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AND ASSESSED: WHY AND
HOW THEY MATTER**

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ABSTRACT

Business cycles are on the whole well defined and described yet they have no generally accepted explanation. Whether in spite of or because of proliferation of abstract and fragmented models in this field, the theory of business cycles is long on questions but short on answers. Natural disasters and then financial crises constituted the earliest perceived reasons for economic instability. Classical literature on the subject, developed in the second half of the 19th and first of the 20th century favored for the most part the concept of self-sustaining or endogenous fluctuations, but recent models again stress outside factors and exogenous random shocks.

In an ideal world under the assumptions of perfect competition, flexible prices, national expectations, and money neutrality, there is room for real business cycles due to shocks to technology and possibly also shocks to tastes, relative prices, and fiscal variables. In the real world, however, there is ample evidence that many sticky prices and wages coexist with many flexible prices and wages. Movements in levels of prices can be stabilizing even while movements in expected changes of prices are destabilizing. Cyclical movements in nominal aggregates point to the role of money. The premise of passive money clashes with the popular view that monetary policy is highly important. The lesson of recent history is that monetary factors influence the course of economic activity along with real and expectational variables.

Incentives exist to learn how to avoid biased forecasts but data and models are not good enough to assure that rational expectations are achieved and maintained. Rational plans of individuals are not necessarily collectively consistent. Unstable and adverse conditions can exist even under the extreme assumptions of perfect flexibility of all prices and perfect foresight.

Highly aggregative models, while attractively simple and articulated, are unable to deal with the diversity of causes and consequences of business cycles. Disaggregation is essential for theories that emphasize endogenous processes of spending, saving, borrowing and investing.

Trend and cycles are interrelated and have common causes. Periods and countries with *high* growth had *low* instability.

Certain variables have long been critically important in business cycles as shown by historical studies within and across countries: profits, investment, interest rates, money and credit. Leads and lags, nonlinearities and asymmetries also had demonstrably eminent roles, which they retain. Multiple-shock models are superior to single-shock models.

Finally, recessions have high social costs in terms of unemployment and depressed growth. Expansions can also be costly by causing imbalances and excesses. Structural and policy problems may seem to be separable from these cyclical problems but often are not.

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BUSINESS CYCLES OBSERVED AND ASSESSED: WHY AND HOW THEY MATTER

By: Dr. Victor Zarnowitz

1. Some Basic Facts and Puzzles

Business cycles are widespread and persistent fluctuations in the overall economic activity and great many of its diverse components and aspects. They have long been observed in many economies varying greatly in size and degrees of openness, industrialization, and decentralization, which yet have one important feature in common, namely significantly large sectors of private business enterprise with production for markets and profits and regular use of money in exchange. They have also been observed over periods with very different characteristics in terms of high and low long-term economic growth trends, the incidence of all types of disturbance, war and peace, technical innovation, social and cultural change, tastes and attitudes toward uncertainty, risk-taking, and return-seeking.

Business cycles are defined to involve phases of absolute decline, which may be mild or severe (recessions) or very deep (depressions). These "contractions" are separated by phases of rising activity or "expansions", which include growth to the previous peaks levels (recoveries) and, generally, growth to new highs. As a rule, but not always, expansions have been longer in duration and/or larger in amplitude than contractions (as would, indeed, be expected of growing economies). For many countries and over many lengthy subperiods, these recurrent sequences of expansion and contraction averaged about 4-5 years, but individual business cycles varied greatly in duration around these averages. Thus, although commonly called "cycles", these fluctuations are not periodic.

Most people, of course, are happy to see the economy expanding and expect to benefit from the growing opportunities (more and better jobs, sales, and profits) that such an economy offers. But in business cycle contractions the opposite happens as losses in lower sales, income,

and employment spread, hurting millions of workers, consumers, and businesses. Investment in new plant and equipment usually falls sharply, reducing productive potential for future growth, a clear loss to society. Enforced reduction in opportunities for education and health care, that is, in human capital, results in a similar social loss. Perhaps most important, all recessions cause a rise in unemployment, much of which is not "voluntary" but associated with lots of misery to the individuals directly affected and their families as well as with a rise in diverse social ills—crime, sickness, alienation. That much of the unemployment is "involuntary" is attested by the common observation that many unemployed workers do not differ from those who retained jobs in the same occupations or industries with respect to qualifications, skills, productivity, and wage demands.

To add insult to injury, the very occurrence of a recession, let alone a depression, is an unsolved puzzle in the sense that there is no generally accepted explanation of why a normally well-functioning economy of a country with growing population and other productive resources should repeatedly suffer such overall declines in employment, production, real income and sales. Economists continue having a hard time trying to reconcile cyclical unemployment (and mass unemployment in general) with the long-held classical concept of an economy in which price changes continuously clear all markets (including the labor market which is supposed to be equilibrated by real wage movements). Whether in spite of or because of a proliferation of generally fragmented and abstract models in this field, the theory of business cycles remains long on both good and poor questions but short on persuasive answers. Thus controversy, much of it rather idle, is perpetuated while progress toward tested knowledge and productive consensus is inhibited.¹

At the same time, however, empirical research on business cycles continues to flourish in many universities and research institutes, private and governmental, around the globe. Interest in information about and forecasts of changing economic and financial conditions (that is, in

¹ Measured solely by loss in consumption, costs of business cycles are low in a model of an economy in continuous equilibrium where fluctuations caused by random shocks do not affect the growth trend rate and all unemployment is voluntary (Lucas 1987). But the assumptions of such a model are in sharp conflict with much of what is known about economic behavior, markets, growth and business cycles (about which more below).

business cycles broadly defined) is huge and growing on the part of business, labor, governments and media serving the public at large. In response, data, surveys, and reports on the subject grow exponentially. Much of this work is ephemeral and some is weak, but there is also much that is good and useful. However, the available data leave much to be desired, in large part because of false economies imposed by short-sighted legislatures on governmental statistical agencies.

2. Disasters, Crises, Shocks

The oldest explanations of macroeconomic instability are most likely those that relied on natural disasters destroying or wasting resources. They are best exemplified by the biblical droughts and plagues, if you will, a sort of quasi-periodic "supply-side" events. Sunspot cycles come closest to this type of theory in the business cycle literature, but they were supposed to have some psychological effects as well (Jevons 1884). Early modern age experienced man-made economic disasters in form of "overtrading" and sharp rises in prices of some real or financial assets, presumably caused by speculative excesses and followed by panics, i.e., distress selling at rapidly falling prices (e.g., the Tulip Mania of 1625 -37). Such *crises* had been observed long before the introduction around the mid-19th century of the concept of a business (or trade) cycle.

Indeed, episodic explanations depending heavily on financial crises and other external disturbances may have been fairly appropriate for the era before the great technological innovations and industrial revolutions beginning in the second half of the 18th century. Production then involved for the most part processing of raw materials by labor and household provision of goods for use. Consumption suffered in times of war and natural disasters but otherwise was relatively stable. Thus short and random fluctuations in trade and inventories may have accounted for most of economic instability. In any event, pre-1800 fluctuations in England were generally not thought of as "cyclical" but attributed to noneconomic causes and commercial or financial "crises" (W.R. Scott 1912; Ashton 1959). The first references to a multi-stage "cycle of trade" and to "periodic commercial crises" were made respectively by Lord Overstone in 1858 and Clement Juglar in 1862.

Theories by the classics of business cycle literature, from the 1890s through the 1960s, concentrated heavily on internal dynamics of capitalistic economies: how their component activities interact in the successive phases of the process, with what differential timing and intensities, and why. Thus they were primarily endogenous, aiming to show how booms generate excesses and imbalances that tend to be reduced in slowdowns and moderate recessions and how more severe downturns create distortions that tend to get corrected in recoveries. The most interesting of these theories saw the business cycle as intricately linked to longer-term real growth trends and involving nominal and expectational variables as well. External events were generally viewed as influencing the outcomes of this process of cyclical growth and sometimes modifying it importantly but as being as a rule secondary to the interplay of the internal economic factors. The best assessments of this literature approved of the evolution from exogenous "crisis" theories to endogenous "cycle" theories as a path of progress (Haberler [1937] 1964).

In contrast to the various historical theories of essentially self-sustained cycles, most of the very recent models of business cycles rely much more on outside factors and random shocks and much less on the inside dynamics of the actual economy. These models are mainly exogenous in that they depict an economy which, though dynamically stable (any single shock would produce only a damped, self-terminating oscillation) keeps fluctuating when subjected to a stream of random disturbances. The notion that the economy's "propagation mechanism" converts highly erratic "impulses" into recurrent movements of expansion and contraction has been formalized in the very influential paper by Frisch (1933) with several important intellectual predecessors (Wicksell 1898; Slutsky 1927; Pigou 1927). The idea has a correct and important kernel but, as so often happens, its widespread uncritical adoption led to unwarranted generalizations and distorted beliefs.

The valid core is simply that all economies are exposed to all kinds of shocks, some of which are undoubtedly important. But most of the truly external changes are small and dispersed, with effects that are in large part weak and/or canceling each other. Most of these events are not strictly exogenous; indeed, there are few identifiable important factors that affect

the economy but are not affected by it. Moreover, it is hard to think of external changes that could by themselves produce the pervasive, persistent, and recurrent movements that constitute the business cycle as well as account for both its many observed regularities and disparities.

What the theory needs is a dynamic model of interdependent markets reacting in particular ways to a variety of impulses. The model should be representative of a growing industrialized economy with both competition and imperfections of structure and knowledge. If such a model, which would necessarily be complex to be sufficiently "realistic", could be approximated, it would probably simulate well the observed trend and fluctuations with some help from outside factors but without requiring any particular type of shocks. In sum, a comprehensive and satisfactory theory of business cycle can be neither purely exogenous nor purely endogenous. Nonlinear limit-cycle models, which do without a stream of shocks, have questionably unstable moving equilibrium paths and unrealistically near-periodic cycles. The newer deterministic chaos models produce random-looking but often excessively volatile fluctuations and are so far lacking good economic foundations. So outside shocks must not be dispensed with but neither should they be viewed as the sole or even main "causes" of major economic fluctuations.

3. Instability in an Ideal World

The shift from mainly endogenous to mainly exogenous business cycles theories is closely related to several trends in recent thought. Most basic is the sharpened version of the old general-equilibrium theory, where prices are taken to balance supply and demand in all kinds of markets more promptly and more generally than was typically assumed in earlier macroeconomic applications, even by economists of strong classical bent. Thus the "new classicals" see wages and prices as completely flexible and believe that flexibility to be always a welfare-enhancing attribute of perfectly competitive markets.

Other assumptions complement that of wage/price flexibility in a radical vision of a perfectly competitive world in which the individual consumer is sovereign and all private

economic decision makers, having full access to all relevant information, maximize expected utility. In deterministic models, this means perfect foresight; in stochastic models, it means rational expectations. The latter denote ideally expectations that are essentially the same as the (presumably correct) predictions of economic theory (Muth 1961) but at the very least expectations that are consistent with the model used and free of any unjustifiable systematic errors. In addition, money is neutral, that is, those economic decisions that matter--on work, consumption, saving, investment, and the like--depend exclusively on real, i.e., non-nominal and non-monetary factors.

Probably many economists see this world as an ideal one, few as a good model of reality. Of the many interesting questions that may be pertinent here, I wish to consider only one: Can an economy of the kind just sketched out produce fluctuations approximately similar to the business cycles of historical experience?

A quick and premature answer would be a negative one which relied simply on the notion that in the envisaged economy full employment would be maintained at all times by prices and wages equating demand and supply instantaneously in every market for products, capital, and labor. Hence fluctuations of prices broadly defined would largely replace fluctuations of quantities which define the business cycle. Even though there is much logical truth to these statements, it is in principle possible to construct models in which shocks to technology or tastes or both would be the driving force behind growth punctuated by transitory declines. These real shocks would presumably have to be serially correlated to cause persistence of the resulting movements in the economy's output and mostly benign but recurrently adverse to cause long rises and shorter downturns. Indeed, in the recently most active class of equilibrium models, the so-called "real business cycle" (RBC) models, it is primarily the exogenous shifts in technology and associated shocks to productivity that generate cycles (Kydland and Prescott 1982).

Most economists would agree that tastes and technology are, along with initial endowments, the basic exogenous data or primitives which influence any economy. True, reverse effects exist, e.g., advertisers try to shape tastes and inventors are mindful of markets' needs for innovations, but the main direction of influence is taken to be from preferences and

technical processes to economic decisions, not the other way around. On this premise, attributing the dynamics of the economy to, say, technological disturbances provides a *causal* interpretation of business cycles, which seems to be a general theoretical requirement favored by many economists nowadays.

The shocks to technology are partly transitory and partly permanent, which creates a signal-extraction problem: it is difficult to determine in real time how much of any shock is transient. A favorable transitory disturbance enhances production, the demand for labor, and the present real wage relative to the future expected real wage. The perceived jump in the return on the current work induces a strong increase in the amounts of labor and effort supplied because people readily postpone leisure (whose substitutability over time is believed to be high). A favorable permanent shock to technology leads firms to invest in new capital so as to raise future output, but the process involves a sizable lag. This "time to build", along with the serial correlation of the shocks, helps to explain the persistence of fluctuations. Unfavorable shocks have the opposite effects. Thus employment, output, and investment should all display procyclical movements superimposed on long-term growth trends due to technical progress implemented with secularly growing quantities of labor and capital.

In the aggregate RBC model large upward and downward shifts in the overall productivity of labor are required to exert strong influence on the total demand for labor. The supply of labor must be highly elastic to transitory changes in real returns to the work effort. All of this is necessary to generate expansions and contractions of cyclical dimensions in total employment and output in response to sufficiently large procyclical movements in real wages and real interest rates. Strong shocks must compensate for the weakness of the propagation mechanism in equilibrium models which make no distinction between actual and potential output (and between unemployment and leisure), hence allow no multiplier effects.

That capital goods take time to build, that is, inputs from more than one period, is not the only "friction" that can improve an RBC model as an approximation to reality. Thus, the assumption of "indivisible labor", where workers must supply the standard number of hours to be employed, results in the total number of hours worked being relatively more and productivity

less variable, which gives a better fit to the data (Hansen 1985). But such devices are alien to the basic principles of equilibrium analysis (consistent pursuit of self-interest by individuals maximizing expected utility and continuous market-clearing by flexible relative prices) so they are often criticized as arbitrary and unnecessary (Black 1995).

There is no compelling reason for the RBC theory to rely exclusively on shocks to technology and productivity: temporary shifts in tastes, notably preferences for consumption could be just as important. Other elements consistent with this class of models are disturbances to government defense and other "autonomous" expenditures, tax rates, and relative input prices. However, it appears that no formal models that stress these factors have so far been constructed.

4. The Variability of Prices and Its Effects

The new classical equilibrium models share their strong priors with the basic microeconomic theory. It is owing to the unquestioned adherence to these tenets that both the theory and the models have major achievements in the deductive and logical sphere rather than the empirical and inferential. Of particular interest here is the confrontation of beliefs with observations with respect to (1) price flexibility, (2) money neutrality, and (3) rationality of expectations.

The most radical of these prior beliefs is that economic agents (consumers, workers, investors, entrepreneurs, business managers) consistently succeed in maximizing expected utility or profits. Such optimization is taken to imply that all markets are kept in continuous equilibrium by changes in relative prices (including wages and interest rates).

However, there is much evidence that many prices and wages are sticky, that is, reacting only gradually or with substantial lags to changes in demands and, probably to a lesser degree, in costs. The most persuasive part of this evidence comes from direct and solid observation of various prices (Carlton 1986) and a well-designed interview survey (Blinder 1991). One important set of reasons for limited price flexibility derive from uncertainty and costs of

information about the levels of market-clearing prices, the quality of the priced goods and services, and the temporary characteristics (timing, duration) of price changes. Another set includes the so-called menu costs of price changes, transaction costs, informational asymmetries, advantages of long-term price and wage contracts, and nonprice market-clearing devices such as changes in delivery periods and promotional efforts. The third group of rational grounds for expecting stickiness covers imperfect competition, market power, and unionization.²

Sticky and flexible prices coexist. Long periods of stability may serve well the parties on both sides of a market; if so, stickiness prevails (the diverse examples include salaries of well-qualified career professionals and prices of newspapers).³ Where volatility suits the interests of the traders, as in the organized exchanges for stocks, bonds, and commodities (well-defined or standardized financial and real assets with liquid markets), prices are highly flexible, frequently changing, and continuously quoted. The two categories are quite distinct and their roles in the economy's dynamics differ, which should ideally be recognized in business cycle analysis.

During a widespread contraction of demand, downward adjustments of wages and prices in numerous markets should normally have the combined effect of reducing the decline in aggregate employment and output. This illustrates the stabilizing role of changes in the levels of wages and prices (P). But if the wages and price reductions are expected to persist and multiply, they may well have the perverse effect of further weakening aggregate demand and thus causing employment and output to fall more rather than less. This is the destabilizing influence of movements in the *expected changes* in wages and prices (p^e). The net result will depend on the relative strengths of these two (P and p^e) effects (Patinkin 1948; Tobin 1975; De Long and Summers 1986).⁴

² For a discussion of all these factors, see Zarnowitz 1992, chapter 4.

³ Some price and wage rigidities are not due to market characteristics but imposed by policy regulations or powerful interest groups. These have generally negative connotations, e.g., the high wages and benefits of German workers are widely blamed for high unemployment in Germany.

⁴ It is also possible for greater price flexibility to simultaneously increase the output variance due to demand shocks and decrease the output variance due to supply shocks (Driskill and Sheffrin 1986).

In the textbook aggregate macroeconomic model, flexible (sticky) prices are represented by a steep (flat) aggregate supply (AS) curve. The steeper AS, the less real activity will fluctuate in response to a *given* range of fluctuation in aggregate demand (AD), so flexible prices are stabilizing. However, this case considers the P effect only: if prices decline in a recession, people's money and net worth will have greater purchasing power. But there may also be a p^e effect such as to *widen* the range of variation in AD: if a deflation of wage rates and prices is expected, incomes will be at risk and buying will be curtailed.

More price flexibility could contribute to fluctuations in the bond market which clearly has strong adverse reactions to any sign of rising inflation. Thus, in the United States, bond yields are positively associated with lagged values of an index of industrial materials prices which are very sensitive and cyclical, tending to rise in booms and fall in slumps.⁵ Now, before the onset of the long inflation dominant in the post-World War II period, the index of U.S. wholesale prices behaved much like the prices of industrial materials and other traded commodities still behave, that is, it was cyclically quite flexible in the downward as well as upward direction. During the last quarter of the 19th and the first of the 20th century--the heyday of the gold standard--wholesale price indexes in Britain and the United States fluctuated widely with downward trends to 1896-97, upward trends to 1920, and declines thereafter, showing high positive correlations with the corresponding bond yield series, which they typically led. These huge up and down movements in the levels of prices and interest rates must have contributed greatly to the large economic fluctuations of the period which witnessed major deflationary contractions in the 1870's, 1890's, 1907-8, and 1920-21 as well as the inflationary upheaval of World War I.⁶

Several conclusions emerge. (1) Not all prices are (or indeed can or should be) entirely flexible, even under perfect competition. The disaggregate Walrasian general equilibrium model

⁵ I refer to yields on 10-year and longer Treasury bond yields and the *Journal Of Commerce* Industrial Materials Price Index compiled by Columbia University's Center for International Business Cycle Research (CIBCR). When the CIBCR index is taken to lead the bond yields by 1-6 months, squared correlations (R^2) clustered near 0.6+ are obtained for the period 1955-96.

⁶ On the high correlations (often 0.8+ and +0.9+) between the historical movements of wholesale prices and bond yields, and on the difficult problems of their interpretation, see Irving Fisher 1930 and Macaulay 1938, chap. VI.

demonstrates the logical principles and aesthetic values of an abstract competitive model with full flexibility, but its applicability to useful study of the dynamics of modern economies is very limited. (2) Flexible market prices tend to move together in waves resulting in inflation and deflation. Inflation is at times relatively steady but more often either definitely increasing or definitely decreasing (disinflation). Sticky prices generally also participate in these trends but more sluggishly, contributing to the great diversity in timing and amplitudes of these diffused price movements. In highly aggregative models, all or most of this diversity is lost but the overall movements of prices and wages may retain important roles. (3) Inflation, unless mild and short or stable and tolerated, is usually destabilizing. Policy measures to counter inflation are often even more so. Moderate inflation may have some temporarily stimulating effects. On the other hand, deflation, again except when very mild or short, is likely to act as a potent depressant. It follows that genuine price level stability is highly desirable; unfortunately, periods of generally stable prices are historically rare and short-lived.⁷

5. Money in Models and Reality

The large price-level movements, which as argued above can and often do strongly affect the course of general economic activity, must be significantly if not predominantly of monetary origin. This alone would assure that money matters for business cycles. But there is also voluminous evidence from economic history and international comparisons which points to links between money and real aggregates (output, employment).

Thus, an early pioneering analysis by founders of modern monetarism concluded that in the United States periods of high growth in the quantity of money have long alternated cyclically with periods of low growth, giving rise to peaks (troughs) that tended to precede the onset of business contractions (expansions). To reconcile such findings with the tenet of money neutrality, Friedman and Schwartz (1963) argued that money has real effects in the short run only; in the long run, its effects are purely nominal, i.e., on the level of prices broadly defined.

⁷ Over very long time periods, waves of inflation and deflation may largely offset each other as in the United States before World War II. This may be preferable to the long drawn-out inflation that ensued but is obviously not to be considered as a single era of price-level "stability".

But the "short run" was here long enough to include the business cycle, as expectations were taken to be adaptive, allowing for a time-consuming process of error correction. (Also, interference with competitive markets limited the rule of efficient flexible prices.) Indeed, the monetarists attributed business cycles primarily to money supply shocks treated as exogenous and due frequently to blunders of monetary policy.

Under the maintained postulates of the neutrality of money and rational expectations, all systematic monetary changes are correctly anticipated so that they can have only nominal effects by causing changes in the general price level. However, in an early equilibrium model which assumes lagging, hence on a current basis incomplete information (Lucas 1977), random monetary shocks cause price-level variations that are misperceived for relative price changes. These money and price surprises take time to be recognized and (in some feasible degree) corrected but in the meantime have strong real effects on the premise of high intertemporal substitution of work effort and leisure. As a result, employment, output, and real investment all fluctuate in response to the partly error-contaminated changes in relative prices and real rates of return.

This equilibrium model is monetary, since it has random variations in the stock of money act as the original source of business cycles. It does employ some real propagation devices such as lags in the demands for production factors and a kind of investment accelerator (Lucas 1975) which are questionable (Zarnowitz 1992, pp. 58-59). However, the main objection to this model is that it requires lengthy informational delays. The fact is that U.S. data on money and prices are available frequently at low costs: there is no reason why they should not be used promptly in the marketplace. Indeed, quick and efficient exploitation of such critical information is implied by the postulate of rational expectations. Empirically, the hypothesis that only unanticipated money changes have real effects has found favor in some early studies but was later rejected by most reported tests.⁸

⁸ See Barro 1977, 1978; Barro and Hercowitz 1980; Mishkin 1983. For a comprehensive and incisive appraisal of both the monetary and real business cycle models of the new classical macroeconomists, see Hoover 1988.

Completing the retreat from monetarism, the early RBC models just ignored money along with the government (Kydland and Prescott 1982; Long and Plosser 1983). The alternative to ducking the issue was to make money respond passively to fluctuations in real activity. This was done by arguing that monetary services vary with total output and hence so do the bank deposits ("inside money") which provide these services and can be viewed as an input to the production process (King and Plosser 1984).

Ironically, at the same time that the temporarily dominant RBC theory was being developed, the most popular view in the media, and indeed in statements of some much quoted political economists, was that the domestic source of business cycles is monetary (an alternative foreign source being the oil price hike). In the U.S. of the mid-1990s, a business downturn again would seem a remote event, not to be expected unless the Federal Reserve drives the interest rates up to counter another threat of higher inflation (or unless an energy crisis occurs because of another Arab oil embargo or Gulf war).

The idea that money is much of the time accommodative or passive is an old one (shared by some Keynesians with some of the new classical macroeconomists) and not without support from the data. But the assumption of full endogeneity of money is just as arbitrary and unfounded as the opposite extreme assumption of full exogeneity of money. Thus the Fed, when persuaded or desirous to keep the interest rates stable, essentially abdicated its control over money supply and influence over macroeconomic activity, as during the periods of pegged and then targeted rates during and after World War II. In contrast, at other times the Fed took strong restrictive measures to combat inflation, which almost certainly had much to do with the recessions that followed, the best recent example being the Volcker policy of sharply lower money growth and higher interest rates in 1979-80.

Even in cases of definite policy interventions, however, other external factors and internal developments contributed critically along with the monetary shocks to the process culminating in recessions and recoveries. Thus interest rates typically rise in advanced stages of expansion, driven by strong credit demands by business, investors, and consumers as well as the financial markets' fears of inflation. Overconfidence breeds overindebtedness, then retrenchment. Growth slows down, profit margins and rates decline, loans are increasingly rationed to smaller and more risky borrowers, and debt refinancing, asset liquidation, and business and personal failures all

increase. Monetarists have long stressed the stability of the demand for money but in the early 1980s money velocity fell steeply, contributing much to the declines of U.S. output and employment in 1980 and 1981-82.

In the late 1980's after the Fed helped contain the consequences of the October 19, 1987 stock market crash by allowing banks the next day to borrow freely from itself, monetary policy and credit conditions tightened. Beginning to face up to the increasingly recognized need to reduce the huge U.S. government deficits, the Treasury's fiscal policy tightened as well. A lengthy slowdown of growth in output and employment, real income and sales ensued, but a recession was avoided for over a year even after short interest rates peaked and the yield curve inverted. This unusual behavior of the rates, which often lag, confounded on this occasion forecasts based largely on interest-related data (Stock and Watson 1993). Finally the much weakened expansion ended when Iraq invaded Kuwait and oil prices surged, increasing fears of inflation and depressing business confidence and consumer expectations. So this recession, like others in general, was brought about by a process involving real, monetary, and expectational variables; it should not be reduced to the effect of a single shock such as the rise in oil prices.⁹

The recovery that according to the NBER began in March 1991 was very weak so that atypically U.S. employment stagnated and the unemployment rate rose for another year. The growth rates of broad money supply (M2) and consumer prices fell during the recessions and recovery, and so did the U.S. Treasury bill rates and bond yields. The longer the lags of interest rates at troughs, the longer tend to be the expansions (Cagan 1969). In the present cycle, the prime rate and the bill rate did not turn upward until about three years after the 1991 trough, and this expansion has indeed already outlasted all but two of the eight previous post-World War II expansions.¹⁰

One of the common characteristics of the long U.S. expansions is that each of them was interrupted by at least one major growth slowdown, which probably acted to prolong them. (Two such "refreshing pauses" occurred in the 1960's.) The current expansion is no exception, having experienced three quarters of very low, though still positive, growth in 1995 followed by

⁹ A similar conclusion can be drawn from analyses of earlier business cycles in the United States: see Zarnowitz and Moore 1977, 1981.

another huge credit expansion, long bull markets in stocks and bonds, mutual funds to feed money into these markets, and lots of speculation.¹¹

The faith that the stock market will continue to go up and its downturns will not last (and hence will offer good buying opportunities) must eventually be based on the premise that the Fed can and will prevent bear markets by acting as a lender of last resort. But surely this is unjustifiable. The now acknowledged basic mission of the central bank is to combat serious inflation of consumer and producer prices, not to assure an indefinite inflation of financial or real asset prices.

How should expectations be treated in an approach that would promise to be useful for the study of business cycles? Bond traders have exceedingly short horizons and an overwhelming interest in detecting early any changes in inflation and how such signals will influence prices and yields. In contrast, company managers planning to invest in new plant and equipment want long-term forecasts of prospective revenues, costs, and returns, which depend mainly on changes in real economic conditions. Workers and consumers need medium-term projections of measured and permanent incomes after allowances for taxes and costs of living. Potential conflicts of interest exist in governmental and private prediction and decision making, e.g., economic consultants may be influenced by optimistic bias of their business clients or conversely may seek to stand out and so produce eccentric or "rationally biased" rather than optimal forecasts (Lamont 1996).

An analyst who recognizes the importance of these distinctions and wishes to take account of them might try to make all such expectations consistent with his model and in this sense "rational." This would be an ambitious exercise and illuminating insofar as it succeeded to create a model with some realistic and interesting features. But in a model that is uninformative there is no reason to pay attention to expectations even if they are fully model-consistent.

Thus, the consistency criterion leaves the concept of rational expectations too general to be useful, unless a substantial consensus exists that the model in question has merit. A more objectively testable definition is that rational expectations are unbiased and subject to random errors only. Here great many tests using data from surveys of professional forecasts and business and consumer expectations have been reported, based on regressions of actual on predicted

¹¹ For an eminently readable and well researched account of how financial markets work and a strongly argued view that the bull market of the 1990s must yield to a bear market just as booms must yield to busts, see Grant 1996.

improved performance in 1996. This episode is widely believed to exemplify a successful "soft landing" accomplished by monetary policy moves. The Federal Reserve has in fact raised the federal funds rate repeatedly by in 1994, then lowered it once early in 1995, this time not waiting for substantial increases in actual inflation (which never came) but acting when some leading indicators and expectations of inflation rose and bond prices fell. However, some of the countercyclical Fed policies misfired in the past, helping to convert slowdowns into recessions, and by no means all of those past slowdowns that issued in renewed expansion were the work of the Fed.

6. Markets and Expectations

Mild and short domestic recessions (such as the one in 1990-91) are soon forgotten by the American public, and foreign recessions without strong adverse home effects draw but limited attention even when they are quite serious (such as those in Germany and Japan during the 1990's). On the other hand, periods of prosperity accompanied by reasonably stable prices of goods and services but rising prices of assets generate widespread optimism that such conditions will long prevail--in other words, that the economic and financial cycles have been somehow eliminated. So it was in the mid-and late 1920's and in most of the 1960s, and so it is again now in the middle third or half of the 1990s. What is rather novel lately is the apparent faith of many, including people in responsible business and government position, that for stability to reign (1) real growth must be moderate or less and (2) prices of goods and services must rise slowly if at all, but (3) prices of financial assets can rise indefinitely.

It is not clear how this program, enforced by tight monetary and fiscal policies with some selected micro interventions, is supposed not only to counter financial crises but also to prevent economic downturns. It is certainly consistent with large allocational shifts that so often occur in expansions with distorting effects (e.g., in mid-1990s US retail stores seemed to be in oversupply, semiconductor plants and their products in shortage). What is being promoted is

¹⁰ At 69 months counted through December 1996, however, the current U.S. expansion still has some way to go before matching the longest and the second longest expansions, in 1961-69 (106 months) and 1982-90 (92 months), respectively.

values. The evidence from these observations as well as indirect statistical tests is mixed but in large measure unfavorable to forecasts of inflation (which have drawn most of the analysts' attention), more favorable to forecasts of other, predominantly real variables.¹²

The hypothesis (not an axiom) of rational expectations receives some support from the argument that efficient collection, sale, and use of valuable data promise to be profitable, whereas lapses from such informationally valid activities are likely to prove costly. However, this only means that people have incentives not to adhere to expectations that are revealed to be systematically wrong but to learn from and eliminate such errors. It does not mean that the data and models we have are good enough to insure that in fact systematic errors are altogether avoided. The economy is changing in ways that are often difficult to detect let alone predict; people's capacity to absorb and exploit new information is limited; and learning takes time. Simply put, even though everyone did their best not to make costly non-random errors, some will commit such errors and will be disappointed, at times even repeatedly.

Rational plans of individuals, moreover, need not be collectively consistent, and, if they are not, then a unique and stable equilibrium over time with market-clearing prices will not exist. Optimal learning may proceed while expectations are adaptive. Reported predictions generally include both extrapolative "backward looking" and autonomous or model-generated "forward looking," components in varying combinations.

Even under the extreme assumptions of perfectly flexible prices and wages as well as perfect foresight (which, however, is limited to the short term), a recently much used type of model can produce surprisingly unstable and adverse conditions, with deflation, a rising real interest rate, and declines in investment and output.¹³ When the assumptions are gradually relaxed, permitting first some stickiness in wages, then increasing returns to scale and imperfect competition with expectations about demand, prices, and profits that can be in error, transitory and then more persistent unemployment emerges as well as fluctuations in output and

¹² For a discussion with long list of references, see Zarnowitz 1992, pp. 60-65, 463-469, and 489-491. Additional studies and surveys include: Lucas and Sargent 1981; Mishkin 1983; Holden, Peel, and Thompson 1985; Lovell 1986; King and Dotsey 1987; Miller 1994; Stadler 1994; Tichy 1994; Webb 1994.

¹³ See Hahn and Solow 1995, an immanent critique of new classical macroeconomics. Theirs is a two-period, no-bequest overlapping-generations model with outside money and bonds issued by firms. This formalization is, of course, highly abstract but the authors argue persuasively that it is far superior to the "aggregate" Walrasian model of a single, immortal, utility-maximizing "representative agent" (see also Kirman 1992). The latter model, favored by some real business cycle theorists, precludes the consideration of all major macroeconomic problems such as depression, high unemployment, and persistent inflation.

employment. Expectations can become self-confirming and multiple equilibria (paths over time) are obtained, depending on the beliefs (predictions, theories) held by the economic agents.

7. Methods and Substance

The methodology of general equilibrium modeling with rational expectations proved highly attractive to the profession recently, particularly to younger economists with strong predilection to rebuild macroeconomics on classical microeconomic principles. Yet it should be clear by now that at least the highly aggregative models in this class found little supporting evidence in the data and little favor with practical forecasters, economists, and decision makers in business and government. Neither real wages nor real interest rates show much cyclical sensitivity. On balance, a variety of tests failed to detect high intertemporal substitution of leisure. They also were unable to identify shocks to productivity of sufficient size and frequency to account for a high proportion of the observed output fluctuations. It is easier to link technological progress and innovations to much longer waves of economic growth than to business cycles. There is simply no large-scale recurrent technological regress.¹⁴

Microeconomics draws strength from using certain strong principles to analyze the behavior of diverse units (a market, a firm, a worker, a consumer) under well-defined settings, motivations, and constraints. Although the new macro models claim the advantage of having solid microfoundations, they are in practice implemented by assuming total uniformity of these units, the endowments they have and the conditions they face. The representative-agent modeling approach reduces all markets, firms, workers, and consumers to a single self-perpetuating source of all expectations, plans, and decisions with given resources, tastes, and technology. The outcome of this maximum aggregation cannot *prove* what it had already *assumed*, namely that all economic instability can only be due to inevitable variations in the data-tastes and technology - to which the all-rational planner responds optimally. There is no true social organism here and no possibility of anything dysfunctional. But this can hardly be a

¹⁴ The procyclical movement of the "Solow residual" (from the aggregate production function that assumes perfect competition and constant returns to scale, see Solow 1957) constitutes no valid evidence to the contrary. Instead of being a proxy for exogenous shifts in technology, these residual estimates probably reflect in the main the effects of labor hoarding and measurement errors (see Mankiw 1989; Eichenbaum 1990). For a discussion of the tests noted above, with numerous references, see Zarnowitz 1992, chaps. 1 and 2.

proper microeconomic framework for the study of business cycles, inflation, or any other serious ill or problem of economic and social nature.

A further methodological difficulty concerns these tests of real business cycle models which use calibration, that is, compare the first and second moments calculated from the models with the corresponding statistics in the data. These are weak and unreliable tests, particularly when additional, often more arbitrary and extreme assumptions are made just to get better-matching moments. More rigorous econometric tests of the likelihood of the parameters suggested by the new equilibrium theories are avoided by some of the proponents of the latter. The procedure amounts in some cases to a rejection of valid evidence that is inconsistent with one's theory: a model is accepted mainly because of some strong prior beliefs, despite weak support from the data.¹⁵

On the positive side, the debate about the market-clearing vs. the older models of business cycles stimulated much useful work on the nature and role of shocks to the economy. Study of seasonal cycles and their interactions with business cycles suggests that demand shocks (shifts of preferences) are important along with the stickiness of many nominal prices and perhaps some relative prices (Miron 1996). Foreign influences via shifts in exports and terms of trade (oil shocks) can at times have strong effects in all open economies, large as well as small (Hamilton 1983). Disturbances affecting the cost and availability of credit are now added to and distinguished from shocks to the supply and demand for money via a more detailed analysis of interest rate and relative asset price effects (Federal Reserve Bank of St. Louis 1995). All in all, the variety of the shocks is bewildering: small and large, nominal and real, random and correlated, transitory and permanent, adverse and benign.

Most of the studies focus on a single type of shock which thereby looks especially important. However, any approach that aims to be reasonably inclusive and realistic must at least consider multiple shocks. For example, real shocks move the IS curve, nominal shocks the LM curve, and both the aggregate demand (AD) in the familiar textbook model. Shocks to technology, the production function and relative input prices move the aggregate supply (AS). Fiscal policy affects IS, monetary policy LM, and hence, again, both affect AD. But through their effects on the price level the disturbances that influence, say, IS directly move LM

¹⁵ This is correctly denounced as an unscientific attitude, which is nevertheless implicitly adopted by many economists. See Mishkin 1995 on Prescott 1986.

indirectly and *vice versa*, so real and nominal shocks interact. Also, all types of shock will in most practical cases affect over time both sides of the market (e.g., technical change first supply, later demand; change in tastes first demand, then supply). It is therefore difficult to separate their effects on output and the price level.¹⁶

That economic fluctuations have multiple sources is an old idea (endorsed early by Mitchell 1913 and Pigou 1927, for example), which is being rediscovered and documented in some recent writings. Simulations of macroeconomic models generally assign the largest weights over the cyclical frequencies to demand shocks (particularly the changes in the most sensitive sectors of business investment, housing, and durables consumption). Fiscal, monetary, and supply shocks may account for about 30% - 40% of the variance of total output (Fair 1988).¹⁷ As the horizon lengthens, the supply shocks are sometimes found to increase in relative importance at the expense of the less persistent demand shocks (Blanchard and Watson 1986).

My own long-held view is that the clue to the understanding of business cycles lies in the identification of their critical constituents and determination of how they evolve and interact, and why. What tends to happen during the successive phases of these historically recurrent but varying and changing fluctuations is far more important than what event or what kind of disturbance may have helped to trigger a particular dramatic episode, which in this process is typically the downturn in total output and employment, or perhaps a financial crisis. Several observations support the argument that the recent emphasis on outside shocks is excessive and possibly distractive, while the old emphasis on internal factors and their relations is probably more appropriate in the sense of promising to make the study of business cycles more productive.

First, there is no independent evidence that certain classes of events can and in fact did repeatedly act as *aggregative* shocks so as to give rise to business cycles of historical experience. This applies to shifts in technology and tastes, which are generally small innovations with differential sectoral or local effects, often gradually diffused over time and anticipated to some extent. Only a few isolated disturbances of related nature have been identified as major

¹⁶ The IS/LM model evolved from Hicks 1937 and Patinkin 1954. IS and LM relate output and interest rates, AD and AS relate output and the price level. The model accommodates some Keynesian and some monetarist views, depending on the assumed slopes of its basic functions, but is entirely rejected by the new equilibrium theorists. The IS/LM, AS/AD analysis is mainly static but some dynamic versions of it have been worked out.

¹⁷ Interestingly, productivity disturbances are credited with no more than 35% -44% of output fluctuations in a study based on a cointegrated vector autoregressive (VAR) model in which two real business cycle theorists participated (King, Plosser, Stock, and Watson 1991).

contributors to specific business recessions, the large oil price increases of the mid-and late 1970s providing the one familiar example of international scope. Most random shocks of any type are presumably small, and their cumulated effects should be either local and transitory or resembling frequent and fairly regular oscillations more than business cycles. Large shocks such as wars, major strikes, and financial crises have had different macroeconomic effects at different times and in different places.

Second, it is remarkable that the same variables have dominated the observation of and the thinking about business cycles for a long time in many different countries: profits (rates, margins, totals); investment (in plant and equipment, inventories, housing, and consumer durables); money (stock, rate of change, velocity); credit (particularly from banks and, increasingly, other financial institutions); interest rates (short, long, the yield curve); and assets (real and financial, values and prices). This is because these are, in fact, variables that are highly cyclical and that have been repeatedly found to interact and influence other factors in ways important to the dynamics of market economies. Consider the old monetary and real overinvestment theories, the vertical and horizontal maladjustments resulting from unstable credit and interest fluctuations, the cost-price-profit imbalances, the multiplier-accelerator models, and the theories of how investment and financial markets interact under uncertainty about future costs and returns. In all of these, the stress is on the nexus of profits, investment, and credit, broadly defined. The largely endogenous theories so important in the past have understood the central role of this dynamic interplay better and dealt with it more directly and sensibly than the new exogenous shock theories.

Third, the endogenous business cycle models do not depend on outside shocks (which are often unobserved and unexplained) but do require lags and/or nonlinearities. Studies of cyclical indicators in the old and rich tradition of the National Bureau of Economic Research (NBER) have documented that timing sequences with persistent, though variable, leads and lags are characteristic of many of these series, in the United States and elsewhere. Some indicators tend to lead, others coincide, and still others lag at turning points in economic fluctuations and relative to each other. The NBER approach to the indicator analysis has long been applied in many research centers, including CIBCR in New York and the Ifo Institute here in Munich, with results that are for the most part reasonably consistent over time and across countries. There is also growing evidence that parameters of various relationships in econometric and time series models

vary in different cyclical phases, suggesting the existence of nonlinearities.¹⁸ There are asymmetries, irreversibilities, and discontinuities in cyclical behavior that are best handled by nonlinear or at least piecewise-linear models.

8. Trend-Cycle Interactions

One of the main ideas of contemporary equilibrium theorists, namely that growth trends and business cycles are interrelated and have common causes, is intellectually very attractive and most likely to prove essentially correct, though much of the work needed to test it lies ahead. The idea has deep roots in the literature, e.g., in the writings of Mitchell and notably Schumpeter. But its implications are not well worked out here. In some real business cycle models higher growth is associated with more instability: when people invest in riskier long-term projects expecting higher returns, faster but more volatile growth results (Black 1987). However, intertemporal comparisons indicate that periods and countries with relatively *high* growth had relatively *low* instability. Thus the 1950s and 1960s witnessed slowdowns or mild and short declines replacing major downturns in many fast growing countries, most conspicuously West Germany and Japan, whereas during the more sluggish second half of the post-World War II era more severe recessions reappeared in these and other developed economies. Long historical data for the United States also show that in periods when the average growth rates in total output were high, their standard deviations were low and *vice versa*.

The arguments why this should be so run both ways. When the average growth rate is, say, 6% p.a. a drop from 8% to 4% is apt to be felt like a descent from good times to bad times, even though it is in reality just a transition from a boom (which may well be overheated and inflationary) to more moderate but still fine growth. Indeed, not so long ago such a development would be treated as a recession in Japan. In contrast, consider a country or a protracted period with an average growth rate of, say, 2%: here a decline of the same size, from 3% to -1%, would mean a true, if mild, business cycle recession, with very different, namely much more adverse social implications. In sum, cyclical setbacks of a given depth, duration, and diffusion are much less painful and much easier to take when the growth trend is high than when it is low.

¹⁸ See, e.g., Montgomery, Zarnowitz, Tiao, and Tsay 1995; also, comments and references in Zarnowitz 1992, pp. 196-98, 254-56.

Moreover, the high upward trend implies high investment that is relatively stable in response to the expectation that demand will be sufficient to keep the economy near full employment. These conditions would also favor low cyclical (and overall) instability.

The chain of influence in the opposite direction is no less important. Large business fluctuations can have high long-run costs insofar as they raise volatility and uncertainty, which causes investment to be suboptimal. Firms may invest in undersized plant and/or work force and commit to technologies that turn out to be too costly (cf. Ramey and Ramey 1991). A severe recession, let alone a depression, can discourage risky long-term investment, hence reduce prospective growth.

It is still true (and entirely consistent with the preceding) that the vigor and length of an expansion may owe much to investment projects undertaken when optimism reigns and entrepreneurial spirits soar. Some of these projects, notably the risky long-term ones, will thrive only under conditions of high demand and easy financing, and they will fail, perhaps in the next contraction. This may add to both the variability and the average rate of growth in the short run, say, within a business cycle or two successive cycles.

Charts of the course of general economic activity as represented by composites of coincident indicators (output, employment, real income and sales) show clearly that over longer periods high growth is indeed associated with more effective resistance to downturns than low growth is. This applies not only to mature economies such as United States and Germany but also to developing economies or "emerging markets" (as the now popular term has it). For example, Mexico in the 1980s and 1990s had both low growth most of the time and three bad recessions. Argentina in the "lost decade" of the 1980s suffered stagnation as well as three severe recessions.

9. On Aggregation and Its Costs

Contemporary formal models of business cycles are highly aggregative, presumably in large part because of the need for manageable simplicity. Full articulation and transparency of small models are highly prized nowadays. But these attributes, though valuable as such, also have high costs since they render the models unable to deal with the diversity of causes and consequences of economic instability.

In fact, human capital and financial capital endowments vary greatly, wealth and income distributions are very unequal at any time but subject to large and partly systematic intertemporal changes, and workers, firms, markets, and products are all quite heterogeneous. Some prices are flexible, others rigid; the degree of competition is high in some places, low in others; costs of transactions, information, and knowledge differ within and across markets. The related distributional changes may have important implications for macroeconomic dynamics.

This has long been asserted in several theories. Thus, according to the old idea of “underconsumption,” people with high incomes have higher propensity to save and lower propensity to spend than people with low incomes, and the contrast is extended to property vs. labor incomes. As a result, it has been argued, consumer spending may be inadequate to support full employment and saving may outrun investment. Greater inequality reduces aggregate demand and output.¹⁹

Another example of distributional shifts that may well be important is the transfer of wealth from creditors to debtors in unexpected inflation and from debtors to creditors in unexpected deflation. The real burden of debt accumulated during the boom when prices generally strengthen would increase when slackening demand causes prices to weaken. This would result in cutbacks of credit and activity coupled with rising delinquencies and failures. The effects would be the stronger the greater the procyclical flexibility of prices and the higher the propensities to borrow, spend, and invest by businesses and individuals who tend to be active debtors (cf. Irving Fisher 1933; also, Minsky 1982).

Thus, disaggregation can be essential for theories that emphasize endogenous processes of spending, saving, and investing or cyclical movements of credit and prices. The “Austrian” stress on the distinction between saving-driven and credit-driven investment, where the former gives rise to equilibrium growth and the latter to the excesses and distortions of the business cycle, also requires disaggregation to reveal the shifts in the structure of real capital and production that are believed to be critical (Hayek 1931). But going beyond the macroeconomic totals to some more detailed categories may be just as important in dealing with the element of shocks. Aggregate shocks, whether to demand or supply or policy, should have no monopoly on

¹⁹ See Das 1993 where some models are developed and some evidence is presented in support of the view that distributional changes interact with aggregate processes so as to produce or contribute to business cycles. However,

our interest with respect to business cycles. Allocative or sectoral types or aspects of shocks, again whether to tastes or technology or particular policies, deserve more attention than they received so far, perhaps particularly from the RBC theories (as emphasized in Black 1995).

It is well to recall, too, that differences and interactions between the economy's parts (activities, industries, sectors, regions) have been shown by empirical work at the NBER and elsewhere to matter greatly for the analysis of business cycles. The endogenous process of transmission and diffusion of local disturbances or shifts across the economy often involves some cyclical tendencies or regularities such as temporal sequences and amplifications. Highly aggregate models that assume homogeneity of economic agents and output, whatever their orientation, cannot accommodate any of these important elements of business cycles.

10. Concluding Remarks

To meet the needs of a normally growing population with normally growing expected living standards, the economy must expand most if not all of the time at a sufficiently high average rate. Recessions interrupt this process as negative growth temporarily replaces the normal positive growth. Their main social costs are the rise in unemployment and the loss of output due to the increased idleness. But they can also have longer adverse effects to the extent that they discourage productive capital investment and lower productivity, thereby reducing for some time the growth trend.

On the other hand, business expansions are themselves a potential source of imbalances and excesses. When relatively cheap credit is readily available, as will often happen during recoveries from a slump, many existing and newly established firms risk to expand their crew, plant, equipment, and inventories. Many of these investment projects will prosper but some will prove to be "malinvestments" (*Fehlanlagen*, in the Austrian School's much used term). The latter will often be revealed as such in recessions and weeded out. In depressions, this process of "creative destruction" gets out of hand and overwhelms the constructive forces of growth for too long.

Speculative excesses leading to financial crises or, in milder form, to so-called credit crunches obviously cause losses to individual investors and traders that may be massive and not

the results are not necessarily robust, e.g., the underconsumption argument fares better under adaptive or static than under rational expectations. See *ibid.* and Zarnowitz 1992, pp. 17-19, for more detail and references.

easily recouped. Their social costs are less obvious but are often high, too, in form of negative effects on investors' confidence, which may depress markets for considerable time, and negative wealth effects which dampen consumer demand and hence in some degree production, real investment and growth. But it should be noted that, while many crashes and crunches occurred during business expansions, some of the worst crises occurred during business contractions.

Let me conclude by noting that this paper traversed a lot of interesting territory in a relatively light manner, since time and space limitations precluded my dwelling upon any of the exposed difficulties. I find that business cycles continue to matter much for a number of good reasons. This is so even though the problems they raise are from time to time (including now) overshadowed by seemingly (but not entirely) unrelated structural and policy problems, which had to be excluded from consideration here.

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