The Oil Drum
DISCUSSIONS ABOUT ENERGY AND OUR FUTURE

Economic Impact of Peak Oil Part 3: What's Ahead?

Posted by Gail the Actuary on October 1, 2007 - 10:00am
Topic: Economics/Finance
Tags: collapse, deflation, foreign trade, hyperinflation, mexico, monetary system, original, saudi arabia [list all tags]

This is the third article in a 3-part series. (Here's a link to Part 1 and Part 2.)

We cannot know exactly what is ahead. In this part, we look at one possible future scenario. When we think of economic impacts, we usually think of the impacts that the squeeze of higher oil prices will bring--such as energy price inflation, food price inflation, and the need for more mass transit.

While these "squeeze" impacts are expected to occur, the real problem may be the discontinuities that occur, because of pressure on monetary systems and pressure on political systems. These pressures can cause unexpected results such as:

• Hyperinflation or deflation that indirectly results in a major decline in imports of all kinds (not just oil),

• Major changes in governments, and

• Fast declines in oil production in some oil exporting countries.

1. What impacts do you expect peak oil to have in the future?

There are three types of impacts that may occur. In the scenario that is presented here, we will assume that they all occur.

Squeeze impacts These are the impacts caused by gradually higher prices and slowly reducing world supply. This type of impact is already squeezing some of the poorer countries out of the world oil market. While this type of impact can be expected to increase over time, in this scenario, it is of far less importance than discontinuities.

Discontinuities for oil exporters In these countries, there is the possibility of social unrest and overthrow of governments once oil production begins to fall. This may happen because government revenues begin to decline, resulting in a cutback in governmental services and imports. The impact is likely to be a faster decline in oil production.

Discontinuities for oil importers Once real growth falters, the combination of increasing debt and decreasing real incomes may overwhelm monetary systems for oil importers. The infinite growth paradigm will come to an abrupt halt. Depending on the type of governmental intervention, the resulting discontinuity could either take the form of hyperinflation or rapid deflation. My analysis suggests either of these may result in a decline in the amount of oil and other goods a country is able to import, because of debt and monetary problems.

2. How soon might such discontinuities occur?

Discontinuities could start very soon, and continue in different countries over many years.

With respect to oil exporters, Mexico, with its declining oil production, is already at risk for social unrest and overthrow of the government. Saudi Arabia has a high risk of government overthrow, once its oil production starts clearly declining. Because of this type of discontinuity, world oil production may begin to decline considerably faster than models based on "business as usual" would suggest.

With respect to oil importers, we indicated in Part 2 that the debt situation in the United States is already in a precarious situation. A little more squeeze in oil availability, or a sharp drop in the value of the dollar, or even widespread knowledge of the likelihood of peak oil and its effects could further destabilize the debt market. Faith in the ability of long-term borrowers to repay their debt could evaporate. Depending on how the government deals with this situation, the result could be either hyperinflation or deflation.

If there are discontinuities, the timing is likely to vary from country to country, depending on the situation in that particular country. Once there is a discontinuity in a major country such as the United States, the impact may to spread to some other countries as well. Some countries may be able minimize discontinuity effects by finding a group of lesser-affected countries and sharing resources within the group.

3. If there is hyperinflation in the United States, what kinds of effects might there be? How about massive deflation?

With peak oil, there are likely to be many debt defaults, ultimately caused by the squeeze of higher oil prices. (This squeeze of higher oil prices may actually cause problems before the peak arrives. See Part 2, Question 12.) If the response of the government is to guarantee payment of debt, so as to prevent business failures, the money supply may expand greatly and hyperinflation may occur. If there are many defaults and the government does not intervene, or its intervention is unsuccessful, the money supply may contract, and deflation may occur.

Hyperinflation. If there is hyperinflation, people and businesses will find that money in their bank accounts and fixed income retirement funds will purchase very little. Incomes of people with jobs are not likely to rise as fast as the price of goods, so they will find it necessary to reduce their purchases. Demand for many optional goods and services will drop.

After a short time, the government will find that its revenue is very low compared to the huge amount of debt that it has guaranteed. Buyers for government bonds are likely to disappear, and the monetary system will collapse.

Whether or not the monetary system fails, foreign governments holding US debt will be very unhappy. Even if there is not a default, the bonds will be redeemed with dollars that are worth much less than when the bonds were purchased. Either way, foreign governments will feel cheated.

Massive Deflation With massive deflation, there will be many business failures --banks, money market funds, hedge funds, insurance companies, and ultimately businesses of many kinds. FDIC insurance will cover some of the bank losses, but this would soon be depleted. Many people will find their life savings wiped out.

Governmental revenue will decline in such a scenario, making it difficult for the US government to repay its debt. Exceedingly high interest rates might be needed to attract buyers for US debt--higher than could be afforded with the decline in revenue. If the problems were to become severe enough, the whole monetary system could collapse.

4. If the monetary system fails, what are the options for replacing it?

In a scenario where the monetary system fails, there will be *big* problems. In such a scenario, it seems like there is a significant chance that the *government* may also be replaced, because the existing government will have no money and there will be a huge number of people who are very angry about the situation. Waiting up to four years for a new president, and up to six years for new senators, may seem unacceptable. Open revolt seems possible.

Once we are talking about replacing the government, we are really speculating. One question is whether the new government would cover the same 50 states as it does today, or a smaller area. When the Soviet Union collapsed in 1991, the governments of its constituent states remained, and these took over.

If the analogous situation happened here, we would fall back on the 50 individual state governments. This would be the easiest new government to implement. It is theoretically possible that the 50 state governments could each set up its own fiat monetary system. It seems to me that this may be the most likely outcome.

5. What kind of new monetary system would work?

If we are talking about 50 state governments issuing currency, I would expect that the level of planning that would go into each of the new systems would be limited. Each state would issue some type of money, good only in that state. A governor might choose to increase the amount of money available whenever he or she found it politically expedient to do so.

With this system, money would still act as a means for facilitating the transfer of goods. No one would reasonably expect money to be a store of value because the amount of money in circulation in the future may be quite a bit greater than today, and the amount of goods available for purchase would likely be decreasing.

In a scenario where a new 50-state monetary system is created, the monetary system would still not act as a store of value. The inflation rate would likely to be very high, and interest rates would not be sufficient to offset the inflation. This result is expected because the amount of goods available to society will be decreasing over time because of peak oil and decreasing imports. Unless someone figures out a way to keep contracting the money supply on a regular basis (ask for 5% back from everyone?), the decrease in available goods would almost certainly result in persistent inflation.

If it is necessary to create a new 50-state government, the length of time it takes to put all of the pieces in place--a new government, a new monetary system, and probably a new banking system--could be a problem. If a new democratically elected government were to be formed, it would seem like the process could take up to three years. We would most likely be without any monetary system at all during this time. If some type of dictatorship took over, the timeframe might be much shorter, but there would be different issues.

6. What kind of financial system would work with a fiat monetary system, long-term inflation, and a declining economy?

In such a scenario, people would expect to spend money pretty much as soon as they earned it. Banks would be primarily for convenience, rather than as a place to store money for the future.

Insurance products with a very short time horizon could be sold - for example, term life insurance, health coverage, auto coverage, homeowners coverage, fire insurance for buildings, and cargo coverage for shipping.

Loans with very short time frames might be offered--for example, short-term financing of goods for resale. Long term business and personal loans would generally not be available, because of the uncertainty of the value of the currency in the future, and also because of the declining economy. (If the only problem were the variable inflation rate, variable interest rate loans might work.)

Because of the uncertain nature of money, it is possible that longer-term loans could be made to individuals that would be paid back in *services* rather than money. For example, a city might pay a person's tuition for medical school in return for his/her agreeing to work for that city for a set number of years to repay the loan. (Does this sound a little like being an indentured servant?)

Financing of large projects by businesses or individuals would be very difficult, because of the lack of long-term loans. Because of this, large projects would most likely need to be undertaken by governments, and financed by tax dollars.

A country with an economy of the type described would likely be very poor. It would theoretically be possible for the country to have a social security-type retirement program financed by a tax on workers. Because of the poverty of the country, such an arrangement seems unlikely, however. Instead, I would expect most people to work as long as they are able, and live with children in later life.

7. I learned that money is always a store of value. Isn't that what economics teaches?

Economics may teach that money is a store of value, but unfortunately this cannot be true when an economy is in a period of long-term contraction. Economists have developed their theories looking at an atypical period in the world's history--one where growth was the norm. They have never stopped to realize that our world is finite, so infinite growth is not possible. Their theories may hold for a specific time period, but aren't true in general.

In some ways, their assumptions are similar to the assumptions of people who once thought the world was flat. At some time in the not too distant future, people will come to realize that the most important word in the phrase "economic theory" is the word *theory*. Economic theory is really just an untested hypothesis, developed in period of long-tern economic growth. Once this growth stops, there is no particular reason to believe that economic theory will hold.

8. What will future trade look like in scenarios such as you are discussing?

If we are looking at 50 state governments, each with its own type of money, future trade is likely to be pretty limited. There will be some trade across state lines, but long-distance transport of people and goods is likely to decrease significantly. It may be possible to import some goods from overseas, but I would expect that an equal-value export would need to be traded at the same time with the same country.

If we are looking at a unified United States, prospects for trade are better. Trade within the United States will most likely continue unhindered. Overseas trade may still be a problem. For

one thing, foreign countries will be unhappy about the default on US debt (or its payment in inflated dollars), and will want to retaliate. At a minimum, they will be unwilling to extend credit, unless it is clearly earned. I expect that countries will develop a close set of allies whose credit can be trusted, and trade mostly with those allies.

In either scenario, I expect that the total amount of foreign trade will drop sharply. As an upper bound, I would expect imports from overseas to equal about 56% of our current imports. (See Part 2, Question 8.) This kind of drop would be needed to eliminate our current balance of payments deficit. Even this level of imports is almost certainly unreasonably high, if our ability to produce goods for export decreases, or if there are barriers to trade. Also, some of our trading partners (like Japan) are likely to have economic problems as well. A better guess might be that overseas imports will equal 10% of current imports.

The decline in trade is a key issue. In a scenario where the US monetary system collapses, there will be oil somewhere in the world, but we won't be able to buy it. The inability to buy the oil will cause the problems, not the lack of oil itself. We also will find ourselves unable to buy most of the other goods we currently import.

9. What will happen to large companies?

In scenarios such as this, I expect that most large companies will either cease to exist, or will break into pieces that fit within a single country. There are several issues:

• If a US company has assets in overseas locations, there is a significant possibility that foreign governments will find an excuse to confiscate those assets, as partial payment for the US default on debt.

• Business airline travel is likely to disappear very quickly, because of the squeeze effect of declining oil supply. It will be very difficult to manage overseas locations using boats as the primary means of travel.

• Financial system problems may be a huge issue. It will be difficult to expand operations without the availability of long-term debt. Stock values are likely to be very low if the economy is in long-term decline, so raising funds from the issuance of stock will not work well either. If there are 50 states with non-interchangeable currencies, business operations across state lines may be very difficult.

• The decline in imports is likely to be a real problem. Local replacements will need to be found for raw materials and parts that were imported from abroad--even replacement parts, to keep machinery operating. Fuel for transportation of products will be very limited. Customers will have difficulty visiting stores, because of limited fuel supplies.

10. What kind of economy can continue, without large companies, with very few imports, and with a finance system as you described?

In such a scenario, I expect that the economy that can exist long-term would be a very simple system, with most people either growing their own food or manufacturing some type of product using local materials. Such a system might be similar to an economy from 1900 or earlier.

If this scenario should happen now, the new economy would not work as well as the economy in 1900 in many ways, because the country would be lacking some of the things available in 1900 -- for example, draft animals for labor and farm tools that do not require fuel. People now are also

lacking the required skills to live as people lived then - knowledge of farming, food processing and woodworking, for example.

For the first several years, I expect we would be able to carry over some of our current lifestyle. People would continue to live in houses that were built prior to the discontinuity--perhaps two or three families in a single house, if the house is conveniently located. Clothing and other manufactured goods would be used as long as possible. I expect that there would be considerable trade in used household goods.

Electricity would continue to be available as long as the grid can be maintained and power plants can be operated. I expect that if new power plants are built, they would use local materials for generation-- wood pieces where there are forests and oil where oil is produced. The availability of electricity is likely to vary by the part of the country. Grids are likely to be difficult to maintain, so eventually electricity is likely to be generated close to where it is used. Many homeowners are likely to be without electricity.

11. Will there be rationing of gasoline and diesel fuel?

In this scenario, it is possible that there would be rationing of fuel for a few years, but I expect the whole transportation system would collapse pretty quickly, so that the need for gasoline and diesel would decline. The reason I see a problem is the fact that our vehicles -- cars, semi-trucks, fire engines, ambulances, farm equipment, and airplanes--have many parts that need to be replaced regularly:

• Batteries
• Oil filters
• Tires
• Brake linings
• Head lights
• Fluids such as anti-freeze, transmission fluid, and motor oil

In addition, roads and bridges that the cars and trucks use need regular maintenance. If we are very much restricted in terms of imports, we will not be able to import the parts and raw materials that we are accustomed to. Because of this, it will be difficult to keep the cars and trucks running and the roads repaired. Even if we have plenty of gasoline and diesel fuel, the system will come to a stop.

Boats and trains may be better, in terms of needing fewer replacement parts. Electric trains would seem to be OK as long as the grid is running. Once the grid stops, electric trains will stop.

12. How much new infrastructure would we be able to build, after the discontinuity?

Very little. There are a lot of things we would like to use our resources for, including:

• Building factories to manufacture all of the things we used to import from overseas, but can no longer import.

• Maintaining roads and bridges.

• Maintaining the grid.

• Transporting raw materials from one end of the country to the other.

• Building new battery powered cars.

There would simply not be enough resources to go around, since the resources we will have will be those within the country itself, plus a few imports. Financing is also likely to be a problem, because of the lack of long-term loans. Most of the infrastructure development would need to be undertaken by governments, because of financing issues.

13. If we need to use more manual labor to grow our food, how will that work? Right now it seems like there are a lot of huge farms.

I can think of two approaches that might be used to make the transition from large mechanized farms to farms using more manual labor. One approach is for the government to print lots of extra money, and use the extra money to buy up the large farms. The extra money will add to inflation. The government will then divide the large farms into small tracts, and assign families to the tracts.

A second approach would be to keep the farms intact, and assign people to work on the farms, much like serfs. The farm owner would assign people to tasks and keep a portion of the crops as his share.

Regardless of which approach is used, a large amount of housing will be needed in areas where farms are located. If existing houses are located in the area, they can be subdivided and used. If not, there will be a need for houses that can be built at low cost with local materials. I would expect homes would be built of local materials such as straw, sod, logs, or adobe. These new homes would lack amenities such as electricity, heat, and running water.

14. Which countries are likely to fare best in the transition to a scenario such as you describe?

The countries that are likely to do best in the transition are the ones whose economies are at a fairly low level currently, so that the people have the skills and the tools needed to grow local crops, and make clothing. It would be helpful for the countries to have fertile soil, adequate rain, and a relatively low population for the area available. It would be best for most people to already be living in the countryside or small towns, because it is doubtful that economies will be able to support large cities after the discontinuity.

Finally, it would be helpful for the countries not to be too affected by climate change. If climate change kills the native crops, there will be a huge problem.

15. What might a country do to prepare for life after the discontinuity?

If a scenario such as the one we have discussed takes place, the world will look much like it did before the industrial revolution in not too many years. Most products will be grown or produced locally. Foreign trade will play a minor role. The array of goods available will be much smaller than today. Finance will play a smaller role than today.

If a country is to prepare for a scenario such as this, one major thing that needs to be done now is to train people for life in a low energy world--teaching the many skills required. It would be helpful to collect open-pollinated seeds for grains, legumes, and vegetables suitable for each area. It may also be helpful to manufacture some tools and easy-to repair machinery for use in the future. A country may even want to re-build some older technology like grain mills powered by waterfalls and cotton gins, since these can be built to be fairly sustainable in the future.

If a scenario such as we are discussing happens in the next few years, spending time and money on attempts to extend our current lifestyle would be counterproductive. The decline would be so significant that we would not be able to maintain our new technologies in the years ahead.

Hopefully, a scenario such as what I have described will never happen. Thinking about it, and why it might or might not happen, can perhaps give us better insight as to how we should prepare for the years ahead.