

Peak Oil and the Long Term Asset Allocation Implications

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Dick Vodra is a financial planner with Spire Investment Partners in McLean, VA. He is one of the industry's leading experts on the topic of Peak Oil and its implications for financial planning and investment management. He wrote his first [article](#) on the topic in 2005, and more recently presented his views at the FPA National Retreat in 2007.

We spoke with Mr. Vodra on June 6, 2008.

Peak Oil is a concept originally developed in 1955 by the geologist M. King Hubbert. Hubbert studied US oil well production and found that maximum production occurred approximately 40 years after discovery. By obtaining data on all US production, he predicted, in 1955, that US oil production would peak in 1970, and his forecast was correct within a few years. The concept became known as Hubbert's Peak, and is now studied on a world-wide basis. Peak Oil represents the point at which the world's production rate for oil cannot be increased. Vodra's article, cited above, provides an excellent overview of the topic.

At the end of this article are graphs showing the current projections from ASPO, the Association for the Study of Peak Oil.

Has there been any significant new information on Peak Oil in the last three years?

The basic story is still valid, and probably more so. Three quarters of the people who focus on Peak Oil are from the petroleum engineering crowd, and the other quarter are those with left wing or anti-capitalist views. Peak Oil and its sister problem, climate change, are real problems. Many find it exceedingly inconvenient (to steal Al Gore's phrase) to deal with these problems, because the way we want the world to work is not the way it works. We are accustomed to free markets and having access to a vast and inexpensive supply of raw materials. We assume that these materials, like oil, water, gold, and other commodities, will always be available in greater supply with better extraction technology. Conventional economics is based on the assumption that our world will work this way



forever. It won't, but most people would rather die than change their minds. The world has a limited supply of most natural resources, and we are starting to run up against those limits now, making it hard to increase or even continue current production levels.

On climate side, all the news is coming in worse than we projected: water temperatures, jet stream changes, ice cap shrinkage, greenhouse gas levels, and so much more. James Hansen, from NASA, says we may already be at the tipping point where feedback effects will overwhelm any attempts we make to address the climate problem.

On the energy side, we have tripled the price of oil, and it hasn't mattered in terms of conservation and overall demand, especially at the global level. We will continue to find oil, but it will not be enough to satisfy world demand and offset the depletion in existing oil and gas fields.

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The data continues to support the hypothesis that the date for Peak Oil production is between

2006 and 2012. However, there are still some, including the US government, who say Peak Oil is 15, 20, or more years away. [Ed. Note: *Noted Goldman Sachs oil analyst Arjun Murti said in a recent [interview](#) "...we don't subscribe to the peak oil view."*]

Climate control is the "rock star" when it comes to planetary crises. Peak Oil is taking a back seat, even though its impact will be felt first.

In the last three years, one major change has been an awareness that the increase in demand for oil from the Middle East is now greater than from China. Therefore, the amount of oil available for international trade is getting smaller.

You said in your article that we could be close to Peak Oil in 2005. Are we there yet? (In your article you predicted that we would be there by the end of 2006, and would know this only in retrospect.)

There are actually several definitions for Peak Oil. Gross production is the figure most often addressed. However, as the effort it takes to extract oil increases (as from wells in the deep ocean), the net production is less than the gross. Further, as oil producing nations increase their consumption, the amount in international trade falls quickly. For example,



the UK exported one million barrels of oil per day as recently as 1999. Five years later, the UK was a net importer. Everyone's numbers are basically flat for gross production, but exports seem to be declining. By whichever definition you use, we are probably at or close to peak now.

There is some discussion over how to factor biofuels into the Peak Oil equation, because it requires oil to produce them. But even allowing for biofuels, I am confident we have reached Peak Oil on a worldwide basis, or will in a matter of months.

Do you see much hope for political solutions to our energy problems?

Unfortunately, it has been very difficult to create meaningful action politically. The Republicans today killed a climate bill [which would have created a US market for trading carbon emissions caps] because they believed it was too expensive. It baffles me that nobody in power takes either Peak Oil or climate change seriously, whether in the US or abroad. Another example of where politicians have failed us is with improving the energy efficiency of buildings. Building standards have a much greater impact on energy consumption than CAFÉ standards [for automobile fuel emissions]. But, because modifying building standards threatens many jobs in the short term, no significant legislative action has been passed.

The countries in the Middle East will take care of themselves first. The US is used to having 75% of the world's oil, but China and India have other ideas. Our share is declining. The military, farmers, and the airlines all take their share. The gasoline that remains for unrestricted consumer use will take a huge hit, in US and in other countries. This will be amplified beyond gross production levels. The sooner we start to plan, the more we will be able to deal with the pain and dislocation ahead of us.

What is driving the cost of oil in today's market – is it speculation or supply and demand imbalances?

It is really supply and demand driving the oil markets, and we don't know where the equilibrium will be. Oil could hit \$150 a barrel next week, and it could be \$200 by Labor Day, or the price could drop by \$10 or \$20. I don't see the 50% price cut that some people talk about, though.

Price increases aren't working, because we can't reduce demand or increase supply enough in the short run to matter. Last year we

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thought \$120 oil would slam the brakes on the economy. It hasn't. I don't know what the price would have to be to produce a 10% drop in demand, which we may need pretty soon.

Price volatility will continue to accelerate. We saw this in the Bear Stearns saga, where the price went from \$65 to \$2 in a matter of days. As soon as you anticipate an event, the financial markets move fast, much faster than physical markets. We saw with food how fast things can change. What ought to take five or six years took six months.

We are just starting to see some of the impacts of higher energy costs. The price of shipping a container from China to the US has tripled in last two to three years. It is now cheaper to buy US made steel than steel from China. The patterns of global trade will change. There are responses, but will they be enough?

One of the major oil producers, Indonesia, just pulled out of OPEC, at least in part because their production was declining. Can you elaborate on this?

This could have happened years ago, because Indonesia stopped being a net exporter earlier in this decade. Countries are choosing sides, and aligning themselves at the first cut with either importers or exporters. If things become nasty, countries like Indonesia want China as their friend, not Saudi Arabia, Venezuela, Nigeria, and Iran.

Right now, and for a while, OPEC has not done much about oil price, and it's not clear that it can. We in the US are desperately trying to find someone responsible for this other than our behavior and the reality of supply and demand.

There is mounting political pressure to open Alaskan National Wildlife Reserve (ANWR) and other off-shore areas for oil exploration. In your article you cite long lead times before these sources could be brought into production. Do you believe that the public is misinformed about the potential benefit (or really lack of benefit) that these sources of oil offer?

Two aspects of this question are important to me. As a financial planner, I would be very concerned if a 50-year old client couple with a 401k came in and said they needed cash, and wanted to spend all their savings. We don't say "don't bother cutting back, just drain the 401k." We say change your consumption habits because you will need this money later. Tapping the ANWR is using up all our reserves as fast as possible rather than looking at the long term. If we drill now, our children will never have



access to this oil. Once you use it, it is gone. Why do we have this obsession to use oil as fast as we can?

We have a pretty good idea how much oil there is in the world, and we've used half of it. Using the ANWR is like taking a loan against your 401k. Don't do it as a first step, only drill there when every other way of conserving is in place.

Drilling to avoid a conservation program does not make sense.

Also, the amount of oil in the "off-limits" areas is not that large compared to US and world demand. ANWR serves as a useful myth that there's no real need to reconsider our usage of oil, while the reality is just the opposite.

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You offered four scenarios for the world post-Peak Oil: (1) it is an empty threat that will blow over; (2) we will undergo a challenging transition period; (3) there will be massive disruption, especially to transportation systems; and (4) there will be a collapse of civilization. Your forecast was in the middle range. Is this still your forecast?

My basic view is that we are on a sinking ship, but we're still afloat. In a literal sense, if the ship you are on is taking on water, you do whatever you can to keep things going, because someone or something may rescue you. If we do nothing, the outlook is bleak. The problems might be too big for us, but I'm not willing to give up the fight.

Given the global nature of this problem, in that it affects China, Europe, and everyone else, even the process of responding will require new ways of cooperation. If we are serious, and we undertake efforts at the scale of the Manhattan or Apollo projects, and do this along with the rest of the world, there is a good chance we can be effective in creating a sustainable world, though not one that consumes at the rate we've achieved in 2008.

The US is going to have to pay more than we want to clean this up, and that is the political hurdle. It is part of what happened today [with the failure to pass the carbon emissions cap legislation].

A technology problem is qualitatively different than an energy problem. We need both new ideas and the ability to implement them on a massive scale. Unfortunately, I see no evidence that our government (including



both candidates in this election) or the Chinese or anyone else is serious that this is a planetary emergency.

After Pearl Harbor, FDR called in the top auto executives to outline the need for tanks, trucks, planes, ships, and the supplies of war. The industry said it wasn't sure how much they could manufacture along with automobiles. FDR told them they had no choice. They were no longer in the auto business; they were now in the munitions and armament business. After victory, they could resume making cars. We need this level of decisive leadership.

We are not in the consumer comfort business any more. We are in the planet saving business. But nobody says this. We need a global plan, starting with the US and China, despite the differences these countries have.

What about the role of nuclear energy?

We basically have two systems that use energy: one for electricity and heat, and one for transportation. Our transportation system is oil-based. We don't have a transportation system that uses electricity. To create one would be a big effort, and we don't have the technology to deliver electricity on a large scale. All the nuclear power in the world won't make rush hours any easier.

I am not aware of any commercially built non-subsidized nuclear power plant. It takes fifteen years from the start of construction before a nuclear power plant breaks even as an energy producer, since they are so hard to build. Producing the cement to build a reactor is greenhouse gas intensive. There is a shortage of nuclear engineers, and uranium quality is degrading and becoming costlier to extract. Nuclear plants last only 40 years. Constructing a whole lot of nuclear power plants is not a short term solution. We need to do something with coal.

Nuclear power is worth looking at, but I am skeptical as to whether it is a major part of the solution.

There are political ideologies that love it and hate it, independent of the merits of the technology. The nuclear debate is not on the technical issues. It may be part of the longer-term solution, but it's not an area I have focused on.



Three years ago you made a very prescient forecast of a scenario where “the global asset bubble will collapse... followed by inflation...” What is your current forecast, specifically on a long term horizon? How should advisors adjust asset allocations to reflect a potentially new reality in the energy markets?

I expect the international oil markets and possibly the international commodity markets to start breaking down within the next 36 months such that we will no longer allocate many commodities solely by price. The imbalance between supply and demand will be so extreme that the markets will no longer be able to assign a fair price to the goods. There will not be an acceptable price at which US, China, and Europe will get what we want without destroying many poorer countries.

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Look at how much volatility we are having now in the oil markets, and we are still in a rough equilibrium. In five years, with declining production, we may have to cope with a 10 million barrel annual global gap between increasing demand and falling supply. I don't think price alone will work.

Ultimately, the solution may be for the importing nations to band together in a cartel-like structure to ration demand and decide a price they can pay, and then negotiate with the exporting nations. We cannot create an economic battle with China, Africa, Europe, Russia, the Middle East, and the rest of the world. Africa will lose in the first round.

There are doomsday scenarios that can evolve from this forecast. But I am optimistic. Most of the large scale disasters that have been predicted haven't happened. In 1954, nobody would have bet against the proposition that some nation would use a nuclear weapon in anger, yet we've avoided that disaster for more than a half century. Twenty years ago, what were the chances the Soviet Union would collapse peacefully? Major planetary predictions are difficult to make accurately.

You have outlined an asset allocation strategy that is based on your forecasts for the energy markets. How has your model performed and what role does it play in your practice?

The financial planning and investment strategy is working.

The natural resource part of my model is up 25% in the past year, and the whole portfolio is up more than 10%. Of course, that's now history, and there's no assurance that the model will do well going forward.

Vodra's Alternative Asset Allocation Model

Vodra has developed an asset allocation model based on Peak Oil forecasts. He believes there are real constraints to what we can do materially, from energy, climate, and other resources. As energy and the environment become more expensive, the transition will require a lot of capital. Consumer products will become less available. Uncertainties and new relationships will emerge, but not in a way that can be predicted. Different economic rules will apply. The transition will not be abrupt, but it will last a long time. Vodra's model reflects the following:

- Internationalization – dollar weakness
- Relative price rise for energy, commodities
- Major risks of consumer inflation and asset deflation
- Major risk of economic declines or slow growth

His portfolio consists of the following:

- 10% US cash
- 10% Non-US cash
- 10% TIPS bonds
- 10% Non-US bonds
- 10% Commodities – indexed or direct holdings
- 20% Energy and natural resources
- 25% General common stocks, globally diversified
- 5% Real estate

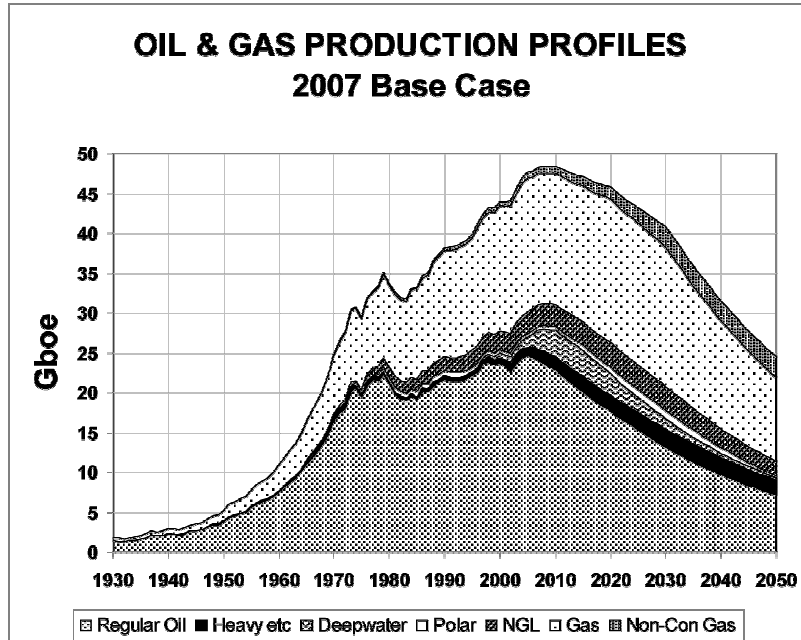
I present this to clients and prospects as one view of how the world might evolve, which is very different from the traditional view of asset allocation that has been taught in CFP classes. I am not so confident as to recommend that clients put 100% of their assets in my model. But, on the other hand, I am disappointed if they won't put any money in my model.



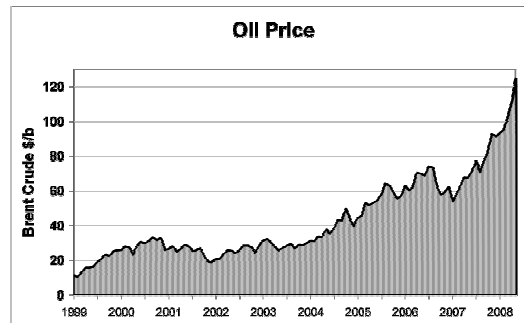
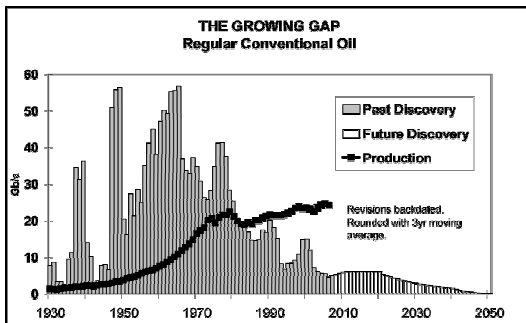
Roughly speaking, I am seeing assets allocated 50/50 between the traditional model and my model, and the trend is definitely toward my model.

The situation with Peak Oil is like the movie *The Perfect Storm*. A highly unlikely – but ultimately predictable – combination of events converges. In the final scene, George Clooney's character is desperately trying to save himself, his crew, and his boat in every way possible. Ultimately, he fails. But if the storm had been 5% or 10% less severe, he might have avoided being engulfed by the overpowering waves. He didn't give up.

The General Depletion Picture



ESTIMATED PRODUCTION TO 2100								End 2007										
Amount			Annual Rate - Regular Oil					Gb	Peak									
			Mb/d															
Regular Oil			2007	2010	2015	2020	2030	Total	Date									
Past	Future																	
Known Fields	New	Total																
1009	725	141																
866																		
All Liquids																		
1151			1299		2450													
2007 Base Scenario			Annual Rate - Other															
M East producing at capacity (anomalous reporting corrected) Regular Oil excludes Heavy Oils (inc. tarsands, oilshales); Polar & Deepwater Oil; & gasplant NGL Revised 06/05/2008			Heavy etc.		3.9		4.6		5.2		5.5		6.2		184		2030	
			Deepwater		6.7		8.8		9.1		7.5		3.6		85		2013	
			Polar		1.2		1.3		1.7		2.2		3.0		52		2030	
			Gas Liquid		7.7		7.7		8.0		8.4		8.2		228		2027	
			Rounding						1		-2		-2		26			
ALL			85		85		80		70		55		2450		2008			





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