

Theory and History Behind Business Cycles: Are the 1990s the Onset of a Golden Age?

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Some have viewed the current business expansion in the United States as the onset of a Golden Age in which the long-time evils of inflationary booms followed by recessions with high unemployment will never return. It is not surprising that the excellent economic conditions in the mid- and late-1990s—substantial real economic growth, falling unemployment rate, low inflation, and a persistent bull market in stocks—have led to a widespread euphoria. During such earlier notable economic expansions as the 1920s and the 1960s, consumer and investor confidence rose to high levels, as growing numbers of people came to believe that a seismic shift had taken place and great new opportunities were opening up at remarkably low costs and risks. The vision of endless and uninterrupted expansion of total employment, output, real income and wealth is, of course, immensely attractive not only to economists, but to all people of good will.

The happy prophecy of a growing recession-free economy has been ascribed to a number of different changes in the economy, but none of these suggested reasons is fully persuasive.¹ Some of the arguments seem to make the dubious assumption that factors which raise productivity growth must also lead to greater economic

¹ For an affirmative version of the arguments summarized here, see Weber (1997); Klein and Cullity (1998) is a rebuttal, and Weber (1998) is a reply. For extensions of the debate, see the proceedings of meetings of the Eastern Economic Association in 1998 and the American Economic Association in 1999, with participation of Blinder, Boldin, Klein, Stock, Watson, and Zarnowitz. Other related articles include Dornbusch (1998); Zarnowitz (1998a); and several unsigned contributions to selected 1998 issues of the Conference Board's *Business Cycle Indicators*.

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stability. Others exaggerate the reasons why the economy may be more stable now than in the past into a claim that economic instability is now obsolete. All leave ample room for counterarguments.

First, the U.S. economy is allegedly much more stable because of the successes of the recent “downsizing” or rationalization efforts of business management. However, layoffs, cost-cutting, corporate reorganizations and factor reallocations have long been part and parcel of the cyclical growth process; for example, Davis, Haltiwanger and Schuh (1996) discuss in rich detail how job destruction varies greatly over the business cycle, rising strongly in recessions, while job creation varies much less. Clearly, effective labor cost reduction might at first raise unemployment and the share of profits, but later enhance productivity and growth. The same companies that become more efficient through downsizing will then need or want to grow in the future, and so will turn to “upsizing,” from layoffs to hires, from downward to upward wage adjustments. It is not clear why such long-standing frictions associated with cyclical or irregular supply and demand shifts should permanently alter the cyclical growth process, or why any allocative shocks due to changes in business policy should have more than mixed and temporary effects.

Second, some have claimed that the technological breakthroughs in computer hardware and software will assure greater economic stability. Clearly, technological advances have been indispensable throughout the modern era in promoting productivity, economic growth, rising standards of living, and even effective systems of government. But the models that rely on generally unidentified exogenous productivity shocks as the primary explanation of the “real” business cycles, are, I believe, generally lacking in plausibility and evidence (Zarnowitz, 1992, ch. 1–2). After all, most technical changes are localized and gradual, with long half-lives in their adoption and diffusion. In the 1990s, the notable progress in computer technology has certainly contributed to the recent sharp rise in business investment and profits. But a strong productivity-enhancing effect of computers is yet to be documented, and it is not at all clear why and how this particular technological advance should perpetuate the present U.S. business expansion.

Third, inventory control is said to have improved greatly, in a way that will make the economy more stable. This claim has some truth. Movements in inventories do tend to propagate economic fluctuations; for example, an economic slowdown causes a build-up of inventories which then becomes a secondary cause of business output weakening further. The ratio of manufacturing and trade inventories to sales has followed a gradual downward trend in the 1990s, probably thanks to the widespread adoption of just-in-time inventory control systems, which tend to reduce the average stocks of purchased materials and finished products on hand. Leaner inventories are likely to have smaller macroeconomic effects. However, it is also true that business inventory investment in constant dollars was about as volatile and as cyclical in the 1990s as it had been in the past, and volatility in inventories certainly remains large enough to play a substantial role in propagating economic cycles.

A fourth argument is that the share in total U.S. employment of the relatively

volatile goods-producing sectors like manufacturing and construction has declined in favor of the presumably more stable services such as trade, finance, transportation, entertainment, education and government. This shift does tend to moderate business cycles, largely by reducing the weight of cyclically volatile inventory investment. But many services appear to be becoming more cyclical, as they confront growing competition at home and abroad. For example, business and consumer services actually declined in the recessions of 1981–82 and 1990–91, while their growth had merely slowed down in earlier downturns (Fosler and Stiroh, 1998).

Fifth, it is argued that deregulation of financial and other industries has helped to stabilize the economy. One common example harks back to the time from the mid-1960s to the early 1980s, when the Regulation Q ceilings on the interest that could be paid on bank and savings and loan accounts were in place. During this time, when short-term interest rates rose above the ceilings, funds poured from banks and thrifts into direct money-market instruments, which in turn severely reduced the quantity of available consumer and mortgage credit. Clearly, excessive or wrongheaded regulation can harm efficient resource allocation and aggravate economic instability. Also, one can make a strong case that more free competition in banking, airlines, trucking, and other industries has increased productivity growth; and to the extent that relative price flexibility is enhanced, less instability in quantities may be expected. But it seems farfetched to think that more deregulation will deliver large benefits in stabilizing the U.S. economy.

A sixth claim is that we have learned how to use discretionary government macroeconomic policies in a way that reduces or ends cyclical instability. The Federal Reserve has allegedly learned how to forecast inflation and how to avert it by timely increases in short-term interest rates. Fiscal policy is no longer used for discretionary stabilization purposes for which it is unsuited; in the past, it was more often than not misapplied or mistimed, creating at least as much economic instability as it reduced. However, there is no clear support in the data for assertions that government can anticipate business recessions or financial crises, nor that it can avert such events with preemptive action. True, policymakers can and sometimes do ameliorate recessions, but wrong, mistimed, or bungled policies can also destabilize the economy.

Finally, globalization is argued to have reduced cyclical instability. Global markets diminish the economy's dependence on domestic demand by creating new markets abroad for U.S.-produced goods and services. They also open up new sources of supply for raw and intermediate materials, final consumer and producer goods, and labor, with the consequence of reducing domestic inflationary pressures on prices and wages. Capital markets have become increasingly global, too, which was supposed to make them broader and more liquid and to reduce the risk of market bubbles and crashes. But while greater openness of economies can surely bring benefits, it also can bring increased vulnerability. Since the economic debacle in east Asia over the last few years, the attendant risks of financial meltdowns in Russia and Latin America, and the manner in which these dangers have contrib-

uted to volatility in stock markets everywhere, talk that globalization will put an end to business cycles has understandably dwindled.

Where and How to Proceed

The disputes over the prospects for the current U.S. expansion are far from being merely academic: they reopen the fundamental yet unresolved issue of the underlying causes of business cycles. One widespread and recurrent concern about the present, which has long roots in the past, is that expectations of business profits and market returns may be outrunning the economy's potential to deliver. Up to a point, high levels of consumer and investor confidence are self-confirming in their positive consequences. However, high confidence can easily shade into overconfidence, which breeds misdirected or excessive investment. Eventually, the balance of expectations shifts, as people realize that the market fundamentals no longer support the euphoria. The expansion slows, then ends, as spending, employment and output turn down. All of this has occurred repeatedly in the past and there is no compelling reason why it should not happen again.

Believers in the inherent stability of market economies attribute recessions to policy errors and external disturbances. Thus, misguided stimulation by excessively easy credit causes inflation, the belated curtailment of which causes business activity to turn down. Some analysts consider the reactive nature of government actions and other possible shocks but give no attention at all to any endogenous theories (for example, Temin, 1998). On the other hand, those who suspect more systematic instability doubt that the story of the Fed killing each of the recent U.S. expansions is the right and full one. They can point to many domestic and foreign recessions that originated mainly in market developments. Just to take the latest few years, overconfidence, overborrowing, and overinvestment contributed to severe business downturns, financial crises, and incipient deflation overseas, presenting the U.S. economy with new challenges.

However, it is not with the specific problems and prospects of the current economic situation that I propose to deal in the body of this paper. We do not know just when and how the present U.S. business expansion is going to end: although the business cycle contains strong self-sustaining elements, it is not predetermined. Instead, I shall focus on broader theoretical and historical perspectives. The next, central part builds upon selected older ideas about business cycles, which I believe still have considerable relevance today when given some new features and interpretations. The theory ties together profits, investment, credit, stock prices, inflation and interest rates, treating their interactions as central to the process of economic fluctuations and growth. It purposely limits itself to essentially endogenous variables representing private sector activities, leaving government policies and outside disturbances for subsequent consideration. I present and discuss some new estimates of profit and investment functions with important roles for growth of demand and productivity, the ratio of price to cost levels, risk perception, credit

volume and credit difficulties. The results of these regressions are generally consistent with the theoretical arguments developed in this paper.

The next, much shorter section contends that these endogenous interactions belong to an enduring core of business cycles. In contrast to these central elements of an endogenous explanation of economic fluctuations, exogenous shocks and policy effects are typically more transitory and peripheral in nature, and hence generally less important. I then return briefly to the 1990s to apply my views on the history and theory of business cycles to this period. The final section offers some conclusions.

Profits, Investment, and Credit in Business Cycles

Business cycles are far from being all alike; their symptoms and causes differ over time and across economies. But a powerful common element runs through the long history of economic fluctuations around growth trends. At the center of business cycles are interacting movements in business profits, investment, and credit. Their rises are cumulative and mutually reinforcing, and so are their declines. Moreover, the three factors play critical roles in explaining what happens at the downturns and upturns of total business activity in market economies. Fluctuations of profits, investment, and credit have been a common feature of business cycles under very different monetary and exchange regimes, through inflations and deflations, in the 19th as well as 20th century, in Europe and Asia as well as in America.

Of the components of aggregate demand, it is the investment spending by firms and households that is the prime mover in economic fluctuations, being by far the most cyclical and the most volatile. This fact has long been known and recognized. On the income side, profits assume the role of the prime mover. This insight is less widely accepted, but in good agreement with economic reasoning and evidence. Credit from banks and other private sources provides the finance for the process, whenever the available reserves permit, under either an external constraint (such as the gold standard) or domestic constraint of monetary policy (usually conducted by a central bank).

The Profit Accelerator

In models of long-term competitive equilibrium, expected economic profits are driven to zero. Pure profits are not a continuous feature of a stationary economy, except where barriers to market entry or other monopolistic elements persist. But not all profits can be explained by deviations from competition or exploitation of receivers of wages or rent. In a dynamic economy, profits serve as the incentive for innovative and entrepreneurial activity. Several otherwise very

different theories agree on this point and see the source of profits in dynamic phenomena of growth and possibly disequilibrium.²

For profits to thrive over a period of time, both aggregate demand and productive capacities must be rising in a mutually consistent way. If demand increases too quickly, shortages of labor and/or capital will result in upward pressures on costs and squeeze profit margins. If demand increases too slowly, overcapacity will develop, reducing investment and profits. This balancing act is a delicate one, but overall growth of demand and output is expected to favor business profitability. The main direction of influence here should be from growth to profit margins.³

To decompose corporate profits (R^c) so as to distinguish their shorter and cyclical movements from long trends, we use the definitional equation $R^c = \pi Y^c$, where π is the profit margin per dollar of corporate income and Y^c is that income. The profit margins π is highly cyclical but approximately stationary, and its natural logarithm can serve as a measure of profitability. Theory suggests and evidence confirms that profitability is likely to be determined more by the *change* than by the *level* of total economic activity. By analogy with the much more familiar investment accelerator, I shall refer to this effect as the “profit accelerator.”

If an economic slowdown reduces profit margins and dims the outlook for profits, the likely reaction of business firms will consist first in cutbacks on decisions to invest, then if matters do not improve, in reductions of inventories, output and employment. Indeed, most recessions are preceded by slowdowns, and by downturns in profit margins, which are among the earliest leading indicators. But not all economic retardations depress profits and degenerate into business contractions. On occasion, economic activity may slow seriously but this is outweighed by productivity and price-cost conditions that remain favorable to business.

The Determinants of Profits: An Illustration

It is to be expected that the profit margin be positively associated not only with economic growth but also with technical progress and the ratio of selling prices to costs of production. Further, the profit margin π should depend inversely on the

² Mitchell (1913) saw the fluctuations in profits arising from cost-price imbalances as critical for understanding the changing investment and production decisions of firms and hence for explaining business cycles. For Schumpeter (1912), profits are the reward for innovations adopted by pioneering entrepreneurs. In von Neumann’s classical production model (1937), the ultimate source of profits is exogenous technology that permits growth. In early Keynes (1930), profits disappear in equilibrium defined by the equality of investment and saving. In Kaldor (1955/56), profits persist because investment contributes to growth of income and capital alike. In most of these models profits include all nonlabor (property) income, and in some pricing is via a markup rule, implying the prevalence of imperfect competition or oligopoly (Kalecki, 1954).

³ Of course, any individual firm under imperfect competition may choose to expand its market share by accepting a lower profit margin for a time (Wood, 1975). By choosing to do so, the firm would give rise to an inverse relationship between growth and profits. But this occasional counterexample does not vitiate the more general connection that growth increases profits as a whole.

effective market assessment of risk, interest rates, and probably inflation, particularly when it raises interest and the tax burden on profits.

Now, consider a regression where the natural logarithm of the profit margin π is the dependent variable. Specifically, π is measured here as the ratio of corporate domestic after-tax profits, with adjustments for inventory valuation and capital consumption, to corporate domestic income. (Profit rates on invested capital might be conceptually preferred, but income is much easier and better measured than the present economic value of physical, human, and intellectual capital.) The independent variables are the rate of economic growth in real GDP (g); change in labor productivity, that is, output per hour of work in nonfarm business sector (h); the chain-weighted price index for GDP as a measure of the price level (P); unit labor costs in the business sector (C); change in the consumer price index as a measure of inflation (p); the long-term interest rate on Treasury bonds (i); and a measure of risk aversion (s) given by the difference, yield on new high-grade corporate bonds minus yield on long-term Treasury bonds.⁴ All data except i and s are converted to log form and extend from the fourth quarter of 1953 to the first quarter of 1998, thus comprising 178 quarterly observations. Some of the data are lagged one or two quarters, and a constant term is added. The results of such a regression, with t-ratio statistics in parentheses, are:

$$\begin{aligned} \pi_t = & 2.935 + 1.486g_t + 2.657h_t + 3.248P_{t-1} - 3.343C_{t-1} \\ & (12.52) \quad (1.81) \quad (3.30) \quad (4.24) \quad (4.31) \\ & - 2.278p_{t-2} - 0.031i_{t-1} - 0.094s_{t-1} \\ & (1.85) \quad (2.87) \quad (2.83) \end{aligned}$$

All coefficients are significant by conventional standards, and the R^2 of the regression (adjusted for the degrees of freedom) is 0.927. All signs are as expected. Productivity h and growth g are positively interrelated, and rises in either or both are good for profits. The ratio of prices to costs P/C should have a strong positive influence on profit margins, but when P and C are taken separately, their coefficients should be about equal with opposite signs, and they are. Inflation reduces true profits by increasing taxes on spurious accounting profits from inventories that keep appreciating and depreciation of historical instead of replacement costs of capital. If one calculates profit margins without adjustments for inventory valuation and capital consumption, then the coefficient on inflation becomes statistically insignificant. When i is not included, the effect on p of π is sometimes positive. To the extent that transient changes in inflation do not affect nominal interest rates, they may be associated with a rise in aggregate demand and a fall in real interest

⁴ The data used are based on the following series in the *Business Cycle Indicators* published by the Conference Board: profits are series 81; economic growth, 55; productivity growth, 358; the price level, 311; employment cost level, 63; inflation rate, 320; interest rate on long-term Treasury bonds, 115; and interest rate on new high-grade corporate securities, 116.

rates. Higher interest rates and risk, however, are consistently and strongly reflected in lower profitability.

These regression results make intuitive sense and are generally robust. For example, one can substitute different measures of economic growth like the composite index of coincident indicators (either contemporaneous or lagged one time period) for real GDP, and find similar results. Or one can use largely analogous determinants for changes in the log of total real profits. Sources of gross corporate income include sales to each of the major sectors of the U.S. economy and abroad; hence the change in the natural log of Y^c is related to the change in the natural log terms for consumption, investment, government spending, exports and imports with the expected signs and roughly according to their relative magnitudes, but with investment particularly significant. However, it must also be noted that the π regression still leaves a systematic pattern of change in the error terms. An $AR(1)$ autoregressive residual correction, which was used to eliminate that pattern, raised R^2 from already high to above 0.9 and the Durbin-Watson statistic to near 2.⁵ I hope to give more attention to how the equation for π could be further improved in form and content in future work.

But the basic theme should not be lost here. A capitalist economy displays an ongoing drive for profits, which will be particularly successful under conditions of rising demand, productivity and confidence, and falling interest rates and risk aversion. Profitability declines when costs encroach on prices: this is the expansion-restraining factor stressed by Mitchell, and the dependence of π on P/C , which is confirmed here, is consistent with that theory. But other factors may also weaken profitability, and endanger continued prosperity, and they relate broadly to changes in demand, technology, and expectations. Particularly important here are the feedback effects from real investment decisions that are risky but hard to reverse and from business and consumer confidence and financial market shifts. Actions of firms, investors, and to a lesser extent consumers are subject to risk and uncertainty, misperceptions and errors, which at times can result in aggregate imbalances.

Investment as Source of Growth and Instability

Various measures of corporate profits show a strong positive influence on generally lagging business fixed investment (for example, Carrier, 1997, ch. 6). There are at least three reasons for the connection. First, rising profits from past and current operations are probably the main source of expectations of higher profits on investments already under way and under active consideration. Second, retained profits and cash flow provide the least expensive and most preferred means of financing investment. Third, recorded profitability serves as the decisive indicator of the appropriateness of past investment decisions and has reputational effects on the access to credit for external investment financing.

⁵ The correction ($AR(1) = 0.844$) helped explain the large local trends (up in 1953–65, down in 1966–74, and up again since 1980), which show up in π in addition to pronounced cycles and in absence of any overall trend.

Indeed, profit variables—rates, margins and totals—are empirically much more strongly correlated with investment than output growth is. It is possible that growth affects profits first and more, investment later and less. A deep reason for this may be that early successes of innovational investment are a major source of both economic growth and profits, whereas subsequent imitational investment has a more mixed impact on both. Also, since the decisions to invest in plant and equipment are long-lived, it would be suboptimal for such investment to rise and fall in close correspondence with short-run changes in output or sales, and wrong-headed for it to respond symmetrically to negative as well as positive movements in either current or expected economic activity.

However, the association between business capital formation and profits is not unidirectional, but rather a complex interaction with differential lags and common factors such as, notably, the rate of real economic growth. In the short-run, the dominant relationship runs from profits to investment, in the longer run mainly in the opposite direction—that is, more investment results in more growth, which produces more profits that lead to more investment and capital accumulation. The process is fueled on the financial side by expansions of credit and the monetary base and on the real side by rising incomes and confidence of consumers, investors, and business. It is to some extent self-rewarding and can endure for considerable time. Successful investment projects allow profits to be realized and so their stream becomes over time a continuous, though uneven, process of income creation and saving, that is, accumulation of capital or wealth. Thus, it may be a useful oversimplification to say that without investment there is no growth and without growth there is no profit.

In the early stages of a business expansion, the prospects for its continuing are typically uncertain, which causes relatively unambitious but safe investment projects to be preferred. Although interest rates move procyclically most of the time, they often continue declining long after real economic activity has embarked upon the process of recovery. The longer the lag of the upturn in interest rates behind the upturn of the economy, the better the prospects that prosperity will strengthen and continue (Cagan, 1969). The waning of uncertainty about the economic outlook inherited from previous weakness occurs while the liquidity levels are still high, the capacity utilization rates moderate, and prices and costs relatively stable. In combination, these conditions probably approach a favorable equilibrium as well as possible. By then, profits will have been improving for some time already, with higher expected returns and rising incentives to invest likely to follow. The entrepreneurial search for profit opportunities is at such times particularly enhanced by improved demand and cost conditions, as well as by increasing support from financial institutions and markets that share the prevailing favorable outlook.

Profit rates tend to have much larger and earlier procyclical movements than interest rates. So have credit flows, that is, changes in business loans or funds raised by private nonfinancial borrowers. This is consistent with the theory that, during business expansions, market interest rates tend to stay below the “natural rate”—that is, the expected yield or marginal productivity of investment—which is shifting

upward with the investment demand function. Interest rates adjust upward but slowly, which reflects the accommodating increases in credit to finance investment.⁶

A rising stock market helps to keep the expansion going in several ways. It lowers the costs of capital, which aids real investment. Its wealth effect makes for higher consumption. It channels some part of the monetary growth into the demand for equities, which may result in less inflationary rise in prices of goods and services and more rise in prices of stocks. But the quest and competition for higher returns entail increasing risks. The riskiness of an investment project is likely to be the greater, the longer its duration and the higher its prospective yield.⁷ Therefore, vigorous and protracted expansions reach into higher risk layers by raising the volume and share of large-scale capital spending projects. To overcome the higher risk barriers, more confident expectations of higher yield may have to be entertained by producers, financiers, and investors. There is much prior belief and some evidence that boom periods and bull markets breed confidence and indeed raise the danger of overconfidence in real and financial investment decisions.

Not all investment projects enhance growth; some turn out to be *malinvestments* mismatching resources and demand, others to be excessive, creating overcapacity in particular industries or regions. When discovered, these errors and the resulting losses discourage investment and deter growth. According to the notion of overinvestment common to a variety of Swedish and Austrian theories of long standing, a cumulation of such poor investments can put an end to a business expansion. Two simple but important insights can be offered on behalf of this idea: sound new opportunities to invest are scarce at any time, and forecasting costs and returns on long-term business investment projects is often extraordinarily difficult. Accordingly, the probability of serious errors in investment decisions is high, even if massive efforts are made to study the alternatives and find the seemingly best plans or gambles.

Still, so long as the economy expands, the rising risks and failures tend to be more than offset by increases in the much larger volume of safe and successful undertakings. Even bad investment projects, as well as good ones, add to the immediate stream of spending and keep up overall demand. Where substantial gestation periods are required to increase the capital stock, demand is likely to grow faster than capacity. It is only when demand slackens, profits fall, and business

⁶ It is worth noting that these observations are broadly consistent with certain ideas of economists as original and influential as Wicksell, Schumpeter, Hayek, and Keynes (1930). Their theories, though deeply different otherwise, agreed that in expansions the demand for investment rises above the supply of saving and is financed by an effectively endogenous process of creation of credit money. The classical exposition of the two-rate model is Wicksell (1901–06). Here rising demand for money driven by the firms' perceived profit opportunities is met by rising supply of bank credit at costs low enough to permit the profits to be realized. This is described as an endogenous "cumulative process," which gradually reduces the excess of investment demand over saving supply (and of the natural over the market rate).

⁷ See Cowen (1997) for further, mainly theoretical discussion of the role of risk in business cycles inspired by old Austrian ideas as well as modern financial literature. However, his discussion is generally silent on the other early line of ideas about risk increasing in investment upswing, from Kalecki (1937) to Shackle (1970); on which, see Courvisanos (1996).

retrenchment threatens that the existence of excess capacities is revealed. When the boom is over, the growing risks it entails can no longer remain underestimated or even undetected; for example, the bad debts incurred when credit standards were unduly relaxed, as the deals seemed too good to miss, show up as such when business turns sluggish.

It is the cyclically most sensitive processes, such as new commitments to invest in plant and equipment, and sectors, such as manufacturing and construction, that are likely to be the earliest to cease expanding. This need not imply an immediate downturn, since there is a backlog of unfilled orders to work off and other sectors, particularly the largest and most inertial one, consumption of nondurable goods and services, may hold up and maintain economic activity. But such relief tends to be temporary. Investment expenditures lag well behind commitments (new capital appropriations, orders, contracts) but their growth will decline soon, with adverse feedback effects on profits (Zarnowitz, 1973, 1992).

Factors in Recession and Recovery

Eventually, one or more of the following scenarios can be expected to make the economy highly vulnerable to recession. First, a growth slowdown may depress profits and business investment. Second, profit rates will generally fall and meet the slowly rising interest rates. Third, some large business and financial failures can no longer be ignored. Usually, bad loans and bad investments have already been piling up; now they must be written off, and costs of legal and industrial conflicts may be on the rise, too. Fourth, credit markets begin to turn away from high risk and leverage to safe and liquid assets. This may degenerate into a credit crunch, that is, curtailment of lending and scramble for liquidity. Fifth, an increasing number of corporate earnings reports disappoint prior expectations, and stock prices turn down. The higher were the price-earnings ratios lifted by a long and confident bull market, the lower they may fall after a denouement. It is possible for any of these developments to occur in isolation and do only transitory harm, but they often appear in combinations, which is particularly destructive.

There is no clear causal chain between business recessions and stock market crashes, banking panics, or credit crunches. Financial crises more typically follow business downturns, but sometimes precede them. The worst, severe disruptions in the availability of credit, with sharp declines in the liquidity and prices of assets, developed in past periods of deflation. The relatively mild credit crunches in the inflationary era of the last half-century occurred mostly during recessions (Zarnowitz, 1992, ch. 3). A financial market disorder always poses the danger that overreaction on the upgrade will be followed by overreaction on the downgrade, a long observed “herding” phenomenon of crowd psychology, about which historical and institutional analysis may have much more to say than deductive theory based on individual rational behavior (Kindleberger, 1989).

The slowdowns preceding business cycle peaks often fall heavily on consumption which, though much more stable than investment, can be highly sensitive to shifts in expectations concerning employment, price and wage trends, and house-

hold assets and debts. This aggravating factor of falling consumption is best seen as a part of the cyclical process already described, rather than as another independent cause of it. The source of the developments to which consumers respond lies mainly elsewhere in the economy, for example, in incomes earned in business and government and in interest rates.⁸

The cumulative process works in reverse during business contractions. Here the market rate of interest declines less than the natural rate based on expected profits, which may temporarily drop very low; so investment demand falls well below saving supply. Historically, cash flowed into the banks, money and prices fell, credit deflation replaced credit inflation, and borrowing was strongly discouraged. In major contractions, such developments still need to be considered, despite great changes in the underlying conditions which require modifications of the theory.⁹

The cumulative downward movements in profits, credit, and early investment commitments typically start before business cycle peaks, but they also end before business cycle troughs. Costs of production and construction, marketing and finance fall in recessions, as the demands for many cost factors decrease more than the corresponding supplies. To the extent that the selling prices, which may be less flexible, resist the downward pressures better, profit margins will improve. Progress in knowledge industries, technology, and organization does not stop in recessions, and eventually the centers of growth overcome the centers of decline.

There are also certain important asymmetries. On the upswing, businesses may have benefited from rises in wages lagging behind rises in prices, but on the downswing wages may decrease less (or increase more) than prices, with further profit-squeezing and layoff-prompting effects. Also, when a cumulated decline in prices is anticipated in contractions, current spending is slowed, especially via postponement of large-ticket purchases, whereas if output prices are expected to keep rising in expansions, current spending is accelerated. As interest rates continue falling and profit margins start improving, the stock market grows less bearish and bottoms out, typically in the latter part of the recession. The early upturn in equity prices is often hesitant, but gradually a firmer bull market develops as the recovery gains strength and spreads. The longer the good times roll, the greater the confidence that they will last. Business firms, banks, and other suppliers of credit

⁸ Nevertheless, shocks such as a sudden market crash, outbreak of a war and fears of shortages, rationing, or credit restrictions could and on infrequent occasions probably did produce “autonomous” destabilizing shifts in consumer demand. For further discussion, see Temin (1976, 1998), Hall (1986), and Blanchard (1993).

⁹ The original theory stems from the time when the gold standard ruled and inflation alternated with deflation so that price level stability in the long-run was widely expected (and reflected in remarkably stable and low government bond yields). In the Wicksellian two-rate model, prices were taken to be perfectly flexible and changing so as to maintain full employment. However, changes in real incomes can be readily added to the cumulative process, with quantity adjustments either replacing price adjustments (Laidler, 1972) or, more generally, complementing them. It is worth noting that in historical periods of declining or stable prices, nominal aggregates reflected business cycles well and were widely used, whereas when inflation prevailed, as in the last half-century, business cycles were best measured in real terms.

and capital increasingly favor higher-yield, higher-risk investment projects and instruments. So in time, the economy returns to the favorable conditions likely to give rise to another phase of high growth in credit, investment, and profits.

Cyclical Investment Functions Exemplified

Consider the determination of gross private nonresidential investment in constant dollars as illustrated by the following regression:

$$\begin{aligned}
 I_t = & 0.788 + 0.040R_{t-1} + 0.294H_{t-1} + 0.021SP_{t-1} - 0.006i_{t-4} \\
 & (-3.81) \quad (2.85) \quad (4.88) \quad (2.44) \quad (-2.66) \\
 & + 0.007i_t - 0.016s_{t-1} + 0.0008x_t + 0.851I_{t-1}. \\
 & (4.19) \quad (-2.68) \quad (4.63) \quad (31.71)
 \end{aligned}$$

Here the capital letters refer to natural logarithms of levels for investment (I), after-tax profits in constant dollars (R), labor productivity (H), and the Standard and Poor's 500 stock price index (SP); i and s stand for interest rates and risk, as defined before; and x represents the exchange rate of the dollar. The equation covers the period Q1 1967-Q1 1998 (125 quarterly observations) and shows all coefficients to be significant with expected signs (t-ratios in parentheses) and an adjusted R^2 of 0.997. Notice that I is in part determined by the same variables that influence profits such as the interest rate, risk aversion, and productivity, although predominantly with longer lags. But even after all these and still other effects are accounted for, real investment in producers' durable equipment and structures is still found to be positively influenced by total real profits earned in the United States during the previous period.

Some technical problems with this particular regression deserve attention. Business capital outlays are lagged and smoothed functions of the more volatile investment commitments, and as such substantially autocorrelated (Zarnowitz, 1973). This explains the high and highly significant coefficient of I_{t-1} in the above equation, but it also suggests that it would be instructive to examine the sources of business capital investment after properly differencing the relevant variables. The interest rate, which is represented by the yield on long-term Treasury bonds, shows the expected negative effect when taken four quarters earlier but a very similar *positive* effect when taken in the same quarter. This suggests the possibility of a reverse causation: investment, by raising output closer to capacity, pushes up interest rates. But this interaction, although plausible, is somewhat complicated and clearly requires more study and better estimation. Here I add one more regression cast in form of differences instead of levels:

$$\begin{aligned}
 \Delta I_t = & 0.025 + 1.086g_t + 0.052r_{t-2} + 0.041sp_{t-3} - 0.007\Delta i_{t-6} \\
 & (4.06) \quad (6.08) \quad (2.04) \quad (1.57) \quad (-2.18) \\
 & - 0.019s_{t-1} + 0.021fr_{t-1} + 0.001\Delta x_{t-1} - 0.002bf_t. \\
 & (-4.16) \quad (2.44) \quad (2.84) \quad (-0.52)
 \end{aligned}$$

The change in the log of business fixed investment (ΔI_t) depends positively on changes in the logarithms of the following: real GDP (g_t), real profits (r_{t-2}), the stock price index (sp_{t-3}), funds raised by private nonfinancial borrowers (fr_{t-1}) and the exchange value of the dollar (Δx_{t-1}). The change in I_t depends inversely on the increase in the long-term interest rate over the previous six quarters (Δi_{t-6}), on risk (s_{t-1}) and the change in log of the liabilities of business failures (bf_t). This equation covers the period Q3 1967-Q1 1998 (123 observations); its adjusted R^2 is 0.512, the Durbin-Watson statistic is 2.108. Again, all regression coefficients have the expected signs and all except the last one have significant t-statistics. Although the lead times were not systematically selected, they appear to be in approximate agreement with the relative timing of cyclical movements in the variables concerned.¹⁰

Thus, stock prices tend to have intermediate leads at the economy's turning points, real business fixed investment tends to have short lags. Profits, which the stock market is always trying to anticipate, should have sizable but shorter leads vs. investment. Differencing may have magnified the variability of timing along with the volatility of the data and raised the weight of contemporaneous values, particularly for g_t , an apparently strong and close determinant of the change in I_t . But the effects on spending of monetary and interest rate changes have repeatedly been shown to be very slow, and our regressions are consistent with this finding.

Further, it is of interest that even the mild risk proxy, which compares the yields of high-grade corporate and Treasury bond yields, has a definite adverse effect on investment in the next quarter. The influence of credit is reflected with the same timing in the positive coefficient of the relative change in funds raised by private nonfinancial borrowers. The harmful role of overinvestment and malinvestment shows up in the negative coefficient of the relative change in current liabilities of business failures; however, this is probably a weak representation of this factor and an underestimate. It will require more work to capture the elusive channels of influence whereby rising risk and losses deter further capital accumulation. Finally, an increase in the dollar's exchange value has a small but significant influence on the change in I_t , presumably because it stimulates direct foreign investment in the United States.

Core and Peripheral Elements in Business Cycles

The classical literature on business cycles preferred endogenous theories, stressing the interrelated functions for business investment and profits, credit, interest rates, relative input and output prices, and the role of the associated risks, uncertainties, and expectations. The great expository work of Haberler first published in 1937 demon-

¹⁰ The data used in the investment regressions of this section include the following series from *Business Cycle Indicators* (in addition to some listed in note 4 above): real business fixed investment, series 86; real corporate profits, 18; stock price index, 19; exchange value of U.S. dollar, 750; funds raised in credit markets, 110; and current liabilities of business failures, 14.

strates this point clearly. Since then, however, most economists shifted to the view that exogenous disturbances, stochastic elements, and policy factors, in short “shocks” of various kinds, are the true “causes” of business cycles. It is recognized that the shocks must be propagated in particular ways by the dynamics of an economy of interdependent markets, but this is believed to be tractable with a wide range of models and compatible with the postulates of the modern general equilibrium theory. The old idea of self-sustaining cycles is generally given no attention at all, but just summarily dismissed (Zarnowitz, 1992, chs. 1–2).

I view the current emphasis on shocks as way overdone. Intensive arguments about whether business cycles are due to real or monetary shocks, or domestic or foreign shocks, are conducted as if these were well-identified categories that include all that matters and preclude each other; also, as if the underlying models could be taken to represent the economy so well as to rule out the possibility of cycles being endogenous. But these premises are simply not credible. Shocks come in a great variety of combinations and frequently are not well identified (Blatt, 1978; Eckstein and Sinai, 1986; Black, 1986). There is little agreement on which theoretical and econometric models of the economy are the right ones to use, hence it is difficult to know what should be taken to constitute a deviation from an established model relationship. I feel quite skeptical of our ability to sort out the shocks as demanded by the desire to discriminate between current alternative models.

Moreover, there are good reasons to accept lead-lag relationships and nonlinearities as important features of the dynamics that can account for the endogenous content of business cycles. But this major aspect of the economy’s motion is simply missed by those analysts who concentrate on the role of shocks in linear models constructed with little or no attention to timing differences, interactions between potentially self-generating movements of strongly fluctuating variables, and likely cyclical asymmetries. I see these elements as being at the core of business cycles, while the outside disturbances whose causal role is often questionable are more peripheral, transitory and episodic.

The broad movements of the economy, including its turning points, are best seen as sequential processes unfolding in historical time, not as isolated events. Those historical and statistical studies of recorded experience that I find especially revealing assign a deeper causal role to imbalances developing during the phases of the fluctuations than to exogenous shocks. Cyclical boom-and-bust imbalances never originate exclusively in either demand or supply, but instead always refer to the interplay between the two market sides. This is so whether the problem is a shortfall of business or consumer demand; monetary or real overinvestment; vertical maladjustment (plans to invest outrun decisions to save) or horizontal maladjustment (overcapacity in some particular sector or region); financial instability or crisis of confidence. Attempting to categorize shocks as stemming from aggregate demand or aggregate supply alone seldom reveals anything deep or interesting about the determinants of economic expansions and contractions.

The system of leading, coincident and confirming indicators consists of time

series data that have, in many studies, proved essential as tools for identifying, dating, analyzing, and forecasting business cycles. It is well to know that this approach originated in the basic working concept of Mitchell and his associates at the National Bureau of Economic Research, which was that the recurrent fluctuations of a private enterprise economy are caused by changes in the outlook for profits. When the outlook is favorable, investment and production expand, when it is adverse, they contract. A number of the principal leading indicators refer to directly profit-related business expectations, commitments and activities in financial, labor and product markets.¹¹

However, while the case for business cycles having a dominant endogenous core is very strong, it should not be overstated. Real, monetary, expectational, domestic and foreign factors all participate in economic fluctuations, and unexpected changes and combinations occur in all of these categories. Unquestionably, some identifiable large shocks have been important. Major wars have had lasting economic consequences, as when World War II finally ended the Great Depression, and small wars influenced at least the timing of some business cycle turning points, as in the Iraq intervention in 1990. The OPEC cartel decisions in the 1970s can surely be viewed as exogenous events.

Monetary and fiscal policy actions can cause unexpected increases or decreases in interest and tax rates. But even where it seems clear-cut to many that the Fed has created a recession, matters are much more complex. For example, the monetary policy shift in October 1979 allowed interest rates to reach unprecedented double-digit levels, which no doubt had much to do with the timing and unusual sequence of the two back-to-back U.S. recessions in 1980 and 1981–82. But the downturn of 1980 was also preceded by the second oil shock, to which it has been attributed by some analysts (Temin, 1998). The business cycle of 1980–92 witnessed other novel developments, too, notably very large drops in the velocity of money. In 1987, 1990, and 1994–95, the Fed failed to anticipate but reacted successfully to troubles in the stock market, the economy, and the bond market, respectively. Much of the time, monetary policies are accommodating, reactive or passive. Even when the Fed seeks to assert active control, its policies operate with long and variable lags. Contrary to what might be called the central bankers' theory of business cycles, economic expansions do not necessarily generate excessive inflation to be countered by tight monetary policies. Also, contrary to some of their critics, the moves of central

¹¹ More generally, I believe that the analysis of economic fluctuations derived substantial benefits from methods developed by the NBER, including the historical reference dates, turning-point identification, emphasis on short unit periods, and efforts at time-series decomposition, deseasonalization, and detrending. Many recent studies of business cycles suffer from ignoring the above matters and relying instead on general methods only. Some use annual data which reveal little of what happens during short recessions, for example. What is desirable are combinations of best modern statistical and econometric techniques with insights from cyclical indicator analysis. For examples of how leading and other indicators can be used along with univariate and multivariate time-series models, Bayesian forecasting methods, probability, econometric, and nonlinear models, the interested reader might begin with the essays in P. A. Klein (1990), Lahiri and Moore (1991), and Stock and Watson (1993) and follow with Zellner, Hong and Min (1991) and Montgomery, Zarnowitz, Tsay and Tiao (1998).

bankers to raise interest rates to prevent or cool a boom do not necessarily either cause or explain recessions.

The record of U.S. fiscal policies on the business cycle is even more mixed, but largely negative. The sharp post-Korean War cutbacks in defense spending aggravated the 1953–54 recession; also, the tardiness and errors of fiscal policy contributed to the setbacks of the 1970s (Blinder, 1979).

Surprises and disappointments are especially frequent and important in the markets for financial assets. But what matters in the present context is not the randomly dispersed individual price shocks that occur in these markets on each business day. Rather, it is the waves of optimism and pessimism, which spread through large numbers of investors and traders from time to time and are often seen later as excessive reactions. Journalists often refer to these errors as manifestations of “greed” and “fear,” as do many traders themselves. This opinion (or self-criticism) is overly rhetorical but not groundless; it does not deserve a derisive reaction from economists who in turn overstate the rationality of economic decision-making under uncertainty. As already noted, such shared errors of judgment in private real and financial investment decisions can be endogenously market-moved and market-moving, and hence important indeed.

A View of Some Recent Developments

The current U.S. business cycle expansion was eight years old in March 1999 and is already the longest in peacetime, second only to the one during the Vietnam period in the 1960s. However, both the 1960s and the 1980s saw much larger overall rises in real GDP and total employment as well as larger declines in the rate of unemployment, as shown in lines 1–2 of Table 1. In the first five years of this expansion, from March 1991 to March 1996, U.S. output grew only about 13 percent, compared to average growth of 28 percent in the same stage of the long upswings in the 1960s and 1980s. The unemployment rate actually continued to rise for 15 months into the 1991–92 recovery, which is highly unusual.

Although the recession of 1990–91 was relatively mild and short, the whole period of late 1980s and early 1990s was sluggish. Net private domestic investment declined sharply, layoffs spread, wages of other than high-skilled workers lagged badly, household debts increased, and consumer confidence fell. Slowdowns before recessions are common but sluggish recoveries like the one in the early 1990s are quite rare: typically, the first several years of expansion see the highest economic growth.

A brief, mild slowdown in 1995 followed a year of rising commodity prices, a bond market downturn, and interest rate increases driven in part by the Fed’s preventive counterinflationary actions. It was not until 1996–98 that U.S. output growth accelerated to surpass the historical pattern. Real investment in structures, which had been declining in the early 1990s, has risen smartly in recent years. Investment in producers’ durable equipment, which includes computers, was ex-

Table 1

Comparing the U.S. Business Expansion of the 1990s with Those of the 1960s and 1980s, by Selected Variables and Stages

| | <i>Percent Change in Years of Expansion</i> | | | | <i>Value of Series at Month</i> | | | |
|---------------|---|------------|------------|------------|---------------------------------|-----------|-----------|-----------|
| | <i>1-3</i> | <i>4-5</i> | <i>6-7</i> | <i>1-7</i> | <i>1</i> | <i>36</i> | <i>60</i> | <i>84</i> |
| | Real Gross Domestic Product | | | | Unemployment Rate | | | |
| Current Cycle | 7.9 | 4.6 | 8.0 | 22.0 | 6.8 | 6.5 | 5.5 | 4.7 |
| Past Average | 17.3 | 9.1 | 6.1 | 35.8 | 8.9 | 6.2 | 4.8 | 4.6 |
| | Nonresidential Structures | | | | CPI Inflation Rate | | | |
| Current Cycle | -13.5 | 9.8 | 11.2 | 5.7 | 4.2 | 2.5 | 3.0 | 1.1 |
| Past Average | 13.8 | 2.3 | -0.6 | 15.6 | 2.6 | 2.5 | 3.6 | 4.1 |
| | Producers Durable Equipment | | | | Corporate Bond Yield | | | |
| Current Cycle | 26.9 | 22.7 | 30.8 | 103.6 | 9.1 | 7.6 | 7.6 | 6.6 |
| Past Average | 37.8 | 8.6 | 9.7 | 64.2 | 8.2 | 7.8 | 7.6 | 7.9 |
| | S&P 500 Stock Price Index | | | | Corporate Profit Margin | | | |
| Current Cycle | 22.0 | 39.5 | 66.4 | 183.2 | 6.0 | 8.0 | 10.0 | 9.0 |
| Past Average | 26.4 | 22.9 | 27.6 | 98.1 | 7.4 | 8.4 | 9.3 | 8.1 |

Dating: According to the NBER chronology, the current U.S. business cycle expansion began in March 1991 (for monthly data) or first quarter of 1991 (for quarterly data). Hence, for the "Current Cycle", the years denote: 1-3, 3/1991-3/1994; 4-5, 3/1994-3/1996; etc. The months denote: 1, 3/1991; 36, 3/1994; 60, 3/1996; 84, 3/1998. "Past Average" refers to U.S. expansions of February 1961-December 1969 and of November 1982-July 1990. Here the years and months are dated analogously starting in February 1961 and November 1982.

Sources: The Conference Board, *Business Cycle Indicators*: Real GDP, series 55, nonresid. structures, 87; prod. dur. eqpt., 88; stock price index, 19; unemployment rate, series 43; CPI inflation rate, 320; corp. bond yield, 116; corp. profit margin, 81.

tremely strong, its growth far exceeding the past record (Table 1, lines 3-4 and 5-6). Corporate profit margins increased strongly during the upswing in the 1990s, rising from 6 percent to the range of 8-10 percent. This high and growing profitability, exceeding the records in previous long expansions, helps explain the recent boom in business capital investment. The extraordinary bull market in stocks has served as a powerful stimulator of both business and household investment (lines 7-8). Housing starts, too, increased much faster, longer, and more steadily in this expansion than in those of the 1960s and 1980s.

The U.S. inflation rate has actually declined during this expansion, from 4.2 percent in March 1991 to 1.1 percent in March 1998, which is unique for the last half-century (lines 3-4). Falling prices of computers and related products, oil, other commodities, and many imports from countries in conditions of financial and economic distress help explain the U.S. disinflation.

Nominal interest rates declined strongly in 1991-94, reflecting the weakness of the recovery. Later, while the short rates increased mildly and stabilized, the long

rates moved lower. Presumably, the persistent weakness of prices reduced expected inflation. In the past, interest rates increased in the corresponding cycle stages along with higher inflation (lines 5–6). For real interest rates, which tend to be negatively correlated with inflation, the converse apparently applied: they increased in the current expansion, particularly for the short rates, whereas they decreased in the previous expansions during which inflation rose. Consistent with the regression estimates in this paper, the declines in inflation and long interest rates, along with the rises in profits and stock prices, had the combined effect of fueling the investment boom. I would argue that it was mainly this process that has allowed the U.S. business expansion to last so long.

However, some technology, pricing and policy factors helped, too. Thus, the six-month smoothed growth rate of the broad money supply was low and at times negative in 1991–94, before rising higher more recently. This shift to a more permissive or stimulative stance is the opposite to that adopted in the earlier expansions, when the monetary growth rates tended to be higher in early than in late stages. Fears that this acceleration will reignite inflation have been falsified by events so far, and hence muted. But there is a new concern, that the Fed has allowed an overexpansion of credit to feed a bull market in stocks that may be overvalued and headed toward a crash. Growth of federal debt declined steeply and consistently in 1991–98. This happy success helped to moderate interest rates, among other positive consequences.

Recent estimates show real GDP growth at 3.9 percent in 1998, marking a third consecutive strong year of growth. However, to infer that the expansion will persist just because it has persisted so far is a *non sequitur*. The dynamic factors stressed in this paper are continuously at work and they will shape the economy's course. For example, the question of whether and when the very high expected profits apparently expected by the booming stock market will be confirmed by actual profits retains great importance.

The theory relating business cycles to the volatility of profits, investment, credit and financial markets remains relevant not only in the United States and Europe, where the theory has its historical roots, but even in Asia's new and different settings during the 1990s. Japan's economy was for a long time the envy of the world and the model for the smaller Asian economies, thanks to its pattern of long and vigorous expansions interrupted only by mild slowdowns. But then speculative excesses in Japan's real estate and stocks led to bubbles that eventually burst. The result in the 1990s has been a long stagnation, intermittent price and debt deflation, and two business cycle contractions (one in late 1992 and 1993, the second underway since about March 1997). Elsewhere along Asia's Pacific rim, expectations of high growth and high returns had attracted large foreign capital inflows. In mid-1997, however, debt and currency crises undermined investor confidence, causing panics and massive flight of capital. Yet Thailand's economy began to weaken in mid-1995 and entered a recession a year later. Korea's slowdown started in early 1996, its contraction in August 1997. The boom-and-bust sequences in east Asia can be traced back to overinvestment and malinvestment as more and more

credit, much of it short-term, was directed to speculative ventures, weak financial intermediaries, and industries with excess capacity. As a result, exports slowed, risk rose, and profits fell rapidly. The east Asian crises of 1997 and 1998 were in fact triggered by just the sort of fundamental imbalances in investment, profits, and credit—for a rich discussion, see Corsetti, Pesenti and Roubini (1998)—that are central to an endogenous view of business cycles.

Concluding Remarks

Changes of great importance have been and still are occurring in the economies around the world, including globalization of production, trade, and finance; structural shifts from country to city, farming to industry, goods to services; and vast innovations in technology, business management, and conduct of economic policies. After a deterioration in the 1970s and early 1980s, U.S. business cycles have become more moderate, as in the earlier part of the post-World War II era. However, a study of seven large and seven smaller economies shows that recessions were more frequent in the second half than in the first half of the post-World War II period (Zarnowitz, 1998b).

Long business expansions benefit society by raising employment, consumption, productivity, and profitability, but they generate imbalances and are difficult to sustain. The interaction of profits, investment, credit and financial markets is an enduring feature of market economies, which plays a central role in business cycles. The U.S. upswing of the past three years provides a vivid example of how profits and investment can reinforce each other, especially when combined with an exuberant stock market. Recent events in Asia demonstrate how investment-dominated booms can give way to a protracted stagnation with tendencies toward deflation and underconsumption (Japan) or to severe recessions harking back to the worst depressions of the past (what used to be called the “newly industrialized economies” or the “tigers” of east Asia). Of course, there are many deep differences between the United States and the countries in recent crises: no forecasts or precise parallels are intended here. What I do suggest is that the same endogenous domestic variables assume major roles in business cycles observed in different economies, and that the relations between them are likely to follow broadly similar patterns.

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