



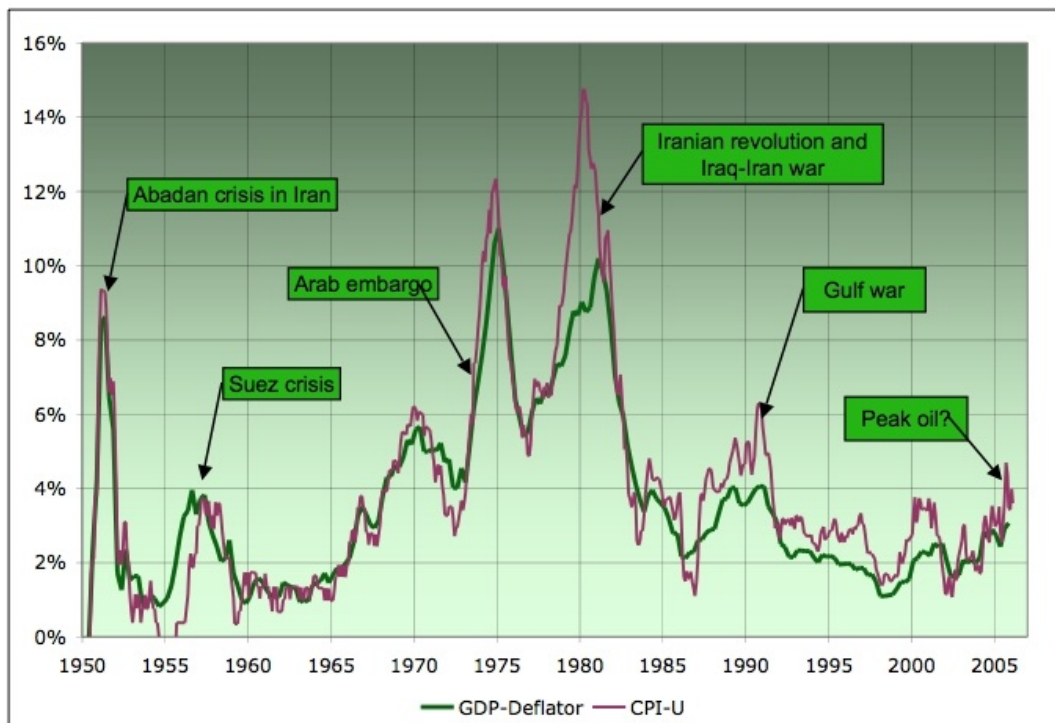
Peak Oil: The inflationary case

Posted by [Stuart Staniford](#) on April 12, 2006 - 4:51am

Topic: [Economics/Finance](#)

Tags: [deflation](#), [inflation](#), [peak oil](#) [[list all tags](#)]

I'm very interested in the whole "inflation versus deflation" peak-oil argument. I started thinking it was clear that peak oil would be inflationary, but I'm getting less sure. I don't understand the deflationist case in enough quantitative detail yet to really assess it, but I'm working on it. Let's start with the case that the post-peak oil era is likely to be inflationary, which can be summarized fairly simply:



US inflation rate (calculated two ways) since 1950 with various oil shocks labeled. The green line is inflation calculated from the quarterly GDP deflator numbers (percentage change from four quarters earlier). Source: [Bureau of Economic Affairs](#). The purple line is calculated from the monthly CPI-U index (percentage change from 12 months earlier). Source: [Bureau of Labor Statistics](#).

Several conclusions can be drawn from this. Firstly, it seems pretty evident that in the past, oil shocks have tended to cause spikes in the inflation rate. The labels mark the dates of:

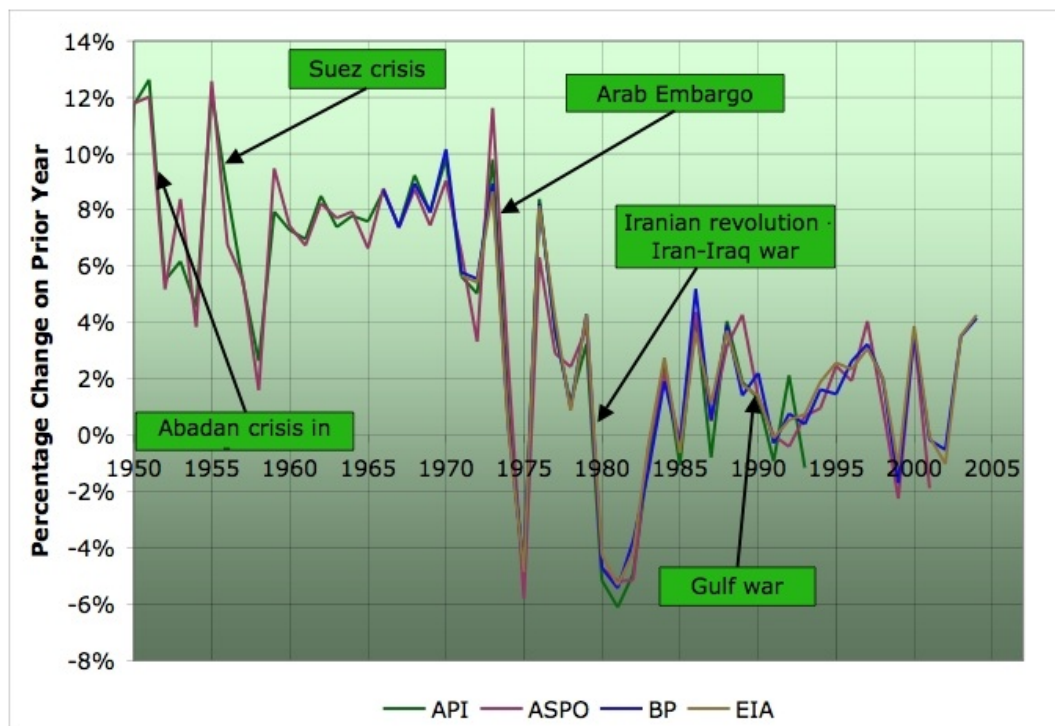
- The [Abadan Crisis](#) when [Mohammed Mossadegh](#) nationalized the Anglo-Iranian oil company, which provoked the British to embargo Iranian oil. This ended with the US-British backed coup that deposed Mossadegh.
- The [Suez Crisis](#) in which Egypt nationalized the Suez canal, the major supply route for oil to

Europe, provoking an alliance of France, Israel, and Britain to militarily seize the canal, before being obliged to withdraw under threats from the Soviet Union and the US. The canal was then placed under control of the first United Nations peacekeeping operation.

- The [Arab Oil Embargo](#)
- The [Iranian revolution](#), and closely following [Iran-Iraq war](#),
- The [1991 Gulf War](#) following the Iraqi invasion of Kuwait in August 1990.

Clearly, every oil crisis of significance in the last 55 years has provoked a burst of inflation. Of course, it's also clear from the graph that oil shocks are not the only thing that provoke or limit inflation, but it's hard to deny that they have a pretty significant effect on it. But, certainly this would suggest that one might well think that the post-peak period would also be inflationary. It will presumably be like one long slow oil shock punctuated by a number of short sharp oil shocks.

Many economists would argue that the absence of big inflation peaks since the early 1980s means that inflation expectations have been conquered, and that things are fundamentally different now. I don't altogether dismiss this, but at minimum it hasn't been tested by any good-size shocks. The only oil shock since the early 1980s was that associated with the Iraqi invasion of Kuwait and the first Gulf war. As the following graph shows, as an oil shock, that was nowhere near the monsters of old (if we measure the magnitude of an oil shock by the change in the growth rate of annual global oil production that it produces).



Percentage change in average annual oil production from one year to the next according to various estimates. Click to enlarge. Believed to be all liquids, except API line is crude only. EIA line includes refinery gains, others do not. Sources: [ASPO](#), [BP](#), and [EIA](#).

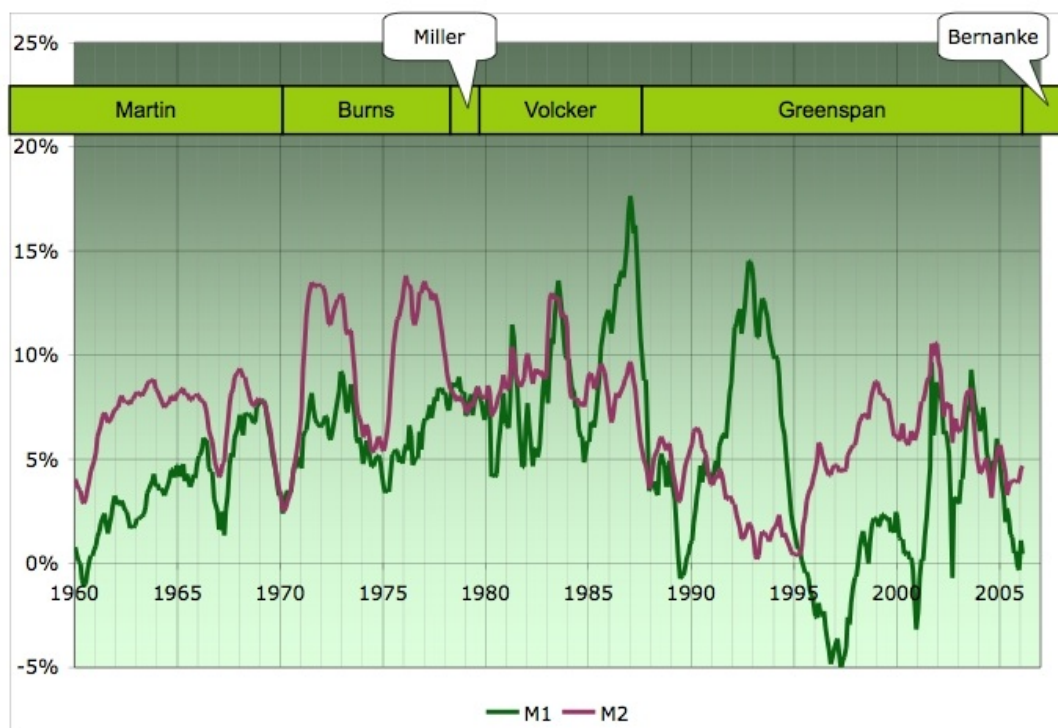
I suspect that if we had had any really big shocks, we'd have had a lot more inflation. Even the events of 2005, when the growth rate in global oil production certainly slowed sharply, are not close to those of the 1950s or 1970s. And indeed, so far we've had only a modest uptick in the inflation rate.

In passing, I would just like to note that the difference between the two inflation lines in the graph

suggests that that inflation is a somewhat imprecise quantity - different agencies can come up with numbers that are only roughly similar by using different definitions. There are considerable difficulties in principle in measuring inflation associated with the fact that dollars in one era are not really commensurable with dollars in another era, since they represent the right to buy a slice of qualitatively different mixes of goods and services. The various agencies have methods of interpolating, but there's something fundamentally subjective about deciding how much a new 1950 car is worth compared to a new 2006 car. Thus I think the inflation rate should be viewed as having an error of a percentage point or two, which means that long-term comparisons of prices are very approximate. This is because those uncertainties compound over time. For example, saying that oil is still cheaper than in 1981 is probably a fairly meaningless statement, as the difference in price is likely smaller than the uncertainties in the compounded inflation from that time to this.

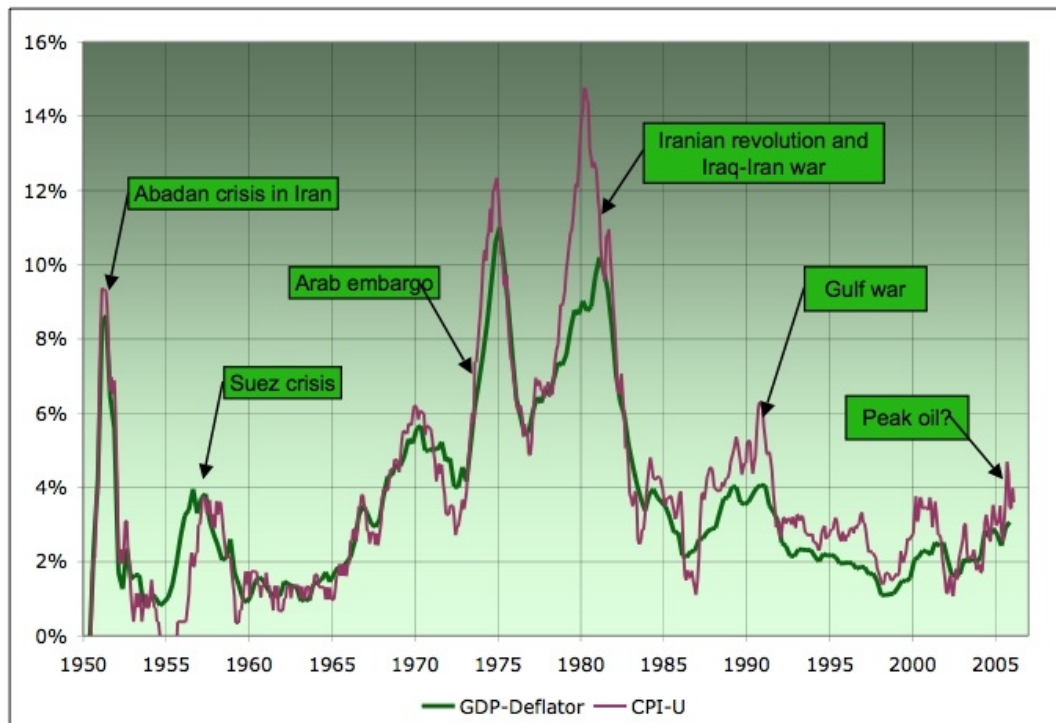
Economists [are fond of arguing](#) that inflation is mainly a function of central bank policy - easy or tight money controls whether there's inflation or not. While I think there's been something to this over the long haul in the distant past, and certainly in cases of hyperinflation, it doesn't seem to have been as important as oil shocks in US inflation in recent decades.

Here's the growth rates in the two most common measures of money supply: M1 (notes, coins, and checking account balances) and M2 (M1 plus savings account balances and small bank CDs). M1 is directly controlled by the Fed via open market operations. M2 is not (since reserve requirements on savings accounts and CDs are zero).



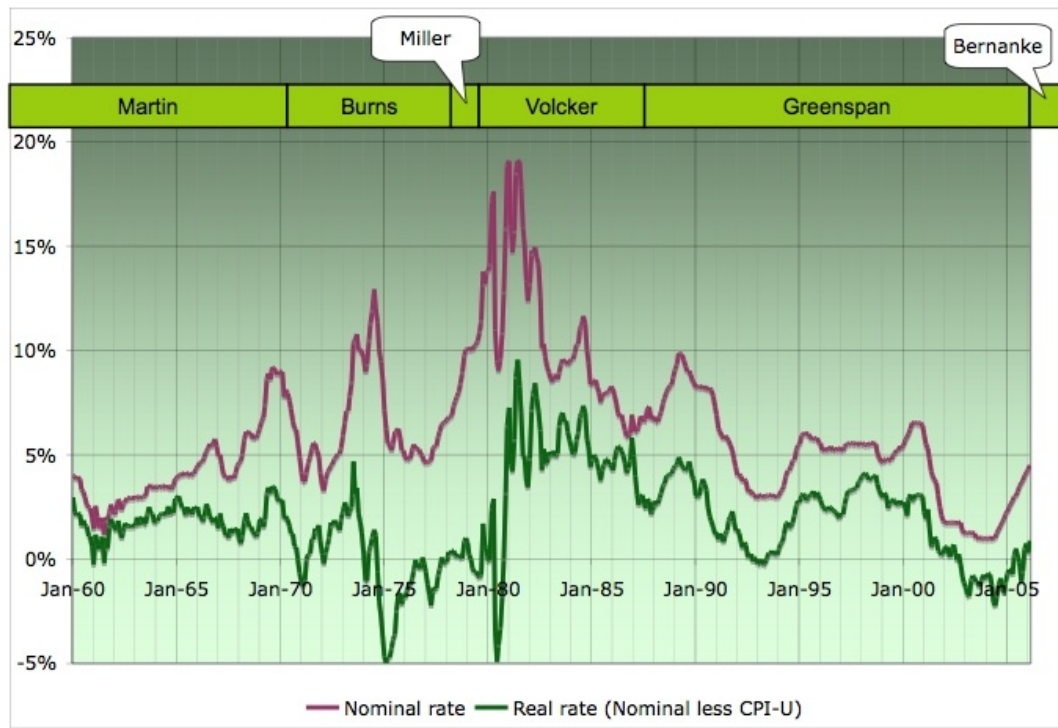
Money supply growth. Percentage growth from same month in prior year. Eras of different Fed Chairs labeled above. Source: [Federal Reserve Bank](#).

Again here's the inflation picture for comparison. I don't see any close correlation. The oil shocks look far more explanatory of the details of the inflation graph. There is an upward bulge in the money supply centered in the 1970s, but it's not clear which way the causation runs - when inflation is high, the money supply needs to be increased just to keep the amount of money available constant relative to price levels.



US inflation rate (calculated two ways) since 1950 with various oil shocks labeled. The green line is inflation calculated from the quarterly GDP deflator numbers (percentage change from four quarters earlier). Source: [Bureau of Economic Affairs](#). The purple line is calculated from the monthly CPI-U index (percentage change from 12 months earlier). Source: [Bureau of Labor Statistics](#).

Then here's interest rates. Obviously, interest rates have a broader effect on the economy than their direct effects on money supply: they control the desirability of lending and borrowing in all kinds of credit. When I look at this next graph, I see a relationship between inflation and interest rates, but the interest rate peaks **lag** the oil shocks, and then interest rates and inflation go up together. What it looks like is the oil shock causes inflation, and then the fed raises interest rates to rein it in again. (Caution: the interest rate graph only goes back to 1960, but the inflation data goes back to 1950)



Effective federal funds rate (source: [St Louis Fed](#)), together with real interest rate computed by subtracting CPI-U inflation. Eras of different Fed Chairs labeled above.

It's also striking how low real interest rates are still. No wonder Americans are borrowing like crazy.

So what would a deflationist peak oil story look like? Well, here's an outline story about it. I'm not close to evaluating this quantitatively yet, so take it for what it's worth - it could easily be wrong in important respects.

The idea is that deflation occurs because of major failures in the banking system causing a contraction of the supply of credit to the economy. In the US great depression, lots of banks actually went under, causing a fairly short sharp deflation. In Japan in the 1990s, the government propped the banks up, meaning they were just stuck with large volumes of bad loans and couldn't do much new lending. This led to a long slow deflation.

In the US, after the great depression, bank regulation was greatly tightened up, FDIC was set up etc. We haven't had deflation since. However, what has happened in the last twenty years is that we've started securitizing mortgages and selling the risk on the credit derivative markets. A lot of it has been bought by a completely new and unregulated animal: hedge funds. This has led to decent volumes of fairly risky mortgage lending that would not have been countenanced decades ago.

Suppose peak oil is initially inflationary as above. In consequence, the Fed has to raise interest rates a lot more than the markets are counting on to counter the resulting inflation. Since around 40% of recent mortgages are ARMs, this causes massive strain on household finances in those houses, and leads to a much higher level of defaults than markets had been counting on.

Since hedge funds are new, have been growing like topsy, and are unregulated, there's probably a good deal of craziness happening (it always goes down like this: think joint stock companies in the seventeenth century, junk bonds in the 1980s, dot-coms, Enron, etc in the 1990s). The hedge

fund boom is probably likely to end in tears at some point, just out of the general nature of financial humanity.

So then if we start to get major failures in hedge-fund land, either the Fed has to step in and prop them up, or it lets them fail. Either way, there's likely to be a sharp contraction in mortgage (and probably other) lending - much worse than the ending of the housing bubble by itself would have occasioned. That is strongly deflationary.

So that's kind of the story - an initial burst of inflation and high interest rates pokes a big hole in the credit markets, which then contract enough to more than offset the inflationary pressure.

Could this happen? I don't really know, but I'm sure you'll have opinions. The floor is yours.



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