FRBSF WEEKLY LETTER

January 30, 1987

"Real" Business Cycles

Monetary policy has been a central element of almost all analyses of business cycles during the past twenty years. Many analysts claim that fluctuation in the growth rates of monetary aggregates is the dominant cause of cycles in real economic activity and in the rate of inflation. This view was most forcefully argued by Milton Friedman and Anna Schwartz in their *Monetary History of the United States 1867-1960.*

Recently, however, economists have seen a revival of interest in the role played by real, or nonmonetary, events in causing business cycles. The general agreement that oil and food supply shocks were the primary causes of the 1974-75 recession gave impetus to that revival. And, more recently, the effects of the sharp decline in oil prices on major sectors of the economy have added more support to the arguments of real business cycle theorists.

This *Letter* reviews two contributions of real business cycle theories: their explanation of how "real" shocks in one or more sectors of the economy can generate output and employment movements across all sectors and through time — the hallmarks of business cycles; and their explanation of the relationship between monetary aggregates and real GNP, which is contrary to views that link business cycles mainly to monetary causes.

Real shocks to output

Real business cycle theories stress that nonmonetary factors such as population growth, technological innovation, and consumer preferences determine the trend for the real growth rate of an economy. According to the theories, prices and wages constantly adjust when shortages or surpluses occur in any markets; and these adjustments serve to keep the economy close to its trend growth. In this context, business cycles arise when real shocks change the economy's productivity or wealth, and upset the economy's equilibrium.

Real shocks can take a variety of forms, such as the disruption in oil supplies in the 1970s, the decline in oil prices in 1986, shifts in demand from one sector of the economy to another, fiscal policy changes, or a technological change such as the development of computer microchips. Strikes and changes in productivity (output per worker) in specific industries are further examples, as are shifts in household attitudes toward saving or working.

Existing real business cycle theories have focused mainly on disturbances to the supply side of the economy as the cause of economic fluctuations. These disturbances set in motion economy-wide adjustments in consumption, production, labor supply, and saving that ultimately re-establish a new equilibrium.

In contrast, traditional theories attribute cycles to the slow adjustment of wages and prices, which they claim prevents the economy from maintaining its equilibrium growth path. Real business cycle theorists, such as Edward Prescott of the University of Minneapolis, Finn Kydland of Carnegie-Mellon, and Robert King, John Long, and Charles Plosser of the University of Rochester, argue that the apparent sluggishness of some prices and wages is not sufficient to prevent the economy from remaining close to its trend growth. From their perspective, fluctuations in real economic activity must be due to changes in the real, nonmonetary factors that determine trend growth.

Causing business cycles

To understand better how "real" shocks can cause business cycles according to real business cycle theories, suppose there is a temporary decline in one sector's productivity. The decline reduces real income in that sector, and leads individuals who earn their living in that sector to reduce their consumption of goods and services produced by their own and all other sectors. In this way, the initial shock spreads to other sectors.

However, people do not immediately reduce their current consumption by the full amount of the temporary decline in their real income. Instead, they spread the effect of the real income reduction over time by cutting back both their planned consumption and their planned saving. As a result, it takes time for the economy to work its way out of the repercussions of the initial shock.

The decline in output induced by the initial temporary drop in productivity leads firms to want fewer workers at the going wage. The resulting slack in the labor market then causes workers promptly to lower their wage demands in an effort to get the relatively scarce jobs. Since, according to real business cycle theories, wages adjust readily to market pressures, real wages — wages adjusted for the cost of living — would fall temporarily. Real business cycle theories therefore predict that real wages move in the same direction as real output.

Voluntary unemployment

The effect on employment depends on the response of individuals to the temporary fluctuation in real wages. Workers may respond to the temporary decline in real wages in two ways. They could react to the resulting decline in their real income by working more. However, since the return to working (the wage) would be lower, workers also might respond by working fewer hours and enjoying more time off.

Real business cycle theorists assume the latter response dominates, and that it can take a variety of forms. Employed workers might reduce their hours of work by limiting overtime hours or by quitting second jobs. Individuals who had been unemployed and looking for work may, in response to lower real wages, spend more time searching for a job, or they may stop searching altogether and drop out of the labor force. Such individuals perceive the benefits (such as a higher paying job) from more extensive job search, or from leisure, to outweigh the net gain from working at the temporarily lower real wage. Thus, the supply of labor falls in response to the temporary decline in real wages.

By assuming that wages respond readily to changes in labor supply and demand, real business cycle theories leave no room for involuntary unemployment. They claim that the cyclical variation in employment reflects movements in labor *supply,* i.e., changes in the labor force. Thus, all cyclical unemployment in existing real business cycle theories is voluntary.

Empirical observations, however, do not support this claim. Experience in the United States demonstrates that most of the cyclical variation in employment is due to changes in the employment rate — the fraction of the labor force employed — rather than changes in the labor force itself or in the number of hours each worker works. This is especially true during recession years, when very little of the decline in total employment is explained by reductions in the measured labor force. For the recent recession year of 1982, for example, only about 3 percent of the total decline in employment can be attributed to reductions in the labor force.

Instead, changes in the demand for labor, causing involuntary unemployment, may account for most of the cyclical variation in employment — contrary to real business cycle theories. Real wage changes may affect some individuals' decisions about whether to work, and how many hours, but they seem to account for little of the fluctuation in *total* employment that characterizes a business cycle.

Real business cycle theorists do have an explanation for this anomaly. They assert that existing unemployment statistics do not correspond correctly to the economic concept of unemployment and, as a result, count people who are voluntarily unemployed. The theorists claim that many workers now counted as unemployed should not be counted in the labor force at all. These include people who are not willing to work at going wages and in available jobs, although they may want to work at their previous (higher) wages in their former jobs. Also among the voluntarily unemployed are those who spend their time searching the job market. Because these workers, the real business cycle theorists claim, are employed in job search — a useful activity — they should not be considered unemployed in an economic sense.

Real business cycle theorists believe that if unemployment and labor force statistics were adjusted to measure only involuntary unemployment, most changes in employment during a business cycle would be traced to changes in the labor force. Unfortunately, sufficient data are not available to make the necessary adjustments. The extent to which real business cycle theories account for movements in employment remains an open issue.

The role of money

In attributing business cycles mainly to nonmonetary causes, business cycle theories have relegated monetary policy to a mainly passive role. Whereas others have interpreted the close historical relation between the money supply and real output to mean that variations in the money supply create business cycles, real business cycle theorists hold that the supply of money responds to the demand for money necessitated by different levels of output. That is, the level of output is directly connected to a demand for transaction services. Money, in turn, is demanded because of its usefulness in lowering the transaction costs involved when producers and consumers exchange goods and services. As output expands or contracts during a business cycle, so does the volume of transactions, and therefore, the demand for money.

According to real business cycle theories, the supply of money will change to accommodate demand. An increase in the demand for money would elicit an increase in the supply of money. A rise in output, for example, would cause both the demand for money and interest rates to rise. As rates rise, banks would attempt to reduce their holdings of excess reserves, which earn no interest, by purchasing interest-earning assets such as government securities, or by making new private loans. Since all such new loans end up as demand deposits (or their close substitutes) at some bank, the money supply would expand in response to a rise in market interest rates.

Real business cycle theorists argue that this money supply expansion would occur even if the monetary authority were to keep the total reserves supplied to the banking system unchanged. Consequently, broadly similar movements in the monetary aggregates and real GNP can result even if reserves supplied by the monetary authority to the banking system do not vary over the business cycle.

The problem with this scenario is that banks hold few excess reserves. Thus, their contribution to expanding the money supply by reducing excess reserves is not likely to be very important. Real business cycle theorists, however, also cite the Federal Reserve's operating procedures to help explain the close relation between money growth and real output.

In most of the period after World War II, the Federal Reserve used short-term interest rates as a means of managing money growth. However, the monetary authority also attempted to counter at least part of the higher interest rates that resulted from an increase in the demand for money by increasing reserves to the banking system. Given such a procedure, any disturbance that causes real output to vary would also cause the money stock to change in the same direction.

Contributions

At this stage of their development, the most important contribution of real business cycle theories lies in their reminder that monetary shocks are not the only potential causes of business cycles. Their view of how the effects of the recent drop in oil prices spread from oil-related industries to entire geographic regions is one case in point. A more complete understanding of business cycles almost surely will require a broader theory, incorporating key elements of both monetary and real business cycle theories.

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BANKING DATA—TWELFTH FEDERAL RESERVE DISTRICT

(Dollar amounts in millions)

Selected Assets and Liabilities Large Commercial Banks	Amount Outstanding 1/7/87	Change from 12/31/86	Change from 1/8/86 Dollar	Change from 1/8/86 Percent[7]
Loans, Leases and Investments[1] [2]	207,823	− 4,587	5,334	2.6
Loans and Leases[1] [6]	187,203	− 4,661	4,513	2.4
Commercial and Industrial	55,573	− 930	2,716	5.1
Real estate	67,224	− 514	1,159	1.7
Loans to Individuals	39,306	− 1,394	573	1.4
Leases	5,601	− 18	− 82	− 1.4
U.S. Treasury and Agency Securities[2]	13,453	118	2,251	20.0
Other Securities[2]	7,167	− 46	− 1,431	− 16.6
Total Deposits	214,990	− 8,446	11,110	5.4
Demand Deposits	59,403	− 9,341	9,308	18.5
Demand Deposits Adjusted[3]	40,830	− 1,588	−5,199	− 11.2
Other Transaction Balances[4]	20,285	337	4,660	29.8
Total Non-Transaction Balances[6]	135,302	559	− 2.858	− 2.0
Money Market Deposit Accounts—Total	46,761	− 308	811	1.7
Time Deposits in Amounts of $100,000 or more	32,276	441	− 6,032	− 15.7
Other Liabilities for Borrowed Money[5]	26,255	− 898	1,850	7.5
Two Week Averages of Daily Figures	Period ended 12/29/86	Period ended 12/15/86		
Reserve Position, All Reporting Banks				
Excess Reserves (+)/Deficiency (−)	10,277	10,054		
Borrowings	11	4		
Net free reserves (+)/Net borrowed(−)	10,266	10,050		

[1] Includes loss reserves, unearned income, excludes interbank loans
[2] Excludes trading account securities
[3] Excludes U.S. government and depository institution deposits and cash items
[4] ATS, NOW, Super NOW and savings accounts with telephone transfers
[5] Includes borrowing via FRB, TT&L notes, Fed Funds, RPs and other sources
[6] Includes items not shown separately
[7] Annualized percent change