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Research Note

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Oil: What price can America afford?

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With the 'green shoots' of recovery more numerous by the day, dark warnings of a new spike in oil prices are also multiplying. Saudi Oil Minister, al-Naimi, has warned that under-investment in oil capacity may lead to a return to $150/barrel oil, "or even worse". The Paris-based IEA has also warned of price shocks due to resurgent demand and restricted investment. Will a high price environment truly emerge, or are price spikes followed by brutal recessions more likely, as experienced in the last year? And what is more important, the absolute price of oil or the rapidity of the price increases? A tour through the historical record may provide some insight.

The burden of oil consumption

In the last 37 years, the US has suffered six recessions. From the beginning, oil played a central role. As the period opened in 1972, Saudi Arabia was selling oil for about $2.50 per barrel – or about $13.50 in today's prices. Oil had seen a decade of unprecedented growth. The US and Western Europe were finishing the process of motorization of their societies, and demand had soared from just over 20 million barrels per day (mbpd) in 1960, to more than 50 mbpd by 1972. At the same time, US oil production had peaked in 1970 and had begun to decline. The time was ripe for a shift of power to the up-and-coming OPEC producers, and it was not long in coming.

The fourth Arab-Israeli war broke out in October 1973, and the Arab Oil Embargo was imposed that same month. By November, the price of oil had doubled, and the US had plummeted into recession. Oil would double yet again within another two months, and by mid 1974 was trading at $15 / barrel, about $55 in today's prices, pushing the US deeper into the downturn. The US did eventually emerge from the recession, but the price of oil did not decline and remained in the $13-15 range until 1979. In the interim, the economy struggled with stagflation, a combination of high inflation and low growth, and the oil price was a primary cause. The US economy has tended to grow well when oil consumption expenditures were less than 2% of GDP. In the early 1970s, for example, oil ranged from 1% to 2% of GDP. By contrast, from 1973 through 1978, oil consumption's share of the economy peaked as high as 6.3%, never fell below 4%, and averaged 5.3% of GDP. In other words, oil expenditures represented a drag of about 3% of the economy throughout the period. Many Americans remember the era as a depressing time, not only of economic difficulty, but also of political uncertainty as the country grappled with its military loss in Vietnam and the rise of communist regimes across the globe. The tide of history looked to be running against the United States. And it would get worse.

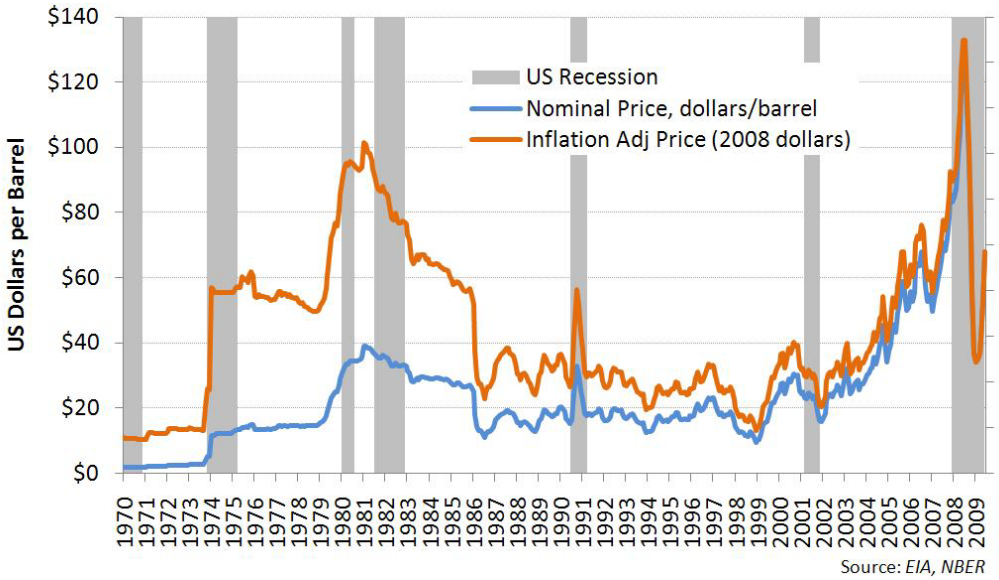

Figure 1: Nominal and inflation-adjusted crude oil prices 1970-2009

In January 1979, the Iranian Revolution broke out, and oil markets were savaged for the second time in a decade. Within a year, oil prices had doubled yet again to $30 ($90 in 2008 dollars), and the US was once again in recession. Oil consumption leapt from 5% of GDP to 8% and on to 9% (peaking at over $100/barrel in today's dollars), in what would mark a recession that, for all purposes, would last the three years from 1980 to 1983.

The Federal Reserve Bank in the 1970s, under its Chairman Arthur Burns, had sought to counteract higher oil prices with an accommodative monetary policy in the hopes of maintaining 'full employment'. This would prove unsuccessful, and inflation soared to 12% under his term, creating the malaise of stagflation. In 1979, Burns was succeeded by the Paul Volcker, who brought monetary discipline to restore the foundations of the economy. Volcker raised interest rates and began to grind inflation out of the economy. Without the cushion of inflation, the full effects of oil prices hit the consumer, and oil consumption was slowly crushed out of the economy. From 1978 to 1983, US oil consumption declined from 18.9 mbpd to 15.2 mbpd, a decline of 20%. Demand would not recover for nearly two decades. Indeed, the effects of OPEC's pricing policy were felt globally. World demand peaked in 1979 and did not return to this level for a decade. For its part, Europe would never see its 1979 peak again.

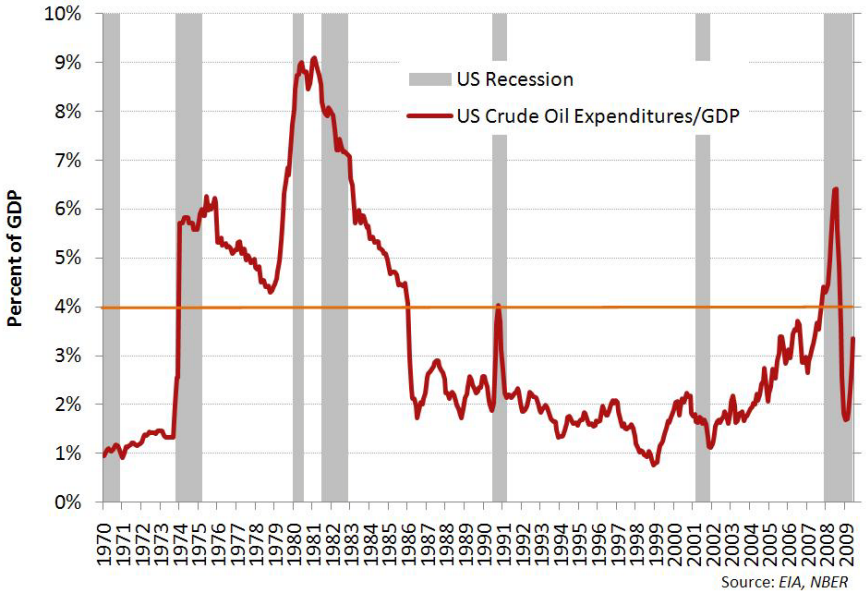

Figure 2: US Crude oil consumption as a percent of GDP 1970 – 2009

However, the policies of Volcker and other central bankers would have their effect, and by 1983, oil consumption as a share of the economy had fallen dramatically. By 1986, it would fall sufficiently to break the will of OPEC and Saudi Arabia would abandon its role as swing producer, never to return. The price of oil fell and US oil consumption fell back to 2% of GDP. The Great Moderation had begun. Equities began their long bull run, inflation would remain tame, and the developed economies would begin a long period of prosperity.

But not without a few bumps in the road. In 1990, Iraqi strongman Saddam Hussein invaded Kuwait, prompting a military response from the US and a brief recession. Oil prices spiked only for a few months, but even this was enough to down the US economy, and the US suffered a shallow downturn which would bring Bill Clinton to the White House ("It's the economy, stupid.").

The US would also suffer one more recession before the current one, the bursting of the technology bubble in 2001. This recession is generally not linked to the price of oil, but even here, as we will see below, oil may have played a role.

In every case when oil consumption breeched 4% of GDP, the US has suffered a recession, and indeed, the current US recession began within two months of oil hitting the 4% threshold, that is, when oil reached $80 / barrel.

Oil price volatility

Are oil price levels the critical factor, or do rapid prices increases – price volatility – also matter? As it turns out, recessions also correlate well with sustained oil price increases. Whenever oil prices have increased by more than 50% year-on-year (trailing 12 month average divided by the previous 12 month average), a recession has followed shortly. Curiously, oil prices doubled in the year preceding the technology-led recession of 2001, a recession not ordinarily associated with an oil prices shock, and a recession in which oil consumption did not reach 4% of GDP, suggesting oil may have be implicated here as well. On the other hand, the 1991 recession associated with the first Gulf War did not result in a sustained price increase. But prices did, in fact, double for a period of about four months – not enough to cause a 50% annual increase, but enough to cause a recession. While the case for volatility remains somewhat circumstantial, in general, a sustained rise in the oil price of 50% or more has always been associated with recession, and this applies to the current recession as well.

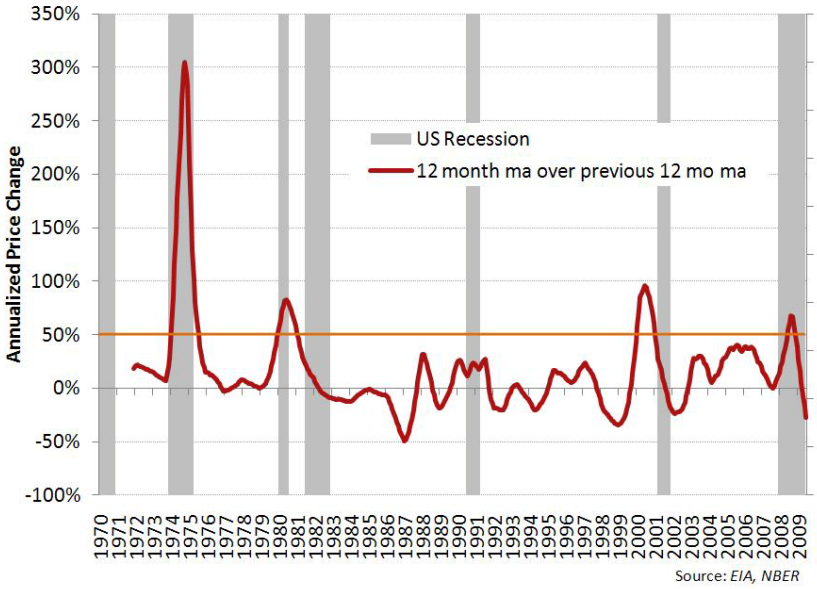

Figure 3: Annualized Change in Crude Oil Prices 1971-2009
(12 Month Moving Average over Previous 12 Month Moving Average)

The 'shed rate'

When OPEC raised oil prices in 1973/74, and again in 1979, the cartel was operating under the belief that oil was a valuable commodity that deserved a higher price. And indeed, early prices increases did take hold. However, OPEC assumed that consuming nations would not react to higher prices at any level. This proved untrue. As the graph below shows, after the first oil shock, the US economy shed oil consumption over a three year period starting in 1975, reducing oil's share from 6% to 4% of GDP. After the 1979 oil crisis, the economy shed 5% of oil consumption in GDP over a six year period. High oil prices will draw a response, and in the case of the US, oil consumption as a share of GDP will tend to be compressed to below 4% of GDP, and perhaps lower, exhibiting mean reversion characteristics.

The maximum rate of adjustment for the economy appears to be about 0.8% of GDP per year. That is, the economy cannot shed oil consumption instantaneously; society needs time to adjust. When the economy is adjusting at full speed, it will tend to struggle. Adjustment will tend to be characterized by recession, inflation, or generally low GDP growth. For example, the period of adjustment from 1974 to 1979 was characterized by stagflation.

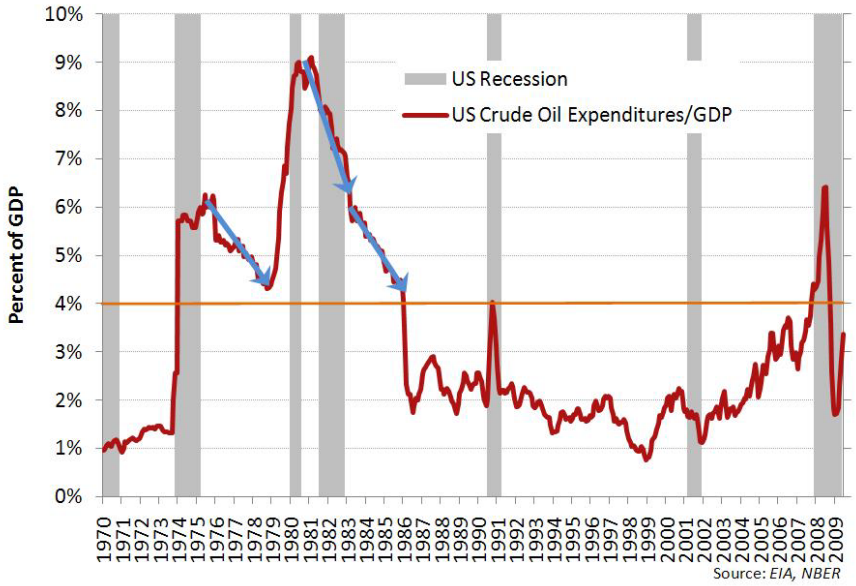

Figure 4: US Crude Oil Consumption as a Percent of GDP 1970 – 2009

Three rules for policy

History then provides us three rules by which to avoid recession caused by oil prices, notably:

- Crude oil expenditures should not exceed 4% of GDP
- Oil prices should not increase by more than 50% year-on-year
- Oil price increases should not be so great that a potential demand adjustment should have to reach 0.8% of GDP on an annual basis, as shedding demand at this rate has generally been associated with recession.

The policy context

We can apply these rules to three alternative approaches to oil and climate policy, notably to:

- Prioritize climate policy with economic impacts secondary
- Prioritize climate policy while taking a cautious approach to the economy, or
- Prioritize economic well-being, with climate policy secondary.

Let us take them in turn:

A climate focus

If indeed climate change represents 'mankind's greatest challenge', then economic dislocation associated with CO_2 reduction may be considered a necessary cost of achieving the goal. Indeed some articles have commented on the beneficial effects of the recession in prompting Europe's declining carbon emissions in the last year. The US is no less commendable. Oil demand in the US has dropped 10% from its peak in November 2007. From a purely climate-centric perspective, this may be considered a success. Nevertheless, while de-constructing the economy will achieve climate goals, as a practical matter, few would endorse such a policy.

A balanced focus

If then we allow that the economy matters, then a more balanced approach would seek set climate policy to reduce US oil consumption at rates below those which would normally be thought to induce recession. This would involve a tax at an effective rate lower than the maximum 'shed rate' of 0.8% of GDP which has consistently been associated with recession. For safety, one might wish to target a rate of perhaps half the maximum, say, 0.4% of GDP per annum, which would equal about $8 / barrel per year, or equate to approximately 20 cents per gallon at the pump (based on crude barrels). At this price, the economy would have ongoing pressure to adjust to higher oil prices, but the rate of change would be set to avoid unmanageable and excessively rapid price increases.

An annual increase of $8 / barrel would represent less than a 50% price increase from current levels and therefore should not create a level of volatility which would cause a downturn. However, this approach would not take into consideration levels of spending, that is, under such a program, oil consumption as a percentage of GDP could exceed the 4% threshold which has generally been associated with recession. As such, this policy would prioritize climate change over the economy, but would seek to apply sustained pressure without pushing the economy into the abyss of recession and would allow fine tuning of policy moving forward.

An economy focus

A third approach would take as its primary focus the economic health of the economy. Energy price volatility is the key consideration in this approach. In the last year, oil prices have varied not by 20 cents a gallon, but by ten times that amount, $2 per gallon, since last July. Since just December, gasoline prices have increased by four times the rate which might represent a prudent carbon tax.

In short, the impact of inherent price volatility is likely to dwarf the magnitude of any carbon tax which a prudent policy maker might apply. For example, the recent collapse in oil consumption and dramatic reduction in US carbon emissions is unrelated to any carbon tax. Instead, it reflects oil price volatility and its impact on the US economy. Therefore, the greater issue – and the more profound driver of oil consumption – is oil price volatility, and this matters perhaps an order of magnitude more than a prudent carbon tax in whatever form.

A policy prioritizing the economy would be geared to minimizing volatility in oil prices and achieving steady oil price growth instead of the boom-bust cycle of the last two years. As a function of its primary objective, such a policy would explicitly consider the impact of any carbon tax in the context of both price volatility and overall cost burden. For example, historical statistics indicate that a 50 cent per gallon tax on $1.60 / gallon pump price would be relatively benign. Such a tax at $4.00 / gallon would be expected to prompt a six month recession. Therefore, a suitable carbon policy would reflect a ‘flex tax’ approach in which the tax would decrease as oil prices increase.

Moreover, such a policy would seek to sustain oil consumption during periods of high prices and promote oil production during periods of low prices in order to preclude recession. Climate policy would be explicitly subordinate to sustained economic stability, if not growth. This policy would not be anti-climate per se; however, it would seek to channel the transition from dependence on oil through a relatively controlled and gradual process, rather than through a series of spike-and-crash recessions, and the explicit emphasis would be on sustainable economic activity rather than on the climate.

Managing what matters

In the end, the administration has to decide whether climate change is the most important matter at hand, in which case any energy-induced recession is worth the price; or whether the health of the economy is of paramount importance, and any climate policy must be subordinate to that.

If the health of the economy matters, then the administration should take note that oil, at the time of writing, stands around $70, and that the recession threshold, by the books, is $80. Oil prices do not have to rally very much to reach unsustainable levels for the US economy.

In the longer term, the administration would do well to heed the forecasts and concerns of wide range of a mainstream analysts. Take for example, an oil forecast from an April report from the Commodities Research group at Macquarie, a leading natural resources investment bank:

“When looking out into 2011-12 and beyond, we see global spare capacity reduced to zero by 2013. Prices will again need to rise to accelerate upstream spending. We do not think, however, that production can be ratcheted higher fast enough. Oil prices could then rally to reflect scarcity, just like they did in 2Q of last year.”

Should oil return to $150/barrel, as Saudi Oil Minister, al-Naimi, has warned or as Macquarie implies above, the statistics are not ambiguous. Expect a recession, and a severe one at that.

ENDS

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