Energy Price Shocks

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Lutz Kilian
University of Michigan
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Abstract: Oil price shocks have been a recurring phenomenon since the 1970s. This paper reviews alternative explanations of oil price shocks. It puts the evolution of the U.S. price of crude oil into historical perspective and compares it with that of the price of coal and natural gas.

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Lutz Kilian, Department of Economics, 611 Tappan Street, Ann Arbor, MI 48109-1220, USA. Email: lkilian@umich.edu.
1. Introduction

Recent events in the Ukraine serve as a reminder that energy is necessary to sustain a country’s real economic activity and to ensure the physical survival of its population except under the most favorable climatic conditions. The main sources of energy to this day have been fossil fuels such as coal, crude oil and natural gas. Electricity in turn is produced mainly from coal power plants and power plants using natural gas (or, in rare cases, fuel oil), augmented by nuclear power and to a lesser extent by hydroelectric power, solar power, and wind power.

The prices of oil, coal and natural gas thus are of immediate concern to policymakers, firms, and consumers. Unexpected changes in the price of energy have the potential of wreaking havoc on an economy. Unanticipated increases in energy prices may cause far-reaching disruptions of economic plans, as consumers and firms are forced to economize on the use of energy, to curtail other expenditures to pay for higher energy costs, and to replace energy-inefficient equipment with energy-saving equipment. Such energy price shocks and their effects on the economy are the subject of a large literature in economics.

Much of this literature has focused on the price of crude oil (e.g., Kilian 2008a, 2014). Crude oil stands out among energy commodities because of its importance for the transportation sector. Although crude oil is not consumed directly and is not used as factor of production outside of the refining industry, oil products such as gasoline, diesel, heating oil, or jet fuel are highly visible in everyday life. Their price affects, for example, the cost of commuting to work, the cost of shipping goods, the cost of air travel, and in some areas the cost of home heating.

Until the early 1970s, the global market for crude oil was fragmented, with the United States being able to produce more oil than it consumed, while other industrialized countries such as Japan or Germany were heavily dependent on crude oil imports. This situation changed when
even the U.S. ceased to be self-sufficient in oil and became dependent on oil imports in the early 1970s. Initially these oil imports came primarily from the Middle East, but increasingly from oil producers in other regions. As global oil trade expanded and national oil market structures were gradually broken up, a global market for crude oil emerged. From 1974 until 2010, the price of crude oil has been determined in this global market place. In other words, adjusting for transportation costs and the inevitable differences in the quality of crude oil produced in different regions of the world, the price of crude has been largely the same worldwide. Only in recent years, as the production of unconventional crude oil surged in the United States and Canada, the market for crude oil appears to have fragmented again, with U.S. oil prices deviating from world prices because of bottlenecks in the oil transportation infrastructure and because of capacity constraints in refining.

Long before the globalization of the market for crude oil in the 1970s, there already was a well-developed global market for coal, as coal is easy to ship internationally. Well into the 20th century, coal was as important for the U.S. transportation sector as oil is today. It was the primary fuel used in shipping until the 1920s and in railroading until the 1950s. It also served as an important source of home heating until the 1950s. Coal continues to play an important role today in producing electricity and heat as well as in the manufacturing of chemicals and metals.

In producing electricity and in manufacturing coal competes with natural gas. The market for natural gas, in contrast to that of coal or crude oil, has largely remained regional to this day. Natural gas is primarily transported by pipelines. Although natural gas may be cooled down and liquefied, allowing it to be shipped as liquefied natural gas (LNG) to any port in the world, both the cost of LNG shipping and the infrastructure required to load and unload LNG are expensive, which has prevented the integration of regional natural gas markets and the emergence of a
Thus, in studying energy prices over longer time periods one inevitably has to take the perspective of one country. This article focuses on the United States because of its long history in producing coal, oil and natural gas and the availability of long continuous price series for these markets. The objective is to document the history of energy price shocks and to examine whether price shocks in oil markets are different from those in other energy markets such as coal, which in the past were as important as crude oil is today.

2. The Traditional Interpretation of Oil Price Shocks

It is useful to begin with a review of the oil price data in the post-war period. Sometimes oil price shocks are associated with sudden increases in the price of oil. This idea can be traced back to the work of Hamilton (1983) who studied the evolution of the nominal price of West Texas Intermediate (WTI) crude oil in the U.S. between 1948 and 1972. Figure 1 illustrates that this price series differs from most other commodity prices in that it often remains unchanged for extended periods followed by discrete adjustments. When expressed in growth rates and adjusted for inflation, as shown in the left panel of Figure 2, this step-function pattern implies unpredictable spikes in the growth rate that represent shocks to price of oil.

This pattern reflects the fact that the U.S. price of crude oil during this time period was regulated by state-level agencies such as the Texas Railroad Commission, as discussed in Hamilton (1983). Under normal circumstances the regulator was able to keep the price of oil unchanged for extended periods. At irregular intervals, however, major oil price adjustments took place. Hamilton documents that these adjustments were associated with exogenous oil supply disruptions in the Middle East that were unforeseen by the regulator and justified ex-post adjustments of the regulated price of oil. These events could be used either to implement long
Figure 1: Evolution of the Monthly WTI Price of Crude Oil during 1947.1-1973.12

NOTES: The WTI data are from the U.S. EIA.

Figure 2: Evolution of the Growth Rate of the Monthly Real Price of Oil

1974.2-2014.8

NOTES: The data are from the U.S. EIA and FRED. RAC denotes the U.S. refiners’ acquisition cost.
overdue adjustments to the price of oil reflecting domestic inflation and/or unexpectedly high
domestic demand for oil or to accommodate additional demand for U.S. oil from abroad. In
short, Hamilton’s review of the evidence suggested that timing of oil price shocks under the
Texas Railroad Commission regime was associated with oil supply shocks in the Middle East
driven by political events unrelated to the state of the U.S. economy, allowing us to treat these
shocks as exogenous to the U.S. economy.

This regime came to an end, when the U.S. demand for oil grew faster than the United
States’ ability to produce oil in the early 1970s. The U.S. became a net oil importer. The fact that
state level agencies were unable to regulate the price of imported crude oil spelled the end of the
Texas Railroad Commission regime, even though the last vestiges of this system survived until
the early 1980s. After 1974, the market for crude oil, for all intents and purposes, became a
global market with the price of oil being ultimately determined by the forces of demand and
supply much like in other global commodity markets. This structural shift in the crude oil market
is reflected in a structural break in the evolution of the growth rate of the real price. Figure 2
shows a dramatic increase in the volatility of three alternative measures of the growth rate of the
price of oil, but especially of the U.S. refiners’ acquisition cost for crude oil imports, which may
be viewed as a proxy for the global price of crude oil. Rather than exhibiting occasional spikes,
the growth rate of the real price of oil as of 1974 begins to look like that of most other
commodity prices.

3. The Modern Interpretation of Oil Price Shocks

Initially, it was thought that this structural change was inconsequential and that at least the major
fluctuations in the real price of crude oil after 1973 could be explained by exogenous OPEC oil
supply disruptions much like in the 1950s and 1960s. Kilian (2008b) demonstrated that this is not
the case. Examples of political events in OPEC countries thought to have triggered oil supply disruptions include the 1973 Yom Kippur War and the subsequent Arab oil embargo, the Iranian Revolution of 1978/79, the invasion of Kuwait in 1990, the Venezuelan unrest of late 2002 and the Iraq War of early 2003, as well as the Libyan Revolution of 2011. The challenge for the traditional view of oil price shocks has been that the predictive power of these oil supply disruptions for the price of oil is quite modest. Oil supply disruptions explain at most a quarter of the increase of the price of oil in 1973/74, for example, and with the exception of the 1990 spike in the level of oil price have not had a major impact on the evolution of the real price of oil since 1974. The major oil price fluctuations instead appear to be driven by shifts in the demand for oil, as has been shown in a series of studies including Kilian (2009), Kilian and Hicks (2013), and Kilian and Murphy (2012, 2014).

By far the most important determinant of the real price of oil is shifts in the flow demand for oil associated with fluctuations in the global business cycle. Flow demand refers to demand for raw materials to be consumed right away in the process of producing more domestic goods rather than being stored for future use. As China's industrial growth accelerates unexpectedly, for example, the flow demand for industrial raw materials including crude oil increases. As the demand curve shifts to the right along the upward sloping supply curve, the real price of crude oil (and of other industrial raw materials) increases. Put differently, the real price of oil is endogenous with respect to global macroeconomic conditions. This phenomenon attracted much attention after 2003, but is by no means new. Shifts in the flow demand for oil played a major role during almost all major surges in the real price of oil including the 1973/74 and 1978/80 episodes.

There is more than one source of shifts in the demand for oil, however. Another
potentially important determinant of the real price of oil is shifts in the demand for oil stocks, reflecting forward-looking behavior by oil market participants. Such demand shocks are also known as speculative demand shocks. They arise, for example, when market participants expect the real price of oil to go up in the future, reflecting expectations of a shortfall of future supply relative to future demand. In this case there is an incentive to buy crude oil now and to store it in anticipation of rising oil prices. The resulting shift in the current demand for oil stocks increases the current real price of oil, as the demand curve shifts to the right along the supply curve.

Such forward-looking behavior is crucial for understanding oil markets. It has been shown that exogenous political events in the Middle East matter for the real price of oil not so much because of the actual disruptions of the flow of crude oil they cause, but because of the expectations of future supply disruptions they may create. Likewise, the anticipation of a global economic recovery or economic slowdown will affect expectations of future oil prices, as will any number of other events and developments that are not commonly included in economic models. Even an increase in uncertainty all else equal may cause a shift in the demand for oil stocks (see Pindyck 2004; Alquist and Kilian 2010). As Kilian and Murphy (2014) and Kilian and Lee (2014) show, such speculative demand shocks driven by expectations of future oil price changes help explain, for example, the surge in the real price of oil in 1979 (following the Iranian Revolution), the collapse of the real price of oil in 1986 (following the collapse of OPEC), and the spike in the real price of oil in 1990 (following the invasion of Kuwait), but they played no important role during the 2003-08 surge in the real price of oil.

Finally, there is a myriad of additional idiosyncratic shocks to the demand for oil ranging from politically motivated changes to the Strategic Petroleum Reserve before elections to shifts in the demand for oil as a result of hurricanes in the Gulf of Mexico shutting down U.S.
refineries. These idiosyncratic demand shocks, however, do not appear to be capable of explaining sustained changes in the real price of oil.

Once it is recognized that not all oil price shocks are the same, it becomes immediately clear that one would expect the evolution of the U.S. economy in the wake of an oil price shock to differ depending on the composition of the oil demand and oil supply shocks underlying this oil price shock. If we ignore this insight, we may find that the statistical relationship between the real price of oil and the U.S. economy appears unstable over time, even when the underlying structural relationship is stable. This point has been illustrated, for example, by Kilian and Park (2009) in the context of U.S. stock markets.

One can still ask how the U.S. economy responds on average to an oil price shock, of course, but there are two important caveats in interpreting the answer. First, these responses cannot be interpreted as the causal effects of the oil price shock because nothing ensures that the oil price shock under consideration occurs holding everything else constant. For example, an unexpected increase in the real price of oil driven by increased flow demand would also be associated with increases in the real price of other industrial raw materials, violating the *ceteris paribus* assumption. Thus the response we observe in the economy is the response to increases in the prices of both oil and industrial raw materials, rather than the price of oil alone.

Second, the average response to an oil price shock can be misleading when it comes to interpreting specific episodes of rising oil prices. For example, traditional models of oil price shocks implied that the U.S. economy should have gone into recession in 2005/06, following the surge in the price of oil that began in 2003. Such a recession obviously never occurred because the preceding increase in oil prices was caused by an unexpectedly booming global economy, not by oil supply disruptions or increased speculative demand. Unlike in the traditional view of oil
price shocks as being driven entirely by exogenous oil supply disruptions, in the modern view rising oil prices may very well be compatible with an expanding economy and a rising stock market, at least for some time.

A final point to bear in mind is that the traditional question of how an oil price shock affects the economy is inherently ill-posed, once we recognize that the state of the economy in turn affects the price of oil. A more useful way of posing this question would be to ask how an exogenous shift in the demand for oil in some part of the world, for example, affects the real price of all commodities including crude oil, the U.S. economy and the economy in rest of the world. Answering the latter question requires a global structural model of the economy and of commodity markets. An example of this type of analysis can be found in Bodenstein, Guerrieri and Kilian (2012).

4. Other Explanations of Oil Price Shocks

Especially near the peak of the real price of oil in 2008, a popular view among some pundits has been that the real price of oil is no longer determined by the laws of demand and supply, but by the actions of financial traders in oil futures markets (sometimes informally referred to as financial speculators). This view reflects several misunderstandings. One is that it is logically impossible for the price of crude oil to be determined by anything else but demand or supply. The only question is what determines the demand for and supply of crude oil. In fact, economic theory suggests that prices in the physical market for crude oil and in the oil futures market are jointly and simultaneously determined by the same underlying shocks rather than changes in one price being caused by exogenous changes in the other. Another misunderstanding is that the

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1 Oil futures contracts are designed to allow traders to lock in the price at which a certain quantity of crude oil is sold and bought at a future date, enabling market participants to hedge oil price risk. These contracts are traded on public exchanges. The oil futures market was created in the 1980s and is distinct from the physical market for crude oil discussed so far.
actions of financial speculators in the oil futures market are believed to be exogenous with respect to developments in the physical market for oil. Not only is it unclear what exactly a financial speculator is, but the claim of exogenous financial speculation moving oil markets is difficult to sustain in practice. Proponents of this view have not been able to provide convincing empirical evidence in support of the financial speculation hypothesis. For a review of this debate the reader is referred to Fattouh et al. (2013).

Upon closer examination, it becomes clear that the real concern articulated by these pundits is not about a failure of the laws of demand and supply at all, but about the perception that economic fundamentals, as measured by shocks to the flow of oil being produced and shocks to the flow demand for oil are not capable of explaining the surge in the real price of oil especially in 2007/08. This is a misperception. Formal empirical models show that economic fundamentals do an excellent job at explaining the surge in the price of oil between 2003 and mid-2008, as well as the collapse and recovery of the real price of oil thereafter (see, e.g., Kilian and Murphy 2014; Kilian and Lee 2014).

The debate about financial speculation as a driver of oil prices illustrates a tendency among pundits to reduce complicated economic relationships in oil markets to simple formulaic explanations. The notion of nefarious speculators in oil markets is one example of trying to make sense of the evolution of the real price of oil without engaging with economic models. Another example is the tendency to attribute oil price increases to actions of the so-called OPEC cartel.² The presumption is that there is a concerted effort by OPEC oil producers to prop up oil prices either directly or by withholding oil supplies from the market. Until ten years ago, major oil price increases were routinely attributed to the machinations of this alleged cartel rather than to the

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² OPEC is the Organization of Petroleum Exporting Countries. It includes oil producers in the Middle East as well as some oil producers in other parts of the world.
underlying forces of demand and supply. Only with the rise of the debate about financial speculation, interest among pundits in OPEC seems to have waned.

The evidence in support of the cartel explanation has always been thin. There is no evidence that OPEC caused the 1973/74 or the 1979/80 oil price shock episodes, for example, even if this claim is often repeated in macroeconomic textbooks. OPEC was far from a unified body in the 1970s and incapable of acting as a cartel. Only in the early 1980s, OPEC attempted to curtail its oil production in an effort to prevent oil prices from falling in response to the Volcker recession. As predicted by the economic theory of cartels, most OPEC members cheated on their cartel obligations, however, which prompted Saudi Arabia to take responsibility for reducing oil production on behalf of the rest of OPEC. This approach proved not only ineffective in that the price of oil continued to fall, albeit at a slower rate, but unsustainable in that falling production in conjunction with falling oil prices resulted in a substantial reduction in Saudi oil revenues. By late 1985, Saudi Arabia was forced to reverse course, and the real price of oil collapsed along with fears of what OPEC might do. There has been no indication of OPEC being able or willing to control the price of crude oil since then. Indeed, it would be hard to explain why Saudi Arabia would have permitted the oil price to fall to $11/barrel in 1998, if it were endowed with the market power sometimes ascribed to it.

5. How to Measure Oil Price Shocks

So far we have defined an oil price shock informally as a change in the price of oil relative to the price of oil that consumers and firms expected. More formally, oil price shocks can be defined as the unpredictable component of the price of oil. One approach is to measure oil price shocks within the context of an econometric model as movements in the price of oil that cannot be explained based on past data. Such oil price shocks are also known as oil price innovations and
can be decomposed further into mutually uncorrelated oil demand and oil supply shocks with the help of additional identifying assumptions.\(^3\)

More colloquially, the term oil price shock is also used to denote episodes of unusually high (or in some cases unusually low) oil prices. Such episodes typically extend over several years. In fact, most surges in the price of oil do not involve any large changes in the price of oil on a monthly basis. Rather they arise because for extended periods the price of oil experiences small, but persistent increments. Examples are the 1979/80 oil price surge and the 2003-08 oil price surge. Sometimes appearances can be misleading. A case in point is the sudden increase in the price of oil in 1973/74. Kilian (2008b) shows that the real price of oil would have increased much earlier than late 1973 and more gradually, had the price of Middle Eastern oil not been constrained by the Teheran-Tripoli agreements of 1971. The sudden increase in late 1973 occurred when oil producers reneged on these contractual agreements and the oil price reverted to market levels. In fact, overall the real price of metals and non-oil industrial raw materials during 1971.11 and 1974.2 increased by 75\% as much as the real price of oil, even in the absence of supply shocks in these markets, suggesting that all these prices were largely driven by the same forces of demand. Hence, historically, the oil price spike of 1990, following the invasion of Kuwait, is the only example of a large and sudden increase in the price of oil since the 1960s. All other oil price shock episodes have involved more gradual increases in the real price of oil.

Finally, yet another notion of oil price shocks has been proposed by Hamilton (1996, 2003). The idea is that an oil price shock occurs only to the extent that the price of oil exceeds the highest price of oil that consumers and firms have experienced in recent memory. More

\(^3\) An alternative approach would be to define oil price shocks based on the market expectation of the price of oil. For example, Baumeister and Kilian (2014) discuss how oil price expectations for a given horizon may be recovered by adjusting the oil futures price by an empirical measure of the risk premium. By comparing the 3-month ahead financial market expectations of the oil price to the realizations of the oil price three months later, for example, one can infer a time series of quarterly oil price shocks.
formally, this *net oil price increase* measure of oil price shocks is defined as the censored variable $\max(0, p_t - p^*)$, where $p_t$ refers to the current oil price and $p^*$ refers to the maximum oil price over the preceding year (or, more commonly, over the preceding three years). By construction, the net oil price increase is predictable based on its own past. At some point it was believed that this statistical transformation of the price of oil would effectively isolate the component of the price of oil associated with exogenous shocks to the flow supply of oil. It has become readily apparent that this is not the case. An alternative and more common interpretation has been that net oil price increases are the relevant measure of oil price shocks because they explain or at least help predict variation in U.S. real GDP.

Figure 3 casts doubt on this interpretation. Treating the net oil price increases of 2004-06 as one episode, there have been eight distinct episodes of net oil price increases since 1974, of which only five were followed by recessions. In some cases the net oil price increase occurred well before the recession. A good example is the net oil price increase of 2000. In other cases it occurred immediately before or at the same time as the recession. Examples are 1981 and 1990. In three cases, net oil price increases were not followed by a recession at all. These episodes are 1996 as well as 2004/05 and 2006 (the latter two may be viewed as one episode), and 2011/12. This evidence suggests that there is no mechanical link between net oil price increases and subsequent recessions.

More formally, it can be shown that the evidence that net oil price increases help forecast U.S. real GDP growth is weak at best (see Ravazzolo and Rothman (2013); Kilian and Vigfusson 2013). For related discussion of net oil price increase measures and their relationship with more conventional oil price shock measures also see Kilian and Vigfusson (2011a,b).
6. Putting Oil Price Shocks into Historical Perspective

Crude oil is only one source of primary energy, but stands out because of its important role in the transportation sector. Historically, coal played much the same role for the transportation sector as oil did starting with the increased adoption of the automobile during World War I. Steam ships and steam locomotives were as dominant in transportation then as oil is today for trucking, shipping, air transport, and railroading. A natural question therefore is whether coal prices were subject to shocks similar to the oil price shocks documented earlier.

This question can only be addressed with annual data because there are no quarterly or monthly oil price series prior to 1947. The left panel of Figure 4 plots the historical evolution of the real prices of coal and crude oil since 1870. The plot deliberately ignores the oil price data

Figure 3: Three-Year Net Oil Price Increase in Real U.S. Refiners’ Acquisition Cost for Oil Imports with U.S. Recession Dates Imposed as Shaded Areas

SOURCE: Kilian and Vigfusson (2014). The business cycle dates are from the National Bureau of Economic Research.
prior to 1910, because, before the adoption of the automobile, crude oil was used primarily to produce kerosene to be used for lighting, heating as well as cooking. It therefore makes sense to discount the history of oil prices prior to 1910 from our point of view. Figure 4 shows that prior to 1970 the degree of comovement between the prices of oil and coal was quite low. Subsequently, there is increased comovement, but the increase in the real price of coal during the 2000s was not nearly as dramatic as that in the real price of oil.

Figure 4: Historical Evolution of U.S. Real Energy Prices: 1870-2013

NOTES: Expressed in real U.S. $ per barrel (crude oil), per metric ton (coal), and per MMBtu (natural gas). The coal price refers to anthracite coal. The coal and gas prices are based on Manthy (1978) and EIA sources; the oil price series is from British Petroleum (2014).

Because these prices are measured in different units, it is useful to express them in percent changes. Figure 5 suggests that the Texas Railroad Commission era which was characterized by unusually low volatility at annual frequency followed by an extreme spike in 1973/74, was a historical aberration. In contrast, the volatility of the real price of oil prior to
World War II largely resembles that since the 1970s. Even discounting the early 1970s, however, the volatility in the growth rate of the annual price of oil appears more than twice as high as the corresponding volatility in the price of coal. This is not to say that there are no sustained increases in the real price of coal – in fact the sustained increases in the level of real price of coal during the 1920s and 1940s dwarfed those in crude oil – but that the year-on-year changes tended to be smaller. In this sense, there is a clear difference between the crude oil market and the coal market.

It is also instructive to compare the real price of oil with the real wellhead price of natural gas. Although natural gas prices are available as far back as 1919, as shown in the right panel of Figure 4, it was only with the creation of a nationwide network of natural gas pipelines in the 1950s that natural gas became an important energy resource for the U.S. economy (see Davis and Kilian 2011). Figure 5 shows that the volatility of the growth rate of the real price of natural gas since the late 1950s has been quite similar to that of the real price of oil before and after the Texas Railroad Commission interlude. Figure 4 in turn suggests that traditionally U.S. natural gas and crude oil prices have moved in the same direction. There are indications, however, that with the rapid growth in U.S. shale gas production in recent years, this traditional pattern no longer holds. Figure 4b shows a dramatic fall in the real price of natural gas after 2008, even as the annual real price of oil recovered after the financial crisis. In contrast, there remains some degree of positive comovement between coal and crude oil prices going back as far as the 1970s. The observed pattern of positive comovement across coal, oil and natural gas prices between the 1970s and the 2000s reflects in part the fact that industrial consumers of energy often had the ability to use dual technology that allowed them to switch between natural gas and fuel oil depending on price and availability. Such substitution tends to be more difficult for
NOTES: All results are obtained from the data underlying Figure 4.

residential consumers of energy, however. For example, to this day there are parts of the United States in which heating oil remains the main source of home heating because there are no natural gas pipelines in that region. Likewise, there is essentially no substitution between oil and either coal or natural gas in U.S. power plants, and the process of replacing coal power plants by natural gas power plants is quite slow. Finally, especially in transportation, there is only very limited substitutability between oil and natural gas to date. Even the indirect substitution of coal, natural gas or nuclear power for oil in the form of electric power has not played a large role in U.S. transportation so far.

Thus, much of the observed comovement in real energy prices appears to reflect common shifts in the demand for all forms of primary energy associated with shifts in flow demand. This
comovement only breaks down when there are large increases in the supply of an energy commodity, as occurred in the natural gas sector after 2008. In contrast, there is no indication that a similar structural shift is underway in the oil sector. Although the production of shale oil has increased exponentially in recent years, it has proved difficult to move this crude oil to the refineries that can process it, causing local excess supply of crude oil in the U.S., as a result of which domestic U.S. oil prices fell below global levels in recent years. In any case, at the global level, the quantitative importance of shale oil remains small compared with the size of the global market for crude oil. Thus, the response of the global price of oil to the U.S. shale oil revolution has been muted. In contrast, in the natural gas sector, U.S. gas production must be balanced against domestic demand rather than global demand with correspondingly larger effects on the price.

An interesting question for future research will be to compare the evolution of energy prices across countries and to disentangle the contribution of various demand and supply shifts to the evolution of these historical energy price series. The latter question has received increasing scrutiny in years, including contributions by Hamilton (2013), van de Ven and Fouquet (2014), and Stürmer (2014).

7. Conclusions
Why do we care about oil price shocks (and by extension other energy price shocks)? One reason is that positive oil price shocks historically have been associated with recessions in oil-importing countries, although the recessionary effects associated with oil price shocks do not appear as large and systematic as originally thought.

Of course, not all increases in the real price of oil are bad. Increases in the price of oil also may serve to transmit signals about the increased scarcity of crude oil (see Hamilton 2014).
In fact, rising oil prices are a precondition for the development and adoption of alternative energy technologies. In this sense, the concern for policymakers is not so much increases in the real price of oil in general, but rather the fact that rapid increases in the real price of oil tend to put economic stress on the oil-importing economy, as the economy adjusts to the increased scarcity of oil.

An even bigger concern is high volatility in the growth rate of the real price of oil, which may prevent the necessary investment in alternative energy technologies or for that matter in additional oil exploration (see Dixit and Pindyck 1994; Kellogg 2014). There has been no shortage of discussions of the need to stabilize oil prices. One response has been the creation of the U.S. Strategic Petroleum Reserve (SPR). It is clear, however, that relative to the magnitude of the global oil market, changes in the SPR are too small to stabilize the real price of oil. Of course, the biggest source of volatility in oil prices in recent years has been the financial crisis. The case can be made that policies preventing such misalignments in the economy may be the most effective approach to reducing the volatility of oil prices and other primary energy prices.

References


