The Oil Drum
DISCUSSIONS ABOUT ENERGY AND OUR FUTURE

Economic Impact of Peak Oil Part 2: Our Current Situation

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This is the second of a three part series giving my view of the economic impact of peak oil.

Peak oil seems likely to make a huge change in our economic system--more than would be expected by a worldwide decline in oil production by a few percentage points a year. In Part 1, we looked at the contrast between economic systems before the industrial revolution and the current economic system. We also looked at economic studies that suggested that energy, and the more efficient use of energy, seem to be big contributors to the real economic growth that took place since the industrial revolution.

In this segment, we will look at some other changes affecting the economy besides the growth in the use of fossil fuels. We will look particularly at debt and how peak oil is likely to affect a financial system that is tied to debt. We will also look at some the stresses that the economy is currently under. Some of these stresses seem to stem from a failure of the United States to fully adapt to its own decline in oil supply since 1971; some of these stresses come from the fact that the world is finite, and we are reaching the earth's limits with respect to more than just oil.

1. Why is debt important to our economy today?

Debt, and the trust that makes debt work, is the glue that holds our economy together.

There is a very close relationship between debt and the supply of money. When a person borrows money from the bank, the loan actually increases the supply of money available. When more and more people take out mortgages and other types of debt, the people taking out the mortgages end up with more house then they would otherwise have. When homeowners refinance their homes and take the equity out, they get additional cash that they can spend on other things.

If we suddenly have a situation where there are many defaults on mortgages or other debt, we end up with a reverse of the above situation, so that there is in fact less and less money. If a bank takes possession of the house when a purchaser is behind on payments, and tries to sell the house to get its money back, the house is added to the large inventory of other unsold houses. This tends to bring the prices of houses down further, and tends to reduce the amount of equity other homeowners have in their homes.

Besides this role of debt, debt (in the form of bonds of various types) makes up a large share of the assets of insurance companies, pension funds, and banks. If there are suddenly many defaults on debt, most of the financial institutions in the country are at risk.

Debt is also a means of smoothing financial transactions. We use credit cards for personal purchases. Businesses make purchases from other businesses, and are often given some specified period to pay (say, 30 days or 60 days), before interest starts accruing. This is a form of debt. Because the US has a trade deficit, there is debt associated with purchases we make abroad. If we buy a car from overseas, on average, there are not enough exports to balance out our imports. Japan (or whoever is selling the car) ends up with more cash than it can use for imports. It often takes its excess dollars and buys US Treasury bonds--another form of debt.

2. How did we get to a situation where debt is so important to the economy? Weren't panics and crashes (like the bank failures during the depression) between 1800 and 1932 so disruptive to the economy that debt could only play a minor role?

During the time when panics and crashes were frequent, it was difficult to use debt widely, since defaults were a major problem. A number of changes were made over the years in an attempt to provide stability. The indirect result of these changes was to make greater use of debt possible. (Increased use of debt was also enabled by going off the gold standard in 1971, since the money supply was no longer tied to the amount of available gold.)

Factors which contributed to the stability of the system included:

• Establishment of the Federal Reserve System in 1913. This acts as a central bank, and tries to regulate monetary supply, primarily by adjusting interest rates.

• Establishment of the Federal Deposit Insurance Corporation in 1934. The FDIC insures deposits in banks and savings and loans up to a specified limit (now $100,000), to prevent runs on banks.

• Establishment of rules for international financial relations at the Bretton Woods Conference in 1944, including the establishment of the International Monetary Fund in 1945.

Another factor adding stability to the system was the economic growth that came through the growing use of fossil fuels.

3. Why would economic growth--pushed along by growing fossil fuel use--make the debt system more stable?

The reason that economic growth makes a debt system more stable is that we are dealing with a system in which a person (or company or government) borrows money at one date, and pays back that money plus interest at a later date. If the economy is growing rapidly, incomes tend to be rising, making the payback of loans, with interest, easier. A person who has taken out a home loan, or a loan for college expenses, will find that his higher income over time makes debt payments relatively affordable. Default rates tend to be low, so interest rates can be relatively low.

If there is no real growth (that is 0% economic growth), there will still be a few situations where loans make economic sense. These projects will have a good enough return that borrowed money can be used, and the return on the project will cover the interest on the loan. In general, the process will not work very well, however. Real incomes will not be rising fast enough to provide a cushion to make interest payments more affordable. Default rates will be quite high, so lenders will need to charge a higher interest rate to cover defaults. This will make loans affordable only in fairly rare circumstances.

If we get to a situation where there is long-term economic decline, rather than growth, debt

becomes a losing battle. Default rates are likely to be very high, making required interest rates (to cover expected inflation, a "rent" payment on money, and expected defaults) extremely high. Virtually no project will have a high enough expected return to be financed by debt in such an environment.

4. Where do we stand now with respect to economic growth?

Wikipedia tells us that income per capita was essentially flat until the industrial revolution. Between 1790 and 1946, Economic History Services data shows that the US experienced long term economic growth. There were a lot of ups and downs, related to the bubbles, panics and crashes that were so much a problem in that era, however.

Since 1946, Economic History Services data shows that the US real growth has been about 3% per year. Year to year fluctuations have been smaller than prior to 1946, due to the changes described in Question 2 and the interventions of the Federal Reserve to maintain stability.

Going forward, it seems very probable that the US real growth rate will decline once world oil production begins to decline. From Part 1, we know that there is a close tie between energy use (and more productive use of energy) and economic growth. We also know from Part 1 Question 6 that productivity growth at this point is relatively small - only 1% or 2% per year, so that we are unlikely to make up a very big decline in supply by efficiency gains.

Surprisingly, a decline in US real growth rate may come even before peak oil. The issue is really one of how much oil is available to the US, through its own production and through imports. If something happens to reduce our imports, such as a drop in the value of the dollar, or greater competition for existing supply, we could find ourselves with less oil, even before the world reaches peak oil. If the decrease in oil supply is large enough that we cannot make up the shortfall by other means (increased coal or biofuels, for example), we could face declining real growth on a long term basis, even before peak oil.

5. Wouldn't declining economic growth cause problems in an economy that is as tied to debt as ours?

Yes! I It is likely to cause a *lot* of problems.

If no intervention is made, there are likely to be a huge number of defaults. This will lead to many insolvencies and deflation, most likely.

If steps are taken to guarantee the payment of loans, this may lead to hyper-inflation. We may still have our bank accounts and pension plans, but we will find that the funds in them will purchase much less than in the past.

It is possible that there will be such serious disruption that the monetary system as we know it disappears. We could temporarily end up with barter as the primary means of exchange. Presumably, an alternative monetary system would be developed fairly quickly, but it could still be quite different from what we have today.

New agreements with trading partners to facilitate inter-country trade would also be required. These new agreements could prove to be a more difficult problem than developing a new monetary system for use within the country.

6. Hasn't planning been done that considered the possibility that over the long term, economic growth may not really be possible?

No. Economic theory has grown up since the industrial revolution, during a period of long-term economic growth. Recent economic work has been done using data since World War II. No one has stopped to think that the analysis period data might not be typical of the situation over the long run.

Some examples of calculations that are distorted by looking at data from only periods of economic growth include the following:

• Pension calculations. Much higher contributions will be needed, it economic decline is expected.

• Loan calculations. A much higher margin for default is needed in interest rates, if a decline in economic growth is expected. Thus interest rates on loans will be higher.

• Projections of stock market values. An analysis that considers only periods of economic growth will show good prospects for stock market growth in the future. An analysis that considers the possibility of long-term economic decline will show declining values.

• Models used by quantitative analysts to price derivatives and sliced and diced bond funds. It is not clear that these models are very good in the best of circumstances. If one adds the major shifts caused by declining economic growth, rather than increasing economic growth, the models are likely to be hugely distorted.

7. I have heard that the US has been spending more than its real income in recent years. It seems like this will only make the problem of a future decline in real income worse. In what ways are we overspending?

There are several ways that we are spending more than our real income:

• We keep adding more and more debt (personal, business, and governmental). We use debt to finance our expenditures, with the idea that our income will be higher in the future, so we can afford to pay for our expenditures plus interest later. One example of this is refinancing home loans, and using the equity to pay for current purchases.

• The government has developed programs like Social Security and Medicare that promise payments in the future, that are only partially funded today.

• We defer maintenance on our infrastructure - roads, bridges, pipelines, and electric grid, for example.

• We are depleting our non-renewable resources. Besides oil, we are depleting our natural gas, so that declining production is expected in North America in a few years. We are also using water from our aquifers more quickly than it can be replenished, and we are depleting our soil by not returning enough organic matter to it.

• Debt payments are artificially low,

• We are importing more than we are exporting, resulting in a growing balance of payments deficit.

8. I'd like to know more about the last two points. Tell me first about the US Balance of Payments situation.

US oil production began to drop in 1971, and the US went off the gold standard the same year. Since then, the US has been importing increasing amounts of oil and other products. This increase in imports has not been balanced by an equivalent increase in exports, so our balance of payments is getting more and more lopsided.

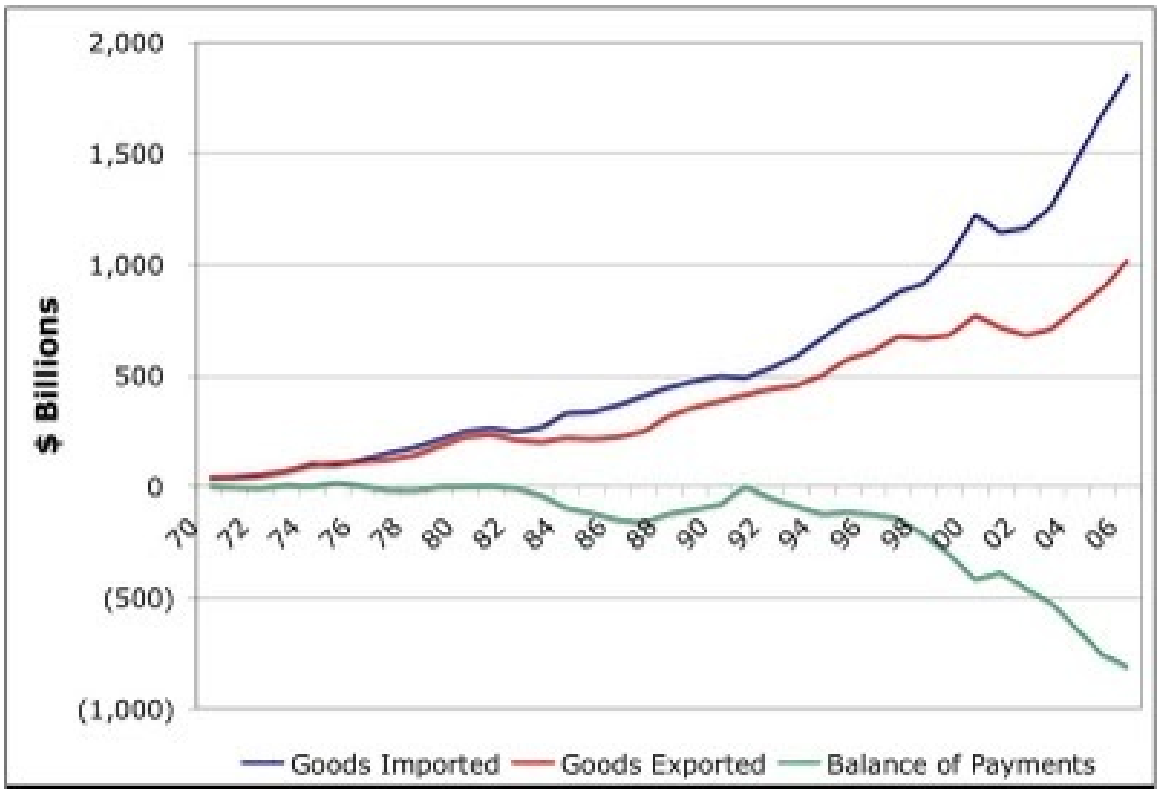

Figure 1: US Balance of Payments, 1970 – 2006

What is happening is the US standard of living is increasingly being subsidized by the deteriorating balance of payments. In 2006, this deficit amounted to about $2,700 per US resident, or somewhat more than 10% of US per capita income. This deficit relates to a wide range of products --only about 15% of our imports are currently petroleum products.

US trading partners are becoming increasingly unhappy about this situation, partly because they realize that they are financing a lifestyle Americans cannot really afford. In addition, many trading partners are becoming aware that world oil production is likely to decline in the next few years. Peak oil is likely to result in declining real GDP and a much greater chance of default on debt. Our trading partners do not want to be caught with a lot of worthless debt.

9. What about the other point in Question 7, "Debt payments are artificially low"?

There are several reasons debt payments are artificially low:

• Foreign trading partners in recent years have been using the excess cash they received from the US purchase of imports to buy US debt. This has helped to keep interest rates artificially low. This issue is closely tied to the balance of payments situation above.

• Low interest rates set by the Federal Reserve have also tended to keep interest rates low.

• Some new debt products have artificially low teaser rates for the first few years they are effective.

• The charges required for defaults on loans have been calculated in a period of economic growth, so are artificially low.

• Underwriting of loans has often been very loose.

If payments on loans are artificially low, lenders will generally fare poorly. Such a situation is not sustainable--In the long term, debt payments (on all new loans and some existing loans) are likely to rise, resulting in market contraction and defaults.

10. Are there problems with the debt system, over and above the artificially low payments that may cause defaults in the future?

Yes. Confidence in the system is being severely tested. One of the basic characteristics of a debt-based finance system is that there must confidence in the system for it to continue to exist–-otherwise lenders will stop granting credit and the system will come to a screeching halt. For example:

• Debt products have been put together without adequate concern for protecting the lender. Home loans were made with initial teaser interest rates and little down payment. Commercial loans were made without proper covenants.

• Questionable loans were repackaged (after being sliced and diced) and resold around the world. These repackaged loans cannot be valued properly, partly because of the questionable nature of many of the underlying loans, and partly because the valuation system that was planned (using rating agencies and theoretical models) works very poorly in practice.

• Off-balance sheet financing of banks makes it impossible to assess a bank's true financial situation. Banks are becoming less willing to lend to each other, because they cannot tell what each other's actual financial situation is. Banks lending to other banks are not protected by FDIC coverage, so they are concerned when there may be a risk of default.

11. What other issues are currently on the horizon?

The world is finite, and we are reaching its limits in many ways. Besides energy-related impacts discussed in Part 1, there are many others:

• There is increased competition for soil and fresh water. It is not easy to increase production of biofuels, because of competition with food production. Costs of food and other products tend to rise with scarcity, adding to the overall pressure on consumers, and pushing real economic growth downward.

• Many minerals are becoming harder and harder to extract, because the locations with high concentrations have been mined. The real cost of mining these minerals is rising, both because of the higher cost of fuel and because of the additional work required to extract these minerals.

• Climate change is becoming a serious issue. There is a significant possibility that climate change will disrupt food production in not many years. There is also a possibility of coastal flooding causing significant damage.

12. How would you sum up what we are seeing here?

We are facing a world that is already stressed - by a debt market that is not working well, by pressure on limited resources, and by climate change. In such a world, it does not take much of a

change to disturb the debt system, and to cause serious problems with the world monetary system.

Peak oil, or even the squeeze preceding peak oil, is likely to result in a decline in real growth. Even a slowdown in growth might cause a problem at this point, given the existing problems in the system. This disruption of economic growth is likely to put pressure on the monetary system, because our monetary system is tied to debt, and debt is easily disrupted by declining economic growth.

The United States is particularly vulnerable to problems because we are living beyond our means and because we are already straining our debt-based system to its limits. There is a significant possibility of a discontinuity of some type--either deflation or rapid inflation. There is even a possibility that our monetary system will fail completely, and need to be replaced.

The long period of economic growth in the past 60 years has lulled analysts of many types into believing that the favorable patterns associated with economic growth will last forever. It is pretty clear that these favorable patterns are in fact temporary. Peak oil, or the squeeze preceding peak oil, is likely to result in a rapid change in the financial situation that may have more impact than the decline in oil production itself.

In Part 3, we will look at the changes that are likely to occur in the years ahead.