

Oil Price Shocks, Monetary Policy and Stagflation

Lutz Kilian

University of Michigan and CEPR

To what extent did monetary policy contribute to the stagflation of the 1970s?

Explanation 1 (Barsky and Kilian 2002):

Worldwide *shifts in monetary policy regimes* not related to the oil market played a major role in causing both the subsequent oil price increases and stagflation in many economies.

Explanation 2 (Bernanke, Gertler and Watson 1997):

The oil price shocks of the 1970s arose exogenously with respect to global macroeconomic conditions, but were propagated by the *reaction of monetary policy makers*.

The Fed created a sharp recession by raising the interest rate in an only partially successful attempt to contain the inflationary pressures triggered by the oil price shock.

Why did stagflation never occur again after the 1970s?

Explanation 1:

- Given the absence of major shifts in monetary policy regimes since the 1980s, there is no reason to expect stagflation to occur.

To the extent that the public views the central bank's commitment to price stability as credible, the pass-through from oil price shocks to the domestic price level is not associated with sustained inflation.

- Why then the surge in the real price of oil in 2003-mid 2008?

Structural shifts in demand associated with the transformation of emerging Asia rather than shifts in monetary policy regimes.

Explanation 2:

- Improved monetary policy responses to oil price shocks:

The central bank – by completely quenching inflationary pressures from unexpectedly high oil prices – prevents stagflation from arising at the cost of a sharp recession.

Problem: No sharp recession in the data.

- Alternative: Oil price shocks are not as inflationary as they used to be, allowing a less aggressive monetary policy response.

Blanchard and Galí (2008): Reduced real wage rigidities.

1. The Monetary Policy Regime Shifts Hypothesis

- Great Moderation debate misses that 1990s were not so different from 1960s. Really, the 1970s were the aberration. Why?
- The beginning of this decade coincided with a shift towards a less restrictive monetary policy regime. The breakdown of Bretton Woods loosened the remaining constraints on monetary policy.

A nominal anchor was reestablished only under Paul Volcker at the end of the decade.

- As the world entered uncharted territory in the early 1970s, policy making entered a stage of experimentation and learning.
- Central bankers felt the responsibility to stimulate employment by loosening monetary constraints, even if that perhaps meant some moderate inflation.

What Happened?

- Data show a dramatic increase in worldwide liquidity in the early (and late) 1970s.
- If inflation is sluggish (as would be the case if the public is slow to catch on to the shift in monetary policy regime), an unexpected monetary expansion will cause a temporary boom in output. Inflation will rise slowly initially, but will continue to rise even after output has peaked, resulting in stagflation.

As inflation peaks, the economy goes into recession. In practice, the recession was deepened by the decision of the central bank to raise interest rates to combat the inflationary pressures it had itself unwittingly created.

Why were policy makers so slow to realize their mistake?

- One reason is that the acceleration of inflation coincided with the oil price shock of 1973/74, which seemed to provide a natural explanation of the inflationary pressures at the time.

After all, monetary policy seemed to have worked just fine prior to the oil price shock.

- As a result, central bankers initiated a second expansionary cycle in the mid-1970s, causing another output boom in the late 1970s.

As the public increasingly caught up to the change in regime, however, stimulative policies became less effective and inflation a growing concern.

- Only when Paul Volcker stepped in and insisted on the primacy of the inflation objective, the cycle was broken.

As in the case of the initial regime shift, the public was slow to accept that a regime shift had taken place, and inflation was slow to come down, even as the economy entered a steep recession in the early 1980s.

In essence, the same model that explains the early 1970s also applies to the early 1980s, except run in reverse.

- Given that central bankers have accepted the primacy of the inflation objective, it is not surprising that there have been no more outbreaks of stagflation.

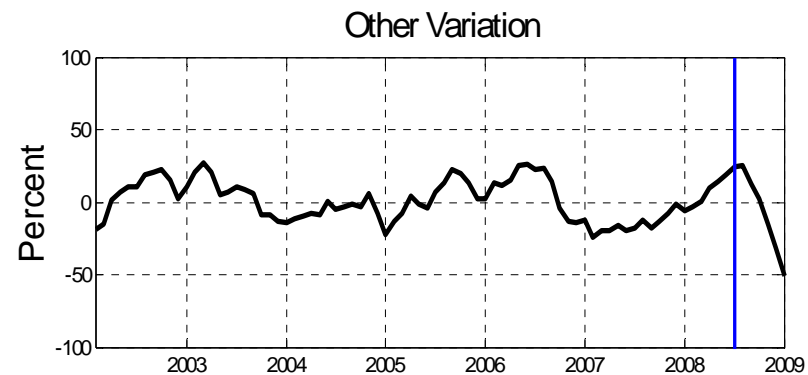
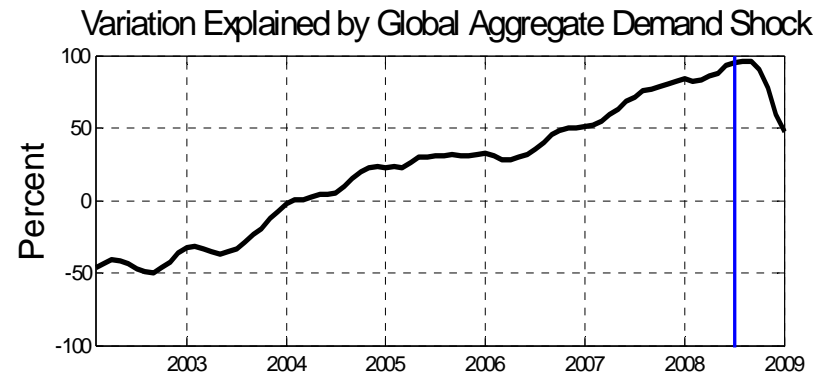
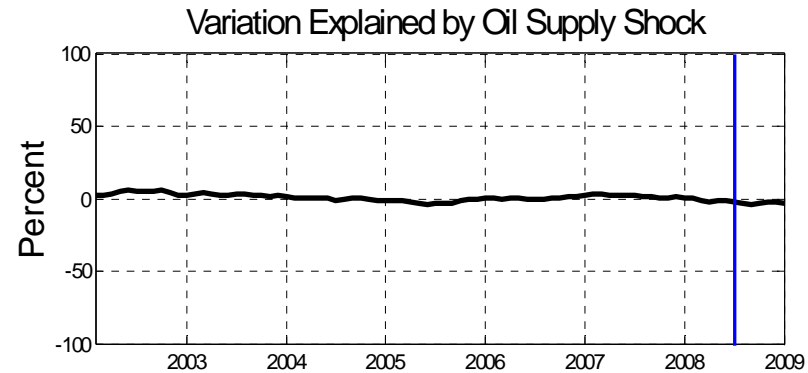
The Effect of Fluctuations in Real Activity on the Price of Oil

- The fact that both major global economic expansions in the 1970s coincided with major increases in the real price of oil (and other industrial commodities) is no coincidence.
- An unexpected increase in global real activity causes increased demand for oil. Such demand shifts may occur for multiple reasons:
 - One is a shift in monetary policy regime: Occurs rarely and takes concerted action by many countries to exert enough demand pressure to drive global commodity prices.
 - Others include unexpected productivity gains in oil-importing economies and unexpectedly fast economic development of emerging Asia.

Average Real GDP Growth Forecast Surprises (Percentage Points)

	2000.12- 2003.5	2003.6- 2008.6	2008.7- 2008.12
U.S.	-0.05	0.02	-0.08
Germany	-0.12	0.00	-0.33
Japan	-0.10	0.08	-0.27
Brazil	-0.10	0.03	0.07
Russia	0.06	0.12	-0.42
India	-0.06	0.03	-0.17
China	-0.04	0.12	-0.17

Explanatory Power of Oil Demand and Oil Supply Shocks for the Real Price of Oil: 2002.1-2008.12



2. The Monetary Policy Reaction Hypothesis

- Consider an exogenous oil price shock.
 - Two main channels of transmission:
 - Increased cost of domestic production (adverse AS shock)
 - Reduced purchasing power (adverse AD shock), amplified by increased precautionary savings and increased operating cost of energy using durables.
 - Supply channel is weak. The literature shows that the demand channel dominates.
 - If AD curve shifts, the shock is recessionary and deflationary.
 - If both AD and AS curves shift to the left, the net effect on the price level will be small.
- ⇒ There is little or no need for central banker to intervene.

Bernanke, Gertler and Watson (BGW 1997):

- Take the stand that the AS shock interpretation is dominant.
- Assert that this shock triggers strong inflationary pressures, while the recessionary impact is weak (“weak form of stagflation”). Fear of wage-price spirals?
- A hawkish central banker will fight inflationary pressure by raising the interest rate, deepening the recession.
- If the central banker only partially succeeds at suppressing inflation, but nevertheless causes a sharp recession, stagflation will arise (“strong form of stagflation”).

Why this interpretation?

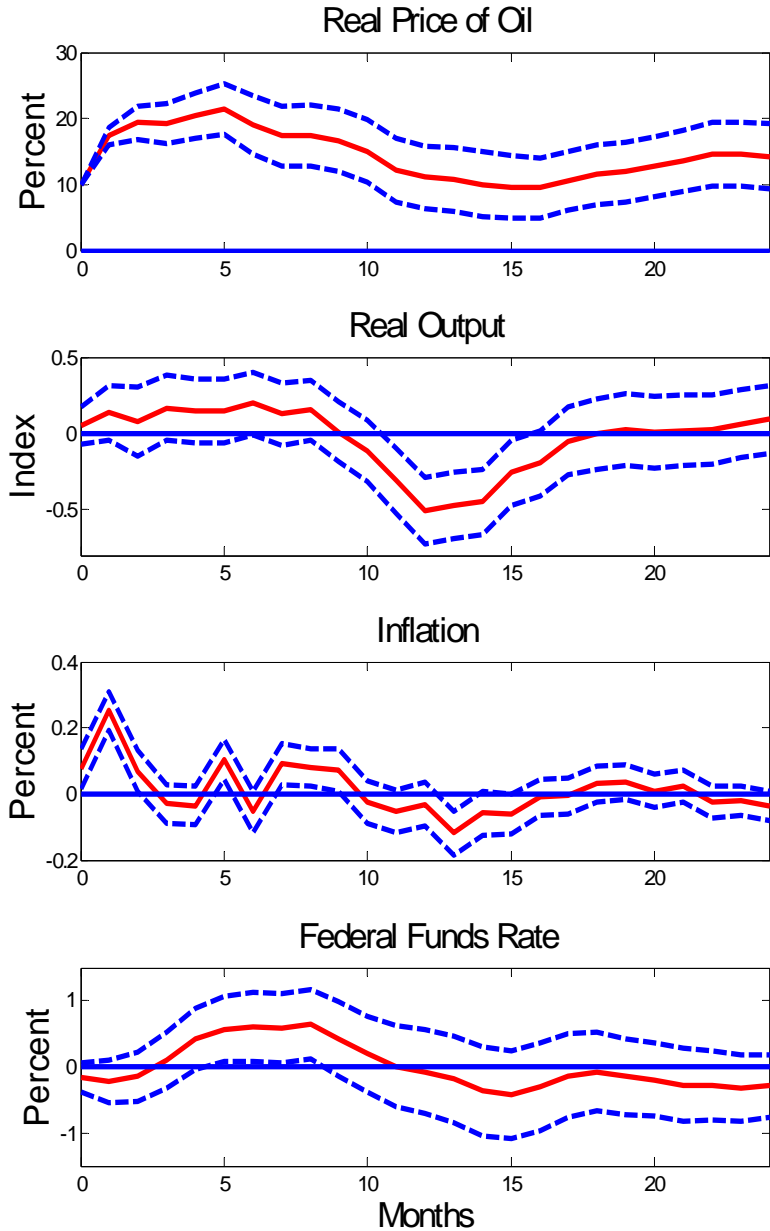
BGW’s premise is that there must be a causal link from oil price shocks to large recessions. Policy reaction serves as amplifier since standard models cannot explain the recessions in the data.

Problems with BGW's Evidence

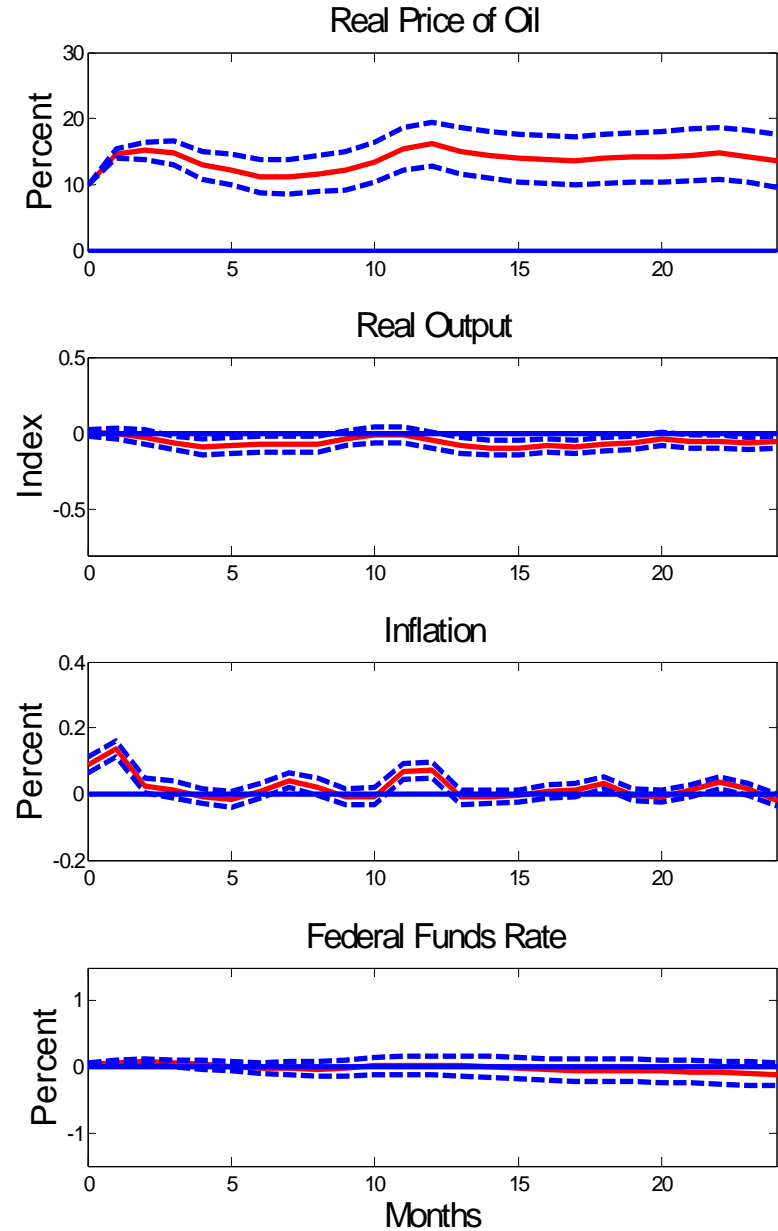
- VAR evidence based on censored oil price changes: Estimates inconsistent because structural model cannot be represented as a vector autoregression and because the nonlinear IRFs were computed incorrectly.
- Reestimate this model using monthly data including the percent change in the real price of oil and the CFNAI measure of deviations of U.S. real output from trend.

U.S. Responses to Real Oil Price Shocks (with One-Standard Error Bands)

1967.5-1987.7

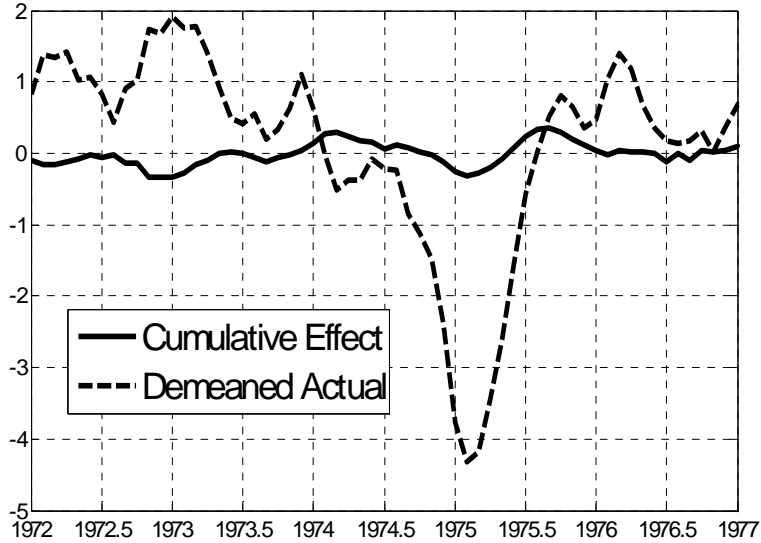


1987.8-2008.6

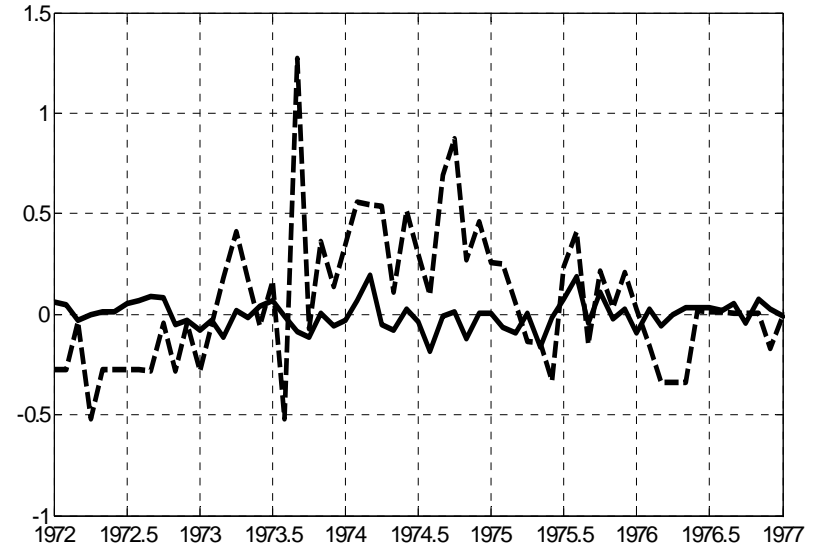


Cumulative Effect of Real Oil Price Shocks: Selected Episodes

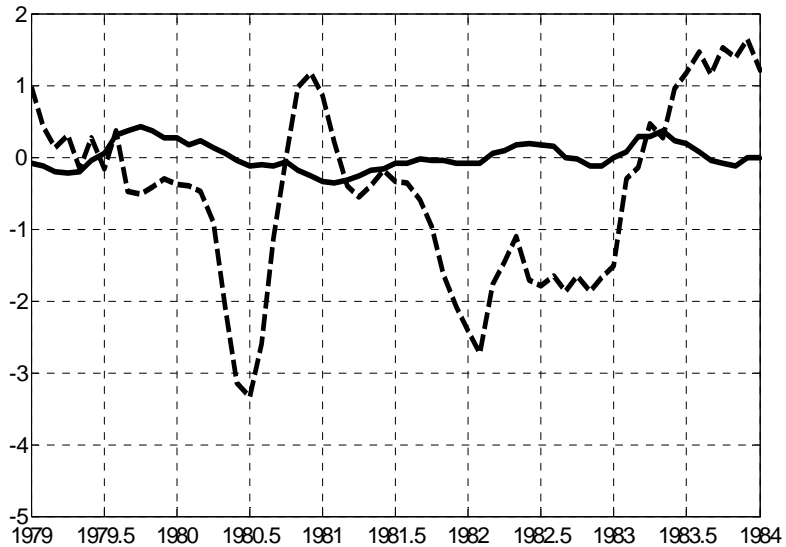
Real Output



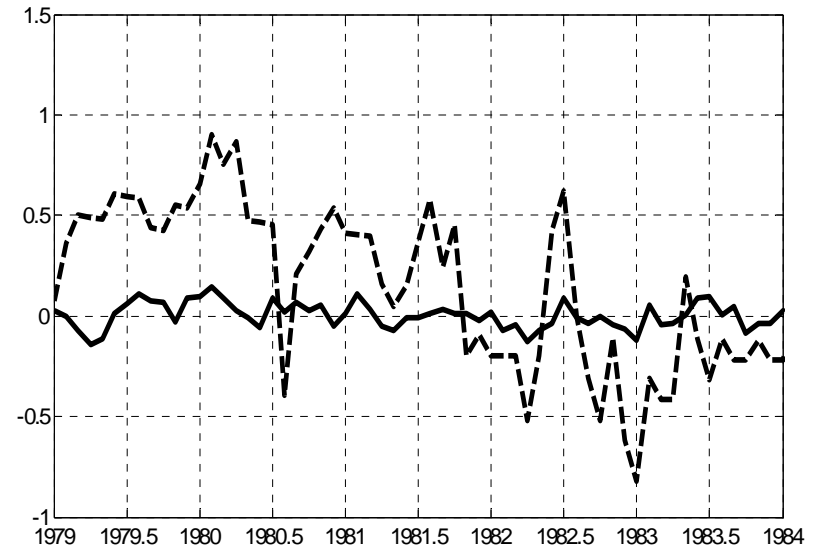
Inflation



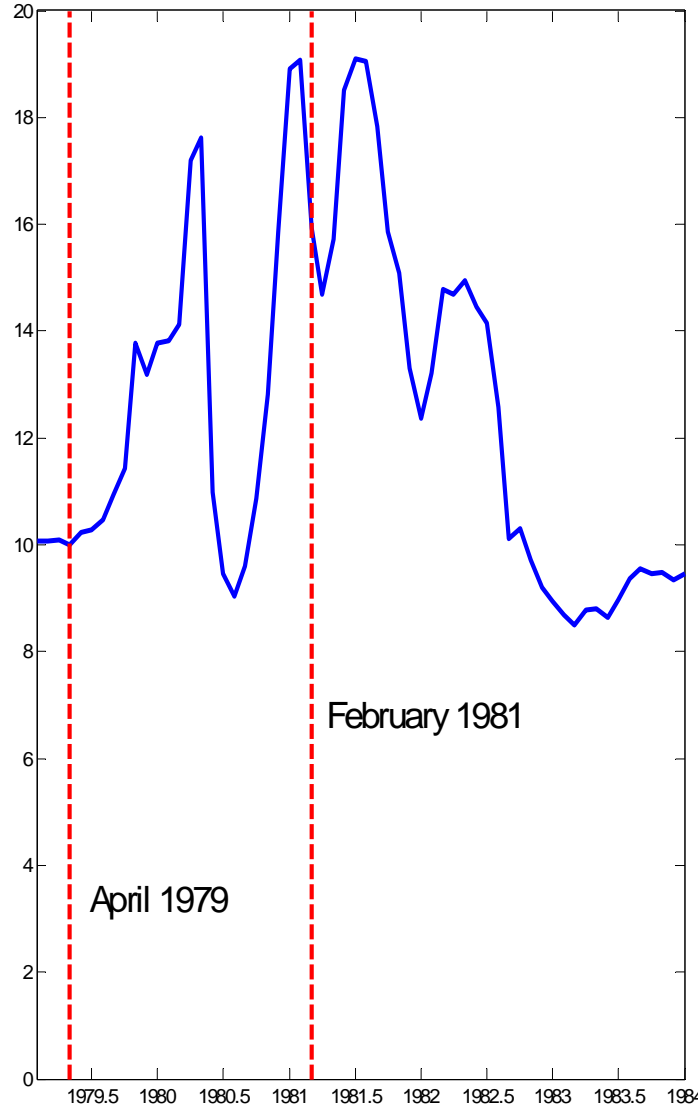
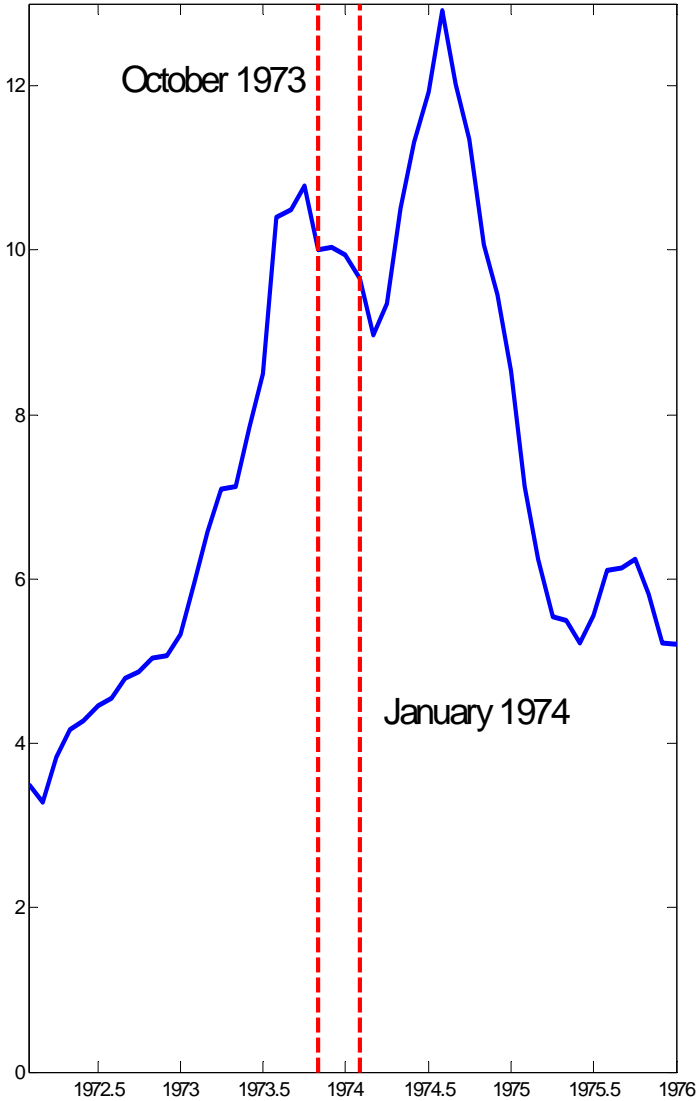
Real Output



Inflation



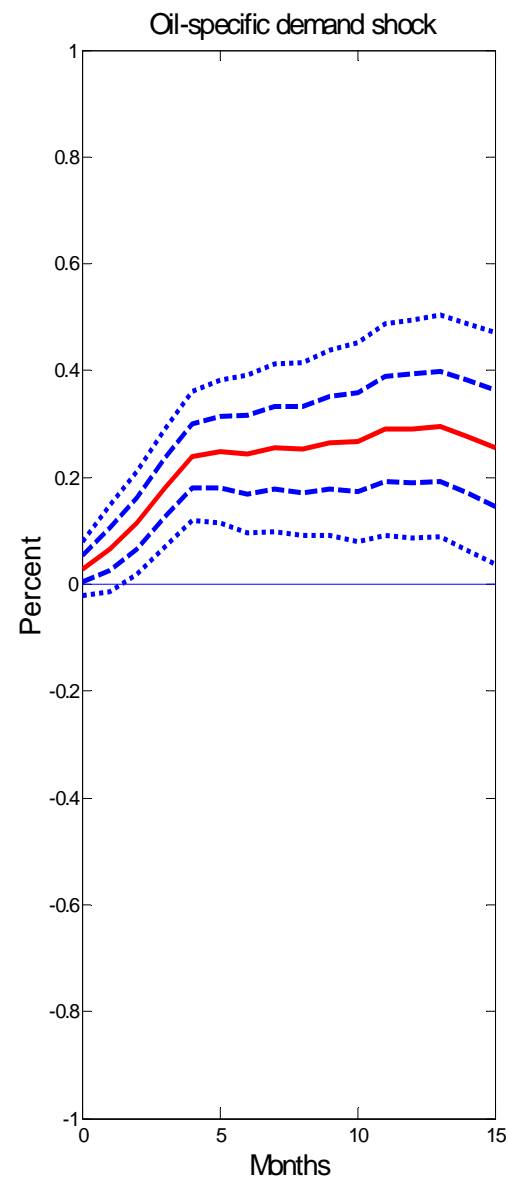
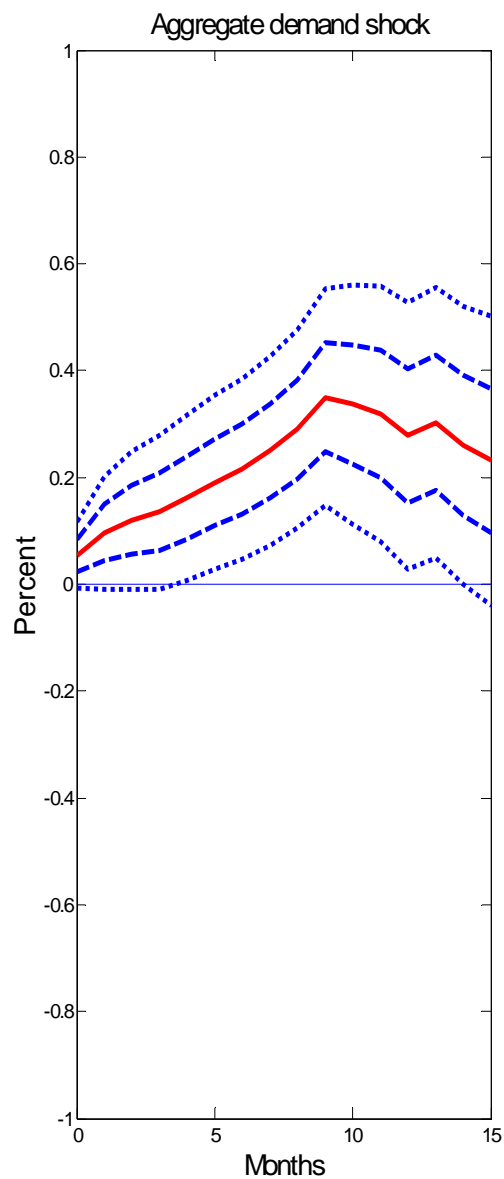
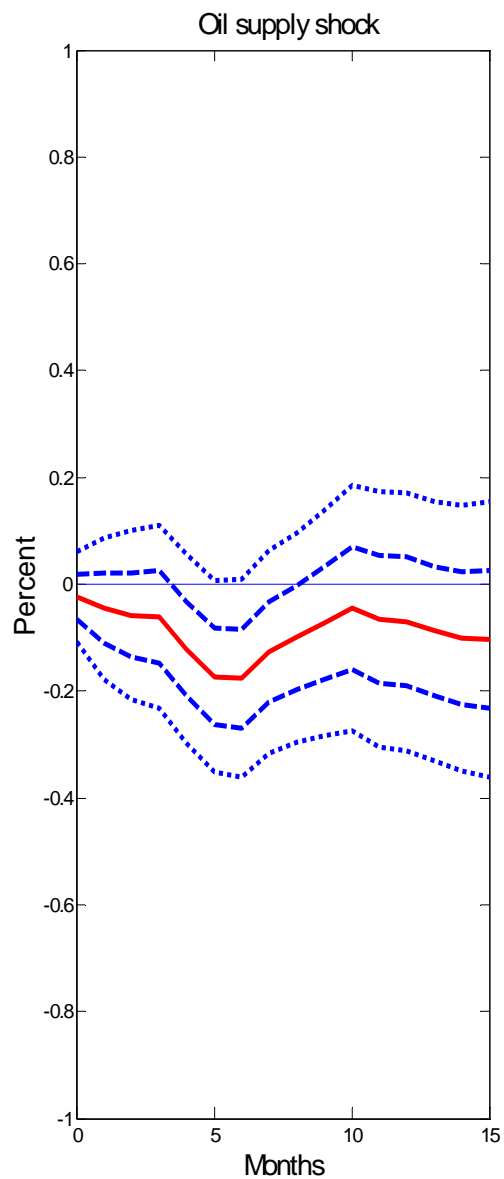
The Evolution of the Federal Funds Rate during the Oil Price Shocks of the 1970s and Early 1980s



Further Misspecification Problems

- BGW's analysis ignores that oil price shocks do not take place in isolation.
- Economic theory tells us that welfare-maximizing central banks should not respond to oil price shocks.
- Response should be to the fundamental shocks, not to the symptoms.

Response of Change in the Effective Federal Funds Rate to Oil Demand and Oil Supply Shocks (with 1- and 2-Std Error Bands)



Do Reduced Real-Wage Rigidities Rescue the BGW Model?

- VARs show that U.S. real wages decline in response to oil price shocks. No evidence that response of real wage to oil price shock has increased in magnitude since the 1970s.
- BG (2008): The same required decline in the real wage in response to the exogenous oil price shock is achieved with a smaller increase in unemployment, consistent with reduced U.S. real wage rigidities.

Problem: The smaller response of unemployment is also explained by changes in the composition of oil demand and oil supply shocks without appealing to structural change.

- This does not preclude that U.S. real wages have become more flexible, but it invalidates the evidence presented by BG (2008).

**Real GDP Growth Rates Relative to Average in the G7 Countries:
Selected Episodes of Oil Price Shocks**

	1973.IV- 1975.II	1978.IV- 1980.III	1980.IV- 1983.I	1990.III- 1993.III
U.S.	-3.84	-2.64	-1.87	-1.30
Italy	-2.01	2.10	-1.66	-1.96
France	-1.06	-0.24	-0.37	-1.72
Germany	-3.38	0.15	-2.01	2.33
U.K.	-3.50	-2.45	-1.14	-2.02
Canada	-0.24	-0.41	-2.56	-2.71
Japan	-1.75	1.00	0.17	-1.19

Did the Fed Contribute to the 2003-08 Oil Price Shock?

- Greenspan has been blamed with the benefit of hindsight for being too lenient in dealing with asset markets.

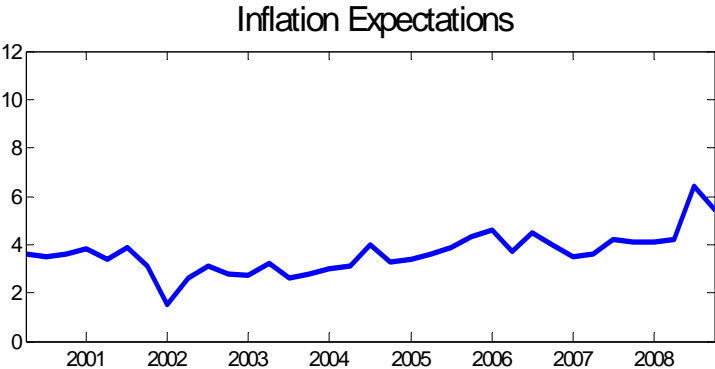
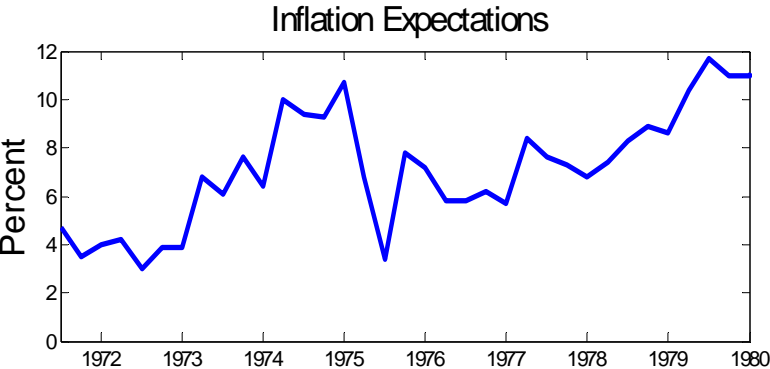
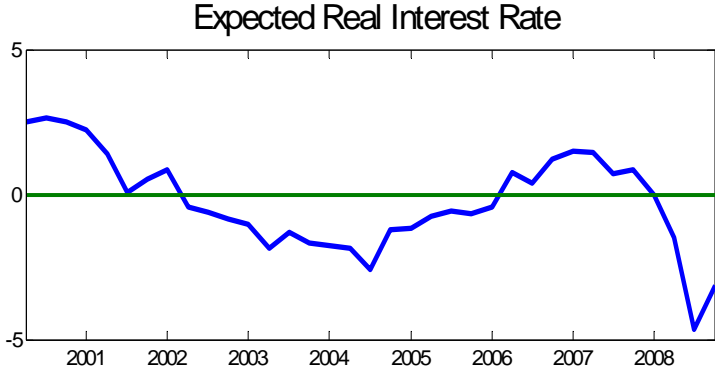
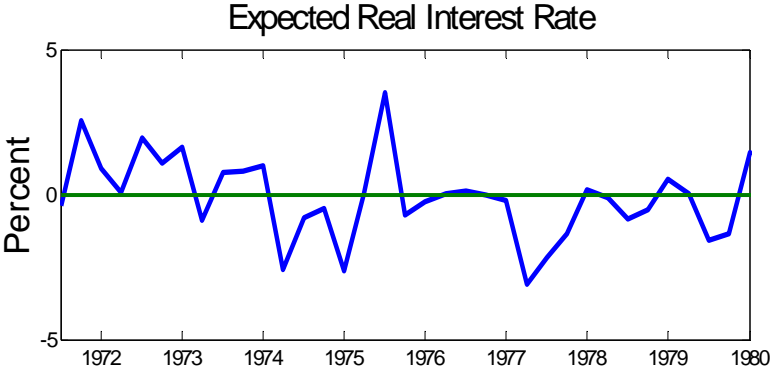
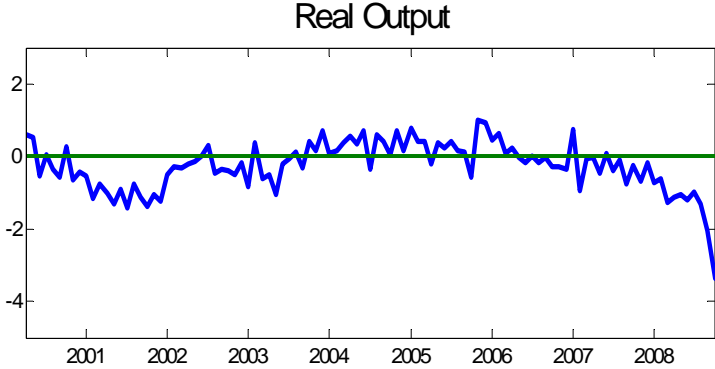
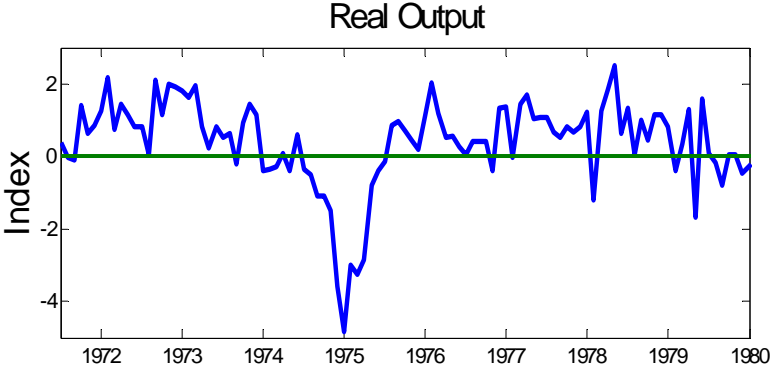
Both Greenspan and Bernanke have been criticized for being overly concerned with the employment objective.

- Has U.S. monetary policy been too stimulative after 2000? Has it contributed to the oil and commodity price boom?

⇒ Unlikely:

- Timing is off.
- No concerted action by OECD economies.
- U.S. economic environment is quite different.

Indicators of the Stance of U.S. Monetary Policy: 1971.II-1979.IV vs 2000.I-2008.III



Other Explanations

1. Exogenous transformation of emerging Asia?
2. U.S. monetary policy eased too early and too fast, enabling export-based economies in Asia to thrive and fueling the commodity price boom?
3. Failure of U.S. regulatory policies rather than monetary policy?

How Should the Central Bank Respond to Oil Price Shocks?

- The appropriate policy response will depend on the composition of the underlying oil demand and oil supply shocks.
- This requires a different class of structural models than are customarily used by policy makers:

Recent advances in the DSGE modeling of endogenous oil prices are a step in the right direction (e.g., Bodenstein et al. 2007, Nakov and Pescatori 2007, Balke, Brown and Yücel 2009).

In addition, future models will have to incorporate in more detail the external transmission of oil demand and oil supply shocks as well as the nexus between crude oil and retail energy prices.

- The traditional monetary policy reaction framework explored by BGW has outlived its usefulness.

It is not clear whether it ever was an adequate description of central bank behavior.

- Nor is the textbook distinction between the limiting cases of an exogenous transitory oil price shock (white noise) or an exogenous permanent oil price shock (random walk) useful.

- Degree of persistence depends on the nature of shock and on the policy reaction.
- All responses are persistent, but ultimately transitory.
- Oil demand shocks affect more than the real price of oil. Persistence of which response?

Example: 2003-08 Oil Price Shock

- The extent to which the price of oil responds to global demand pressures depends on how elastically oil is supplied.

Recently, oil supply has been very inelastic. Demand shifts have been persistent.

- Since this oil price shock reflected a persistent shift in the real scarcity of resources, there is nothing a central bank could or should have done in response beyond making sure that inflation expectations remain anchored in the face of inflationary pressures arising from both oil and commodity prices.

Conclusions

- Central bankers are rightly proud that they have learned the lessons of the 1970s, but there is no reason for complacency.
- It is easy to forget that the central bankers of the 1970s had the best of intentions and were fully aware of the dangers of inflation.

Ingredients of the 1970s crisis:

- Major structural changes and need for experimentation.
- Multiple shocks and complexity of the economy make it difficult to sort out competing interpretations of the data in real time.
- Perceived need to stabilize employment.
- Urgency for action (infusion of liquidity).
- Inflation considered the lesser risk compared with unemployment.

Much like today?

Policy makers have not lost sight of the inflation objective, but:

- Determining the right timing for withdrawing excess liquidity is about as difficult as guessing when the stock market will recover. In both cases, the right timing depends on consumer and business confidence.
- There will be a tendency to downplay the risk of inflation relative to that of unemployment, all the more so as confidence is fragile. What is potential output in a post-crisis world?
- Hence, the real test of whether we have learned the lessons of the 1970s is yet to come.