

# CRS Report for Congress

## Understanding Stagflation and the Risk of Its Recurrence

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# Understanding Stagflation and the Risk of Its Recurrence

## Summary

The slowing of economic growth and the rising rate of inflation in early 2008 have given rise to concerns that the U.S. economy is at risk of an episode of *stagflation*. Stagflation describes an economy that is characterized by high rates of both unemployment and inflation. The term came into popular use in the 1970s to describe the economy at that time. The unemployment rate reached 9.0% in May 1975 and a high of 10.8% in November 1982. The rate of consumer price inflation reached 12.2% for the 12-month period ending in November 1974, and 14.6% for the 12-month period ending in May 1980. Inflation is currently about 4% and the unemployment rate is near 5%, both well below the rates in the 1970s that were cause for alarm. Nonetheless, higher oil prices and turmoil in financial markets have led some to warn that stagflation may be in our future.

The key to understanding the nature of stagflation is the natural rate of unemployment. That is the lowest rate of unemployment consistent with a stable rate of inflation. Below that rate, inflation tends to accelerate. In the view of the natural rate model, unemployment and inflation rates may be relatively high at the same time, and they may even rise simultaneously for a time, particularly if inflation and the natural rate of unemployment are rising at the same time. What is unlikely to happen, however, is for the unemployment rate to be high and for the inflation rate to continue accelerating. If the unemployment rate is above the natural rate, then cooling labor and product markets would be likely to reduce upward pressure on wages and prices.

Stagflation in the 1970s coincided with two large “oil shocks.” A large increase in the price of oil can have macroeconomic consequences in terms of higher inflation, higher unemployment, and lower output. Both the inflation and output effects of energy shocks are temporary, however. Once prices adjust, the economy returns to full employment and its sustainable growth path. 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 with 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.

Although stagflation is understood to be high rates of both inflation and unemployment, it is not clear how high those rates have to be to merit the designation. Whether or not rates less than those observed in the 1970s constitute stagflation may be a subjective matter. Recent unemployment and inflation rates are not nearly as high as they were in the 1970s. Some economists, however, fear that the recent expansion in monetary and fiscal policy, at a time when unemployment is low but rising and energy prices are rising, could lead to a new bout of stagflation in the near future. Although policy may not be able to prevent episodes of stagflation from occurring, there may be enough understanding of the underlying causes to avoid making conditions substantially worse.

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# Understanding Stagflation and the Risk of Its Recurrence

The slowing of economic growth and the rising rate of inflation in early 2008 have given rise to concerns that the U.S. economy is at risk of an episode of *stagflation*. In the best of times, policymakers hope to keep both the unemployment rates and inflation rates as low as possible. Stagflation, in contrast, may be the worst of times. Stagflation describes an economy that is characterized by high rates of both unemployment and inflation.

Stagflation is a term that came into popular use in the 1970s to describe the economy at that time. The unemployment rate reached 9.0% in May 1975 and a high of 10.8% in November 1982. The rate of consumer price inflation reached 12.2% for the 12-month period ending in November 1974, and 14.6% for the 12-month period ending in May 1980. Many observers also associate this period of stagflation with large oil price shocks, and some draw another parallel with the recent rise in oil prices.

Inflation is currently about 4% and the unemployment rate is near 5%, both well below the rates that caused alarm in the 1970s. Nonetheless, higher oil prices and turmoil in financial markets have led some to warn that stagflation may be in our future.<sup>1</sup>

The reason stagflation elicits particular concern is that it presents a policy dilemma in that it may be difficult to find a way to reduce inflation and unemployment at the same time. Typically, inflation is seen as the result of growth in aggregate demand outpacing growth in supply, and a contractionary policy would seem appropriate to bring it under control. Rising rates of unemployment tend to result when demand growth falls short of growth in supply and so a stimulative policy might be called for. The policy dilemma arises because the two approaches are incompatible.

There are two views of stagflation. One is that it is the result of economic policy errors. The other view is that it is the result of external supply shocks, such as oil price increases, which may be beyond the influence of economic policy. Understanding what stagflation is requires an explanation of the nature of the relationship between inflation and unemployment. This report discusses that relationship in order to provide some understanding of the policy problems. In doing so, it examines the U.S. experience with stagflation in the 1970s. It also examines

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<sup>1</sup> See, for example, Graham Bowley, "That '70s Look: Stagflation," *The New York Times*, Feb. 21, 2008, p. C1.

some of the research that has been done on the relationship between oil prices and economic performance.

## The Prevailing View Before the Stagflation of the 1970s

The experience of the 1970s had much to do with changing the prevailing view of the relationship between inflation and unemployment. Prior to that, it was widely believed that inflation and unemployment were unlikely to trend either up or down together simultaneously. Rather, it was thought that there was a trade-off between the two and that they were more likely to move in opposite directions.

In a famous article published in 1958, economist A.W. Phillips claimed to have found evidence of an inverse relationship between the rate of increase in wages and the rate of unemployment. Comparing rates of increase in wages with unemployment rates in Britain between 1861 and 1957, Phillips found that as the labor market tightened, and the unemployment rate fell, money wages tended to rise more rapidly.<sup>2</sup> Because wage increases are closely correlated with price increases, that relationship was widely interpreted as a trade-off between inflation and unemployment.<sup>3</sup> The implication was that policymakers could maintain lower rates of unemployment by tolerating rates of inflation. It also implied straightforward policy implications for either macroeconomic problem — high unemployment could be eliminated through expansionary monetary or fiscal policy, and high inflation could be eliminated through contractionary policy.

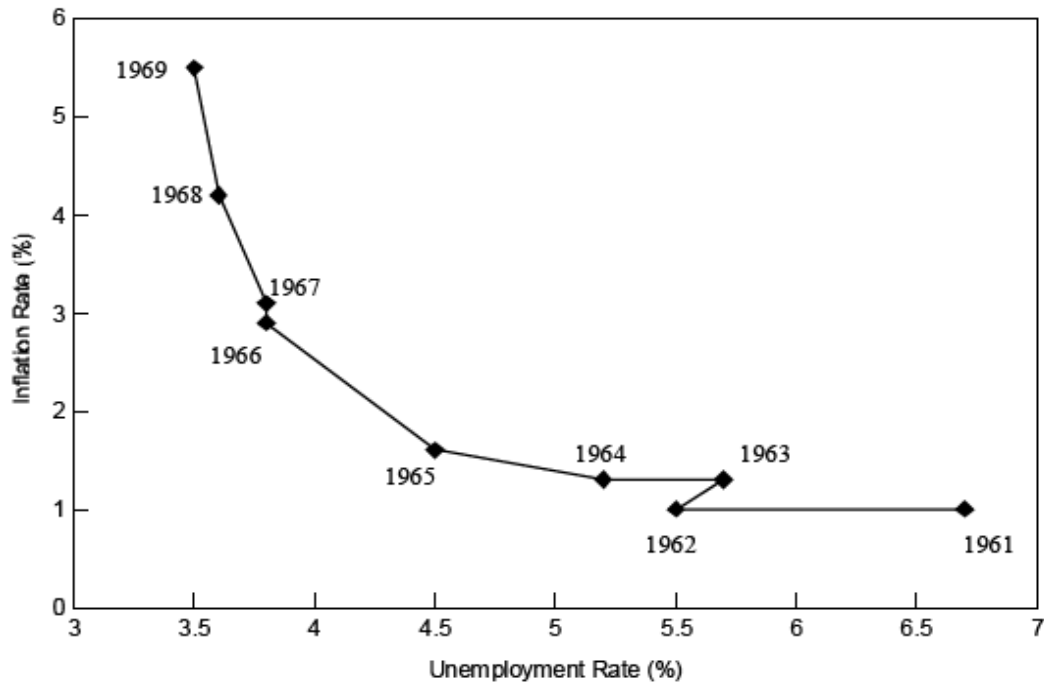
The curve describing this trade-off became known as the “Phillips curve.” A stable Phillips curve would mean that policymakers might choose the combination of inflation and unemployment rates that seemed most palatable and set it as the goal of macroeconomic policy. The U.S. experience of the 1960s seemed to provide evidence for the existence of such a trade-off and encouraged those who held this view.

**Figure 1** plots annual U.S. civilian unemployment and consumer price inflation rates together for the 1960s. These data suggested that there was a trade-off for the United States, and that policymakers could choose from among a number of combinations of unemployment and inflation rates, depending on their relative distastes for the two.

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<sup>2</sup> A.W. Phillips, “The Relationship between Unemployment and the Rate of Change of Money Wages in the United Kingdom, 1861-1957, *Economica*, Nov. 1958.

<sup>3</sup> The difference between wage increases and price increases is largely accounted for by changes in labor productivity.

**Figure 1. Inflation and Unemployment, 1960 to 1969**

**Source:** Department of Labor, Bureau of Labor Statistics.

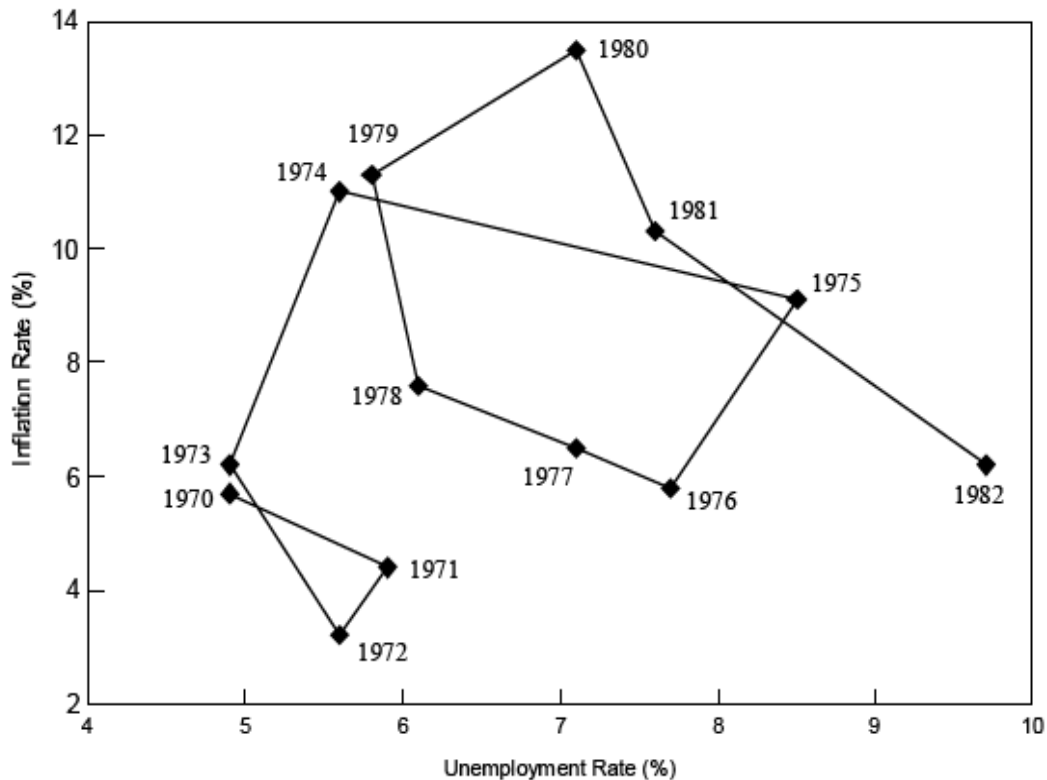
The theoretical explanation for the downward-sloping line describing the trade-off relied on the simple relationship between supply and demand. As long as aggregate demand is growing more rapidly than the economy's capacity to produce, the unemployment rate will tend to fall, and vice versa. Furthermore, demand in excess of supply will tend to push up both wages and prices, so that rising prices tend to be correlated with falling unemployment.<sup>4</sup>

## The Lesson of the 1970s

The experience of the 1970s led to the widespread dismissal of the view that there was an exploitable trade-off between inflation and unemployment. Much of the 1970s was characterized by simultaneous increases in inflation and unemployment rates. The phenomenon came to be known as "stagflation," because of sluggish rates of growth which led to rising unemployment rates and accelerating inflation. It became evident that policymakers did not have the option of settling for a higher rate of inflation in exchange for a lower rate of unemployment.

**Figure 2** shows what happened to the relationship between the civilian unemployment rate and consumer price inflation beginning in 1970. It seems clear that any trade-off that may have existed during the 1960s, as was shown in **Figure 1**, was temporary.

<sup>4</sup> See Richard G. Lipsey, "The Relation Between Unemployment and the Rate of Change of Money Wages in the United Kingdom, 1862-1957: A Further Analysis," *Economica*, Feb. 1960, pp.1-31.

**Figure 2. Inflation and Unemployment, 1970 to 1982**

**Source:** Department of Labor, Bureau of Labor Statistics.

As it happens, this breakdown in the apparent trade-off between inflation and unemployment was anticipated. In the late 1960s, two economists, Milton Friedman and Edmund Phelps, suggested that there had to be more to it than a simple trade-off between inflation and unemployment. They predicted a breakdown of the Phillips curve. They argued that while monetary or fiscal policy might be conducted in such a way as to realize a particular combination of unemployment and inflation in the short run, it would not necessarily be a sustainable combination.<sup>5</sup>

This new argument contended that the trade-off along the Phillips curve was dependent on the fact that *unexpected* increases in the price *level* would reduce real wages. A reduction in real wages would tend to increase the demand for labor, and push down the unemployment rate. A rise in prices could still result in lower unemployment as Phillips had suggested, but only until workers realized that the purchasing power of their wages was falling. This new view argued that there was not just a single Phillips curve, but a unique Phillips curve for every different possible expectation of inflation.

<sup>5</sup> See Milton Friedman, "The Role of Monetary Policy," *The American Economic Review*, vol. 57, no. 1, Mar. 1968, pp. 1-17. Also, Edmund Phelps, "Phillips Curve, Expectations of Inflation and Optimal Employment Over Time," *Economica*, Aug. 1967, pp. 254-281.

An unexpected increase in the rate of inflation would, temporarily, reduce the rate of increase in real wages and contribute to a decrease in the unemployment rate. A faster rate of inflation causes workers to underestimate the effects of rising prices on their money wages, and unemployment declines due to a fall in real wages. But, unless workers *never* catch on (an unlikely prospect), at some point they will adjust their wage demands to reflect the higher rate of inflation. This increase in real wage demands will tend to reverse the drop in the unemployment rate due to the inflation surprise. In the long run, in this model, the unemployment rate tends toward a level that represents an equilibrium between the supply of labor and demand for it. This level was dubbed the “natural” rate, and it is the rate of unemployment consistent with a stable rate of inflation.<sup>6</sup> If the inflation rate is zero, then the natural rate is also the unemployment rate consistent with a stable price *level*.<sup>7</sup>

In the absence of deliberate policy changes, wage adjustments would always be working to move the economy to its natural rate of unemployment — either from a higher rate or a lower one. Depending on the conduct of economic policy, however, the adjustment to the natural rate can either be assisted or hindered.

According to the natural rate model, fiscal or monetary policy may shift the economy from one point to another along the original Phillips curve only as long as workers fail to appreciate changes in the price level or the rate of inflation. A higher rate of inflation would not mean a permanent decline in the unemployment rate. Eventually, other things being equal, expectations would adjust and the unemployment rate would tend to return to its natural rate.

If policy attempted to push unemployment below the natural rate, the rate of inflation would wind up permanently higher after workers raised their expectation of inflation, and there would be a new trade-off consistent with that higher expected rate of inflation. Any short-term trade-off between inflation and unemployment would now involve higher rates of inflation than before. This process of shifting the trade-off could continue as long as policymakers keep trying to push the unemployment rate below its natural level. (As discussed below, policymakers can choose a short-term trade-off only if the natural rate can be accurately estimated.)

For example, suppose that the unemployment rate is 5% and the inflation rate is 3%. In addition suppose that workers are fully aware of the inflation rate and fully expect that their wages will increase at the same rate.<sup>8</sup> Now suppose that policy seeks to lower the unemployment rate by tolerating a more rapid rate of inflation. Say the inflation rate rises to 5%, which means that nominal wages that are rising at a 3% rate are falling at a 2% rate, in real terms. Those falling real wages increase the

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<sup>6</sup> The term ‘natural rate’ was originally applied, in a similar way, to interest rates by turn-of-the-century economist Knut Wicksell. See M. Blaug, *Economic Theory in Retrospect* (Homewood, IL: Richard D. Irwin, Inc., 1962), pp. 562-563.

<sup>7</sup> Some economists use a more clinical term for the natural rate, the “non-accelerating inflation rate of unemployment,” or NAIRU. At times, the natural rate is more casually referred to as the full-employment rate of unemployment.

<sup>8</sup> For clarity and simplicity, this discussion ignores the effects of productivity growth on wages.



demand for labor, and the unemployment rate will fall below 5%. But, as seems likely, eventually workers will realize that inflation has accelerated and adjust their wage demands to match. As wages rise again and catch up with prices, the demand for labor will slacken and the unemployment rate will tend back to 5%.

As **Figure 2** shows, when the terms of the trade-off shifted in the 1970s, the line moved in a clockwise pattern. In the natural rate model, the clockwise cycling of unemployment and inflation is due to the combination of expectations adjustments and policy changes. Unemployment falls and inflation rises when policymakers, by pursuing stimulative monetary or fiscal policies, attempt to exploit the “trade-off.” At first the rise in inflation may be unexpected, but as inflation expectations adjust and wage demands rise to maintain their purchasing power, the unemployment rate tends to go back up. Contractionary policies designed to combat higher inflation cause unemployment to rise further but also cause price increases to moderate. Finally, as contractionary policy comes to an end and unemployment begins to fall, inflation continues to fall as expectations adjust downward.

The implication of a shifting trade-off is that in the long run there is no trade-off between inflation and unemployment. Although unemployment can temporarily be pushed below the natural rate through expansionary policy, policymakers cannot opt for an unemployment rate below the natural rate of unemployment and stay there.

## Is Stagflation a Trap?

Stagflation is a relative phenomenon. It has no cardinal definition, it is simply understood to be a period of high unemployment and inflation rates. As a relative notion it would seem to be represented by the upper right hand area of **Figure 2**. Where exactly in that figure stagflation starts and stops, however, is subjective.

References to stagflation in the popular press seem to suggest that it is viewed as a kind of trap. That sentiment may be rooted in the 1960s view that there was a trade-off between inflation and unemployment and that policy could not hope to reduce one without raising the other. If the natural rate model is correct, concerns that stagflation is a trap are mistaken.

Stagflation is generally understood to be a state of high unemployment and inflation rates. It can be more precisely described in the context of the natural rate model. In the view of the model, unemployment and inflation rates may be relatively high at the same time, and they may even rise simultaneously for a time, particularly if inflation and the natural rate of unemployment are rising at the same time. What is unlikely to happen in this model is for the unemployment rate to be high and for the inflation rate to continue accelerating. If the unemployment rate is above the natural rate, then cooling labor and product markets would be likely to reduce upward pressure on wages and prices. Once a slowing inflation rate came to be appreciated by workers and was taken into account in their wage demands, demand for labor would pick up and the unemployment rate would tend to fall.

Escaping a high inflation environment cannot be accomplished without a cost, however. If individuals come to expect high inflation while the economy is at the natural rate of unemployment, then the only way to reduce inflation would be to use

contractionary policy and temporarily push the unemployment rate above the natural rate. Most economists believe that the reason the “double dip” recessions of the early 1980s were the deepest since the Great Depression was because the Fed decided to use contractionary policy to reduce the inflation rate. Because the inflation rate was so high, a long and deep recession was necessary to reduce inflationary expectations.

## What is the Natural Rate of Unemployment?

Although the model may be useful on its own, it would be of more value if the natural rate of unemployment could be known with some confidence. It probably cannot be estimated with any precision and it may also be the case that it varies over time because it is determined by labor market conditions and policies that change over time.<sup>9</sup> Most economists believe that the reason the United States was stuck in a stagflation in the 1970s was because the natural rate had risen. From this perspective, since policymakers were unable to recognize the rise until after the fact, they directed policy to an unemployment rate that was unsustainably low. Recent experience can also illustrate the effects of a changing natural rate.

Beginning in early 1994 and continuing into 1995, the Federal Reserve, in order to prevent an acceleration in the rate of inflation, engineered a three percentage point rise in short-term interest rates. This tightening of monetary policy began at a time when the actual civilian unemployment rate was *above* 6%.

More recent economic experience suggests that the natural rate is below 6%. In September 1994, the civilian unemployment rate fell below 6%, and with the exception of a brief interruption from late 2002 through the middle of 2003 it has remained below 6%. Between 1992 and 2005, consumer price inflation remained below 3.5%. That the unemployment rate has been so low for so long with no significant rise in the inflation rate has convinced many that the natural rate has fallen since the 1980s, and that unemployment rates below 6% are compatible with a long-run stable rate of inflation. It is worth noting, however, that since mid-2004 the unemployment rate has been below 5.5%, and since late 2005 has been below 5% while the inflation rate has picked up. That might be reason to believe the natural rate is currently at or above 5%.

If the natural rate is now somewhere between 5% and 6%, it would be unlikely for inflation to continue to accelerate if the unemployment rate were to rise above 6%. Inflation tends to exhibit considerable inertia and thus may be slow to respond to an economy that is slowing down. For that reason there may be a period of time where both the unemployment and inflation rates are relatively high. It is unlikely, however, that both would rise over a prolonged period.

## Supply Shocks: The Effects of Oil Prices

The preceding discussion suggested that stagflation was partially the result of errors of policy. Not necessarily deliberate ones, but perhaps the result of uncertainty

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<sup>9</sup> Robert Gordon, “The Time-Varying Nairu and its Implications for Economic Policy,” *Journal of Economic Perspectives*, vol. 11, no. 1, Winter 1997, pp. 11-32.

regarding how low the unemployment rate could go without eventually resulting in accelerating rates of inflation. External events beyond the direct influence of policy may also play a role, however. Stagflation in the 1970s coincided with two large “oil shocks.”

Due to the central role energy plays in the functioning of our 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 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,<sup>10</sup> information costs, uncertainty, and contracts in our 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.<sup>11</sup>

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

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<sup>10</sup> 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.

<sup>11</sup> 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. Many of the studies to follow find that this is not true, however.

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. 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, 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.<sup>12</sup> 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 a measure of standard of living that refers to the labor and capital embodied in U.S. exports that can be exchanged for the labor and capital

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<sup>12</sup> 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.

embodied in foreign imports.<sup>13</sup> 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.

**Policy Implications.** Historically, formulating an effective policy response to oil shocks has been difficult. Expansionary fiscal or monetary policy increases aggregate demand and inflationary pressures. In typical downturns, monetary and fiscal policy can safely become expansionary without triggering a significant increase in inflation because the fall in demand reduces inflationary pressures. In oil shocks, policymakers must be simultaneously concerned with the fall in economic activity and the rise in prices.

By tackling one problem, they risk exacerbating the other. For example, if policymakers use expansionary fiscal or monetary policy to offset the fall in output, prices may rise further and inflationary expectations could become embedded. A key concern for policymakers is whether the rise in prices remains isolated in energy prices or whether they spread to other goods (often referred to as “core inflation”). This was the problem in the 1970s, when inflation, which was already rising before the oil shocks, continued to accelerate following the oil shock of 1973 until it reached double digits in 1974. Once the public came to expect higher inflation, the subsequent expansionary policy measures had less and less of a positive effect on aggregate demand, making any trade-off between inflation and unemployment less and less favorable. Following the second oil shock of 1979, a Federal Reserve that was determined to stamp out double-digit inflation chose instead to tackle the inflationary pressures caused by the oil shock by raising interest rates. This decision exacerbated the effect on output, contributing to the most severe economic contraction since the Great Depression.

Although the rise in inflation in the 1970s is often attributed to the oil shocks, some economists have disputed that assertion as well. If prices were perfectly flexible, then a rise in oil prices could not raise the overall price level unless it was “accommodated” by expansionary monetary policy. (Otherwise, other prices would fall as much as oil prices had risen to keep inflation constant.) Since prices are not perfectly flexible, it may be that higher oil prices temporarily cause overall inflation to rise even without monetary accommodation. But unless oil prices are continuously rising, a shock cannot cause inflation to rise on an on-going basis. For inflation to keep rising, at some point, excessive monetary expansion is needed.

Another reason why policy responses have been unable to prevent oil shocks from leading to recessions historically is because policy changes are hampered by lags in policy recognition, implementation, and effectiveness. Because oil shocks are typically unpredictable events, policy cannot be modified far enough ahead of time to prevent a downturn.

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<sup>13</sup> See CRS Report RL32591, *U.S. Terms of Trade: Significance, Trends, and Policy*, by Craig K. Elwell.

### **Is Stagflation Caused by Oil Price Shocks or Monetary Policy?**

Despite the remarkable historical coincidence between oil shocks and recessions, a strain of research has suggested that there might nonetheless be some third force responsible for the recessions. In particular, the research has tried to separate the effects of the oil shocks on the economy from the effects of simultaneous changes in monetary policy. As the last section suggests, policymakers do have the option of ignoring the inflationary effects of the shock and concentrating on its economic effects. In that sense, the downturn can be seen as “caused” by policy, not the shock itself. Some of the research has concluded that had it not been for the changes in monetary policy, the oil shocks would have had little effect on economic growth.

Ben Bernanke, now Chairman of the Federal Reserve, and his co-authors were interested in finding out what effects monetary policy changes had when they were unanticipated.<sup>14</sup> They chose to study oil shocks because these are one of the only macroeconomic phenomena that most economists would agree are both unanticipated and not the result of domestic policy. First, they estimated the effect of a 10% increase in the price of oil when monetary policy responds as it has historically. They estimated that over 24 months, GDP would fall by 3.1% and prices would rise by 0.09% relative to a baseline. To separate the effects of the oil shock from the effects of the change in monetary policy, they then estimated a counter-factual example where monetary policy does not respond to the oil price increase, which they represented with a constant federal funds rate. In this case, GDP was estimated to *rise* by 1.3% and prices by 0.13%. They concluded that oil price shocks have very little negative effect on the economy; rather it is the monetary response to oil shocks that leads to the historical coincidence between oil shocks and recessions.<sup>15</sup>

The work of Bernanke, et al. raises an interesting conceptual question: while the effects of oil shocks and monetary policy can be statistically separated, can they be separated in reality? Bernanke, et al. attribute the tightening of monetary policy following oil shocks as the Fed’s response to the increase in inflationary pressures that oil shocks are commonly believed to cause. Commenting on the Bernanke paper, Sims points out that the assumption that monetary policy could remain unchanged in response to an increase in inflationary pressures is not a reasonable one. It is unlikely that private individuals would have no reaction to an unsustainable policy, making the statistical separation of oil price effects from monetary effects problematic.<sup>16</sup> This would suggest that one can reasonably question whether there is a practical distinction between attributing a recession to an oil shock or attributing it to the monetary response to an oil shock.

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<sup>14</sup> Ben Bernanke, Mark Gertler, and Mark Watson, “Systematic Monetary Policy and the Effects of Oil Price Shocks,” *Brookings Papers on Economic Activity 1*, 1997, p. 91. Their regressions cover the period 1965-1995. None of their results is statistically significant.

<sup>15</sup> Using similar methods, Ferderer found the opposite results: the effects of oil shocks were larger than the effects of monetary policy. See J. Peter Ferderer, “Oil Price Volatility and the Macroeconomy,” *Journal of Macroeconomics*, vol. 18, no. 1, winter 1996, p. 1.

<sup>16</sup> Christopher Sims, “Comments,” *Brookings Papers on Economic Activity 1*, 1997, p. 146. To address this criticism, Bernanke et al. also run simulations in which the federal funds rate is held constant but expectations are assumed to adjust more quickly. Under this scenario, output still rises and inflation rises slightly more quickly.

Hamilton and Herrera pursue this line of reasoning in a critique of the Bernanke paper.<sup>17</sup> Although Bernanke's regressions can be mechanically interpreted to imply that monetary policy could prevent a recession, Hamilton and Herrera point out that these regressions would imply that the federal funds rate would have to have been an improbable 9 percentage points lower in 1973 to prevent a recession. It is unlikely that private individuals' expectations would have remained unchanged in light of such a significant policy change. Hamilton and Herrera also argue that Bernanke et al. underestimate the effects of oil shocks because they use too short a lag length.

Bernanke et al. assume that changes in oil prices affect the economy for the next seven months, whereas Hamilton and Herrera suggest a lag length of at least 12 months would be more appropriate since many works find the largest economic effects of oil price changes come after three and four quarters. In particular, by using a longer lag than Bernanke, they find that countering oil shocks with expansionary monetary policy has much larger effects on inflation since monetary policy affects inflation with a significant lag.

Barsky and Killian present a compelling analysis shown in **Figure 3** that oil shocks did not cause the recessions since the 1970s — the difference in timing between the official onset of the recession preceded the rise in oil prices.<sup>18</sup> The 1980 recession follows closely on the heels of the price increase, but the 1981-1982 recession was preceded by only a small increase in oil prices.<sup>19</sup> The 2001 recession began after oil prices had risen and already started to fall again, although economic research suggests the rise in prices may affect the economy with a lag. But in the 1973 and 1990-1991 recessions, the recession began (as dated by the National Bureau of Economic Research) before the oil price increased. These two experiences are noteworthy because both recessions are closely associated in people's minds with geopolitical events linked to oil, the oil embargo and the Gulf War, respectively. (This is not to suggest that those recessions were not made worse by the oil shocks.) Furthermore, a well-known predictor of recessions, the yield curve inversion, preceded the oil shock in 1973, 1978, and 1989, suggesting that the seeds for the subsequent recessions may have been sown elsewhere.<sup>20</sup>

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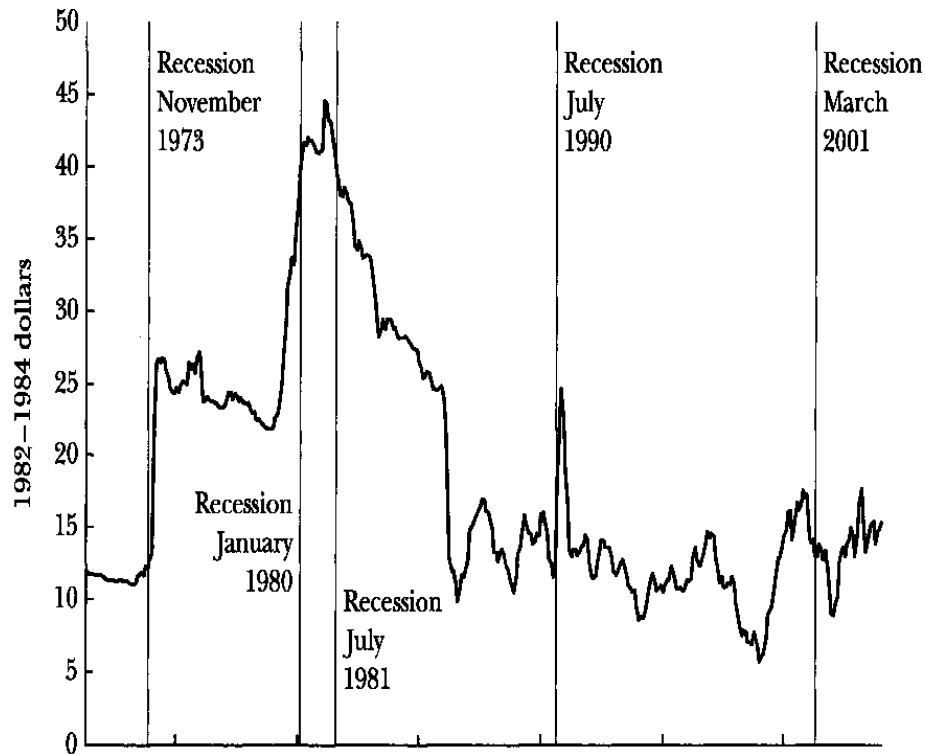
<sup>17</sup> James Hamilton and Ana Maria Herrera, "Oil Shocks and Aggregate Macroeconomic Behavior: The Role of Monetary Policy," *Journal of Money, Credit, and Banking*, April 2004), p. 265.

<sup>18</sup> Robert Barsky and Lutz Killian, "Oil and the Macroeconomy Since the 1970s," *Journal of Economic Perspectives*, vol. 18, no. 4, Fall 2004, p. 115.

<sup>19</sup> The 1981 to 1982 recession was widely viewed as the consequence of a more restrictive monetary policy designed to reduce inflation and inflationary expectations.

<sup>20</sup> See CRS Report RS22371, *The Pattern of Interest Rates in 2006-2008: Does It Signal an Impending Recession?* by Marc Labonte and Gail Makinen.

**Figure 3. Real Price of U.S. Crude Oil Imports and Recessions, 1971-2003**



**Source:** Robert Barsky and Lutz Killian, "Oil and the Macroeconomy Since the 1970s," *Journal of Economic Perspectives*, vol. 18, no. 4, Fall 2004.

## Conclusion

Stagflation is a reminder that economic analysis and economic policy have room for improvement. Even without the complication of oil price shocks, it may arise because policy is based on both imperfect information and an imperfect understanding of the economy. (Economists note that the beginning of the upward trend in inflation preceded the first oil shock.) The full effects of a change in monetary or fiscal policy are felt some time after the fact, and that lag is uncertain and may vary from one occasion to another. The effects of oil price increases or any other external shock to the economy also take time to be fully realized.

Although policy may not be able to prevent episodes of stagflation from occurring, there may be enough understanding of the underlying causes to avoid making conditions substantially worse. Although increases in inflation may initially be driven by forces that are out of policymakers' hands, such as oil shocks, in the long run high inflation cannot persist without monetary accommodation by the Federal Reserve. Most economists believe that stagflation would not have lasted as long as it did in the 1970s if the Fed had raised rates sooner, and believe that a fundamental shift in Fed policymaking toward an emphasis on price stability explains why stagflation has not occurred since. The 1970s experience with stagflation is seen as the worst of both worlds — expansionary policy that delivered high inflation but failed to deliver low unemployment — and the lesson that many economists have



taken from that experience is a skepticism that “activist” or “fine-tuning” policymaking can deliver economic stability.

While stagflation is understood to be high rates of both inflation and unemployment it is not clear how high those rates have to be to merit the designation. The 1970s and early 1980s are the prime historical example of stagflation. The unemployment rate reached 9.0% in May 1975 and a high of 10.8% in November 1982. The rate of consumer price inflation reached 12.2% for the twelve month period ending in November 1974, and 14.6% for the twelve month period ending in May 1980.<sup>21</sup> Whether or not rates less than those constitute stagflation remains a subjective matter. At the moment, both inflation and unemployment rates are well below what they were in the 1970s episode.

Recent unemployment and inflation rates are not nearly as high as they were in the 1970s. Some economists, however, fear that the recent expansion in monetary and fiscal policy, at a time when unemployment is low but rising and energy prices are rising, could lead to a new bout of stagflation in the near future. It remains to be seen whether the recent loosening of policy marks a shift away from an emphasis on price stability.

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<sup>21</sup> At the time, the term “misery index” was used in the popular press to describe to sum of the two measures. That measure is not addressed here because it has no analytical value.