles" originating in productivity shocks or in the process of technological advance. No paper is purely theoretical in nature, though most use theory in the development and interpretation of the empirical investigation. Thus the volume does not

3. Solomon Fabricant has pointed out that the cycles recorded for the United Kingdom before 1800 may be mainly agricultural cycles rather than business cycles.

4. Of the two exceptions, the Eckstein/Sinai paper works with a large-scale quarterly econometric model that cannot by its nature by extended before 1947. The Blanchard/Watson paper also is limited to postwar quarterly data.

contribute a new theory of the business cycle, but rather offers a set of tests of old theories, applying a variety of modern frameworks of analysis and econometric techniques to a wide variety of United States data covering the period from 1890 to 1983.

Rather than summarizing the papers in turn, this introduction explores broader themes and their relation to results contained in the conference papers. It examines continuity and change in economic ideas about the sources of business cycles, in the behavior of the economy itself, and in the methodology and style of research on business cycles. The discussion of continuity and change in economic ideas focuses on a few central themes that are echoed in the content of several of the conference papers; it is deliberately not a full-fledged survey of business-cycle theory, that task having been admirably accomplished very recently by Victor Zarnowitz (1985). The treatment of continuity and change in economic behavior pulls together results from several conference papers and concentrates on changes in the nature of the business cycle before and after World War II. The interest in continuity and change in methodology and style is stimulated by the contrasts between this conference and a previous NBER conference on business cycles held in 1949, with proceedings published in 1951, and by the fact that several participants attended both conferences.[5]

Continuity and Change in the Analysis of Business Cycles

Development of Business Cycle Theory

The distinction between impulses and propagation mechanisms, introduced into economic analysis by Ragnar Frisch (1933) and Eugen Slutsky (1927), is accepted as a common analytical framework by the authors in this volume and can serve to classify earlier and more recent contributions to the theory of business cycles. Pre-Keynesian theories were primarily concerned with the propagation mechanism and focused on the internal dynamics of the economic system. Recurrent fluctuations were viewed as an outcome of these dynamic elements, with a strong tendency to repeat themselves even in the absence of exogenous influences, and such external impulses were viewed as of secondary importance, mainly accounting for the varying amplitudes and nonperiodic character of cycles.[6]

The endogenous processes might be primarily monetary or real. Monetary elements included R. G. Hawtrey's induced changes in the supply

5. See National Bureau of Economic Research 1951.

6. For supporting quotes and further detail, see Haberler 1958, 10, and Zarnowitz 1985.

of bank credit, Knut Wicksell's discrepancy between market and equilibrium rates of interest, and Friedrich Hayek's overinvestment financed by excessive bank credit creation. Real elements focused on particular aspects of long-lived durable goods, including the "Austrian" emphasis on "vertical maladjustments" or imbalances between the production of capital and consumer goods and J. M. Clark's early version of the acceleration principle. The studies by Mitchell (e.g., 1927) stressed the cyclical evolution of relative prices, particularly changes in unit labor costs relative to output prices, which lead to profit and investment fluctuations. Schumpeter's waves of innovation, opening up and then exhausting opportunities for profitable new investment, could be viewed as impulses from a short-run perspective or as a dynamic process from a longer-run perspective. Similarly, impulses in the form of unpredictable shifts in demand or supply schedules for particular products, Dennis Robertson's so-called horizontal maladjustments, could lead to temporary recessions if the costs of moving factors of production between industries were high.

The first mathematical theories of the business cycle excluded shocks and were based entirely on a dynamic propagation mechanism, as in Paul Samuelson's (1939) multiplier/accelerator model. Theories of this type, while a staple of classroom teaching for instructors eager to display their ability to solve difference equation systems, have long been recognized as incapable of explaining the irregular nonperiodic timing of cycles, and as generating cycles that are implausibly explosive or damped into extinction, depending on the value of an accelerator coefficient that could generate recurrent cycles only at a single knife-edge value.

The inadequacy of Samuelson's purely linear dynamic model led in two directions in the postwar development of business cycle theory. Some writers, especially John R. Hicks (1950) and Richard Goodwin (1955), attempted to salvage the theory of a self-generating no-shock business cycle by imposing capacity ceilings and capital replacement floors to limit the amplitude of an otherwise explosive Samuelson-type cycle. However, early attempts to build realistic dynamic cycle models with econometrically estimated parameters, for example, by Lawrence Klein and Arthur Goldberger (1955), soon showed that such systems were highly damped, even when private investment was allowed to be fully endogenous, and could not generate recurrent cycles in the absence of exogenous shocks.[7] This evidence naturally helped to shift the attention of economists from propagation mechanisms to the sources of impulses, and soon the profession lost interest in business cycle theory per se as it became caught up in the emerging debate regarding

7. See Adelman and Adelman 1959.

the relative role of monetary and fiscal shocks.[8] Since that time the business cycle has been viewed as resulting from irregular impulses whose effect on economic activity is transmitted by a complex dynamic propagation mechanism.

The aftermath of the early 1960s monetary/fiscal policy debates was a growing dichotomy im empirical studies of business cycle phenomena. The main thrust of research by "Keynesian" economists was to try to understand the propagation mechanism itself, the "black box" through which monetary and fiscal influences altered spending. This involved the construction of large "structural" econometric models and spawned growing subliteratures on the components of these models—consumption function, investment function, money demand function, Phillips curve, and others. Monetarist economists (an adjective coined in 1968) were less interested in probing the black box and were content to develop reduced-form single-equation models that linked fluctuations in economic activity directly to prior fluctuations in the growth of the money supply, although in fairness one must acknowledge Milton Friedman's earlier research on elements of the black box that yielded his permanent income theories of consumption expenditures and the demand for money. By the early 1970s debates between monetarists and their Keynesian critics had come to center on successive techniques for relating business cycles to monetary impulses, including the much discussed work of Anderson and Jordan (1968) and of Sims (1972, 1980).

The "oil shocks" of 1973–74 and 1979–80 reinforced the interest in external impulses as sources of business cycle fluctuations and recalled Robertson's "horizontal maladjustments." Now, however, the source of the aggregate disturbance was not the immobility of factors of production, but rather the stickiness of prices in the nonoil part of the economy that prevented the overall price level, and hence aggregate real balances and real aggregate demand, from remaining unaffected by the relative oil price shock.[9] A "macroeconomic externality" developed, with an ensuing recession and recovery transmitted through the economy's dynamic propagation mechanism. As a result of the experience of the 1970s, it is now common to extend the earlier dichotomy between monetary and real shocks to a three-way distinction between monetary shocks, real demand, and real supply shocks, with real demand impulses further subdivided among private investment and consumption shocks, fiscal disturbances (particularly in connection with

8. In the early 1960s this debate centered on the monetary history of Friedman and Schwartz 1963 and the statistical "contest" between autonomous spending and monetary impulses developed by Friedman and Meiselman 1963.

9. Analysis of the critical effects of external price shocks was developed by Gordon 1975 and Phelps 1978 and is reviewed in Gordon 1984.

tax rates and defense expenditures), and portfolio or "money demand" shifts (often induced by changes in financial regulations).

Another effect of the supply shocks of the 1970s was to shift the blame away from government as the sole source of shocks. The monetary/fiscal controversy of the 1960s had tended to locate the source of economic fluctuations in the vagaries of the Federal Reserve Board and the spending and tax decisions of successive federal administrations. But the oil shocks of the 1970s clearly seemed to be an external phenomenon that forced upon the Fed a decision whether to accommodate. In turn this led to a broader perspective on the nature at monetary shocks, which could be viewed not as truly exogenous, but at least in part as representing the passive role of the monetary authority in reacting to supply shocks and in financing deficits that arise from politicians' unwillingness or inability to finance expenditures through increases in conventional taxes. When the monetary authority reacts to changes in interest rates, inflation and/or unemployment with a stable set of response coefficients, it is said to have a stable "monetary reaction function." A shift from one set of responses to another in today's terminology is designated a "change in monetary regime" and may bring with it a change in behavior in the private sector, such as a greater reliance on escalator clauses in wage contracts if the monetary authority is believed to have shifted to a more accommodative or less inflation resistant reaction function.

At the same time that some economists were developing an analysis of "macroeconomic externalities" that depended on sticky prices in part of the economy, a completely different direction was taken by Lucas and his disciples, who developed a theory of the business cycle within the context of a central norm of continuous market clearing equilibrium that had not been taken seriously in macroeconomics since the publication of Keynes's *General Theory* four decades earlier. The underlying impulse generating the Lucas business cycle could be either a monetary or a real ("productivity") shock, and this created a response in output for the length of time that agents, with their rational expectations based on knowledge of the underlying economic model, were assumed to need to acquire information on the value of the aggregate shock. Although this approach has been given the label of "rational expectations macroeconomics," it could more accurately be called "classical equilibrium macroeconomics" or "stale information macroeconomics," since the aggregate shock could cause a business fluctuation away from the classical equilibrium solution only in the presence of an information barrier.

The Lucas approach spawned an explosion of sometimes fertile model-building exercises on particular aspects of labor, product, and financial markets, but it remained unconvincing to most of the mac-

roeconomics profession and never took hold in the policymaking community as had Keynesian economics in the 1940s and 1950s and monetarism in the late 1970s and early 1980s. Classical equilibrium macroeconomics suffered from two Achilles' heels. First was its inability to explain how an information barrier of a month or two could generate the output persistence observed in the typical four-year business cycle, much less the twelve-year Great Depression. Models that combine rational expectations with multiyear labor contracts, like those developed by John Taylor and others, maintain the attractive elements of rational expectations but yield dynamic behavior closer to traditional Keynesian models than to the pure Lucas market-clearing models. The second Achilles' heel was the internal inconsistency of stale information itself, which should, if solely responsible for the phenomenon of business cycles, have led to the development of an "information market" with newsboys on every street corner peddling instant reports on the latest aggregate monetary and inflation shocks. A possible additional reason for the lack of widespread acceptance of the market-clearing Lucas models was the deep-seated belief of many economists and policymakers that a significant fraction of unemployment in recessions is "involuntary."

The Sources of Postwar Business Cycles

Two different methodological approaches are used by the conference papers to isolate and measure impulses that contribute to business cycles. The Eckstein/Sinai paper, the first in this volume, uses as its tool of analysis the Data Resources, Incorporated (DRI), large-scale econometric model of the United States economy. This model contains five hundred equations that relate endogenous economic variables to each other and to a small set of exogenous variables, which are treated as the impulses that generate a substantial fraction of business-cycle variability. The central results of the paper consist of an attribution of the postwar variation of real GNP to specific supply and demand shocks. The oil shocks of 1973–74 and 1979–80 are the most important sources of supply disturbances. Demand shocks are primarily monetary, resulting from the tendency of the Federal Reserve Board to pursue a procyclical monetary policy that aggravated cyclical swings. A second aspect of demand impulses is the "credit crunch" or "financial factor" emphasized by the authors. This involves three elements: (1) the institutional element of deposit rate ceilings and loan rate ceilings that aggravate the impact of endogenous swings in interest rates on the demand for housing and some categories of consumer spending; (2) the propagation mechanism that produces fluctuations in interest rates and loan demand as a side effect of output cycles; and (3) increasingly risky balance sheet configurations late in the business cycle, leading to the

possibility of abrupt cutbacks in production and employment following a downturn in sales or profits. It may seem surprising that the authors attribute just one-third of the amplitude of postwar business cycles to the oil shock, monetary policy, and credit crunch phenomena combined, indicating that a substantial business cycle remains after purging the economy of these elements.

The remaining two-thirds of business cycle volatility is attributed to a combination of additional supply and demand shocks, together with the underlying propagation mechanism that generates cycles in the absence of impulses. Additional supply shocks included isolated large strikes in the steel and auto industries, as well as the Nixon-era wage and price control program that tended to stimulate the economy during the boom of 1972–73 and to aggravate the decline in output during the 1974–75 recession. Another more subtle supply factor was the influence on the underlying growth of capacity (and indirectly on the demand for investment goods) exerted by changes in the demographic structure of the labor force and by the much discussed productivity growth slowdown of the 1970s. Of the demand elements that are isolated in the paper, the most important contributions to business cycle volatility are made by consumer durable and residential housing expenditures, and the smallest contribution is made by business fixed investment.

The latter finding is consistent with the conference paper by myself and John Veitch, which shows that consumer durable and residential housing expenditures have been the most volatile components of investment in the postwar period, whereas in the interwar interval (1919–41) producers' durable equipment and nonresidential construction were relatively greater sources of volatility. In the end the Eckstein/Sinai paper leaves about one-third of the variability of real GNP unexplained, "reflecting the propagation mechanisms in the system," although at least part of their "variance-stripping" exercise that reaches the one-third residual involves removing variations in real investment expenditures that result from the propagation mechanism linking investment to income. And at least a part of the residual portion of variation identified with the propagation mechanism should be viewed as a result of autonomous impulses in government defense and nondefense spending, as well as in exports.

A second method of identifying shocks is carried out by several of the other conference papers, which estimate equations that relate a few economic aggregates (e.g., real GNP) to their own lagged values and also to lagged values of other economic aggregates (e.g., money, interest rates). The "residual" in each equation is identified as the relevant economic impulse or "innovation." The Blanchard/Watson paper uses this method to answer much the same question as the Eck-

stein/Sinai paper—that is, What was the nature of the impulses that generated postwar business cycles? They conclude that postwar fluctuations were due neither to an accumulation of small shocks nor to infrequent large shocks, but rather to a mixture of large and small shocks. Further, no one source of shocks was dominant. Blanchard and Watson find demand, supply, fiscal, and monetary shocks to have been equally important, but at different times, and conclude that "postwar recessions appear to be due to the combination of two or three shocks."

An examination of the time series of the Blanchard/Watson shocks allows us to link their shocks with particular historical episodes. By far the dominant fiscal impulse was the upsurge of defense spending during the Korean War period, 1951–53, and the sharp decline thereafter in 1953–55. A smaller positive fiscal impulse occurred during the Vietnam War period, 1966–68. The authors find that monetary shocks were relatively small but frequently destabilizing, aggravating the recessions of 1953–54, 1957–58, 1960–61, and 1981–82 and amplifying the boom of 1972–73. Supply shocks were particularly important in the period 1974–75. The impulse they identify as the "demand shock" was larger in magnitude in several episodes than the monetary shocks and any but the Korean War fiscal shocks. The timing of the demand shocks duplicates that of the economywide business cycle itself and can be interpreted as the residual variation that cannot be explained by the other three shocks, just as the Eckstein/Sinai exercise also yields a residual component.

Overall, we emerge from the Eckstein/Sinai and Blanchard/Watson papers with a very different view of the underlying sources of business cycles than is contained in pre-Keynesian classical theory or in Keynesian theory itself. The pre-Keynesians, with their attention to financial and real aspects of the propagation mechanism, treated business cycles as a self-generating and recurrent aspect of the uncoordinated interaction among economic agents in the private sector. Keynesian theory also attributed the origin of cycles to private behavior and emphasized one particular aspect, the instability of business expectations that gave rise to fluctuations of fixed investment. But Eckstein/Sinai and Blanchard/Watson follow the shift in the intellectual tide that can be dated back to the Friedman/Schwartz *Monetary History* by attributing to government rather than private actions a substantial fraction of the blame for postwar cycles. Part of the government contribution to instability, measured by the Blanchard/Watson fiscal impulse variable, result from wartime fluctuations in defense expenditures and may be regarded as unavoidable.

The monetary impulse is interpreted differently in the two papers. Eckstein and Sinai attribute instability mainly to interest rate fluctua-

tions, deposit rate and loan rate ceilings, and balance sheet instability, while Blanchard and Watson adhere to the monetarist interpretation that treats monetary instability as equivalent to innovations in the money supply. Thus a Milton Friedman–like monetary rule would eliminate instability as measured by Blanchard and Watson but might aggravate instability as measured by Eckstein and Sinai, insofar as more steady monetary growth would allow shifts in private sector commodity demand and portfolio choice to be communicated directly to variations in interest rates. That both papers attribute a residual portion of business cycles to these private sector commodity and portfolio demand shifts establishes continuity with the earlier business cycle literature and sustains our motivation to study the private sector investment process and to investigate the feasibility of countercyclical stabilization policy.

Continuity and Change in Cyclical Behavior

General Characteristics

Zarnowitz and Moore's paper documents elements of continuity in American business cycle behavior since 1846 as well as changes in the postwar period as compared with the century before 1945. They find both continuity and change in the most basic measures of the cycle, with an unchanged frequency of about 3.5 years but with a major change in the diminished amplitude of cycles after 1945. For instance, the average increase of both industrial production and employment in pre-1945 expansions was roughly double that in post-1945 expansions. As for contractions, the pre-1945 decline in industrial production was roughly double that in the postwar period, while the decline in employment was more than four time as great. There was continuity, however, in the timing relationships of the major groups of indicators (leading, coincident, and lagging), an indication that the reduced amplitude of postwar business cycles did not cause much change in the sequence of events occurring in a typical cycle.[10]

Not only were postwar recessions much shallower, they were shorter; from 1846 to 1945 recessions were two-thirds as long as expansions, but from 1945 to 1982 they were only one-fourth as long. Another major change was in the cyclical behavior of inflation. Average inflation rates were similar in expansions before and after 1945 but were much higher in the postwar than in the prewar contractions. Thus a novel element

10. A revisionist view has been developed in Christina Romer 1984a, b, two recent papers that argue that the greater stability of the postwar economy is a figment of changes in data measurement techniques and that the use of prewar measurement techniques on postwar data makes the postwar economy appear more volatile than in the official data.

in the postwar business cycle has been the persistence of upward price pressures in contractions.

Sources of Greater Postwar Stability

It took only a decade of postwar experience to make private agents aware that there had been a major improvement in economic stability compared with the pre-1945 era. The dating of this recognition can be established as occurring during the interval 1953–59, when stock market investors reacted to the shallowness of the 1953–54 and 1957–58 recessions by bidding up the Standard and Poor's composite stock market index by 124% over that six-year interval. It was just at the end of this period, in late 1959, that Arthur Burns delivered his presidential address to the American Economic Association that is cited and taken as a point of departure by several papers in this volume.[11] To what extent do the papers in this volume affirm, contradict, or go beyond Burns's analysis of the sources of greater stability and reduced amplitude of the postwar business cycle?

The following sections begin with the factor that Burns stressed most heavily, the stabilizing role of government through the sheer increase in the size of its tax and transfer system. Next I turn to the effects of discretionary stabilization policy in general and then to specific aspects of fiscal and monetary policy highlighted in the conference papers. Then I examine briefly some of the postwar structural changes Burns emphasized and the rather different evaluation contained in this volume. The most controversial issue tackled in this volume is one that Burns neglected entirely, the causes and consequences of the greater persistence of wage and price changes evident in the postwar data. The analysis of changes in behavior concludes by reviewing the main findings of four papers devoted to the analysis of components of spending—inventory change, consumption, investment, and the foreign sector.

The Size of Government and Its Role as a Buffer

Of central importance to Burns was the increased size of the federal government, particularly the stabilizing role of government transfer payments and the government's much greater participation in the ebb and flow of private incomes through the enlargement of the personal income tax system. He pointed out that personal disposable income did not decline during the 1957–58 recession, and I may update this point, as do DeLong and Summers in their paper, by contrasting the mere $2 billion decline in real disposable personal income over the five quarters of the 1981–82 recession with the much greater $45 billion decline in real GNP.

11. See Burns 1960.

The increased size of government and the "buffering" of the fluctuations of disposable personal income show up in several types of quantitative evidence. The role of government is largely responsible for the decline in dynamic multipliers implied by large-scale econometric multipliers, from multipliers of four or five in prewar data to two or less in postwar data.[12] The DeLong/Summers paper shows that the dollar response of disposable income to a dollar change in GNP was 0.76 in 1898–1916, 0.95 in 1923–40, but a much smaller 0.39 after 1949. Hall's conference paper finds that innovations or shocks to consumption spending fell by a factor of three from the period 1920–42 to 1947–82, and this must reflect in part the greater stability of disposable income relative to total income.[13]

DeLong and Summers note that the "buffer" role of government in stabilizing the postwar economy should not be taken at face value, for an additional assumption is required. The increased stability of disposable income implies increased stability of consumption expenditures "only if liquidity constraints are an important factor in the determination of aggregate consumption." By this they mean that prewar consumers, if not liquidity constrained, should have been able to sustain a permanent level of consumption by borrowing during recessions and repaying loans during expansions. One may doubt that this theoretical possibility was of any practical relevance in prewar business cycles, given their large amplitude and nonperiodic character noted above in the discussion of the Burns/Mitchell definition. Smoothing of consumption during the Great Depression of the 1930s would have required consumers to borrow sums equal to several years' income, with only the promise of uncertain future income available as collateral. DeLong and Summers define "liquidity constrained" as *any* sensitivity of consumption to disposable income beyond the effect of changes in current disposable income on permanent income and find, not surprisingly, that by this definition almost all prewar consumers were liquidity constrained. Hence they accept that the reduction in the elasticity of disposable income to total income did have the stabilizing effect that is usually accepted in the literature.

The Full Employment Commitment and the Role of Stabilization Policy

Burns also emphasized a second aspect of government's role, not only its increased size, but also its new commitment to full employment. He pointed not just to the stabilizing role of monetary policy in achieving a prompt decline in long-term interest rates shortly after postwar

12. See Hickman and Coen 1976, table 9.6, 194.

13. Here the size of the innovations is taken to be the standard error of estimate in Hall's equations that regress the change in consumption on the change in total income.

business cycle peaks (in contrast to the long lags that were prevalent before the war, documented in the Zarnowitz/Moore paper), but also fiscal policy, with its well-timed tax reduction achieved midway through the 1953–54 recession. Burns felt, however, that more important than any specific actions of monetary and fiscal policy was a general change in attitude, as consumers and businessmen gained confidence that a business cycle contraction would not be allowed to go too far and thus avoided the sharp cutbacks of spending plans that had heretofore typified the contraction phase. Burns gave less emphasis to other government measures, for example, price supports that eliminated the sharp declines in farm prices that were so important in 1920–21 and 1929–33 and the insurance of bank deposits by the Federal Deposit Insurance Corporation (FDIC). In the aftermath of the monetarist tilt in business cycle analysis associated with the Friedman/Schwartz monetary history and its emphasis on the destruction of bank deposits during the 1929–33 Great Contraction, we tend now to rank FDIC higher than Burns did on the list of reforms contributing to postwar economic stability.

The conference paper by DeLong and Summer does not accept Burns's view that discretionary stabilization policy made a contribution to the smaller amplitude of postwar business cycles. Rather than examining specific aspects of monetary and fiscal policy, they propose an indirect test. Turning again to the impulse propagation framework, they assume that all impulses originated in the private sector and that the presumed role of government stabilization policy was to influence the propagation mechanism, "reducing the persistence of shocks to GNP, not by limiting the size of the initial shocks." In other words, prompt action by discretionary government stabilization policy following a negative shock in year one would return real GNP to its normal value in year two rather than allowing the shock to persist.

One may question the usefulness of this test, however. First, it seems to associate all impulses with private sector activity. However, we have noted the Blanchard/Watson analysis that identifies not just private sector demand and supply shocks, but also shocks originating in fiscal and monetary policy. The "political branch" of government may have increased instability by starting and stopping wars during the period 1950–75, and the "stabilization branch" of government may have attempted to reduce the impact of instability originating not just in the private sector but also in the "political branch." Second, the increased persistence of output fluctuations in the postwar period does not necessarily mean that stabilization policy was less effective, but could imply that the impulses themselves had more serial correlation in the postwar period. We all know that the Korean War lasted three years and the Vietnam War for more than a decade. Third, supply shocks of the 1970s identified by Blanchard and Watson not only persisted over

several years but also had a negative influence on real output that could not be offset by monetary policy without an inflationary response that fully accommodated the shocks. Most characterizations of the postwar monetary reaction function, including that in John Taylor's paper, imply that the Federal Reserve reacted against both output and inflation shocks.

Herschel Grossman, in his discussion of the DeLong/Summers paper, also points to the decreased volatility of monetary aggregates in the postwar period. It is hard to believe that the Fed's success in avoiding anything like the 1929–33 collapse in the money supply did not contribute to postwar stability, though as a semantic point this achievement might be attributed as much to the FDIC as to discretionary Federal Reserve actions. And as we have seen, both the Eckstein/Sinai and the Blanchard/Watson papers attribute a modest portion of postwar instability to monetary policy. As for fiscal policy, the record is mixed when we abstract from fluctuations in defense expenditures. Some fiscal actions have aided stabilization, including tax reductions during the recessions of 1954 and 1975 and the countercyclical pattern of nondefense expenditures achieved by the Eisenhower administration in 1958. Destabilizing episodes include the failure to raise taxes to pay for the Vietnam War in 1966–67 and the expansion of government purchases in the overheated economy of 1972–73.

Additional Empirical Evidence on Fiscal and Monetary Policy

The conference paper by Robert Barro, like the DeLong/Summers paper, conflicts with Burns's view that fiscal policy has contributed to the postwar stabilization of the American economy. Barro's analysis of fiscal policy is limited to a particular question, the determinants of changes in the United States public debt over the period 1920–82. Barro finds that the equation he estimates for changes in the debt is stable before and after World War II, and this implies that there is no "support for the idea that there has been a shift toward a fiscal policy that generates either more real public debt on average or that generates larger deficits in response to recessions." The support for the first proposition is that there is very little change between 1920–40 and 1948–82 in the constant term in the debt change equation, indicating a similar "normal" creation of real debt in the absence of temporary government expenditures and when the economy is operating at a stable unemployment rate. The support for the second proposition is that the extra debt creation in business cycle recessions per extra point of unemployment was similar before 1940 and after 1948. Since Barro's test does not distinguish between cyclical deficits created by automatic stabilization (i.e., tax progressivity) and discretionary fiscal policy changes, it leaves open the source of its surprising result that the cyclical responsiveness of the debt has not changed since 1920.

Just as changes in the impact of fiscal policy can be divided in principle between the role of automatic stabilization working through changes in the size of government and in tax rates and the role of discretionary destabilization policy, so changes in the impact of monetary policy can be divided among the roles of changing government regulations, private institutions and practices, and discretionary monetary policy. The conference paper by Benjamin Friedman documents the many regulatory changes that have altered the interrelationships between the financial and real sectors in the United States economy. In addition to insurance for deposits in commercial banks and savings intermediaries, Friedman points to deposit rate ceilings (introduced in 1933 and phased out gradually in the 1980s), which caused the brunt of monetary restriction in most postwar recessions to fall disproportionately on the housing industry. Changes in private practices have included greater integration across regions and nations and the growth of pension funds relative to insurance companies and mutual savings banks.

Has the net influence of these changes in the monetary sector been to make the real sector more stable since World War II? Friedman's evidence finds important strands of continuity between the prewar and postwar eras. In particular, the growth of money and credit and the levels of interest rates continue to display procyclical patterns. And as shown in the comment by Allan Meltzer, the lead of the growth rate of the money supply in advance of business cycle turning points in the postwar period was about eleven months at troughs and fifteen months at peaks, only a month or two shorter than the estimates of Milton Friedman and Anna Schwartz for the period 1870–1960. Benjamin Friedman distinguishes between continuity in the qualitative relationships of financial and real variables and the absence of stability in specific quantitative relationships. "These monetary and financial aspects of U.S. economic fluctuations exhibit few quantitative regularities that have persisted unchanged across spans of time in which the nation's financial markets have undergone profound and far reaching changes."

Despite these quantitative changes, however, Friedman's paper does not conflict with the widely accepted ideas that financial and monetary factors made a major contribution to postwar stability, particularly in the role of deposit insurance in eliminating the danger of a deposit drain such as occurred in 1929–33 and the role of less variable monetary growth (achieved both directly by discretionary monetary policy and indirectly by deposit insurance) in contributing to the reduced amplitude of postwar business cycles. And as DeLong and Summers emphasize, the much greater role of consumer credit in the postwar era has helped to loosen the connection between fluctuations of income and consumption and thus to reduce the fraction of consumers who

are "liquidity constrained." That monetary growth continued to exhibit procyclical fluctuations after World War II can be given the monetarist interpretation that a constant growth rate rule for the money supply would have improved economic performance or the Keynesian-activist interpretation that countercyclical swings in monetary growth would have been even better.

Structural Changes

In addition to structural changes involving financial markets and the size of government, Burns emphasized other changes in the private sector, including the increasing concentration of business enterprise and the role of corporations, as well as the shift of employment away from the most cyclically sensitive industries. The role of corporate concentration attracts virtually no attention in the conference papers (except for a brief mention by DeLong and Summers), probably because the degree of concentration was already substantial in 1929 and did not appear to mitigate or dampen the Great Contraction.[14]

The shifting structure of labor markets may have been more important in contributing to cyclical stability. Burns stresses that the "broad effect of economic evolution until about 1920 was to increase the concentration of jobs in the cyclically volatile industries, and this was a major force tending to intensify declines in employment during business contraction." However, after 1919 the tide turned, and the share of employees in the most volatile industries stabilized and henceforth, since the time of Burns address, has declined rapidly.

The extent of this shift is highlighted by the official data shown in table I.1, which includes both government employees and farm managers and workers. The most dramatic changes from 1920 to 1981 were the decline by half in the "blue collar" operative and laborer categories, and the virtual doubling of the "white collar" sales, clerical, and service occupations. This shift has resulted partly from the greater growth of the demand for services than for goods, and partly from the more rapid growth of productivity in farming and manufacturing than in the nonfarm nonmanufacturing sector (a gap that has widened since 1970). However, the timing shown in table I.1 does not support a major role for this structural shift in explaining the smaller amplitude of postwar business cycles, since the shift was greater from 1950 to 1981 than from 1920 to 1950. The conference paper by Zarnowitz and Moore concurs that shifts in the structure of employment were more important after 1959, and particularly after 1969, than they were from 1929 to 1959.

14. The share of total manufacturing assets held by the one hundred largest corporations was already 35% in 1918 and reached 49% by 1970.

Table I.1

	Percentage of Total Employment		
	1920	1950	1981
Cyclically sensitive	*52.0*	*45.5*	*32.4*
Craftsmen and foremen	13.0	14.2	12.6
Operatives and laborers	39.0	31.3	19.8
Cyclically insensitive	*48.0*	*54.5*	*67.6*
Professional, technical, and managerial, including farmers and farm managers	27.3	24.8	29.3
Sales, clerical, and service	20.7	29.7	38.3

Further evidence on changes between interwar and postwar labor markets is provided in the conference paper by Bernanke and Powell. They find important elements of continuity in labor market behavior within the manufacturing sector that appear to leave little room for labor market elements to explain the greater stability of the postwar economy. First, procyclical labor productivity fluctuations appears to be present in every industry in both their periods, 1923–39 and 1954–82. This means that even before World War II it was common for hours of labor input to fluctuate less than output, thus dampening the impact of output fluctuations on personal income. Labor market variables are more stable in the postwar period, but this may simply reflect the greater stability of output. Otherwise the main postwar change has been a greater reliance on layoffs rather than short workweeks as a means of reducing labor input, at least in part owing to the greater generosity and availability of unemployment benefits. To the extent that laid-off workers perceive a greater reduction in their "permanent income" or a greater liquidity constraint than workers experiencing a reduction in hours, this shift may have contributed to a greater cyclical sensitivity of consumption in the postwar period, partly mitigating other factors contributing to greater stability.

Greater Wage and Price Stickiness: Causes and Consequences

A major change in the postwar business cycle that was neglected in Burns's 1959 address, perhaps because it was not yet evident, was the shift to a greater degree of wage and price stickiness. Here it is necessary to distinguish "price flexibility" from "price persistence." As documented in recent years by Charles Schultze, myself, and others, the postwar period has combined continuity with the pre-1929 period in the short-run *flexibility* of prices, that is, the division of a nominal GNP change between price and quantity in the first year after the

change, but a shift toward much greater *persistence* in the form of a dependence of this year's inflation rate on last year's rate. Taylor's conference paper confirms the greater persistence of postwar wage and price behavior: "wages and prices have developed more rigidities, in the sense that past values of wages and prices influence their current values. . . . In comparison, during the period before World War I wage inflation fluctuated up and down much more rapidly."

The greater postwar persistence of wages and prices is generally attributed to two factors. First, the increased importance of labor unions since the late 1930s has led to centralized wage bargaining, and high perceived costs of negotiation have made it economical to establish three-year contracts in many industries. That today's wage changes were in many cases agreed upon last year or the year before tends to insulate wage changes from current market forces and to increase their dependence on what has happened previously. Second, the greater confidence of private agents in the willingness of monetary and fiscal policy to reduce the severity of recessions lessens their need to reduce wages and prices quickly and increases their incentive to wait for the expected prompt return of prosperity. An additional third factor in wage stability may be the structural shift in the occupational mix of employment documented in the table I.1, with a major shift from operatives and laborers in the cyclically volatile manufacturing and construction industries to less volatile sales, clerical, and service occupations. Another related shift has been toward lower quit rates and a greater importance of lifetime job attachment.[15]

This characterization of postwar behavior, with continuity from earlier periods in the short-run response of prices to demand disturbances but much greater year-to-year persistence, is not disputed by any of the papers in the volume. However, the *consequences* of greater wage and price persistence is a matter of lively debate between Taylor and DeLong/Summers in an exchange that appears at the end of the volume. Did postwar wage and price stickiness contribute to more (Taylor) or less (DeLong/Summers) amplitude in fluctuations of output?

The issue in dispute can be understood within the context of conventional aggregate supply and demand analysis, in which price stickiness is represented by a relatively flat aggregate supply curve and price flexibility by a relatively steep aggregate supply curve. Clearly, any exogenous shift in nominal GNP, which changes the position of the aggregate demand curve, will cause a greater response of output along a flat aggregate supply curve than along a steep aggregate supply curve. John Taylor's main conclusion can be interpreted in this context, that

15. Data on quit rates are discussed in the conference paper by DeLong and Summers. Lifetime job attachments are emphasized by Hall 1982.

given the smaller nominal GNP shocks that occurred in the postwar era (owing to the many factors discussed above, e.g., the FDIC), stickier wages and prices implied more pronounced output fluctuations than in the alternative hypothetical case where the more flexible prewar wage and price response had been maintained. "But the dynamics, or *propagation mechanisms,* of the economic system are much slower and more drawn out in the postwar period. This tends to translate the smaller shocks into larger and more prolonged movements in output and inflation than would occur if the prewar dynamics were applicable in the later period. In other words, the change in the dynamics of the system offset some of the gains from the smaller impulses."

DeLong and Summers contend, however, that the crucial step of taking the smaller size of postwar demand impulses as given is unwarranted. The main conclusion of their paper is that the greater persistence of wage and price changes is directly responsible for the smaller fluctuations in nominal aggregate demand. The theoretical background of the DeLong/Summers argument was set out a decade ago by James Tobin (1975), who shows that there are conflicting effects of a decline in prices in a recession. Through the conventional wealth or Pigou effect, price flexibility raises real balances and helps to stabilize the economy. But there is a countervailing destabilizing effect of price flexibility, owing to the "expectations effect" and the "distribution effect." The first is the tendency of consumers and firms to postpone purchases if they expect deflation to continue, and the second is the tendency of debtors with nominal fixed obligations that rise in real value during a deflation to have a higher propensity to consume, that is, to cut back consumption more than the increase in consumption by the creditors whose assets increase in real value at the same time. If the destabilizing effects of price flexibility offset the stabilizing effects, this would confirm the DeLong/Summers argument that less wage and price flexibility has reduced the amplitude of postwar demand impulses.

In their theoretical discussion DeLong and Summers place less emphasis on the "distribution effect" channel than on an "expectation effect" channel operating through real interest rates: "changes in the aggregate price level produce changes in the real cost of capital that have effects on the level of expenditures on items that have a high interest elasticity of present value." The evidence provided in support of this channel is a reduced-form vector autoregression model containing the inflation rate, the ratio of real GNP to "natural" real GNP, and the nominal commercial paper rate. Their striking finding is that price innovations have a positive effect on future output both in 1893–1915 and in 1949–82. The implication is that nominal GNP shocks cannot be taken as exogenous, but rather vary in the same direction as price shocks. This evidence of an accommodative demand policy is

consistent with Taylor's empirical finding for the period before World War I but inconsistent with his conclusion that policy was nonaccommodative after World War II.

Further discussion of the Taylor and DeLong/Summers results is carried out in the exchange between the authors at the end of the volume. Here it is appropriate to note a conflict between the DeLong/Summers results and the study of investment behavior in the Gordon/Veitch conference paper. If DeLong and Summers were correct that real interest rates represent the channel by which price innovations influence expenditures, then we would expect to find a significant influence of the real interest rate in equations for household and business expenditures on structures and equipment. Yet Gordon and Veitch find no significant real interest rate effects on these expenditures at all for the interwar period and only modest effects on these expenditures at all for the interwar period and only modest effects in the postwar period that are concentrated on household investment (consumer durables and residential housing) rather than on business investment. In contrast to these weak real interest rate effects, they find a strong and consistent impact of the real money supply on all forms of investment in both the interwar and the postwar periods. Since the real balance effect makes a price innovation push investment spending in the opposite direction, it represents the stabilizing channel in the Tobin (1975) framework described above. At least we can agree that the effects of price flexibility on output stability are opened up by the Taylor and DeLong/Summers papers as key issues that for a full resolution will require additional future research.

Impulse and Propagation in Components of Spending

Four conference papers examine components of spending: Alan Blinder and Douglas Holtz-Eakin on inventory behavior, Robert Hall on consumption spending, Gordon and Veitch on investment spending, and Rudiger Dornbusch and Stanley Fischer on the foreign sector. There is modest overlap in this division of labor, since consumer durables expenditures are included in the spending components studied by both Hall and Gordon/Veitch, while all components of spending include the traded goods of interest to Dornbusch and Fischer.

Of all the conference papers that examine changes before and after World War II, the Blinder/Holtz-Eakin paper finds the most evidence of continuity and the least evidence of change. In both periods inventory changes have played a major role in business cycles, especially around turning points and during cyclical downswings, and they have been strongly procyclical. If the World War II years are omitted, the correlation of nominal final sales and inventory changes remained similar when 1929–41 and 1947–83 are compared. But whereas the vari-

ance of nominal final sales decreases substantially after World War II, the variability of inventory investment actually increases. The paper also shows that certain features of inventory data, "annoying" because they conflict with standard theories of inventory adjustment, characterize the prewar as well as the postwar data. In particular, the fact that production is more variable than sales and that sales and inventory change covary positively tends to contradict the production smoothing/buffer stock model equally in both periods.

Hall's study of consumption behavior contrasts the Keynesian and equilibrium business cycle models. In Keynesian models, the consumption function slopes upward; when the public earns more income, it consumes more. But in the equilibrium theory households choose their desired level of work—that is, income—by moving along a negatively sloped consumption function representing the trade-off between work and consumption. Hall's estimates imply a "draw" between the two models, with the estimated consumption function essentially flat and a marginal propensity to consume of roughly zero. Because this phenomenon equally characterizes the periods 1920–42 and 1947–82, it reveals no change in behavior that would explain greater economic stability in the postwar period. The residual terms in Hall's equations, the implied consumption impulses, are moderately more variable in the interwar period, and this is dominated by a negative innovation in 1930–32. Overall, however, the size of the impulses is small relative to the magnitude of overall changes in real GNP, and Hall concludes that shifts in consumption behavior are "an important, but not dominant, source of overall fluctuations in the aggregate economy."

The Gordon/Veitch study of investment behavior includes consumer durables as well as the usual components of fixed investment—producers' durable equipment and residential and nonresidential construction. The paper finds that the covariance of investment with noninvestment GNP was large and positive in the interwar period and that changes in interwar structures investment were largely autonomous; that is, they can be treated as a primary impulse responsible for the interwar business cycle. Interwar expenditures on durable goods (both consumer and producer), however, appear to have been part of the economy's propagation mechanism rather than an independent source of shocks.

An important change in the postwar era has been that investment contributed much less to the overall business cycle than in the interwar period. The variance of investment, together with the covariance of investment with noninvestment GNP, together account for fully 71% of the variance of real GNP during 1919–41 but only 7% during 1947–83. The covariance of investment and noninvestment spending is actually negative during the full postwar period, possibly as a result of

"crowding out" of investment in periods of high defense expenditures. This phenomenon is one more indication of the destabilizing role of the "political branch" of government, in contrast to earlier periods when a larger share of instability originated in the private sector.

However, more can be said about the investment process than simply that "structures investment was autonomous" and "durables investment was induced as part of the propagation mechanism." In addition to the real impulse embodied in the structures innovation, there was also a financial impulse. Both structures and equipment investment have been influenced by changes in the real monetary base in the postwar period, as was equipment investment in the interwar period. Further, both types of investment have been influenced by changes in the money multiplier (that is, the money supply M1 divided by the monetary base) in both the interwar and the postwar periods. In the earlier period, the multiplier change may convey the effect of the destruction of bank deposits in the Great Depression, and in the postwar period it may be related to the periods of credit crunch and disintermediation emphasized by Eckstein and Sinai.

The Dornbusch/Fischer paper on the open economy is not oriented around changes in the business cycle before and after World War II. Indeed, it is difficult to see how open economy issues could explain the greater stability of the economy in the early postwar years, since the authors show that the ratio of both imports and exports to GNP was lower in 1950–69 than in any period before 1929 or after 1970. Thus when Burns was examining the sources of postwar economic stability, the United States was virtually a closed economy, and we must search within rather than outside it to gain an understanding of that period. In fact the main influence of the foreign sector on the domestic economy in the period 1947–60 was destabilizing, including the contribution of declining exports to the 1949 recession after their 1947 Marshall Plan peak and to the 1957–58 recession after their 1956–57 Suez peak.

Nevertheless, other aspects of business cycle behavior are illuminated by the Dornbusch/Fischer treatment. Their analysis of the pre-1914 gold standard era stresses the greater international synchronization of business cycles than in the postwar period, suggesting that foreign shocks were a more important source of American cycles in that period. They are skeptical that the Smoot-Hawley tariff of 1930 could have played any major role in explaining the severity of the Great Depression.[16] They stress the impact of foreign price innovations, in

16. Their treatment of the interwar period exhibits a surprising neglect of the "great pyramiding of international credits" in 1927–29, stressed by Burns 1968 and Kindleberger 1973.

the form of jumping oil and raw materials prices, on the United States business cycle in the 1970s and early 1980s. Finally, they point out the implications of flexible exchange rates in altering the effectiveness of monetary and fiscal policy. In particular, flexible rates steepen the economy's aggregate supply or Phillips curve and imply that a period of monetary tightness will achieve a faster and less costly disinflation than under fixed rates. The opposite (a flatter Phillips curve) occurs when disinflation is attempted through tight fiscal policy.

Concluding Comments on Changes in Behavior

We emerge from the conference papers with an updated version of Burns's (1960) analysis of the sources of postwar stability. Burns is supported in his emphasis on the greater size of government, with the concomitant growth in the personal income tax system and buffering of changes in disposable personal income from changes in total income. But other changes Burns stressed receive less support in this volume. There is doubt in several papers that discretionary stabilization policy did more good than harm, as Burns claimed, and considerable evidence that fiscal policy (primarily through variations in defense spending) and monetary policy contributed their own set of destabilizing influences that aggravated the postwar business cycle. Also receiving little support is Burns's emphasis on structural changes; for instance, most of the shift in the structure of employment out of the cyclically volatile industries came after 1970 and hence cannot explain the period of relative stability between 1950 and 1970. There is no dissent in this volume, however, to the suggestion that the creation of the FDIC in 1934, which Burns treated as only a secondary factor, deserves elevation to first rank among structural changes dampening the postwar cycle.

Another major structural change emphasized here but neglected by Burns was the role of labor unions in the development of staggered three-year wage contracts, and the resulting increase in the postwar persistence of wage and price changes. What remains unsettled is whether greater price persistence contributed to economic instability by offsetting the postwar decline in the size of economic impulses or whether it could have played a major role in reducing the size of the impulses themselves. We are left with a chicken/egg interaction, in which greater output stability may have contributed to price persistence while greater price persistence may have contributed to output stability. Perhaps the underlying causes of both chicken and egg were the simultaneous emergence in 1946 of the larger personal tax system and the symbolic role of the Full Employment Act, together with the growing evidence throughout the 1940s and 1950s that the FDIC, together with changed Federal Reserve attitudes, had converted a collapse in the banking system from an ever-present danger into a remote historical relic.

Continuity and Change in Methodology and Style

This volume is the second that reports on the proceedings of a major NBER conference devoted entirely to the subject of business cycles. The proceedings of the 1949 conference were published in 1951. Contrasts between the two conferences provide some illumination on changes that have occurred in the study of business cycle phenomena over the past thirty years, a contrast that received insufficient attention at the conference itself (a complaint made at the end of Fabricant's conference comment).[17]

As at our conference, participants in the 1949 conference spanned several generations. Wesley Mitchell had agreed to open the conference and to unveil for the first time in public some of the results of his forthcoming book (1951), but he died just before the conference began. Another major figure of the older generation, Joseph Schumpeter, presented a defense of the historical approach to the analysis of business cycles but died before he could revise his paper for the conference volume. Among the participants were economists who have since won the Nobel Prize for their pioneering work, much of it related to the study of business cycles (Jan Tinbergen, Milton Friedman, Lawrence Klein, Simon Kuznets, and Wassily Leontief). And some continuity is achieved by Moses Abramowitz, Solomon Fabricant, and Geoffrey Moore, who were present at both the 1949 and the 1984 conferences.

The most striking difference between the two conferences lies in the much greater domination in 1949 of methodological development and disputes and the much smaller role of substantive analysis of the sources of business cycles and changes in their nature. One symbol of the difference in emphasis is that the earlier conference volume contains four times as many index entries to "Econometrics" as it does to "Depression." Perhaps it is natural that some economists in 1949 should have been as excited to be in on the ground floor of econometric modeling as others in the mid-1970s were about the development of equilibrium business cycle models.

In a sense the 1949 conference can be viewed in retrospect as a confrontation between the NBER, a long-established organization devoted to a descriptive style of empirical research intended to provide a basis for hypothesis formation, and the new Cowles Commission, devoted to the still novel econometric approach in which theory and empirical testing were, in principle, integrated. Some of the econometricians came to the 1949 conference not so much to talk about

17. Correspondence with three participants in the 1949 conference (Moses Abramowitz, Solomon Fabricant, and Milton Friedman) has been immensely helpful in developing the interpretation in this section, and some sentences here are drawn directly from their letters.

whatever substantive work might be presented as, full of the belief that they had found the truth, to convert and obtain disciples while exposing the dead end that the older work had reached. Perhaps the reason this confrontation occurred was that indeed the technical development of econometrics was proceeding rapidly and the time had come to apply a new standard of evaluation to the past wholly speculative theorizing on business cycles of people like Robertson, Pigou, and J. M. Clark, together with the reluctance of Burns and Mitchell at the NBER to go very far beyond their "natural history" technique of observation, classification, and description and enter the realm of hypothesis formation and testing.

The main methodological tension in 1949 was between the econometric method, which at that time involved specification of many behavioral relationships as part of what we now call "large scale" econometric models, and the "historical" or "historical-quantitative" method, represented both by the NBER approach and by the descriptive historical method as practiced and defended by R. A. Gordon and Schumpeter. One dimension of the dispute was whether business cycles could be treated as a stable process, as required by an econometric model with fixed parameters. Schumpeter's defense of the historical method started from the proposition that the differences between cycles were more important than the similarities: "that the darkest hues of cyclical depressions and most of the facts that make of business cycles a bogey for all classes are not essential to business cycles per se but are due to adventitious circumstances" (National Bureau of Economic Research 1951, 150). But Schumpeter was more charitable to the econometric method than econometricians were to the historical. In a perceptive conclusion that recognized the importance of the Frisch/Slutsky distinction between impulses and propagation mechanisms, Schumpeter thought the historical method most suitable for studying impulses and the econometric method for studying propagation mechanisms: "historical analysis gives information as regards impulses and dynamic models as regards the mechanisms by which these impulses are propagated through the system or, to put it differently, as regards the manner in which the economic resonator reacts when 'irritated' by the impulses" (p. 153). However, econometricians were not so ready to accept a role for the historical method. In the words of one critic of a historical paper, "Facts, especially statistical facts, do not by themselves prove a relationship between cause and effect," and in another comment Tinbergen stressed the importance of developing refutable hypotheses.[18]

In the first two decades after the 1949 conference, growing armies of econometricians advanced toward the methodological frontier with

18. The quotation is from National Bureau of Economic Research 1951, 215.

their ever-larger models, now estimated on quarterly rather than annual data. But the advance of the armies was slowed and then halted in the late 1960s and early 1970s by the unexpected difficulty of the terrain, which sent the inflation, productivity, stock market, and money demand regiments into retreat. Then the remaining regiments were defeated in a "last stand" by small opposing forces led by Lucas and Sims. Lucas's critique undermined the use of econometric models (either large or small scale) for policy simulation experiments, since private behavior could not be assumed to remain unchanged in the face of arbitrary changes in policy parameters. Sims's critique struck a blow at the "incredible" exclusion restrictions assumed in the specification of structural equations of large-scale models and in addition introduced into common usage the small-scale reduced-form vector autoregression (VAR) models, distinguished by their symmetry in treating all variables of interest as endogenous and in entering every variable into every equation. As a result large-scale models were cast out of academic research to the Siberia of commercial forecasting firms.

The methodological uniformity of the papers at this conference attests to the victory of Lucas and Sims and the demise of large-scale models containing many separate behavioral equations. Just one paper (Eckstein/Sinai) reports simulations with a large-scale model. Four others test particular structural theories and estimate equations for inventory change, consumption, federal debt, and Phillips curves that can be viewed, at least in principle, as components of large-scale models. But this leaves six papers that base some or all of their main conclusions on small-scale VAR models.

One reason for the current popularity of small models is that their workings can be understood and compactly displayed, in contrast to large-scale models where (as Singleton notes in his comment) so many of the specification decisions are made "behind the scenes." Interestingly, at the 1949 conference Tinbergen was already aware that "most economists when criticizing econometric models were pressing toward including many variables. This very inclusion, however, makes the model unintelligible" (National Bureau of Economic Research 1951, 140). Tinbergen's solution was to build small "inner circle" models of key variables that could be "backed" by detailed equations for components of spending, income, and financial markets. The papers at this conference attest to the powerful attraction of building such "inner circle" (i.e., small) models and the unwillingness of contemporary economists to become enmeshed in secondary details until a consensus has been reached on primary issues.

An important contribution of the VAR technique is to formalize the distinction between impulses and propagation mechanisms. Impulses ("innovations") are simply the residual variation that remains net of

the contribution of a variable's lagged values, as well as the other lagged values in the model. Taylor's decomposition of output and price impulses and Blanchard and Watson's decomposition of fiscal, monetary, demand, and supply impulses are examples of this technique (although these authors also develop small structural models to explain the same data). In some papers the VAR technique is used not to identify innovations but to establish direction of causation (Friedman) or the sign of a response (DeLong and Summers's positive response of output to price innovations).

This reliance on small-scale VAR models creates in some of our conference discussants the feeling that the methodological counterrevolution has gone too far. In Allan Meltzer's words, "perhaps a principal conclusion to be drawn is that you cannot get something for nothing. If we are unwilling to impose a structure on the data, by stating testable hypotheses, the data may mislead us into accepting that the world is as lacking in structure as this approach." One can argue, however, that imposing structure on a small VAR model by omitting some variables to achieve identification does not in most cases lead to much change in the estimated decomposition of variance. What is needed, following Schumpeter, may be a greater application of the historical method to the estimated impulses. In which episodes was the "economic reasonator irritated" by special and nonrecurrent impulses, such as the influence of war and the aftermath of war, speculation and the breakdown of the banking system, temporary institutions like deposit rate ceilings, and external supply shocks? More attention to the nature and origin of impulses may lead to increased clarity in discussions of policy, with shocks that can be offset by a policy reaction distinguished from those that cannot.

The tendency in some contemporary papers is to practice the historical method by default. In the development of a VAR model, any extension beyond the standard core variables (prices, output, money, interest rates) must be guided by the characteristics of the historical period to be studied. For instance, inclusion of import prices might be required in the 1970s, but a distinction between exogenous and endogenous changes in the money supply (as in the Gordon/Veitch split of money between the base and multiplier) might be more appropriate in assessing the role of deposit destruction in the Great Depression. In the present conference an implicit historical judgment is made in several papers that the Great Depression is so special an episode that the interwar data should be excluded entirely (Taylor) or that an attempt to estimate a small model for interwar data leads to implausible results (DeLong/Summers). An example of the historical method applied to an understanding of econometrically estimated impulses is provided in the Gordon/Veitch paper, where a serially correlated negative impulse

to investment spending in 1929–30 is related to the historical circumstances of overbuilding and immigration legislation in the 1920s.

A final methodological question concerns the influence of the Burns/Mitchell NBER methodology on the course of business cycle research since 1949. Some research conducted after that data by associates of the NBER continued to use the Burns/Mitchell methodology, most notably the recent volume by Milton Friedman and Anna Schwartz, *Monetary Trends* (1982). The Zarnowitz/Moore paper in this volume continues the NBER tradition. But in the rest of the profession there is little residual use of reference cycles as a method of organizing data and analysis, with the important exception involved in the continued use of the NBER chronology for dating peaks and troughs of business cycles and the continuing role of the NBER as the official arbiter of these dates.

One reason the NBER reference cycle methodology has fallen into disuse is set forth in the short contribution by DeLong and Summers on asymmetries in business cycles, which the reference cycle technique was designed to investigate. They find little evidence of asymmetries of behavior in expansions and contractions, and they write off asymmetric behavior as a first-order problem in business cycle research. Another contribution to the demise of the NBER methodology has been the role of the computer in encouraging individual rather than team research. Individuals can now sit at home with their terminals or personal computers and carry out analyses that before the 1960s would have required a large number of research assistants and background research—the institutional base that the NBER provided. In fact, in the past decade the NBER has changed its role almost completely, becoming a clearinghouse for individual researchers rather than a central location where full-time employees are engaged in empirical research.

Immersion in the volumes from the 1949 and 1984 conferences stimulates a few reflections on changes in academic style. One finds the 1949 conference papers less interesting, inconclusive, and often immersed in unimportant details, in contrast to most of the papers here. But the 1949 remarks by discussants are often livelier, more interesting, and more antagonistic. Perhaps today we are more polite because air travel and the expansion of our profession brings us together at conferences so often, and today's discussion of A's paper by B may be followed in six months by an assignment of A to discuss a paper by B. There is a sense in the earlier volume that participants were more distant and saw each other less often. They also much less often read each other's work before publication, for we should not neglect the contribution to communication and understanding made by the Xerox machine and low-cost photo-offset printing available to economists and at least partly made possible by an infusion of government research

funds. Today we tend to "work things out" by revising papers and discussions to eliminate blatant errors and misunderstandings. There is nothing in this volume to match a discussant's remark in 1949: "I shall argue that his time series data contain an obvious gross error, that he has not chosen a desirable postwar revision of my prewar econometric model, and that his forecasting technique is both wrong and inefficient" (National Bureau of Economic Research 1951, 115). Part of the lack of friction evident in this volume may simply reflect the narrower range of disagreement in 1984, despite the fact that in several conference sessions authors of a mainstream or "Keynesian" background have their papers discussed by developers and practitioners of monetarism and of the equilibrium business cycle approach, and vice versa.

A final difference in academic style worth noting is the shift from book-length research projects in the old days to the production of short and discrete research papers today. Many authors at this conference have combined the business cycle research reported here with papers on one or more other topics given at other conferences in the same year, and perhaps a journal article or two on the side. Naturally this frenetic pace inhibits cleaning up loose ends and unsettled issues and encourages the frequent finesse that a particular interesting question is "beyond the scope" of the current paper. In contrast the activity of Burns, Mitchell, Schumpeter, Kuznets, and others tended to be concentrated on book-length projects that took years to complete. While those earlier economists sometimes lost the forest for the many trees they studied in detail, it is hard to avoid the conclusion that their work gained some of its originality and depth from concentrated immersion.

All of us can benefit from the study of these earlier works, and we may ponder why contemporary economists have just begun to extend their quarterly econometric studies to the long business cycle experience of 1890–1947 when the requisite data, long assumed to be unavailable, has been resting all this time on dusty library shelves in books written by Mitchell and many other pioneering associates of the National Bureau of Economic Research.[19]

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19. A notable exception are the two papers by Romer (1984a,b) cited earlier.

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