The effects of the recent oil price shock on the U.S. and global economy[1]

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Summary

Oil prices shocks have a stagflationary effect on the macroeconomy of an oil importing country: they slow down the rate of growth (and may even reduce the level of output – i.e. cause a recession) and they lead to an increase in the price level and potentially an increase in the inflation rate. An oil price hike acts like a tax on consumption and, for a net oil importer like the United States, the benefits of the tax go to major oil producers rather than the U.S. government.

The impact on growth and prices of an oil shock depends on many factors:

- The size of the shock, both in terms of the new real price of oil and the percentage increase in oil prices. At its close of $43 a barrel on July 30, 2004, the current real price of oil is high – well above the levels during the 1990 and 2000 oil mini-shocks, but it remains well below the peak real oil price of $82 in 1980, and equal to the post 73 real price of $43. The recent 65% increase in oil prices (since the 2002 average price)[3] is comparable to the increase in 2000 (60%, but from a very low starting point, as oil prices had fallen to a low of around $15 in 1999), higher than the increase in 1990 (40%), but much smaller than the increases in 1973 (210%) and 1979-80 (135%).
- The shock's persistence. This will depend on many things, many as much political as economic, since the current high oil price reflects both booming Asian demand (China alone is expected to account for roughly 40% of the increase in demand for oil in 2004) and geopolitical risk in the Middle East (the "fear premium" estimated to add between $4 and $8 to current prices).
- The dependency of the economy on oil and energy. The U.S. economy is much less energy intensive than it was in the 1970s, but it also much bigger and produces comparatively less domestic oil. Net oil imports of 1.2% of GDP in 2003 are higher than net oil imports of 0.9% of GDP in 1970.
- The policy response of monetary and fiscal authorities

These effects are not trivial: oil shocks have caused and/or contributed to each one of the US and global recessions of the last thirty years. Yet while recent recessions have all been linked to an increase in the price of oil, not all oil price spikes lead to a recession. The 2003 spike associated with the invasion of Iraq is a good example.

Private sector estimates generally suggest that a persistent 10% increase in the price of oil – say an increase from $30 to an average of $35 over the course of 2004 -- would reduce the US and the G7 growth rate by about 0.3%-0.4% within a year. Some (Goldman

[3] Oil prices have been highly volatile in recent months and the precise price increase depends on where oil settles and on the baseline used in the comparison. At the current (end of July and early August 2004) price of $43, oil has increased by 65% from its average 2002 price of 26. At $43, oil has increased by 38% relative to the average 2003 price of $31.1. The 2004 price increase is somewhat lower if one takes the average of oil price for 2004 that is $38, as of August 2004. Prices refer to West Texas Intermediate spot levels.

Sachs) are more pessimistic, and calculate that if oil prices were to increase further to levels closer to $45, the reduction in the G7 growth rate may be closer to 1% of GDP. Thus, private estimates of the negative effects of an oil shock currently range between 0.3% to 1% of US and G7 GDP growth. This means that the US economy, which was growing in Q4:2003 and Q1:2004 at about a 4.3% average rate could be expected to see a slowdown of its growth to a level between 4.0% and 3.3%. Global growth would also de-accelerate from its current very strong pace. And, indeed, the first estimate for Q2:2004 U.S. GDP growth was 3.0%, confirming that high oil prices in the first half of 2004 put a dent on real consumer demand. Looking ahead, persistence of oil prices at recent high levels of $43-44 per barrel (or even higher prices) could further slow down the U.S. economy below a 3% growth rate.

However, there are several reasons to worry that the current oil price shock may have larger growth effects than currently expected by most economists:

- Most forecasters did not expect the 2000 shock to lead to a recession, yet it clearly contributed to the resulting slowdown. While current oil prices are high mostly as a result of booming global demand, not a fall in supply, high oil prices stemming from a booming Asia have a similar impact on the U.S. as high oil prices that arise from limits on supply.
- The tight oil market gives market power to Saudi Arabia, which is the only producer with significant spare capacity. It also makes the world extremely vulnerable to any major interruptions in supply. Major price spikes -- like that of 1973 -- happen when supplies are already tight. On the other hand, oil consuming nations do hold larger strategic stockpiles now than in 1973, providing some protection against supply disruption.
- Other financial vulnerabilities may exacerbate the output effects of an oil shock. Financial markets are quite unsettled, as market players are trying to reposition themselves ahead of the Fed's anticipated tightening and are taking off the carry trades they put on to profit from extremely low U.S. interest rates.
- The U.S. economy has other sources of vulnerability as well. U.S. consumers are by many measures already overstretched: consumption growth has been spurred by borrowing in the face of stagnant real incomes for many wage earners. High oil prices might dent their confidence. Recent data suggests that a slowdown in consumer spending linked in part to higher oil prices accounted for the fall in the pace of U.S. growth in the second quarter of 2004.
- The Fed also has less room to direct monetary solely toward policy to maintaining output than it did in 2000: unlike in 2000, when inflation was falling, inflation was already picking up in 2004 - admittedly from a very low level - prior to the recent surge in oil prices; and recent inflation news have shown a worrisome pick-up in the inflation rate. The combination of low pre-existing rates, a weak dollar and high oil prices limit the Fed's ability to maneuver. With some concerned that the Fed is already "behind the curve" in terms of responding to the recent inflation increase, the Fed would have to increased the Fed Funds rate more and faster than currently expected by the markets if further oil price shocks were to feed into the inflation rate.

- Finally, markets are concerned about the size and pace of the Chinese slowdown following a period of unsustainable overheating. While a slowdown in China would reduce demand driven pressures on oil and likely would lead to lower prices barring any changes in supply, it also would remove one of the main engines of world growth.

All these factors add to the downside risks and may lead to a more severe growth slowdown following the recent oil price shock.

The effects of the recent oil price shock on the U.S. and global economy

Oil prices shocks have a stagflationary effect on the macroeconomy of an oil importing country. The size of the output growth/level effect and inflation rate/price level effect of an oil shock depend on many factors:

- The size of the shock, both in terms of the percentage increase in oil prices and the real price.
- The shock's persistence
- The dependency of the economy on oil and energy
- The policy response of monetary and fiscal authorities

These effects are not trivial: oil shocks have caused and/or contributed to each one of the US and global recessions of the last thirty years. Specifically:

- The 1974-1975 US and global recession was triggered by the tripling of the price of oil following the Yom Kippur war and the following oil embargo.

- The 1980-1981 US and global recession was triggered by a spike in the price of oil following the Iranian revolution in 1979.

- The 1990-1991 US recession was partly caused by the spike in the price of oil following the Iraqi invasion of Kuwait in the summer of 1990.

- The 2001 US and global recession was partly caused by the sharp increase in the price of oil in 2000 following the California energy crisis and the tensions in the Middle East (the beginning of the second intifada). But other factors were more important: the bust of the internet bubble, the collapse of real investment and, in smaller measure, the Fed tightening between 1999 and 2000.

While all post-73 recessions have been associated with oil shocks, not all oil shocks lead to a recession. The most recent example is early 2003: the pre-Iraqi war spike in oil prices did not lead to a recession.

Today, there are two concerns: one, that the current high oil prices will exert a significant drag on the world, and the U.S. economy, and two, that, a political shock in the Middle East (violence in Iraq/ attacks on Iraq's petroleum infrastructure, concerns about terrorism in Saudi Arabia, the Israeli-Palestinian conflict) may lead to a reduction in oil supply, an additional surge in prices and another oil price triggered recession.

There are offsetting factors at play. On one hand, the effects of oil shocks on growth and inflation have become milder over time: in 1974-75 and in 1980-81, the growth effects were sharper and more persistent with a larger output drop than in 1990-91 and 2000-01.

The inflationary effects of the shock were also sharper with inflation in double digits in the two 1970s episodes. Conversely, both the 1990-91 and 2001 recessions were more shallow and less protracted (only 3 quarters) and the effects on inflation were very mild.

There are several reasons why the impact of oil shocks was larger in the 1970s:

1. The real price of oil rose to a higher level in the 1973 and 1979 shocks than in the 1990 and 2000 shocks. Real oil prices (in today's real dollars) peaked above $43 per barrel in 1974 and to $82 in 1980, relative to $30 in 1990 and to $32 in 2000. Even at close to $43 (on July 30), oil remains below it 1980 earlier peak when adjusted for inflation.
2. The speed of the change in price. By that standard the increases in 1973-74 and 1979-80 were larger (about 210% and 135%) than in 1990 and 2000 (40% and 60%). Also, in the two latter shocks, the shock occurred from very low initial real prices; for example, in 1997-98 real oil prices had fallen to about $15; thus, the subsequent sharp increase through 2000 was from a very low level. Recently, prices have increased by about 65% (relative to 2002 average prices) – a substantial, but by historical standards, more modest increase.

3. Early shocks were more persistent. It took about four/five years until the real price of oil fell back significantly. The 1990 and 2000 shocks were temporary (lasting about 3 quarters). The oil price shock in early 2003 was moderate in size. But the latest shock, starting in 2002 has been quite sharp and persistent so far (lasting about 9 quarters).

4. The United States' dependence on oil has fallen over time. Oil consumption as a share of GDP has fallen in the last 20 years (by about 50%) The 1973 and 1979 shocks hit an economy that was more dependent on oil than today in terms of consumption (though not, as we will discuss later, an economy that was more dependent on imported oil). The pace at which the United States economy's energy efficiency increased slowed after oil prices fell off their early 80s highs and the country's focus on energy conservation waned. Or perhaps more accurately, with low energy prices, continued improvements automobile efficiency were offset by a general trend towards larger, more powerful cars.

5. The major oil consuming countries generally lacked strategic petroleum stockpiles in the 1970s. Now, most consumers maintain significant buffers, though this has partially been offset by falls in private inventory.

6. The 1973 and 1979 shocks hit the economy while inflationary pressured were already on the rise; in 1971-73 commodity prices and inflation were already up before the oil shock; similarly in 1979 inflation was already rising before the oil shock. In 1990 and 2000 instead the shock hit the economy when inflation was low (4% in one case and 2% in the other).

7. The first two oil shocks led to an increase in inflation largely because of the monetary policy response: in 1974 and in 1979, the policy response was to think that the shock was temporary and to respond with monetary easing. This fed inflation expectations in periods when inflation was already up. Inflation only fell back to a lower permanent rate after Volcker engineered the famous and painful disinflation in 1981-82 (with a double dip recession in 1982 following the oil induced one in 1980.

8. An oil shock, even a permanent shock, should only result in a one off increase in overall price level; it leads to a persistent higher inflation rate if the policy response if wrong. When inflation expectations are low and the oil shock transitory as in 1990 and 2000, the Fed can afford to care more about growth and unemployment and ease monetary policy to stimulate growth without worrying too much about the inflationary effects of the shock and of its policy easing.

Other factors, which matter in understanding the macro effects of oil shock, have to do with the structure of the international oil market. Factors to consider include:

1. The large swings in the price of oil reflect the fact that, in the short run, oil demand is inelastic to price: Small changes in supply have large price effect. So, actual or expected reductions in supply in 1974, 1979, 1990, and 2000 have led to sharp increases in prices in the short run as demand was rigid.

2. Conversely, increases in demand driven by global economic recoveries, as in the recent 2003-2004 global recovery, can lead to sharp increases in prices. Oil supply is relatively inelastic in the short run, unless OPEC has substantial spare capacity that it brings on line to meet growing demand. Oil and commodity prices are cyclical: in an economic boom, such prices go up as world demand is rising rapidly more than supply; while in periods of recession, oil and commodity prices tend to sharply fall as demand falls while supply is rigid. Right now, oil prices are increasing more because of strong demand than any outright falls in supply, though expectations that OPEC will keep supplies relatively tight and concerns that the world lacks much remaining spare oil production capacity also matter.[4]

3. This combination of rigid supply and demand leads to booms and busts in the price of oil. Typically, initially a political shock in the Middle East leads to expected fall in supply that spikes the price of oil given the short run rigidity in demand. Then, if the price shock is large and persistent, the US and global economy enters into a recession. This recession triggers a fall in demand, which in face of rigid supply, leads to a sharp price drop. Oil and commodity prices increase again only after the economy recovers from such a recession. Thus, oil markets are often characterized by "hog price" style cycles.

[4] OPEC's Q1 2004 crude oil production of 27.9 mbd is up 2.9 mbd from 2002; supplies inside the OECD have fallen very slightly (0.2 mbd) and non OECD/ non-OPEC production is up by 1.9 mbd, largely because of higher production in Russia; demand over this period has increased by about 4.0 mbd (IEA. 2004)

4. The supply reaction depends in part on the production decisions of OPEC . Some OPEC decisions are triggered by political factors (such as the 1973 oil price tripling and oil embargo); but OPEC is also aware that an oil price spike that pushes the US and global economy into a recession would hurt them if it causes a collapse in oil prices. The major OPEC countries with large reserves also have an incentive for the oil-importers not to make major investments in energy efficiency that would reduce their long-run dependence on oil. OPEC generally has acted to regulate supply to avoid excessive and persistent spikes that may hurt them in the medium run, though right now, the absence of significant spare capacity inside OPEC constraints their ability to control prices.

5. Maintaining a successful cartel over time is difficult. High prices tend to encourage production outside the cartel, and to reduce demand. Each member of the cartel has an incentive to cheat. The leading member of the cartel may not be willing to cut its production and see its market share fall to offset the cheating of others. However, right now, the oil price is increasingly not set by the actions of all OPEC members, but rather by the actions of Saudi Arabia (and to a much lesser extent the UAE). Most other OPEC members are already producing all they can (and amounts well above their quota). Saudi Arabia is the only country with substantial spare production capacity.[5] That vastly simplifies the politics of a cartel.

6. Oil prices are set in US dollars. This helps the US, but the US dollar price of oil is not independent of the value of the US dollar relative to other currencies. When the US dollar weakens, the purchasing power of OPEC and other oil producers' dollar revenues in terms of other currencies is reduced and the producers tend to increase the dollar price of oil.

7. A supply shock that increases oil price often has an impact on the relative value of major currencies (US $, yen and euro). The currencies of countries that are more oil dependent tend to weaken. Japan and Europe were more dependent on oil imports than the US in the 70s and 80s, so oil price shocks led to a strengthening of the US $ and a weakening of the euro and yen. This resulted in a double-whammy for Europe and Japan when oil prices go up because of supply shocks, they lose twice: once because oil prices in dollars are higher; a second time, because their currency weakens relative to the US $. An example of this was in 2000 in Europe when the oil shock hit while the euro was weakening relative to the US $. This historical relationship, though, may be changing: the US has a large current account deficit that is worsened by an oil shock, and the US

[5] Saudi Arabia alone accounts for about ½ of OPEC unused "spare" capacity according to the IEA. That understates the Saudis influence: Saudi Arabia accounts for 65% of OPEC's spare capacity if Venezuela, Nigeria and Indonesia's theoretical spare capacity is left out (neither Indonesia nor Venezuela is producing their current quota level: Indonesia is currently a net oil importer, as demand has grown and Indonesia's mature fields are supplying less; Venezuela's productive capacity fell substantially during the political unrest of 2002. Nigeria's extra capacity is in the politically unstable Delta).The Saudis and the UAE together account for about 80% of OPEC's real spare capacity. April 2004 OPEC production was 1.93 mbd in excess of quota; most OPEC countries are currently producing just about as much as they can.

now imports more oil (on net) than Europe (the US imported 12.2 mbd in 2003; OECD Europe imported 8.9 mbd).

8. For the first time, a surging global economy outside the United States is largely driving the oil market. Demand is increasing right now in large part because of booming demand in Asia. China and other emerging Asia accounted for 17% of total world oil demand in 2003, but China and other emerging Asian economies are expected to account for 59% of the growth in demand for oil in 2004 (the U.S. accounts for 26% of overall demand, but only 16% of the expected increase in demand). China accounts for 7% of total world demand for oil, but its rapid growth means that it alone will account for nearly 40% of the expected increase in demand in 2004. China's net oil imports are expected to nearly double – rising by 80% -- between 2002 and 2004 (IEA data). From the point of view of the United States, a price increase triggered by rising Asian and Chinese demand is much like a price increase triggered by a fall in supply – the U.S. has to pay more for its oil imports, even though growing U.S. demand is not the core reason for higher prices.

9. The oil price has some elements of an asset price whose current price depends not only on current demand and supply conditions but also on expectations of future demand and supply. Thus, geopolitical tensions that create concerns about future oil production affect the current price of oil. Many analysts estimate that there is $4 to $8 "fear premium" in the current per barrel oil price. Such concerns also obviously have an impact on the futures market for oil.

In trying to predict the effects of the latest 2004 oil price shock on the macroeconomy, all the factors discussed above need to be taken into consideration:

1. Even with oil prices being above $40 per barrel, the real price of oil remains well below its price in previous oil shocks, and the percentage increase is less than in 1973-74 and 1979-80. On the other hand, a 65% plus percentage increase in oil since 2002 is still steep enough to have an impact.

2. Current oil dependence on oil imports (as measured by net imports as a share of GDP) is as high as in the 1970s. Net oil imports have increased from 0.9% of GDP in 1970 to 1.2% in 2003 as domestic production has fallen relative to domestic consumption, and the pace of improvements in energy efficiency has moderated. Net oil imports are more relevant than the economy's overall energy efficiency in assessing the growth effects of an oil shock. If net imports were zero, an oil price increase would not affect real GDP and would only redistribute income from domestic consumers to domestic producers of oil. Thus, the real GDP effect of an oil shock depends on the size of net imports. The magnitude of the negative effect on disposable income of the latest oil shock is similar to that of the 1990 and 2000 shocks, about 0.6% of disposable income (estimate from Goldman Sachs). This is about half the hit on disposable income of the 1973-74 and 1979-80 shocks.

3. Whether the current shock will be transitory or permanent is a harder question to answer. It depends on factors that are as much political as economic. It also depends on the pace of China's continued growth, and on the pace at which new supply can be brought on line to meet growing oil demand.

4. The inflationary effects of the shock will be moderated by the fact that the inflation rate is quite low compared to the 1970s cases. On the other hand, the monetary policy response is more tricky today than in 2000-2001. In early 2001 when the effects of the 2000 oil shocks were starting to kick in, inflation was low and falling (and there were concerns about deflation) and the dollar was strong . The Fed could afford not worry about inflation and worry instead only about growth and unemployment, reducing the Fed Funds rate from 6.5% to 1% in spite of oil prices going up

5. Today, the economy is recovering (even if the recovery is in many ways fragile), labor markets, while still very slack are improving, the dollar has weakened over the last year, imported inflation is up (both commodity prices and import prices) and the inflation rate is increasing together with inflation expectations. Thus, the Fed cannot afford to ease further. If anything, some argue that the Fed is already behind the curve in terms having caused a dangerous bubble in asset markets and having moved too slow to stem higher inflation expectations and actual inflation rates.

6. The increase in oil prices reflects strong demand growth, particularly in Asia, more than any outright falls in supply (though the Saudis could have done more to increase their output at the margins, as they are now signaling they will do this summer). However, for the U.S., higher oil prices stemming from an Asian boom act much like higher oil prices from a reduced supply.

7. Private sector estimates generally suggest that a persistent 10% increase in the price of oil – say from an average $30 to $35 - would reduce the US and G7 growth rate by about 0.3%-0.4% within a year. Some (Goldman Sachs) are more pessimistic, and calculate that if oil prices were to increase further to levels closer to $45, the reduction in the G7 growth rate may be closer to 1% of GDP. Thus, private estimates of the negative effects of an oil shock currently range between 0.3% to 1% of US and G7 GDP growth. This means that the US economy, which was growing at about a 4.3% average rate in Q4:2003 and Q1:2004) may see a slowdown of its growth to a level between 4.0% and 3.3%. Indeed, the first estimate for Q2:2004 U.S. GDP growth was 3.0%, a slowdown driven in part by the effect of high oil prices in the first half of 2004 on real consumer demand.

However, there are reasons to believe that economists may be underestimating the likely growth effects of the latest oil shock. Indeed, both in 1990 and 2000, most economists argued that the oil shock would not lead to a recession and yet a recession did occur, as

higher oil combined with falling equity prices and a change in business and consumer confidence. The reasons for concern are as follows:

- First, "animal spirits" (effects on consumer and business confidence) matter when one considers the effects of oil prices. In 1990, some called the recession the "CNN recession" as consumers worried about the war and the oil price shock stayed at home watching news on the Gulf situation and the war rather than going out and spending their income on consumption. Consumer spending has been driving the American economy; high oil might lead the American consumer to pull back. Indeed, recent data suggest that this is exactly what happened in the second quarter. Also, uncertainty about the future price of oil could impact business confidence and real investment (as it did in the first quarter of 2003 right before the Iraqi war).

- Second, households are highly leveraged with high debt burdens (and rising debt service burdens once interest rates start to rise); given low household savings, they cannot react to the shock to their real income from higher oil prices by further reducing savings to keep real consumption on other goods constant. Higher gas prices may mean less spending on other goods.

- Third, this oil shock is occurring in a period when strong global growth is combined with higher than usual global uncertainty: the risks of a sharp slowdown of China after its overheating; large and unsustainable twin budget and current account deficits; a U.S. government and economy that now depends on massive, sustained foreign purchases of U.S. Treasuries; the expected Fed tightening that is already leading to a sharp fall in bond markets; the fragility of many emerging market economies; the recent fall in global stock prices; the beginning of the unraveling of the massive highly leveraged carry-trades and chase for yield driven by easy global liquidity conditions. There is a risk – hard to quantify – that the unwinding of some excessive risk taking triggered by low U.S. rates could trigger some sort of systemic crisis.

- Fourth, if inflation in the US picks up faster than expected, earlier and stronger tightening by the Fed may slow down growth more than currently expected by the markets.

- Fifth, tight supplies may keep prices high for some time, and make the world intrinsically vulnerable to any further interruption in supply. Even if Saudi Arabia is able to convince OPEC to formally increase OPEC's production target (as it is trying to do), most producers are already producing at or near capacity.[6] Market power is shifting towards the

[6] A formal increase in OPEC's quota would "ratify" current levels of production; as more OPEC members are producing more than their quota. Those producers who are producing as much as they can have no

relatively small set of producers -- the Saudis, and to a much lesser extent, the UAE -- with remaining spare production capacity. The 1973 OPEC embargo triggered a major increase in prices because supplies were already tight. An exogenous political shock -- whether from events in Iraq, political tensions in Saudi Arabia or the Middle East, or a terrorist attack -- in an already tight market could lead additional to concerns about future oil supply, and even higher prices. And, as recent events demonstrate, the stability of the oil market also depends on the stability of Russia's production: Russia has joined Saudi Arabia among oil exporting heavy weights.

- Sixth, markets are concerned about the size and pace of the Chinese slowdown following a period of unsustainable overheating. While a slowdown in China would reduce demand driven pressures on oil and likely would lead to lower prices barring any changes in supply, it also would remove one of the two main engines of world growth.

Thus, the risk that a persistent increase in oil prices may lead to a stronger slowdown of the US and other G7 economies than currently predicted cannot be ruled out. Already some economists (Goldman Sachs) suggest that the oil shock, together with the other elements of fragility in the economy may slow down the growth rate of US GDP to around 3% by early 2005, a sharp slowdown compared to the 4.3% average of Q4:2003 and Q1:2004. Nor can the risk of an even sharper growth slowdown be ruled out if the oil shock becomes even larger and more persistent. Indeed, the first estimate of U.S. GDP growth for Q2:2004 showed a slowdown of the economy to 3% growth down from the 4.1% average of the previous two quarters, with the slowdown due in part to the effect of high oil prices on real consumption. Looking ahead, persistence of oil prices at recent high levels of $43-44 per barrel (or even higher prices) could further slow down the U.S. economy below a 3% growth rate.

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incentive to see OPEC increase its overall production: they would not gain from any increase in their production, but would see their revenues fall if the oil price fell. Producers with spare capacity, like the Saudis, would gain from more production even if they got slightly less on their existing production. Plus, the Saudis have a far stronger incentive than countries with smaller reserves not to price "oil" out of the market, and engender a shift in the world's capital stock away from oil.