

THE MACROECONOMICS OF "OIL PRICES" AND "ECONOMIC SHOCKS": LESSONS FROM THE 1970S

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Abstract

This paper examines the relationship between oil price shocks and recessions and focuses particularly on the period of stagflation in the 1970s. Nearly every recession in the U.S. since WWII has been preceded by an oil price shock, and examining the literature as to the causal mechanisms finds there are a range of opinions from supply and demand side factors to the precipitated monetary policy response. Evaluating these across a number of countries finds that the mechanisms at play are complex and disputed. This paper reviews the literature and evaluates the various theories put forward before concluding that whilst oil plays a key role in the economy, the recessions following oil price shocks are more likely to be as a result of monetary policy decisions than the oil price shocks per se.

Keywords: Oil Price, Economic Shocks, the USA

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1 Introduction

The link between oil shocks and macroeconomic performance has long been established. As documented by Hamilton (2005:1) “*Nine out of ten of the U.S. recessions since World War II were preceded by a spike up in oil price*”. However, while few contest that this is more than mere coincidence there is little consensus among economic historians as to its meaning.

Two 1970s episodes of this phenomenon have proved highly controversial. The 1970s were an interesting period in economic history in a number of respects. It was a period of high inflation, economic downturn and increasing unemployment (Kilian *et al.*, 2004). This led to the period being coined the ‘Great Stagflation’ (Blinder *et al.*, 2008). The two significant periods of inflation in the 1970s and early 1980s were preceded by oil supply shocks in 1973/4 (OPEC I) and 1978/9 (OPEC II), lending credence to the view that oil price shocks were responsible for the bout of stagflation. The 1970s also saw the implementation of a new monetary policy regime after the breakdown of the Bretton Woods period in which convertibility of U.S. dollars to gold was suspended (Barksy *et al.*, 2004). This created a new paradigm between the use of monetary policy and achieving economic objectives adding to the complexity of disentangling whether oil price shocks or monetary policy were responsible for the downturn (Barksy *et al.*, 2004).

Conventional reading of the 1970s stagflation suggests a causal relationship between oil price shocks and inflation leading to poor economic

performance. The textbook explanation describes how an exogenous supply-side shock (in the form of oil) either directly or indirectly leads to inflation and recession (Blanchard, 2000). Other commentators argue that a more complete explanation of the relationship requires incorporating demand channels through which oil price shocks influence the decisions of consumers and firms. In contrast, recent literature has questioned the ability of oil price shocks to explain the magnitude of U.S recessions. As a result some economists have argued that oil price shocks precipitated the mechanism by which the Federal Reserve responded by raising interest rates and thereby turned what would have been a relatively benign economic downturn into a recession.

Other authors take the monetary explanation further and go so far as argue reverse causality i.e. that oil price increases were in fact the result of monetary policy. Economists including Killian and Barksy (2001) and DeLong (1997) have questioned the assumption that oil supply shocks are exogenous and instead argue a monetary explanation of the period of stagflation in which oil shocks are either irrelevant or an endogenous result of monetary policy.

2 The Historical Relationship between Oil and Macroeconomic Performances

Hamilton (1988, 2005, 2010) among others has drawn a relationship that predates the 1970s and records the relationship occurring as early as the 1890s. This section will provide an historical

analysis of the changing role of oil from the 19th to 21st Century.

1850 – 1950

Hamilton (2010:3) provides evidence of linkages between energy prices and economic performance as early as the mid-19th Century, citing the U.S. Civil War as the ‘first oil shock’. In the 19th century oil’s primary use came in the form of illuminants, lubricants and solvents, and as such its economic value was derived from the demand for these products (Hamilton, 2010:3). By the turn of the twentieth century, electric lighting began to replace the role of illuminants. Instead, oil became important as a source of industrial manufacturing and commercial projects and, increasingly, as motor vehicle fuel. As can be seen from Figure 2, U.S. motor vehicle registrations rose from 0.1 vehicles per 1,000 residents in 1900 to over 100 after 1920 (Hamilton, 2010). After the end of WWII in 1945, this trend exploded with automotive sales accelerating dramatically. Furthermore, between 1945 and 1947, U.S. demand for petroleum products increased 12% (Williamson *et al*, 1963:805).

1950 -1980

As the world became increasingly more integrated after WWII, oil prices in the U.S. began to become more influenced by exogenous shocks to world supplies such as the Suez Crisis 1956; the Arab-Israel War 1973-1974; the Iranian revolution 1978-1979; the Iran-Iraq War 1980; and the Persian Gulf War in 1990-91 (Hamilton 2010).

By 1972, despite further exploration in Alaska, oil production in the U.S. had peaked. To replace declining production the U.S. began to increasingly rely on imported oil from abundant supplies in the Middle East. As well as a growing dependence on imported oil, the 1970s witnessed unprecedented disruptions in the global oil market and poor macroeconomic performance in the U.S as well as many other OECD countries (Hamilton, 2010).

1973-4: OPEC Embargo (OPEC I)

The first of the two major oil shocks of the 1970s came on October 6, 1973, when Syria and Egypt launched a surprise attack on Israel. In response the U.S. provided Israel with weapons and funding (Hamilton 2010). On October 17, the Arab members of the Organization of Petroleum Exporting Countries, OPEC, announced an embargo on oil exports to countries viewed as supporting Israel (Hamilton 2010). By November 1973, Production was down 4.4 mb/d compared to September, approximately 7.5% of global output according to Hamilton (2010:14). By January 1974, the price of oil had effectively doubled. U.S. GNP between 1973 and 1975 fell by 0.8 percent (Bohi, 1989).

1978-1981: Iranian revolution & Iran-Iraq war (OPEC II)

The second major oil shock began in 1978 when strikes and national turmoil in Iran spread to the oil sector and production fell by 4.8 mb/d, or 7% of world production at the time according to Hamilton (2010). Saudi Arabia and other oil producing countries did increase production in attempt to fill the gap, but could only replace about a third of the lost Iranian production (Hamilton 2010). By late 1979

Iranian production had returned to half its pre-revolutionary levels, but was quickly wiped-out again when they were invaded by Iraq in September 1980. Iraq’s production also fell substantially.

Hamilton (2010) finds that the combined loss of production from the two countries was approximately 6 percent of world supply. U.S. GNP between 1979 and 1981 fell to 0.9 percent having grown in the 1975-1979 period by 4.7 percent (Bohi 1989).

1980 -2010

After the high prices of the 1970s, the 1980s witnessed a significant drop in the price of oil from \$27/barrel in 1985 to a low of \$12/barrel in 1986 (Hamilton, 2010:). While oil price increases had been well timed with episodes of economic contraction, oil price decreases failed to show the same statistical significance. A large body of literature has stressed the potential importance of asymmetric responses of U.S. macroeconomic aggregates to energy price shocks. This finding has been important in criticising certain proposed mechanisms by which oil price shocks affect the macroeconomy (Barksy *et al*, 2004).

It has also been widely observed that energy price shocks do not appear to affect the U.S. economy as much as they used. Hooker (1996) for instance, finds convincing evidence of a structural break in the data, with oil price changes making a substantial contribution to inflation before 1980 but little or none thereafter.

3 Oil and the macroeconomy

Numerous studies including: Rache and Tatom (1977); Rotemberg and Woodford (1996); and Hamilton (2005) have tested and rejected the hypothesis that the relationship between oil prices and output could merely be statistical coincidence (Hamilton, 2005). As shown in section two, the literature has convincingly revealed that before 1985 high oil prices were a significant bellwether of U.S. economic activity, suggesting a causal link. Yet, In spite of the abundant empirical literature suggesting this link, there is little consensus as to the causal mechanism in action. This section of the paper will analyse the different mechanisms proposed by which

oil shocks have impacted the U.S economy in the 1970s.

3.1 Supply-side and Demand-side Shocks

There are several mechanisms through which an oil price shock (defined as an unanticipated change in the level of oil prices) could affect the economy. The first is through its effects on aggregate supply. (Hamilton, 2005)

Production

This explanation commonly begins with the production function relating the output, Y, produced by a particular firm to its inputs of labour, L, capital, K, and energy, E:

$$Y = f [L, K, E]$$

Holding L and K equal, when energy prices rise, firms cut back on their energy use, implying that less output is produced at any particular level of capital and labour. An increase in energy prices is therefore an adverse supply shock (Bohi, 1989).

One of the recurring shortcomings with this mechanism in the literature is that the cost share of energy in production is small. Rotemberg and Woodford (1996) and many others (including Hamilton, 2005) find that energy accounts for only a small part of the total marginal cost of production and therefore there is no reason to suspect the effect on output to be significant.

Rotemberg and Woodford (1996) show that traditional production models of the transmission of energy price shocks are not capable of explaining the size of the fluctuations in output. Similarly, Bohi (1989) finds the share of energy in production in the U.S. implies that the 1974 oil price increase could reduce GNP by only as much as 0.72 percent (explaining only 14 percent of the actual decline) and the 1979/80 oil price shock by only 0.36 percent (explaining only 11 percent of actual decline). When Bohi (1989) expands the analysis to Germany, Japan and the UK he finds that the share of energy in production to be even smaller.

Productivity

A further area of investigation is the effect of oil price shocks on productivity. The idea here is that a reduction in the use of energy could reduce the productivity of labour and/or capital. As can be seen from Table 2, productivity grew much slower after 1973. In fact, between 1973 and 1982 productivity growth was negative. Theories as to why productivity fell during this period has generated its own collection of economic literature, however one popular explanation for the slowdown is the large increase in energy prices that followed the OPEC oil embargo in 1973.

Some economic historians have argued that a reduction in the use of energy could reduce the productivity of capital. Baily's (1981) proposition is that the rise in energy prices during the 1970s may have made many older, more energy-intensive capital and factories unprofitable to operate.

This, he argues, could cause a reduction in output without any perceived change in capital inputs. In reply to this theory Hulten, Robertson and Wykoff (1989) argue that if this hypothesis were true, one would expect the economic depreciation of capital to lead to lower prices of used equipment. However, they found that the price of used equipment did not change much after the 1973 oil shock and that the price of energy-intensive equipment actually increased in some cases.

Overall, it seems while in theory supply side shocks could explain the macroeconomic effects of an oil price increase, in practice there is little supporting evidence. Furthermore, variations of the standard models add complexity and do little to shed any light on the mechanism at play.

Employment

Related to the mechanisms described above is the effect of oil on the level of employment. The

NAIRU (non-accelerating inflation rate of unemployment) is the unemployment rate compatible with stable inflation (Beissinger, 2001). To test if the real oil price has an impact on the NAIRU, it is necessary to know if it shifts the labour demand and/or supply curves (Gali, 2010).

On the supply side, it is argued that real wage claims of labour unions increase after an oil shock. Layard *et al* (1991) argue that due to wedge effects, the wage setting curve is affected by oil price shocks. For example, Labour unions push to increase real wages by raising nominal wages, since the real price of oil and foreign consumption goods have increased. Layard *et al* (1991:412) argue that this mechanism might be able to explain the asymmetric effects of oil prices as "*Real wage resistance does not work so strongly in reverse*" although they do concede that they lack much in the way of evidence or theory to support the claim.

Demand for labour by the firm will fall at any possible real wage if the decline in energy use lowers labour productivity (Bohi, 1989). Furthermore, if wages are sticky i.e. they fail to adjust; the level of employment will fall. Wage inflexibility is frequently cited as one cause of increases in unemployment after the 1970s oil shock, with variations in economic performances between countries explained by differences in wage flexibility (Bohi 1989).

The wage-rigidity theory is often used to describe how Japan avoided recession after the second oil shock while the UK experienced one of the worst recessions. However, Bohi (1989) argues that aggregate measures of the wage gap in Japan are

not consistent with this hypothesis.

Demand-Side Shock

Rather than considering oil shocks as a supply-side shock, another strand of the literature focuses on reduction in demand for goods and services prompted by energy price shocks. Hamilton (2008) argues that the key mechanism through which energy price shocks affect the economy is through disruptions in consumer and business spending on goods and services.

One such demand mechanism in the literature is the 'sectoral shocks hypothesis' (Lilien, 1982; Hamilton, 1988). This model incorporates two direct effects, the uncertainty effect and the operating cost effect (Kilian, 2008b). The uncertainty effect occurs when changing energy prices creates uncertainty about the future path of prices leading consumers to delay or forego purchases of consumer durables (Kilian, 2008b). The operating cost effect similarly is the result of uncertainty created by changing energy prices but households delay the purchase of energy-using durables, such as motor vehicles (Kilian, 2008b). As the dollar value of such purchases may be large relative to the value of the energy they use, even relatively small changes in energy prices can have large effects on output (Hamilton 1988). It is argued for instance, that the absence of domestically produced fuel-efficient automobiles in the United States in the 1970s meant that consumers, conscious of increasing fuel prices, turned to the smaller fuel efficient foreign produced vehicles, leading to a fall in U.S. automobile sales (Kilian, 2008b).

As can be seen in Figure 4, although there is some evidence that auto sales fell after the shocks, the drops are rather small by historical standards and occur only gradually. Furthermore, they look to represent a decline that started well before the oil shock. For example, car sales in the U.S. peaked nearly a year before the 1973/4 oil shock (Kilian, 2008b).

Additionally, industries related to the automobile sector might be affected. Bohi (1989) finds evidence (see Table 3) that steel and transport equipment, two industries closely tied to the production of automobiles, declined sharply in the U.K and the U.S., both of which produced less fuel-efficient vehicles. On the other side, Japan and Germany, two countries that domestically produced fuel-efficient automobiles, show less of a decline or even growth in steel and transport equipment (Bohi 1989).

Furthermore, the 'sectoral shock hypothesis' argues that these effects may cause the reallocation of capital and labour away from the automobile sector. Lacking flexibility in capital and labour markets, the reallocation could lead to resources being unemployed, thereby causing further cutbacks to consumption and amplifying the effect of higher energy prices on the real economy (Kilian 2008b).

Loungani (1986) found evidence supporting the possibility that oil price shocks were sectorally dispersed. Other researchers (such as Lee and Ni 2002) have found partial support for this view of the strength of oil price shocks (Kilian 2008b).

In a related mechanism, Bernanke (1983) developed a model in which an oil price increase adds uncertainty and causes firms to defer or postpone investment until it is understood whether the price of oil is a temporary hike or a new permanent plateau. Calculating the importance of such channels is more difficult, yet a number of authors have ruled it out suggesting that the investment uncertainty effect, if it exists at all, is small in comparison with apparent magnitudes needed to explain the effects of oil on output (Barksey *et al*, 2004).

Overall, demand shocks seem to present a powerful narrative in explaining the mechanism by which oil shocks could cause economic downturn in the 1970s, yet evidence to support such theories remains contested.

3.2 Oil, systemic monetary policy and recessions

While some economists have argued for either or both supply and demand mechanisms to describe how oil shocks induce inflation and slow real growth, the common thread has been that oil shocks in themselves were the key explanatory variable. However, an alternative view supported by the likes of Bernanke, Gertler and Watson (1997) is that oil shocks affect the economy in an indirect way, and that of much more significance is the Federal Reserve's monetary response to oil shocks.

United States

When the first oil price shock hit the U.S., monetary policy, was already reducing the money supply in an attempt to curb inflation (Bohi, 1989). After the oil shock monetary policy responded by aggressively decelerating the growth of the money supply, yet it failed to stop inflation rates averaging 9 percent between 1973-5 and may additionally contributed to the economic downturn (Bohi, 1989).

During the second oil price shock, combating inflation remained the primary concern of the Federal Reserve. To this end the Federal Reserve responded by tightening monetary policy to slow the growth of the money supply. This proved to be more of a challenge than it had been in 1973/4 as by this stage the credit market, which had grown steadily from the late 1960s, was booming by the late 1970s and combined with an increasingly speculative financial market. As such monetary authorities had to take extraordinary measures to control the money supply, such as by restraining credit (Bohi, 1989).

As the two oil price shocks occurred during the extraordinary financial landscape of the 1970s,

disentangling whether it is oil prices, or rather contractionary monetary policy, which is the more powerful explanation of the 1970s recessions, is quite complex. Some economists such as Bohi (1989) have argued that had monetary authorities taken a less contractionary monetary position, energy price shocks of the 1970s may have “*passed without serious repercussions on the economy*” (Bohi, 1991:78). Bohi’s conclusion was supported Bernanke *et al* (1997) who showed, by using structural VARs and counterfactuals with alternative monetary policy rules, that the endogenous response of monetary policy to an inflationary oil shock was more important than the oil shock *per se*. Their 1997 results showed that the endogenous response of monetary policy accounted for almost all of the negative impact of oil shocks on the macroeconomy (Bernanke *et al* 1997).

In a reply to a critique from Hamilton and Herrera (2004), Bernanke *et al* (2004) re-estimated their model and found that a 10 percent oil price shock, with the endogenous increase in the funds rate, led to an approximate 0.7 percent decline in GDP. This result was similar to their 1997 result with a short lag length. When they re-estimated their ‘Sims-Zha’ counterfactual experiment, in which the funds rate is not allowed to increase (monetary policy is frozen), the decrease in output after an oil shock was 0.4 percent, suggesting that had contractionary monetary policy not been implemented, the impact of oil price shocks on the economy would have been relatively benign (Carlstrom *et al*, 2006). Numerous other authors including Carlstrom *et al* (2006) have reproduced models and counterfactual simulations with alternative modelling assumptions in an attempt to disentangle oil price shocks and contractionary monetary policy. After reviewing the literature, Kilian (2008b:25) concludes: “*How much the Fed’s endogenous response to higher oil prices contributed to the subsequent economic declines still remains unresolved*”.

As shown there have been a number of methodological challenges involved in ‘disentangling’ the effects. How much of the downturn can be attributed to monetary policy and how much from effects of oil on the macroeconomy remains a highly contentious issue. One simpler method involves comparing the variation in policies and outcomes in other countries to identify the causal mechanisms at work.

Japan

When the Bretton Woods system collapsed in 1971, the Bank of Japan, convinced of the importance of a fixed exchange rate, intentionally inflated the economy in an effort to prevent the yen from appreciating (Shigehara, 1982). The inflationary pressure created led to excess liquidity in the economy and a significant spike in aggregate

demand. By the beginning of 1973, just months before the first oil price shock, Japan was facing high levels of inflation and took the decision to reverse its expansionary policy and contract the money supply (Bohi, 1989).

When the oil crisis did hit in October 1973, Japan was effectively well on its way to a self-induced economic downturn. The real interest rate had doubled, bank reserve requirements increased and lending tightened (Shigehara, 1982). As previously mentioned The United States and Japan took the most aggressive measures to deflate their economies after 1973 oil price shock, and as a result Japan consigned itself to three years of high unemployment, inflation and poor economic performance (Bohi, 1989).

The lessons learnt from the first oil price shock meant that Japan approached the second oil price shock, in 1979, armed with a set of very different policies. Unlike the United States, and many other nations, Japan responded to the second oil crisis with deliberately expansionary stabilization policies (Bohi, 1989). As can be seen from Table 4, the U.S. plunged into a second recession after 1979 whereas Japan experienced a period of relative economic stability. The Japanese example therefore provides compelling evidence to suggest that the monetary policy response is of significantly more importance than the oil price shock *per se*. The argument is further strengthened when one considers the fact that Japan imports a larger share of its energy consumption than Germany, Italy, the U.S. or the U.K (Bohi, 1989).

Italy

Italy began the 1970s under very different social and political conditions than many of the other industrial nations. After the WWII and fascist dictatorship under Mussolini, Italy was hit by both right-wing and left-wing terrorism in the 1960-70s (Rossi *et al*, 1996). It has been argued by some economic historians that the domestic socio-political factors as well institutional breakdown of the Bretton woods system left the Italian economy exposed to shocks. In the early 1970s the Bank of Italy had pursued an accommodating monetary policy resulting in strong growth and an increasing money supply (Rossi *et al*, 1996). After the first oil price shock in 1973, faced with rapidly expanding domestic demand and a sharp inflationary surge, monetary authorities attempted to introduce contractionary policies.

Yet unemployment rose from 6.2 per cent to 7.3 per cent according to Rossi *et al*, (1996) and Consumer price inflation averaged 15 per cent per annum. Furthermore, like the U.S., Italy enjoyed a credit boom from 1969-1973 with domestic credit growth averaging 18 per cent per year (or 10 per cent in real terms) (OECD, 1975). This was a battle the Bank of Italy was still contending with when the second oil price shock struck in 1978/9. In a similar

situation to the U.S, domestic inflation targets were regularly exceeded as credit controls failed to adequately curb growth in the money supply (OECD, 1975). This may explain why inflation in Italy and the U.S was significantly higher than in Germany.

Germany

As with other nations after the collapse of the Bretton Woods system, Germany was facing high inflation in the beginning of 1973 and as such had adopted a tight monetary policy (Lehment, 1982:238). Like Japan, Germany was already facing a recession when the first oil price shock struck in 1973. In response the Bundesbank, concerned about another surge in inflation, tightened the money supply further. The result was period of recession combined with high inflation. The second oil shock was approached with a similar contractionary monetary policy and the resulting economic performance, which had been relatively strong in 1978, fell dramatically (Bohi 1989).

After both shocks, Germany managed to avoid serious inflation, whereas in the United States inflation was considerably higher. Much of this can be attributed to the Bundesbank policies of aggressively controlling inflation. Lehman (1982) refers to the Bundesbank Annual Report for 1980, where the increase in oil prices is cited as one reason for aggressively decelerating the money supply. Furthermore, as previously mentioned, controlling the money supply in the U.S and Italy had become increasingly challenging due to the acceleration in the growth of credit. In 1980 real interest rates in the U.K and the U.S returned to negative levels as inflation reignited, in contrast to positive real interest rates in Germany and Japan where inflation remained under control (Bohi 1989).

United Kingdom

The UK is a particularly interesting case, as although the country was highly dependant on imported oil in 1974, by 1979 it was well on its way to self-sufficiency. The UK encountered the first oil shock while facing an inflation problem and implementing a contractionary monetary policy (Bean 1987).

By the mid-1970s oil prices had effectively quadrupled as a result of the first oil price shock making the North Sea reserves more valuable and extraction more viable. As a result, the UK went from being a net oil importer in the mid-1970s to net oil exporter by the mid-1980s (Bean 1987).

By the second oil shock in 1978/79 the UK, although approaching self-sufficiency in domestic oil consumption, experienced a deeper and longer lasting recession than many other OECD nations, including the U.S. This conflicted with the popular argument in the economic literature that economic exposure is related to the degree of dependence on

energy imports (Bohi 1991).

There are two main explanations as to why UK output fell following the second oil shock: the first theory embodies the 'Dutch disease' concept, which explains how an increase in revenues through natural resource discoveries leads to an appreciation in the exchange rate, resulting in relatively cheaper imports and more expensive exports. As such, the balance of payments strengthens but manufactures lose international competitiveness (Bean 1987).

Evidence of such an effect-taking place occurred when the rate of exchange of the pound for the dollar rose by 20 percent in 1979–80 followed by a decline in manufacturing. To empirically test the extent to which North Sea oil can account for the appreciation in the exchange rate, Bean (1987) runs a number of simulations. His results predict a 13 percent appreciation of the nominal exchange rate, compared to an actual exchange rate appreciation of 18 percent, suggesting oil may play a significant role in explaining the behaviour of the exchange rate.

However, Bean (1987) argues that oil cannot fully explain the magnitude of the collapse in manufacturing output and the rise in unemployment. The second theory argues that contractionary fiscal and monetary policies implemented under the Thatcher government could have led to a downturn. Monetary policy for instance could lead to a rise in domestic interest rates and an over appreciation of the exchange rate. The result is a loss of international competitiveness leading to a recession. There is evidence of such an effect: The Bank of England bank rate rose from 12.5 percent in 1978 to 17.0 percent in 1979 (Bean 1987). A number of studies including Bean (1987:82) use simulations conclude that North Sea oil played a significant, but by no means exclusive role in explaining the appreciation of sterling in 1979-80 and the demise in manufacturing and that the role of economic policy is an important factor in explaining the economic experience of the late 1970s and early 1980.

3.3 The 'Great Stagflation' – an endogenous explanation

The previous section has shown how the monetary policies of the late 1960s to early 1980s can explain a significant amount of the inflation, unemployment and poor economic performance over the period. Some authors have taken the monetary explanation further and gone so far as to argue reverse causality i.e. that oil price increases were in fact the result of monetary policy. Economists including Barsky and Kilian (2001) and DeLong (1997) have questioned the assumption that oil shocks are exogenous and instead argue a monetary explanation for the period of stagflation in which oil shocks are either irrelevant or an endogenous result of monetary policy.

Barsky and Kilian (2001) focus on the episodes of oil supply shocks in 1973/4 and 1978/79 and make, according to Blanchard (2001), a number of

controversial points. The first controversial point they argue is that the increase in the price of oil in the 1970s was an endogenous response to money-driven world boom. Most economic historians have classed the first oil shock as an exogenous event whereby the oil price increase can, at least at some degree, account for the following recession. However Barksy and Kilian (2001) have argued alternative motivations for the oil embargo. They provide evidence to suggest that the 1970s rise in oil prices, like that in other commodity prices, was in significant measure a response to macroeconomic forces, ultimately driven by monetary conditions. They argue that although political factors were not entirely absent from the decision-making process of OPEC, the two major OPEC oil price increases in the 1970s would have been far less likely in the absence of conducive macroeconomic conditions resulting in excess demand in the oil market. Furthermore, they argue that Arab oil producers had economic concerns and had discussed the possibility of an embargo prior to the war. They point to the fact that the embargo was lifted without achieving its political objectives to credit their view.

Although it seems economic objectives were very important in the decisions made by Arab oil producers, there are a number of issues with the view that the oil embargo was purely economic.

Firstly, non-Arab oil producers did not impose an embargo suggesting economic benefit was not in itself a strong enough motivation. Secondly, as argued by Hamilton (2003:389) the oil embargo was not “spearheaded” by the biggest oil producers, who would have had the most to gain economically, but by smaller Arabic nations who had little oil to sell. While it seems that oil price increases of the 1973-74 need to be considered in economic perspective, it also seems clear that size and timing of the production decrease were motivated predominantly by geopolitical factors (Hamilton, 2003).

The second controversial point Barksy and Kilian (2001) make is that stagflation can be explained within a model with only monetary shocks. They argue that oil price increases were not nearly as essential a part of the causal mechanism generating the stagflation of the 1970s as is often thought. Core to the model proposed is the idea of sluggish inflation. Sluggish inflation reflects the fact that agents learn only gradually about shifts in monetary policy (Barksy and Kilian 2001). They argue that given the slow and stable inflation rates of the 1960s, it is plausible that agents were slow to revise their inflationary expectations when confronted with an unexpected monetary expansion in the early 1970s. They argue that this interpretation appears even more plausible considering the financial turmoil and uncertainty associated with the breakdown of the Bretton Woods regime. Similarly they argue that in the 1980s recession, expectations of inflation were slow to adjust when Paul Volker launched a new monetary policy regime resulting in

much lower inflation.

Much of the criticism of the mechanism has come from Blinder (2008) and Blanchard (2001) who argue that a rather modest increase in the nominal interest rate could not have led to the size of the recessions witnessed in the 1970s. Overall, the theory proposed by Barksy and Kilian (2001) has stirred up the debate in the economic history community as to what caused the period of stagflation in the United States in the 1970s. Their theory however, fails to stand up to much of the criticism directed at it, particularly in regards to the claims of oil as purely an endogenous result of monetary policy.

Conclusion

A review of oil price shocks and recessions suggests, at first glance, a causal link. Indeed as noted by Hamilton, almost every recession in U.S. history since WWII was preceded by an oil shock. This is graphically illustrated in the two oil price shocks of 1973/4 and 1978/9, which ushered in periods of high inflation, unemployment and poor economic performance in many OECD countries. But what are the real causal mechanisms? Answering this question has occupied many economic historians and elicited a large body of economic literature.

This paper has examined the literature describing possible mechanisms by which energy price shocks adversely affect economic performance. Traditional explanations of the 1970s stagflation phenomena place the role of oil as a significant supply shock event at the centre of the debate. However evidence is also presented that concludes that the direct effect of higher energy costs on production and employment is small. This finding is further supported by the fact that, during the 1970s, energy-intensive industries fared no worse than low-intensity energy industries, and there is no evidence that energy intensive equipment became obsolete or cheaper.

An alternative view has emerged which suggests that oil price shocks affect the economy on the demand side, through their effect on consumer and firm’s expenditures. In this view, higher energy prices cause both a reduction in aggregate demand and a shift in expenditures, which in turn causes a wave effect through the economy, as firms adjust their production plans. While demand side mechanisms seem intuitively sensible, evidence to support them is mixed at best.

More recently the role played by monetary policy during periods of oil price shocks has offered an alternative explanation. Some commentators argue that oil shocks precipitated the mechanism by which monetary policy led to an economic contraction. Other economic historians take this view even further suggesting that monetary policy can actually account for all of the downturn as well as the oil shock itself. This second view, while causing

quite a stir in the economic history community, has done little to prove that the 1970s was purely a monetary phenomenon.

The evidence presented in this paper shows that recessions not only follow oil shocks, but have also consistently followed contractionary monetary policies. Japan after the second oil price shock was the only country to adopt an expansionary monetary policy, and was alone in avoiding a severe recession. Disentangling the effects of oil price shocks and monetary policy proves difficult when analysing the recessionary periods of the 1970s, as most industrial countries were already fighting inflation with contractionary monetary policies, and as such many were already heading towards an economic downturn. Attempts at disentangling the effects have proved complicated and open to criticism, yet the

evidence of Japan's response to OPEC II, as well as counterfactual simulations run by the likes of Bernanke *et al* (1997) and the asymmetric correlation of oil prices and economic performance suggest that policy decisions of central banks may have had a significantly greater impact than oil shocks.

The debate as to the role oil shocks play on the economic performance will likely continue for some time yet. It is exceedingly difficult to isolate the individual effect of oil price shocks given the economic backdrop and the associated monetary policy response. Yet the emerging view that monetary policy plays a much bigger role than oil price changes may provide some important lessons for the future.

Tables and Figures

Table 1. Exogenous disruptions in world petroleum supply 1950 – 19

Date	Event	Drop in world production (%)
November 1956	Suez crisis	10.1
November 1973	Arab–Israel war	7.8
November 1978	Iranian revolution	8.9
October 1980	Iran–Iraq war	7.2
August 1990	Persian Gulf war	8.8

Source: Hamilton (2003)

Table 2. Sources of Economic Growth in the United States (Denilson) (Percent Per Year)

	1929-1948	1948-1973	1973-1982	1929-1982	1982-1997
Sources of Growth					
Labour growth	1.42	1.4	1.13	1.34	1.17
Capital growth	0.11	0.77	0.69	0.56	0.98
Total input growth	1.53	2.17	1.82	1.9	2.69
Productivity growth	1.01	1.53	-0.27	1.02	0.76
Total output growth	2.54	3.7	1.55	2.92	3.45

Source: Blanchard (2000)

Table 3. Percentage Changes in Industrial Production in four countries, 1973-75 & 1978-80

Industry	Germany		Japan		United Kingdom		United States	
	1973-75	1978-80	1973-75	1978-80	1973-75	1978-80	1973-75	1978-80
Steel	-9.02	2.36	-7.98	6.31	-10.94	-16.83	-10.94	-9.32
Transport Equipment	-3.70	0.42	-1.46	11.90	-4.95	-4.50	-9.02	-5.88

Source: Bohi (1991:16)

Table 4: Indicators of economic activity: Germany, Japan, United Kingdom, United States and Italy

	<u>Germany</u>	<u>Japan</u>	<u>UK</u>	<u>US</u>	<u>Italy*</u>
GNP (real)					
1960-73	4.5	10.4	3.1	4.2	5.3
1973-75	-0.7	0.6	-0.8	-0.8	-0.3
1975-79	4	5.3	2.4	4.7	4.0
1979-81	0.7	3.4	-2	0.9	1.2
Inflation					
1960-73	4.2	5.5	5.2	3.4	4.9
1973-75	6.8	14	20.8	9	16.2
1975-79	3.6	4.7	3.6	6.7	11.1
1979-81	4.6	3.1	15.2	9.1	18.5
Unemployment					
1960-73	0.8	1.2	3.2	4.5	5.7
1973-75	2.7	1.7	3.4	7.1	8.2
1975-79	3.5	2.1	5.9	6.7	6.1
1971-81	3.7	2.1	9.4	7.4	8.4

Source: Bohi (1989)

*For Italy see Marcellino and Mizon (2000)

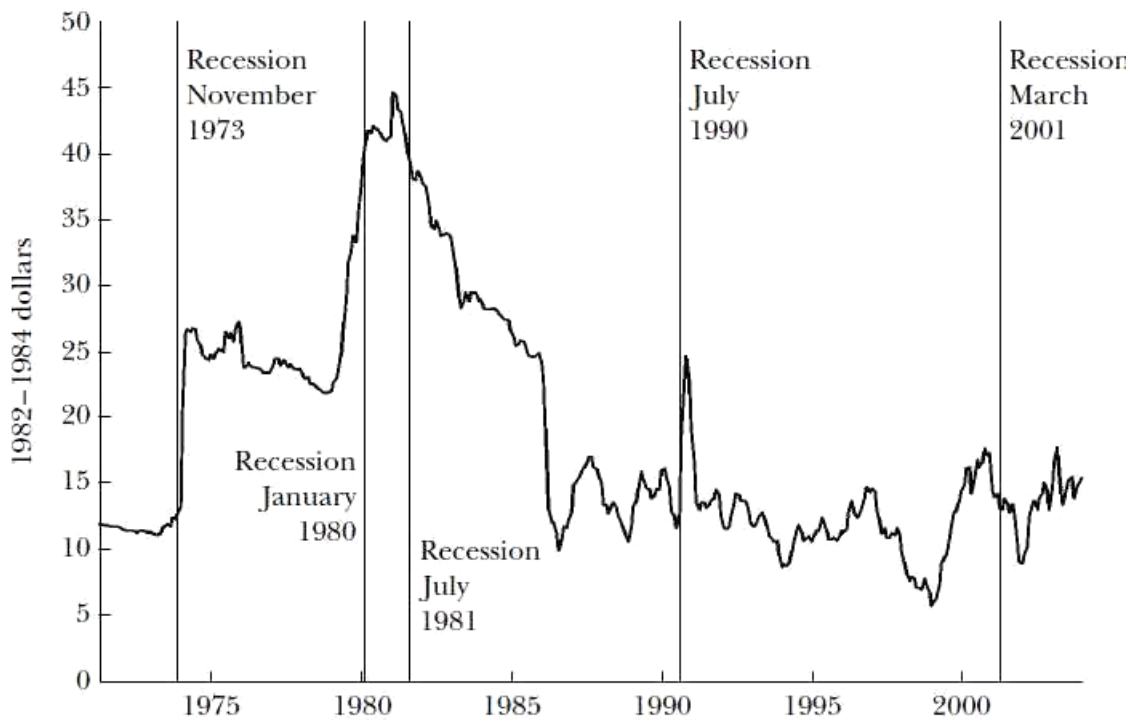


Figure 1. Real Price of U.S. crude oil imports and recessions, March 1971 – December 2003

Source: Barksy and Kilian (2004)

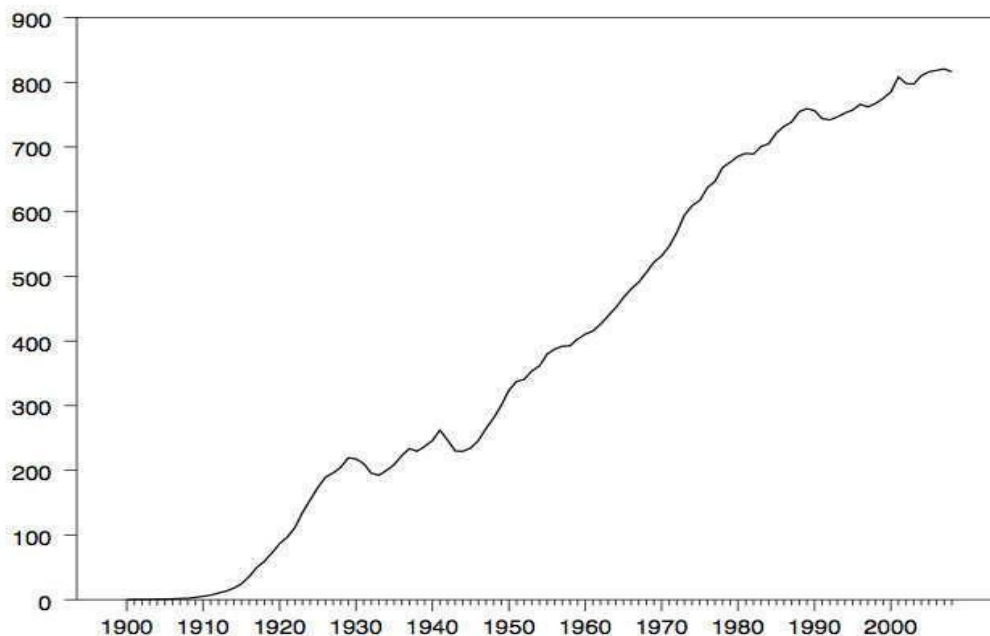


Figure 2. Total U.S. vehicle registrations per thousand U.S. residents, 1900-2008

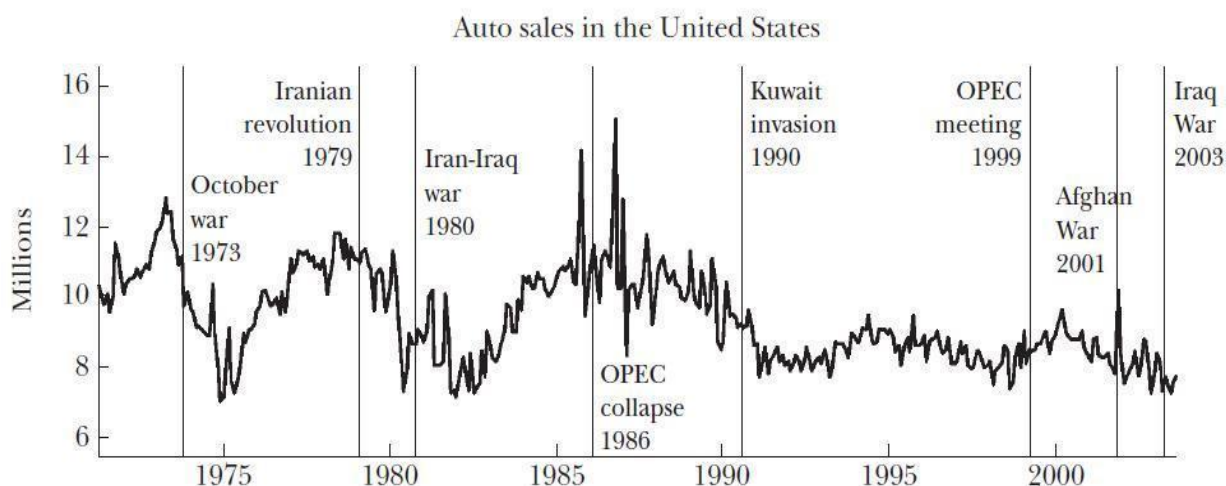


Figure 3. Oil Price uncertainty and real consumption of durables, 1971.3 – 2003.7

Source: Barsky and Killian (2004)

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