

CRS Report for Congress

Evaluating the Potential for a Recession in 2008

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Summary

The U.S. economy has faced some bad news lately. The housing boom has come to an abrupt halt, and housing sales and house building have been falling at double digit rates. Problems in housing markets have spread to financial markets, causing a “liquidity crunch” in August 2007, and calm has not been restored since. Financial institutions have written off large losses because of falling asset values, particularly for mortgage-backed securities. Commodity prices have been rising, and the price of crude oil has recently topped \$120 per barrel. While each of these factors might not be enough to cause a recession in isolation, their cumulative effect could be great enough to push the economy into recession. In light of this news, it is perhaps unsurprising that consumer confidence is at a five-year low.

In response to these events, Congress has enacted an economic stimulus package (P.L. 110-185) and the Federal Reserve has aggressively cut interest rates and lent directly to the financial system to spur economic growth. Despite these actions, a recent survey of private sector forecasters put the chance of a recession in 2008 at 60%.

A look at the available data suggests that economic growth has slowed considerably, but it is too soon to tell if the economy has entered a recession. Typically, the NBER does not announce that the economy has entered a recession until the recession is well under way, for good reason. Recessions are defined as prolonged and sustained declines in economic activity, so by definition, a persistent downturn cannot be identified until it has persisted. Any decline in economic activity at this point is only nascent. Growth was slow in the last two quarters for which data are available, but remained positive. During the onset of the liquidity crunch, economic growth was an unusually high 4.9% in the third quarter of 2007. Employment declined slightly in the first four months of 2008. The same forecasters who believe there is a one in two chance of recession also predict that growth will average 1.4% in 2008.

Given the lags between policy changes and their effects on the economy, the economy has not yet felt the full impact of the stimulus package and the Federal Reserve’s actions.

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Introduction

The U.S. economy has faced some bad news lately. The housing boom has come to an abrupt halt, and housing sales and house building have been falling at double digit rates. Problems in housing markets have spread to financial markets, causing a “liquidity crunch” in August 2007, and calm has not been restored since. Commodity prices have been rising, and the price of crude oil has recently topped \$120 per barrel. In light of this news, it is perhaps unsurprising that consumer confidence is at a five-year low.¹

In response to these events, Congress has enacted an economic stimulus package (P.L. 110-185) and the Federal Reserve has aggressively cut interest rates and lent directly to the financial system to spur economic growth. Despite these actions, a recent survey of private sector forecasters put the chance of a recession in 2008 at 60%.²

A look at the available data suggests economic growth has slowed considerably, but it is too soon to tell if the economy has entered a recession. Recessions are defined as prolonged and sustained declines in economic activity, and any decline in economic activity at this point is only nascent. Growth was slow in the last two quarters for which data is available, but remained positive.³ During the onset of the liquidity crunch, economic growth was an unusually high 4.9% in the third quarter of 2007. Employment declined slightly in the first four months of 2008. The same forecasters who believe there is a one in two chance of recession also predict that growth will average 1.4% in 2008.

Given the lags between policy changes and their effects on the economy, the full impact of the economic stimulus package and the Federal Reserve’s actions has not yet been felt. This report summarizes the available evidence pointing for and against a recession in the near term.

¹ Conference Board, “The Conference Board Consumer Confidence Index Declines Almost 12 Points,” press release, March 25, 2008.

² Blue Chip, *Economic Indicators*, vol. 33, no. 5, May 2008.

³ It is noteworthy that final sales declined in the first quarter of 2008. In other words, GDP growth was positive only because firms added to inventories.

How Recessions Are Defined

Recessions are officially designated by the National Bureau of Economic Research (NBER), a non-profit research organization.⁴ According to popular belief, recessions are periods of two or more consecutive quarters of negative economic growth. While historical recessions have often followed this pattern, it is not the official definition. In fact, the 2001 recession did not follow this pattern — economic growth contracted in the first and third quarters of 2001, but not the second. Rather, the NBER defines a recession as

a significant decline in economic activity spread across the economy, lasting more than a few months, normally visible in real GDP, real income, employment, industrial production, and wholesale-retail sales.⁵

Gross domestic product (GDP) data is released quarterly and the latter four measures are available monthly. Since recessions are dated on a monthly basis, GDP data does not offer enough precision for the NBER's purposes. Of the four monthly factors, the NBER

places particular emphasis on real personal income excluding transfers and on employment, since both measures reflect activity across the entire economy. The committee places less emphasis on the industrial production and real sales series, which mainly cover the manufacturing and goods-producing sectors of the economy.⁶

Typically, the NBER does not announce that the economy has entered a recession until the recession is well under way — for good reason. By definition, a persistent downturn cannot be identified until it has persisted. For example, the recession which began in March 2001 was not announced by the NBER until November 2001. As it turns out, the NBER later identified November as marking the end of the 2001 recession. Thus, it is possible that at some future date, the NBER could identify the economy as currently experiencing a recession.

Figures 1 and 2 show real personal income (less government transfers) and employment, respectively, before, during, and since the 2001 recession. While both figures show a clear and sustained downturn in 2001, neither shows a similar downturn to date. Real personal income has flattened since mid-2007, but has not shown any persistent decline. (It fell, but only modestly, during the 2001 recession.) Employment has declined in the first four months of 2008, but only modestly compared to past recessions.⁷ Industrial production has been flat but shown no

⁴ For more information, see CRS Report RS22793, *What is a Recession, Who Decides When It Starts, and When Do They Decide?*, by Brian W. Cashell.

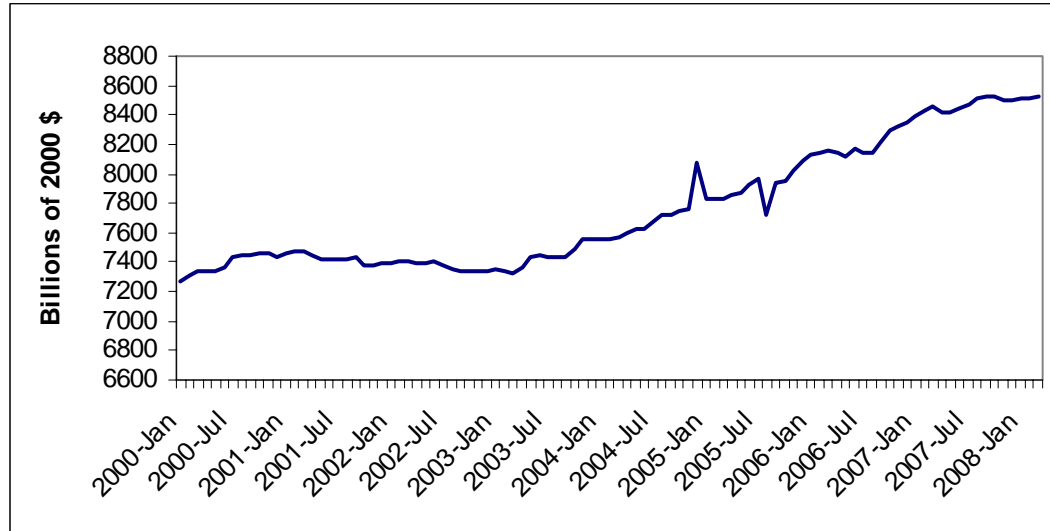
⁵ National Bureau of Economic Research, "The NBER's Business Cycle Dating Procedure," Oct 21, 2003, p. 2.

⁶ Ibid.

⁷ There are two major official employment series kept by the Bureau of Labor Statistics, the Current Employment Series (known as the "payroll" series) and the Current Population (continued...)

downward trend since mid-2007. Retail sales fell in February, but rose in January and March 2008. On balance, a recession may have already started, but it is too soon to be sure since data do not exhibit a smooth trend.

Figure 1. Real Personal Income

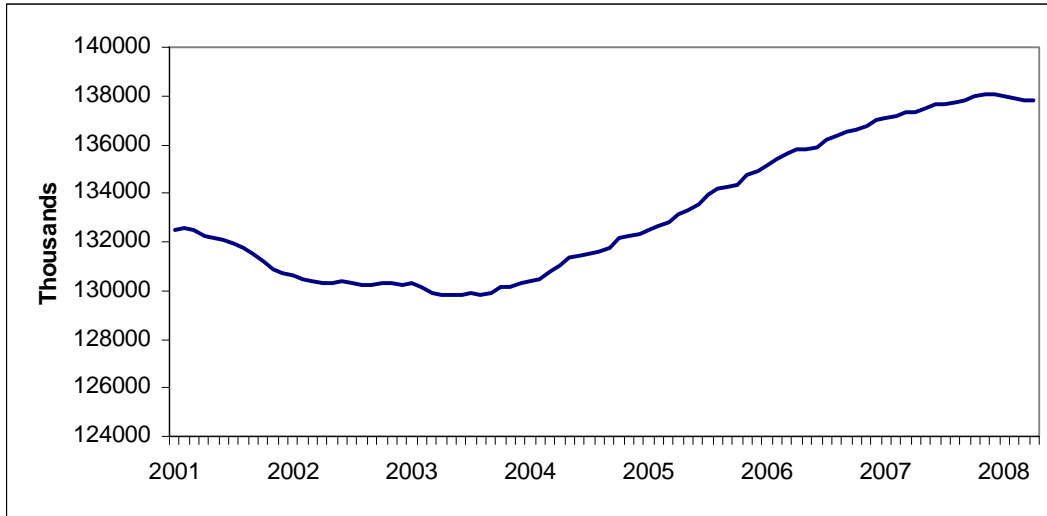


Source: CRS calculations based on data from the Bureau of Economic Activity

Note: Series constructed by subtracting government transfers from personal income and adjusting for inflation by the personal consumption expenditures deflator, as used by the NBER. Monthly data are annualized.

⁷ (...continued)

Series (known as the “household” series). The NBER, and most economists, favor the payroll series because it has a larger and more robust sample. For that reason, the payroll series is discussed in the main text and shown in **Figure 2**. In 2008, the two series have moved together. The unemployment rate is calculated from the household series, and has also shown a slight deterioration in the second half of 2007.

Figure 2. Non-farm Employment

Source: Bureau of Labor Statistics

Note: The figure plots the “payroll” employment series from the Current Employment Statistics, as used by the NBER.

What Causes Recessions?

In the long run, economic growth is determined solely by the growth rate of productivity and capital and labor inputs that determine the overall production of goods and services — what is sometimes referred to as the “supply side” of the economy. But in the short run, growth can be influenced by the rate of overall spending, also known as the “demand side” of the economy. The pattern caused by these short-term fluctuations in spending is known as the business cycle. Overall spending includes consumer spending, business spending on capital goods, government spending, and net exports (exports less imports).

Spending and production are equalized by prices. Because prices adjust gradually, spending can temporarily grow faster or slower than the potential growth rate of the supply side of the economy. Recessions are characterized by a situation where spending is not growing fast enough to employ all of the economy’s labor and capital resources. Recessions can come to an end because government has used fiscal or monetary policy to boost spending or because spending recovers on its own when prices have gradually adjusted. Then the economy begins a period of expansion. Economic booms eventually give way to “overheating,” which is characterized by a situation where spending is growing too fast, and labor, capital, and productivity cannot grow fast enough to keep up. In this scenario, faster economic growth can become “too much of a good thing” because it is unsustainable. Overheating is typified by a rise in inflation — because there is a greater demand for goods than supply of goods, prices begin to rise. Overheating then gives way to recession. While the pattern is predictable, the timing of the pattern is not — some expansions are longer than others.

Although there is no foolproof way to differentiate between changes in growth being caused by cyclical forces and structural forces, movements in the inflation rate offer a good indication. When inflation is rising, growth is probably above its sustainable rate because overall spending is growing too fast, and when inflation is falling, growth is probably below its sustainable rate because overall spending is too sluggish. Inflation is not a perfect indicator of cyclical activity, however, because sudden spikes in the price of specific goods sometimes cause overall inflation to temporarily change. Volatile energy prices are the prime example of when a change in inflation may not be indicative of the stage of the business cycle.

Employment and the Business Cycle

Just as rapid economic growth can be too much of a good thing, so too can rapid increases in employment and decreases in the unemployment rate. As explained above, the economy's potential growth rate is determined by the growth rate of inputs to the production process, such as labor. When employment rises faster (slower) than the labor force grows, the unemployment rate will fall (rise). With enough employment growth, at some point all available labor will be utilized in the production process, and this will happen before the unemployment rate reaches zero. Unemployment never reaches zero because some workers will always be in the process of leaving an old job and finding a new one, and some workers will always be in the wrong place at the wrong time for the skills they have compared to the skills needed for local employment opportunities. The rate of unemployment consistent with employment for all workers who do not fall into these two categories is known as the "natural rate of unemployment" or "full employment" or the "non-accelerating inflation rate of unemployment (NAIRU)."⁸

If overall spending is growing rapidly enough, unemployment can be temporarily pushed below the natural rate. When unemployment is pushed below the natural rate, too many jobs will be chasing too few workers, causing wages to rise faster than productivity. But wages cannot persistently rise faster than productivity because, again, overall spending cannot grow faster than production (assuming labor's share of income remains constant). Wages can temporarily rise faster than productivity, but the result would be rising inflation. In recessions, the process works in reverse. Because spending is insufficient to match potential production, businesses lay off workers. This causes the unemployment rate to rise above the natural rate. As unemployment rises, workers moderate their wage demands in order to find scarce jobs or keep existing jobs. As a result, inflation falls.

What Causes the Business Cycle?

Expectations play an important role in the business cycle, and people's expectations are not always rational. John Maynard Keynes described the cause of the business cycle as "animal spirits," or people's tendency to let emotions, particularly swings from excessive optimism to excessive pessimism, influence their economic actions. For example, businesses make investment decisions based on

⁸ For more information, see CRS Report RL30391, *Inflation and Unemployment: What Is the Connection?*, by Brian Cashell.

their projections of future rates of return, which will depend on future sales and so on. These inherently uncertain projections change as current conditions change. If businesses believe economic conditions will be unfavorable in the future, they will not make investments today, reducing the growth rate of GDP from what it otherwise would have been. Likewise, households may postpone purchases of durable goods or housing if economic conditions look unfavorable. People's projections of the future may be overly influenced by the present or recent past.

Even when expectations are rational, expectations can change as unexpected events occur. "Economic shocks" also play a dominant role in the business cycle. A shock refers to any sharp and sudden change in economic circumstances on the demand or supply side of the economy that disrupts the steady flow of economic activity. A well known example is an energy shock: when the price of energy suddenly rises, it disrupts both production, because energy is an important input to the production process, and consumer demand, because energy products account for a sizeable portion of consumer purchases.⁹ Other prominent shocks include natural disasters, global events that influence foreign trade, financial market unrest, and so on. A sudden change in expectations that affects consumer or investment spending can also be thought of as a shock to aggregate demand. Since these shocks are typically unpredictable, the business cycle remains unavoidable.

Policy can also play an important role in the timing and shape of the business cycle. The speed at which a recession ends can depend on the amount of monetary and fiscal stimulus. Although overheating may not be directly caused by stimulative policy, sometimes policymakers do not realize the economy is beginning to overheat until it is too late. Expansions often end when, in order to offset the rise in inflation, monetary policy is tightened to reduce overall spending to the point where it is growing at the same pace as overall supply again. In the process of policy-induced deceleration, the economy can easily overshoot and begin to contract. In essence, policymakers trade off a lower rate of economic growth in the short run to achieve a more stable and higher average growth rate over time.

Current Recessionary Pressures

As discussed in the last section, recessions are started by negative economic shocks or the normal boom and bust pattern inherent in the business cycle. Both of these factors may be present currently. The economy has undergone an energy shock in the form of a sudden spike in energy prices. While a boom and bust pattern is only modestly visible in price inflation data, it is starkly present in the housing market. Furthermore, the housing downturn has spilled over into financial markets, and the resulting pullback in credit offers another potential recessionary channel.

Although any one of these factors in isolation might not be powerful enough to cause a recession (depending on their severity), in concert they could. An economy-wide recession would result if spillover effects from the downturn in these three areas

⁹ For more information, see CRS Report RL31608, *The Effects of Oil Shocks on the Economy: A Review of the Empirical Evidence*, by Marc Labonte.

caused activity in the rest of the economy to decline as well. In the fourth quarter of 2007, declines in residential investment and inventories dragged down GDP growth, but the other sectors of the economy grew at relatively healthy rates. In the first quarter of 2008, weakness in the economy was more widespread.¹⁰ The following sections will discuss the channels through which these shocks could lead to an economy-wide slowdown for each factor.

Housing Bust

After years of rapid appreciation, national house prices flattened in 2006 and have fallen slightly since.¹¹ Larger price declines have occurred in several regional markets. There have already been large drops in house sales and residential investment (house building). Since the rise in prices during the preceding housing boom was unusually large, it is difficult to say how deep and long-lasting the housing downturn will be. Given the central role that the housing boom has played in the current economic expansion, many observers fear that a crash in the housing market will lead to an economy-wide recession.¹² They are concerned that the fall in house prices could spill over into a decline in aggregate spending through four channels.

First, builders could respond to lower prices by reducing residential investment, an important component of gross domestic product (GDP). This effect has already been felt, with the rate of residential investment falling by double digits since mid-2006 and reducing overall GDP growth by about one percentage point on average, all else equal. While this drag on growth may persist in coming quarters, most observers agree that it is unlikely to get much larger. This suggests that the drag from the slowdown in house building is too small to cause a recession by itself.

Second, the fall in housing prices could lead to a decline in consumer spending through a negative “wealth effect.” Some economists have argued that when house prices were rising, households responded to their greater housing wealth by increasing their consumption spending; were prices to fall, presumably the effect would be reversed. This effect is difficult to measure and faces some theoretical objections. For example, every housing transaction is composed of a buyer and seller. When house prices fall, sellers are made poorer but buyers are made wealthier, in the sense that they are provided an opportunity to devote less of their income to mortgage payments and more to other consumption.

¹⁰ Output data by industry are released with a considerable lag. The most recent industry data available show that 80% of the slowdown in growth in 2007 was caused by a decline in output in the financial sector and construction, and a slowdown in growth in real estate/rental housing and mining. While growth slowed somewhat across many industries, these data suggest that problems in housing and the financial sector were still mostly contained in those industries in 2007. Source: Bureau of Economic Analysis, “Advance GDP-by-Industry Statistics,” press release BEA 08-17, April 29, 2008.

¹¹ Based on government data from the Office of Federal Housing Oversight for resales of owner-occupied homes with conforming mortgages. Private sector data sources show a sharper decline in house prices.

¹² For in-depth analysis, see CRS Report RL34244, *Would a Housing Crash Cause a Recession?*, by Marc Labonte.

Third, the reset of mortgages to higher payments for many recent buyers has led to a significant increase in the share of households suffering from financial distress, as evidenced by the rise in the mortgage default rate. Resets can occur because borrowers took out adjustable rate mortgages or mortgages with introductory payments that later increase. During the runup in house prices, both types of mortgages increased sharply. For some homeowners, a fall in prices would eliminate the option to refinance to avoid the distress. These homeowners may then be forced to reduce consumption spending in response. A rise in defaults can feed back through and deepen the housing downturn.

Fourth, since mortgages are backed by the value of the underlying house, a fall in prices could feed through to financial sector instability. This channel will be discussed in the next section.

Liquidity Crunch

Since efficient financial intermediation is vital to a healthy economy, if a housing downturn caused widespread harm to the financial sector, the overall economy could suffer.

A change in the value of a house has no direct effect on the value of a loan. But falling prices would be harmful to the financial system if homeowners responded by defaulting on existing loans.¹³ For the value of the mortgage to exceed the value of the house, even after prices have fallen, the loan would have to have a high loan-to-value ratio (a loan made fairly recently and probably to a first time homeowner). It should be noted, however, that loan-to-value ratios have risen significantly in the past few years, because homes are being purchased with smaller downpayments and because existing homeowners have borrowed against their equity.

Overall default rates have risen since late 2006 for reasons beyond the traditional causes of unemployment, illness, divorce, and so on. Default rates on subprime loans, which are loans made to borrowers with weak credit profiles, have risen more rapidly. Default rates on all adjustable rate mortgages (prime and subprime) have risen as well, and the problem may worsen in the near future as a significant share of existing mortgages are forecast to adjust to higher interest rates. Falling prices can lead to rising defaults by preventing borrowers from escaping (through refinancing or selling) a mortgage that they cannot afford. Mortgages can either be unaffordable because borrowers could not really afford them in the first place or they can become unaffordable when adjustable mortgages reset to higher payments.¹⁴

¹³ Lower housing sales would require financial institutions to shift some of their activity from mortgage lending to other types of lending or investments. While this would not necessarily affect the overall profitability of the financial sector, some institutions might find the shift in lending difficult, particularly if they are small and heavily reliant on mortgage lending.

¹⁴ For information on mortgage resets, see CRS Report RL33775, *Alternative Mortgages*, by Edward Murphy.

Today, some mortgages are held by depository institutions and some are securitized and sold on the secondary market as mortgage backed securities (MBSs). One rationale for the development of a secondary market was to move non-diversified risk off of bank balance sheets and disperse it throughout financial markets. So far, the increase in default rates has not resulted in any widespread problems for depository institutions. There is a fear, however, that as the mortgages underlying the MBS default, they will be brought back onto the bank's balance sheets, either through guarantees made to MBS investors or structured investment vehicles (SIVs).¹⁵

Although securitization may have softened the blow of the housing crash for commercial banks, it has caused widespread financial turmoil in secondary markets. Even though subprime MBSs are only a small part of overall financial markets, the repricing of MBSs to reflect the housing downturn has been untidy, leading to bankruptcy for many non-bank mortgage lenders that rely on securitization and for MBS investors. In August 2007, problems with MBSs spilled over into other financial markets, leading to a widespread "liquidity crunch," in which financial intermediation ceased to function smoothly.¹⁶ At this point, it is too soon to tell how quickly financial markets will recover from the liquidity crunch, and if the crunch will have lasting effects on the rest of the economy.

Since the beginning of the liquidity crunch financial institutions, particularly investment banks, have written off large losses as a result of the fall in asset prices. These losses could lead the banks to curtail new lending through a balance sheet effect. When the value of a bank's assets declines, then its capital will also decline if its liabilities remain constant. The bank may then wish to replenish its capital by taking on fewer new loans. If banks make fewer loans, then all bank-financed projects could decline, including business capital investment unrelated to housing. Through this channel, the liquidity crunch could spread to the overall economy.

Energy Shock

Because of the central role energy plays in the functioning of the U.S. economy and its unusual price volatility, changes in energy prices tend to have a greater short-term impact on the economy than changes in the prices of most other goods. Energy "shocks" can have macroeconomic consequences, in terms of higher inflation, higher unemployment, and lower output. Historically, energy price shocks have proven particularly troublesome for the U.S. economy. Sharp spikes in the price of oil have

¹⁵ SIVs are off-balance sheet entities established (but not owned) by commercial banks. An SIV finances the purchase of long-term MBS by selling short-term notes and commercial paper. The spread between the long- and short-term rates is profit. For the concept to work, the SIV must be able to borrow cheaply — a triple-A rating is a basic requirement. To secure that rating, the SIV generally agrees to maintain certain levels of collateral and the sponsoring banks often commit themselves to providing lines of credit if the SIV becomes unable to raise funds in the market.

¹⁶ See CRS Report RL34182, *Financial Crisis? The Liquidity Crunch of August 2007*, by Darryl Getter, Mark Jickling, Marc Labonte, and Edward Murphy.

preceded nine of the 10 post-war recessions. But since the current economic expansion began in 2001, energy prices have spiked on several occasions.

Economic theory suggests that economies suffer from recessions due to the presence of “sticky prices.” If markets adjusted instantly, then recessions could be avoided: whenever economic conditions changed, price and wage changes would automatically bring the economy back to full employment. In actuality, however, there are menu costs,¹⁷ information costs, uncertainty, and contracts in the U.S. economy that make prices sticky. As a result, adjustment takes time, and unemployment and economic contraction can result in the interim.

When oil prices rise suddenly, it directly raises the energy portion of inflation measures such as the consumer price index (energy prices make up about 9% of the consumer price index.) As a result, the overall inflation rate is temporarily pushed up since other prices do not instantly adjust and fall. If other energy prices rise at the same time, as has often been the case, then the effect on overall inflation will be magnified.

Because energy is an important input in the production process, the price shock raises the cost of production for many industries. Transportation accounts for a majority of oil consumption in the United States, but hydrocarbons are also used for heating and industrial uses, such as the production of plastics. Because other prices do not instantly fall, the overall cost of production rises and producers respond by cutting back production, which causes the contraction in output and employment, all else equal. There may also be adjustment costs to shifting toward less energy intensive methods of production, and these could temporarily have a negative effect on output. Typically, the effect on output occurs over a few quarters.¹⁸

The effects described thus far can be thought of as occurring on the supply side of the economy. Oil shocks may also affect aggregate demand. When energy prices rise, they involve an income transfer from consumers to producers. Since producers are also consumers, aggregate demand is likely to fall only temporarily as producers adjust their consumption to their now higher incomes. This adjustment is likely to be less or to take longer when the income recipients are foreigners than when they are Americans.

Since the United States is a net importer of oil, the net effect on U.S. aggregate demand depends on how foreign oil producers use their increase in wealth. The adjustment to the wealth transfer from consumer to producer is transmitted through the international balance of payments. How the increase in oil prices affects the current account deficit (a measure that primarily consists of the trade deficit) depends, in turn, on how foreign oil producers decide to use this purchasing power.

¹⁷ Products with high “menu costs” are those which are costly to re-price, and therefore have sticky prices. Restaurant menus, periodicals, and catalog items are examples of products with high menu costs.

¹⁸ If rising energy prices affect the economy through this transmission mechanism, then falling energy prices should have the opposite effect on the economy: they should temporarily lower inflation and raise output, all else equal.

If they use it to purchase U.S. goods, then U.S. exports would increase and there would be little effect on the current account deficit. If they use it to purchase U.S. assets — whether corporate stocks, Treasury bonds, or by simply leaving the revenue in a U.S. bank account — then it would represent an inflow of foreign capital to the United States, which would increase the current account deficit. The purchase of U.S. assets would stimulate total demand in the United States through lower interest rates, thereby offsetting the contractionary effects of the larger trade deficit, at least in part and possibly with a lag. Or the foreign oil producers may use their increased wealth to purchase other countries' goods or assets, in which case the adjustment process in the United States could take longer.

A second effect on demand can be expected to occur because the rise in energy prices will probably push up the overall price level because other prices do not fall immediately in the face of a decline in demand. The increase in the price level will reduce the real value of the available amount of money in the hands of buyers, and this reduction in the value of money will also reduce spending. A third effect on demand can occur if the rise in energy prices increases uncertainty and causes buyers to defer purchases. This effect is also likely to be of a short-run nature. The magnitude of all three effects will depend on how much energy prices rise and how long they remain high.

Both the inflation and output effects of energy shocks are temporary: that is, once prices adjust, the economy returns to full employment and its sustainable growth path.¹⁹ This observation yields an important insight: it is not the *level* of energy prices that affects economic growth and inflation, but rather the *change* in energy prices. Thus, if policymakers are concerned about the effect of energy prices on output and inflation, they should focus more on rising energy prices than “high” energy prices, even if the high prices are permanent. The only permanent macroeconomic effect of higher energy prices is their negative effect on the terms of trade. The “terms of trade” is the ratio of export prices to import prices.²⁰ It means that the United States has to give up more of the goods it produces than previously to obtain a barrel of oil. Permanently higher energy prices lead to a one-time permanent decline in the terms of trade and the standard of living of U.S. consumers, all else equal.

Popular Leading Indicators of Recessions

As discussed below, using policy to avoid a recession requires accurate predictions of where the economy is heading before it has already slowed down. Forecasters are always looking for “leading indicators” — reliable signs of where the economy is headed in the short run. This section focuses on popular leading

¹⁹ This point is not always explicitly made in the time series analyses reviewed below, which tend to end their estimates at the last time lag that yields statistically significant results or arbitrarily cut off the estimates after a few lags to meet a statistical criterion concerning the limit on the number of variables allowed.

²⁰ See CRS Report RL32591, *U.S. Terms of Trade: Significance, Trends, and Policy*, by Craig K. Elwell.

indicators of recessions. These indicators should not be thought of as the cause of recessions; rather, forecasters attempt to identify predictable patterns within economic data. If the same economic forces that cause a recession first surface in leading indicators, then leading indicators can be watched to spot a recession before it emerges. A measure could also be a leading indicator because it is more readily available than GDP data. GDP data is released quarterly, with a lag of about a month after the quarter has ended, and is subject to significant revisions in later months.

Leading indicators will be successful only if the business cycle features predictable patterns. If every business cycle is unique, then leading indicators based on past experience may have little predictive power going forward. Since the economy is constantly changing and recessions are infrequent, it may be that indicators that were useful a few recessions ago (i.e., a few decades ago) are no longer relevant in today's economy.²¹

The remainder of this section will discuss some of the most famous leading indicators to explain why their predictive power is believed to be high.

Yield Curve Inversion

The yield curve inversion is a well-known recession indicator. A “yield curve” refers to a graph plotting the yield on securities by maturity, from three month to thirty years in the case of U.S. Treasuries. Typically, interest rates are higher on securities with a longer time to maturity. Prior to each of the last six NBER-designated downturns (12/69, 11/73, 01/80, 07/81, 07/90, and 03/01), the yield on all maturities of U.S. Treasury securities fell below the federal funds rate (the rate that the Federal Reserve targets to conduct monetary policy).²² In the discussion to follow, this will be referred to as an inversion of the yield curve.²³

It should be noted that the time that elapses between the month the inversion occurs and the subsequent NBER-designated peak in economic activity is not a constant. The number of months prior to the peak that the inversion occurred (and the peak) have been: 20 months/December 1969; 8 months/November 1973; 15 months/January 1980; 9 months/July 1981; 16 months/July 1990; and 9 months/March 2001.

²¹ A further objection to leading indicators is that they fall foul of the “Lucas critique.” Economist Robert Lucas argued that one cannot assume that past relationships between economic variables will remain stable in the future because economic actors learn about past relationships and adjust their behavior accordingly. For example, once there is a consensus that a specific economic variable is a leading indicator of a recession, economic actors are likely to react to changes in that indicator in a way that they did not previously.

²² For analytical purposes, only the yields on U.S. Treasury securities are used in order to hold the risk factor constant. The yield on private sector securities can vary across time because investors change their evaluation of their riskiness. Unlike private sector securities, Treasury securities have virtually zero default risk.

²³ In this report, inversion does not necessarily mean that the yield on all shorter term Treasury securities was above those on longer term debt. It only means that the federal funds rate was above the yield on all marketable Treasury securities.

Although the structure of Treasury interest rates has had a good predictive record, it is not perfect. There have been two economic contractions since the federal funds market was developed in 1954 that were not preceded by an inversion (those beginning in August 1957 and April 1960). In addition, inversions occurred in both June 1966 and August 1998 with no subsequent economic contraction. The 1957, 1960, and 1966 anomalies may be due to the early and limited nature of the federal funds markets and the fact that this rate was not then the main vehicle for carrying out monetary policy. It is now widely accepted that the decline in longer term Treasury yields in the 1998 episode was associated with an international “flight to quality” following the financial crisis in East Asia in the last half of 1997 and the debt default by Russia in the summer of 1998.

Between June 2004 and June 2006, the Federal Reserve executed 17 equal hikes of $\frac{1}{4}$ percentage point in the federal funds rate, raising the target rate from 1% to a high of 5.25%. The yields on short maturity Treasury securities have risen in harmony with the federal funds target; the yields on longer term Treasuries have not. This has resulted in a flattening of the yield curve. By late July 2006, the yields on all Treasury securities were below the target on federal funds, where they remained until late 2007, when Fed easing brought the federal funds rate below the 30 year Treasury yield.

To understand why a yield curve inversion might precede a recession, it may first be useful to explain why the yield curve is usually upward sloping. Investors are only willing to take on more risk if they receive a higher rate of return. In this case, the greater riskiness of longer term Treasuries comes not from default risk, but from interest-rate risk. The price of a bond fluctuates inversely with changes in interest rates, and bonds with a greater maturity length will change in value more than short-term bonds for a given change in interest rates. Thus, even if investors expected interest rates to be constant over the next five years, a five-year bond would have to offer a higher rate of return than a one-year bond to compensate for interest rate risk in order for investors to be indifferent between the two, and this results in an upward sloping yield curve.

Next, consider what could cause a yield curve inversion. An inversion usually occurs as a result of a rising federal funds rate, which is consistent with a tightening of monetary policy. The Federal Reserve reduces the supply of federal funds, pushing up the federal funds rate. With fewer reserves, banks are forced to reduce loans and sell other assets, leading to a reduction in the growth of money and credit and, ultimately, a reduced rate of total spending. If this reduction is large enough, it can cause an economic contraction.²⁴ (An additional incentive for banks to contract credit following an inversion is that the rate they must now pay to borrow reserves is above what they can earn using those reserves for the acquisition of very safe assets.) Borrowing for, say, five years could be financed by issuing a five year note

²⁴ A rising federal funds rate is also consistent with an increased demand for those funds, the sign of a vigorous economic expansion. By letting the rate rise, the Fed may also be tightening money and credit growth relative to what would be the case if it had held the rate constant. However, this tightening will be less than would be the case if it actually reduced the supply of those funds.

or by issuing a one year note and rolling it over into a new note each time it matures. As a result, there is a relationship between interest rates at different maturities. If long-term rates are partly determined by the average of present and future short-term rates, then the yield curve would become inverted if short-term rates today were higher than short-term rates expected in the future. This would occur when the federal funds rate was rising if investors expected it to fall in the future. For example, if they thought that the higher rate was going to reduce GDP growth, they might expect that the Fed would be forced to reduce the target rates in the future to increase GDP growth.

Why is there a time lag between the yield curve inversion and the recession? In this case, the delay is because of the lag between the change in Fed policy and the slowdown in economic activity that a tightening of credit conditions eventually causes. As economists are prone to argue, the time that elapses from a decrease in the growth of money and credit to a decrease in the growth of money spending is not uniform (mainly because economic conditions differ when monetary policy is tightened). It can be both long and of a variable length. This accounts for the variable lag reported above between the month the inversion occurs and the month in which the economy reaches a business cycle peak. With a long and variable lag and cases of “false positives,” such as 1998, some skeptics have questioned whether the yield curve is really a useful recession predictor.

Credit Spreads

Forecasters have also focused on the “credit spread” as a business cycle predictor. The credit spread refers to the difference in yield on two assets that have the same characteristics except that one is riskier than the other. Many different assets have been used to measure credit spreads, including the spread between Treasury bills and commercial paper and between highly rated and lower rated bonds.

Credit spreads are seen as a measure of investors’ perception and tolerance of risk — when spreads are higher, investors require a higher rate of return to be willing to take on risk. When the economy slows down, more firms fail and investors become more fearful of risk. The financial turmoil that has gripped markets since August 2007 has led to a sharp increase in credit spreads, with Treasury yields falling sharply while other asset yields have risen.²⁵

But just as financial market downturns do not always translate into economic downturns, a rise in credit spreads does not always accurately predict a recession. For example, financial turmoil in 1998 led to a sharp rise in credit spreads, but did not result in a recession. Economists Estrella and Mishkin found the commercial

²⁵ Stock and Watson found that the commercial paper-U.S. Treasury spread did not predict the 2001 recession, but the junk bond yield spread did. James Stock and Mark Watson, “How Did the Leading Indicator Forecasts Perform During the 2001 Recession?”, Federal Reserve Bank of Richmond, *Economic Quarterly*, vol. 89, no. 3, Summer 2003.

paper-Treasury bill spread to be a statistically significant recession predictor only up to two quarters forward, and it did not perform well in out-of-sample forecasts.²⁶

Stock Prices

Economic theory states that stock prices are determined by the present discounted value of future earnings. In a recession, corporate earnings would be expected to fall for the market as a whole, and this would reduce stock prices. If the slowdown were anticipated by investors, the fall in prices would happen before the economy began to slow. If the combined wisdom of the marketplace is accurate, stock prices could potentially offer valuable information about the future path of the economy. Even if investors cannot accurately forecast future economic growth, movements in stock prices may provide useful “real time” information about the current economy given that economic data is released with a lag, and recessions are not declared until after the fact.

As discussed in the next section, stock prices are seen as providing useful enough information that they are one of the Conference Board’s leading indicators. Moreover, stock prices fell in the months before the 2001 recession. But econometric analysis has mostly found that stock prices do not predict economic growth.²⁷ One exception is an article by Estrella and Mishkin that found stock prices to be a statistically significant recession predictor up to four quarters forward.²⁸ Evidence presented by Hamilton and Lin suggests that while recessions and bear markets go hand in hand, recessions have often started before the decline in the stock market.²⁹

Index of Leading Indicators

It may be that no single measure can reliably predict a recession, so some forecasters have attempted to evaluate several measures simultaneously. For example, the Conference Board, a private firm, compiles a well-known composite index of leading indicators, and tracks the index on a monthly basis. Its index is composed of the following measures:

1. Average weekly hours, manufacturing
2. Average weekly initial claims for unemployment insurance

²⁶ Arturo Estrella and Frederic Mishkin, “Predicting U.S. Recessions: Financial Variables as Leading Indicators,” National Bureau of Economic Research, working paper 5379, December 1995. A test of the usefulness of an indicator is whether the relationship fitted to past data holds for future (“out of sample”) data.

²⁷ For a review, see James Stock and Mark Watson, “Forecasting Output and Inflation: The Role of Asset Prices,” *Journal of Economic Literature*, vol. XLI, no. 3, September 2003.

²⁸ Arturo Estrella and Frederic Mishkin, “Predicting U.S. Recessions: Financial Variables as Leading Indicators,” National Bureau of Economic Research, working paper 5379, December 1995.

²⁹ James Hamilton and Gang Lin, “Stock Market Volatility and the Business Cycle,” *Journal of Econometric Forecasting*, v. 11, no. 5, September 1996, p. 573.

3. Manufacturers' new orders, consumer goods and materials
4. Vendor performance, slower deliveries diffusion index
5. Manufacturers' new orders, nondefense capital goods
6. Building permits, new private housing units
7. Stock prices, 500 common stocks
8. Money supply, M2
9. Interest rate spread, 10-year Treasury bonds less federal funds
10. Index of consumer expectations

In recent months, the index has shown a downward trend. The largest drag on the index recently has been building permits, as a result of the housing downturn.

Including so many different measures in an index could lead to a problem of "over-identification," where variables are included that just coincidentally moved in concert with the economy in the past, without any structural relationship. If the past correlation was coincidental, it is unlikely to result in accurate predictions in the future.

Of course, some indicators in the composite may be more important than others. Weekly manufacturing hours and the money stock have the largest shares in the index. The index is supposed to provide predictions about all stages of the business cycle, whereas some indicators may be more useful for predicting a downturn than others. According to forecaster Edward Leamer, the interest rate spread, unemployment claims, and building permits, in that order, are the best predictors of when a recession will start.³⁰ Filardo shows that while the composite of leading indicators has predicted most past recessions successfully, its usefulness is limited by the fact that the lead time between the prediction and the onset of the recession is highly variable, and the index has at times predicted false positives (i.e., predicted a recession when no recession occurred).³¹

Policy Responses

Just as an economic slowdown is caused by market forces, market adjustment will also cause economic activity to eventually recover on its own. But policymakers may prefer to use stimulative policy to attempt to hasten that adjustment process, in order to avoid, or at least ameliorate, the detrimental effects of cyclical unemployment. By definition, a stimulus proposal can be judged by its effectiveness at boosting total spending in the economy. Total spending includes personal consumption, business investment in plant and equipment, residential investment, net exports (exports less imports), and government spending. Stimulus could be aimed at boosting spending in any of these categories.

³⁰ Edward Leamer, "Is a Recession Ahead? The Models Say Yes, but the Mind Says No," *Economists' Voice*, January 2007. According to a model based on those three measures, there was a 100% chance of recession in the next twelve months from October 2006 to the article's publication in January 2007.

³¹ Andrew Filardo, "How Reliable Are Recession Prediction Models?," Federal Reserve Bank of Kansas City, *Economic Review*, vol. 84, no. 2, 1999:Q2, p. 35.

Fiscal Stimulus

Fiscal stimulus can take the form of higher government spending (direct spending or transfer payments) or tax reductions, but either way it can boost spending only through a larger budget deficit. A deficit-financed increase in government spending directly boosts spending by borrowing to finance higher government spending or transfer payments to households. A deficit-financed tax cut indirectly boosts spending if the recipient uses the tax cut to increase his spending. If an increase in spending or a tax cut is financed through a decrease in other spending or increase in other taxes, the economy would not be stimulated since the deficit-increasing and deficit-decreasing provisions would cancel each other out.

Since total spending can be boosted only temporarily, stimulus has no long-term benefits, and may have long-term costs. Most notably, the increase in the budget deficit “crowds out” private investment spending because both must be financed out of the same finite pool of national saving, with the greater demand for saving pushing up interest rates.³² To the extent that private investment is crowded out by a larger deficit, it would reduce the future size of the economy since the economy would operate with a smaller capital stock in the long run. In recent years, the U.S. economy has become highly dependent on foreign capital to finance business investment and budget deficits.³³ Since foreign capital can come to the United States only in the form of a trade deficit, a higher budget deficit could result in a higher trade deficit, in which case the higher trade deficit could dissipate the boost in spending. Indeed, conventional economic theory predicts that fiscal policy has no stimulative effect in an economy with perfectly mobile capital flows.³⁴ Some economists argue that these costs outweigh the benefits of fiscal stimulus.

The most important determinant of a stimulus’ macroeconomic effect is its size. The recently adopted stimulus package (P.L. 110-185) increases the budget deficit by about 1% of gross domestic product (GDP). The major provisions of the package were tax rebates for individuals and investment tax incentives for corporations, which would be expected to boost consumption and capital investment, respectively.³⁵ In a healthy year, GDP grows about 3%. In the moderate recessions that the U.S. experienced in 1990-1991 and 2001, GDP contracted in some quarters by annualized rates of 0.5% to 3%. (The U.S. economy has not experienced contraction in a full calendar year since 1991.) Thus, a swing from expansion to recession would result in a change in GDP growth equal to at least 3.5 percentage points. A stimulus package of 1% of GDP could be expected to increase total

³² Crowding out is likely to be less of a concern if the economy enters a recession since recessions are typically characterized by falling business investment.

³³ If foreign borrowing prevents crowding out, the future size of the economy will not decrease but capital income will accrue to foreigners instead of Americans.

³⁴ For more information, see CRS Report RS21409, *The Budget Deficit and the Trade Deficit: What Is Their Relationship?*, by Marc Labonte and Gail E. Makinen.

³⁵ For details of the stimulus package, see CRS Report RL34349, *Economic Slowdown: Issues and Policies*, by Jane G. Gravelle, Thomas L. Hungerford, Marc Labonte, N. Eric Weiss, and Julie M. Whittaker.

spending by about 1% for the year (with the effect concentrated in the quarters that the stimulus was delivered).³⁶ To the extent that spending begets new spending, there could be a multiplier effect that makes the total increase in spending larger than the increase in the deficit. Offsetting the multiplier effect, the increase in spending could be neutralized if it results in crowding out of investment spending, a larger trade deficit, or higher inflation. The extent to which the increase in spending would be offset by these three factors depends on how quickly the economy is growing at the time of the stimulus — an increase in the budget deficit would lead to less of an increase in spending if the economy were growing faster.

The effectiveness of the stimulus package in the current environment may also depend on the nature of the slowdown. If the fundamental problem retarding economic growth is a credit crunch, caused by banks' desire to repair their balance sheets, it is unclear how much a general boost to consumer spending and tax incentives for firms to invest can solve the problem.

In judging the need for fiscal stimulus, policymakers might also consider that stimulus is already being delivered, in addition to the stimulus package passed in February, from two other sources. First, the federal budget has *automatic stabilizers* that cause the budget deficit to automatically increase (and thereby stimulate the economy) during a downturn in the absence of policy changes. When the economy slows, spending on entitlement programs such as unemployment compensation benefits automatically increases as program participation rates rise and the growth in tax revenues automatically declines as the recession causes the growth in taxable income to decline. In addition to the stimulus package, the Congressional Budget Office projected in March 2008 that under current policy, the budget deficit would increase by another \$42 billion in 2008 compared to 2007.³⁷

Second, the Federal Reserve has already delivered a large monetary stimulus. Its actions will be discussed in the next section.

Monetary Policy

The Federal Reserve can use expansionary monetary policy to boost spending in the economy by lowering the overnight interest rate, called the federal funds rate. The Fed alters interest rates by adding or withdrawing reserves from the banking system. Lower interest rates increase interest-sensitive spending, which includes physical investment (i.e., plant and equipment) by firms, residential investment (housing construction), and consumer durable spending (e.g., automobiles and appliances) by households. In addition, lower interest rates would stimulate the economy by reducing the value of the dollar, all else equal, which would lead to

³⁶ See, for example, "Options for Responding to Short-term Economic Weakness," Testimony of CBO Director Peter Orszag before the Committee on Finance, January 22, 2008.

³⁷ Note also that, in January 2008, CBO estimated that if supplemental military spending to maintain current troop levels overseas and an alternative minimum tax patch are enacted, and expiring tax provisions are extended, the 2008 deficit could increase by another \$42 billion compared to 2007.

higher exports and lower imports. Changes in the federal funds rate lead to changes in spending with a lag.³⁸

Beginning in September 2007, before data were publicly available to demonstrate that economic growth had slowed, the Fed began lowering the federal funds rate. Since then it has lowered the rate several times. The Fed has also greatly increased its direct lending to the financial sector, through the discount window and a series of new lending initiatives, including lending to non-depository institutions for the first time. In March 2008, it financed the purchase of \$30 billion of assets from the investment bank Bear Stearns to prevent it from filing for bankruptcy. The assistance was unprecedented for its size, nature, and recipient (Bear Stearns was not a member of the Federal Reserve system).³⁹

Some critics have argued that financial institutions will be relatively unresponsive to interest rate cuts until they have strengthened their balance sheets. Thus they argue that the Fed's moves are well-intentioned, but will prove ineffective. Others argue that the Fed has neglected the risk that excessive monetary expansion will result in a problem of rising inflation. They argue allowing market forces to adjust would be better for the economy than rate cuts in the long run, even if it deepened the downturn in the short run. Since monetary policy affects the economy with a lag, it is too soon to say whether the Fed or its critics are correct.

Are Recessions Unavoidable?

If recessions are usually caused by declines in aggregate spending, and the government can alter aggregate spending through changes in monetary and fiscal policy, then why is it that the government cannot use policy to prevent recessions from occurring in the first place? While recessions should theoretically be avoidable, there are several real world problems that keep stabilization from working with perfect efficiency in practice.

First, many of the economic shocks that cause recessions are unforeseeable. By the time policymakers can react to the shocks, it may be too late to avoid a recession. As their name suggests, economic shocks tend to be sudden and unexpected. Few energy analysts predicted that the price of oil would rise from less than \$20 per barrel in 2001 to about six times as high today; if the rise in price could not be predicted, then neither could its effects on the economy.

Second, there is a time lag between a change to monetary or fiscal policy and its effect on the economy because individual behavior adjusts to interest rate or tax changes slowly. It will take time for firms to boost investment in response to lower interest rates and the tax incentives included in the stimulus package. Also, although the stimulus bill became law in February 2008, consumers did not begin receiving their "rebate" checks until May. Because of lags, an optimal policy would need to

³⁸ For more information, see CRS Report RL30354, *Monetary Policy and the Federal Reserve*, by Marc Labonte and Gail E. Makinen.

³⁹ For more information, see CRS Report RL34427, *Financial Turmoil: Federal Reserve Policy Responses*, by Marc Labonte.

be able to respond to a change in economic conditions before it occurred. For example, if the economy were going to fall below full employment next year, policy would need to be changed this year to prevent it.

Third, for stabilization policy to be effective given lags, policymakers must have accurate economic forecasts. Yet even short-term economic forecasting — particularly in the case of turning points in the business cycle — is notoriously inaccurate. In January 2001, the Congressional Budget Office, the Office of Management and Budget, the Federal Reserve, and virtually all major private forecasts predicted growth between 2.0% and 3.1% for the year.⁴⁰ In reality, the economy entered a recession two months later, and grew by 0.8% for the year. Given the important role of unpredictable shocks in the business cycle, perhaps this should not be a surprise.

Fourth, since forecasts are not always accurate, our understanding of the economy is limited, and the economy does not always respond to policy changes as expected, policy changes do not always prove to be optimal in hindsight. For example, if the natural rate of unemployment (NAIRU) rises and policymakers do not realize it, they may think that expansionary policy is needed to reduce unemployment. Economists believe that this is one reason inflation rose in the 1970s.

Fifth, in the case of monetary policy, changes in short-term interest rates do not lead to one-for-one changes in long-term interest rates. Long-term interest rates are determined by supply and demand, and many factors enter that equation besides short-term interest rates. Yet many types of spending may be more sensitive to long-term rates, reducing monetary policy's effectiveness. One reason the housing boom continued after 2004 was that mortgage rates increased far less than the federal funds rate.

Sixth, since policy changes do not lead to large and rapid changes in economic activity for the reasons listed above, it may take extremely large policy changes to forestall a recession. Yet policy changes of that magnitude could be destabilizing in their own right. Extremely large swings in interest rates could impede the smooth functioning of the financial system and lead to large swings in the value of the dollar. Large increases in the budget deficit could hamper the government's future budgetary flexibility. Uncertainty is an argument in favor of more modest policy changes.

Finally, policy's influence on the economy is blunted by the open nature of the U.S. economy in an era of increasing globalization. As discussed above, the expansionary effects of increases in the budget deficit have been largely offset by increases in the trade deficit in recent years. Likewise, the contractionary effects of higher short-term interest rates have not led to significantly higher long-term rates because of the ready supply of foreign capital. Nevertheless, higher short-term interest rates would still have a contractionary effect on the economy through the larger trade deficit that accompanies foreign capital inflows. But if foreign capital flows kept long-term interest rates (such as mortgage rates) from rising in response

⁴⁰ Blue Chip, *Economic Indicators*, January 2001.

to contractionary monetary policy, capital mobility may have rendered monetary policy unable to effectively counteract the housing bubble. An open economy is also one that is more influenced by developments abroad — as the economy's openness has increased over time, foreign economic shocks (positive or negative) have had a larger effect on the United States, and domestic events, including policy changes, have had a smaller effect.