

# OIL SHOCKS: HOW DESTABILISING ARE THEY FOR A CONTEMPORARY CAPITALIST ECONOMY?

JYOTIRMOY BHATTACHARYA

Following the stagflation of the 1970s, it had till recently been the general opinion among macroeconomists that oil price shocks pose a serious threat to the stability of the world economy, including the advanced capitalist countries. As Hamilton pointed out in his pioneering study of the impact of oil price shocks on the US economy, Hamilton (1983): “All but one of the U.S. recessions since World War II have been preceded, typically with a lag of around three-fourths of a year, by a dramatic increase in the price of crude petroleum”.

The twenty-first century has not been kind to this consensus. The increase in petroleum prices that have followed the US invasion of Iraq have cumulatively been as large as those of the 1970s. Yet, the advanced capitalist countries have not faced either recession or inflation comparable to those of the stagflation era, even though the latest episode of price increase has extended much beyond Hamilton’s lag of “three-fourths of a year”. It is only now, after years of high oil prices, that these economies are facing a slowdown. Then too, the immediate cause of that slowdown is the financial crisis that these countries face following the collapse of the US housing bubble. Even if a mechanism could be found whereby high oil prices would be a cause of the bubble bursting, the long lag between the price increase and the slowdown and the relatively small (as of yet) magnitude of the slowdown compared to the 1970s would still cast doubts on any simple mechanisms connecting oil price increases to economic instability.

Such doubts had already started being voiced during the 1990s based on research which showed an apparent break in the relationship between oil prices and macroeconomic variables in the 1980s, with the relationship being much weaker in the later period. These observations led to three broad questions. Was there really a weakening in the oil-macroeconomy relationship during the 1980s or was the apparent weakening a statistical artifact? If the relationship was weak during the 1980s, had it been strong even in the 1970s? If the relationship was strong during the 1970s and weak in the 80s and 90s, what had changed in between?

## 1. EVIDENCE AT THE AGGREGATE LEVEL

Figure 1 plots the nominal US oil prices from 1970:1 to 2008:8.

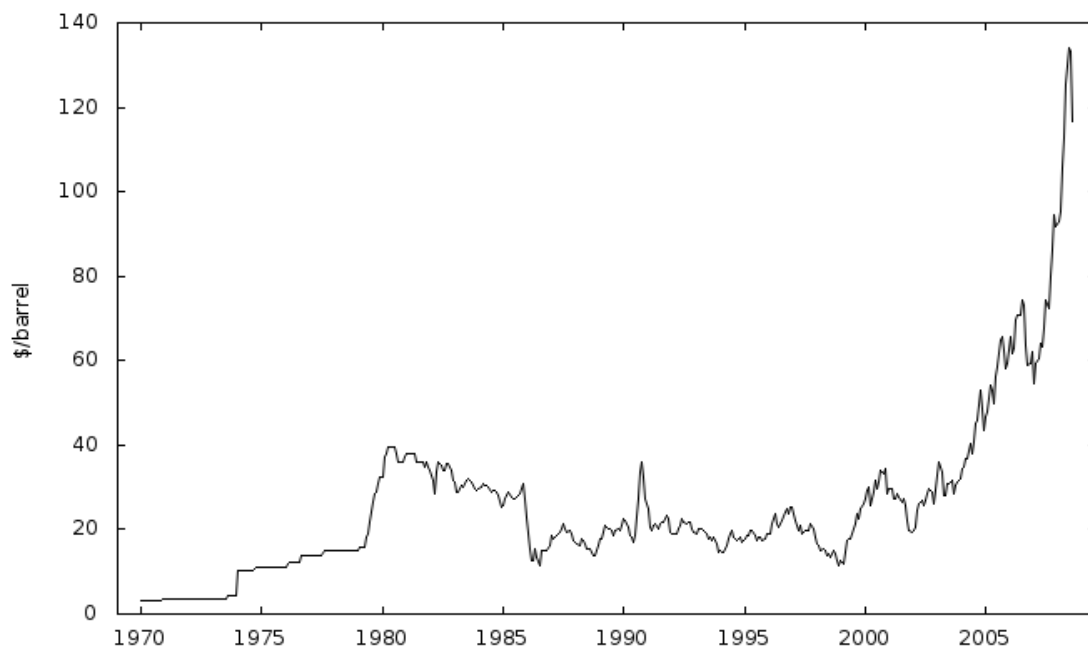


FIGURE 1. US Oil Prices—West Texas Intermediate  
(Source: FRED)

	run up period	50% rise date	max log change (\$)	max log change (real)
O1	1973:3–1974:1	1974:1	104%	96%
O2	1979:1–1980:2	1979:3	98%	85%
O3	1999:1–2000:4	1999:3	91%	87%
O4	2002:1–2007:3	2003:1	125%	110%

TABLE 1. Postwar Oil Shock Episodes. [Source: Blanchard and Galí (2008)]

Different methods have been suggested to identify and time ‘oil shock’ events from price series. Any such criteria will to some extent be arbitrary. For the sake of illustration we follow Blanchard and Galí (2008) who define a ‘large oil shock’ as “an episode involving a cumulative change in the (log) price of oil above 50 percent, sustained for more than four quarters”. Using this criteria they identify the episodes shown in table 1.<sup>12</sup>

For the four episodes that they identify, Blanchard and Galí calculate the change in inflation and GDP for the individual G7 countries as well as a few aggregates of advanced countries. These are shown in tables 2

<sup>1</sup>Blanchard and Galí conclude their analysis at 2007:3. But it is evident from figure 1 that O4 is still continuing.

<sup>2</sup>Blanchard and Galí’s criteria does not identify the shock triggered by the first Gulf War since the price increase was reversed quickly

	O1	O2	O3	O4	AVG(1,2)	AVG(3,4)
Canada	4.7	1.8	2.2	0.5	3.3	1.4
Germany	0.1	2.6	1.1	-0.2	1.4	0.4
France	5.4	3.1	1.3	0.5	4.2	0.9
U.K.	10.2	4.3	0.0	0.5	7.3	0.3
Italy	7.7	5.6	1.0	-0.1	6.6	0.4
Japan	7.9	1.0	-1.7	0.9	4.4	-0.4
U.S.	4.9	4.0	1.7	-0.2	4.5	0.7
G7	4.8	1.9	0.3	0.0	3.3	0.2
Euro12	4.3	2.7	1.3	-0.5	3.5	0.4
OECD	4.9	1.8	0.1	-0.5	3.4	-0.2

TABLE 2. Oil Shock Episodes: Change in Inflation. [Source: Blanchard and Galí (2008)]

	O1	O2	O3	O4	AVG(1,2)	AVG(3,4)
Canada	-8.3	-1.0	-1.5	3.2	-4.6	0.8
Germany	-9.6	-3.5	1.3	-2.5	-6.6	-0.6
France	-7.6	-4.4	0.6	1.2	-6.0	0.9
U.K.	-16.4	-9.2	0.4	2.5	-12.8	1.4
Italy	-8.6	0.4	3.0	-2.0	-4.1	0.5
Japan	-16.1	-4.4	7.6	3.3	-10.3	5.4
U.S.	-13.3	-11.8	-3.7	7.1	-12.5	1.7
G7	-12.6	-7.7	-0.2	3.9	-10.2	1.8
Euro12	-9.1	-2.9	1.0	-0.4	-6.0	0.3
OECD	-11.2	-6.5	0.1	4.1	-8.9	2.1

TABLE 3. Oil Shock Episodes: Cumulative Change in GDP.[Source: Blanchard and Galí (2008)]

and 3. With a few exceptions these both these table show the pattern referred to in the introduction. In the 1970s, oil price shocks clearly lead to stagflation. In the 1990s and 2000s, the effect is much less, if not non-existent.

Starting with Hamilton (1983), attempts have been made to look at the same relationship using the entire time series of oil prices and macroeconomic aggregates rather than individual shock episodes. Mork (1989), Hooker (1996), Hamilton (1996) are important contributions to this literature. Once we move away from looking only at oil price increases clearly associated with political/military events in the Middle East, two problems need solving. First, to what extent can we consider oil price changes as being exogenous to macroeconomic fluctuations. Second, we have to account for the possibility that the effect of oil price increases and oil price decreases may not be symmetric. The answer to these questions have an important bearing when evaluating

alternative theoretical explanations of the oil-price economy relationship, but none of the adjustments needed to account for them overturn the basic conclusions in the tables above—oil-price increases had a large impact on output and inflation in the 1970s, the effect is much less in the 1990s and 2000s. The challenge for theory is to account for both these facts simultaneously.

## 2. WHY SHOULD OIL SHOCKS CAUSE RECESSIONS?

The competitive market-clearing neoclassical model does a very bad job of explaining the impact of oil prices on output. In a model of that sort, output is most easily modelled as being produced jointly by labour, capital and energy by a production function:

$$Y = F(N, K, E) \tag{1}$$

If the price of energy is exogenously given, and a rise in energy prices causes other factors to be substituted for energy, this may cause output to fall. But a simple consequence of profit maximisation with production function (1) is:

$$\frac{\partial \ln F}{\partial \ln E} = c$$

where  $c$  is the share of energy costs in total output. Since to the first approximation the left hand side is the elasticity of output with respect to energy inputs, all the quantities in the expression above are observable and it lends itself to statistical tests. For the U.S. economy a reasonable value for  $c$  might be 4%, which would imply an output reduction of 0.4%, much smaller than what was observed during the 1970s.

A naive demand-side argument which sees an oil price increase as a tax which reduces the disposable income of oil buyers and increases the income of oil sellers would fare no better. Even if we assume that oil sellers do not consume any domestic goods out of their extra income, the relative income fall of oil buyers would at most be proportional to the share of oil in consumption expenditures, and that number would once again be too small to explain the recessions of the 1970s.

Given this, attempts have been made to explain the recessionary effects by bringing in secondary factors which may magnify the initial impact of oil price increases. Rothemberg and Woodford (1996) bring in imperfect competition and mark-up pricing, Finn (2000) introduces complementarity between energy and capital and variable capital utilisation and Hamilton (1988) introduces frictional employment arising out of the need to move labour out of industries which are directly or indirectly energy intensive (such as automobiles) to other industries. Apart from limited empirical support, a major problem for all these models is their inability to explain the weakening of the oil-price macroeconomic relationship in the last two decades.

### 3. INFLATION AND MONETARY POLICY

Rather than try to understand the stagflation of the 1970s purely in terms of a response to oil price shocks, Bernanke et al. (1997) see it as more of a consequence of incorrect monetary policy on the part of the Fed. Working in a VAR framework, they try to simulate the effects of a monetary policy that does not respond to oil price shocks and finds that the reduction of output is lesser in their hypothetical regime. Their results have been questioned on statistical grounds by Hamilton and Herrera (2004). Moreover, the claim that the recessions of the 1970s were due to monetary policy being too tight is hard to reconcile with the fact that these recessions were accompanied by high inflation. However, alternative ‘monetary’ accounts have tried to avoid these problems by framing their arguments in terms of the greater ‘credibility’ of monetary policy in advanced countries in recent decades.

However, discussion of a oil shocks being propagated through monetary policy draws attention to one development that may explain the greater stability of recent times. As we noted in section 1 above, there has been a reduction in the impact of oil shocks on prices in the developed countries. While there is no conclusive demonstration of the causes of this decline, one plausible reason might be the reduction in the bargaining power of workers due to decreasing unionisation and increased globalisation. If this is so, then a given oil shock would lead to a larger decline in real wages, cause less pressure on prices and thereby allow the central bank to follow a less recessionary monetary policy. So, even if the change in monetary policy regime is found to be the major change between the 1970s and now, that change may be more due to changing social relations than due to the increasing wisdom of central bankers.

### 4. CONCLUSION

The response of contemporary capitalist economies to oil price shocks has changed. Why, we don’t understand very well, and maybe the next oil shock will prove all predictions of fundamental change wrong. But what we do see is that at least in certain conjunctures, the failure of money to retain a stable value with respect to the most important primary commodity need not spell out an immediate crisis for advanced capitalist countries.

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