

Our Finite World

Exploring how oil limits affect the economy

The Economy Is Like a Circus

Posted on [April 17, 2017](#) by [Gail Tverberg](#)

The economy is like a circus. It comes to town, and eventually it leaves town. We get paid in tickets to this circus. As long as the circus stays in town, we can use our tickets. Once the circus leaves town, we are pretty much out of luck.¹

The reason the circus stays in town is because the economy stays in sufficient balance that the economy can go on. This is much like the way many other self-organized systems function. For example, our bodies continue to function as long as there are suitable balances in many different areas (oxygen, food, water, air pressure). Ecosystems continue to function as long as there is sufficient rain, adequate temperatures, and enough sunlight.

There are many different views as to what limits we reach in a finite world. Some people think we will “run out” of oil, or of energy products. Some think that the energy return will fall too low, as measured in some manner. I see the adequacy of the energy return as being very much tied to the financial system. Thus, the forecast by [US Atlanta Fed GDPNow](#) indicating that first quarter 2017 US GDP growth will only be 0.5% is likely to be a problem, assuming it is correct.

Our economy operates on economies of scale. Once we get too close to shrinking, or actually start shrinking, we reach a point where the economic circus starts to leave town. At some point, we will discover the circus is gone. The economy we thought we had, will have left us. If some people are survivors, they will need to pick up the pieces and start over with an entirely new system.

What the Economy Needs to Do to Keep Functioning

For our economy to continue functioning, a number of variables are important:

- **Prices of commodities** – Prices cannot be too high for the consumer to afford goods made with them. They also cannot be too low for producers. If prices of oil and other commodities are too low for producers (as they are now), producers need to keep raising debt levels to stay in business. There is a risk that production will stop from lack of adequate new investment, or from the bankruptcy of producers.
- **Wages of non-elite workers** – These wages need to be high enough so that workers can *afford* goods made with commodities, such as cars, homes and computers. These big purchases tend to use commodities even after they are made, adding to “demand” for commodities. If commodity prices such as oil are too low (as they are now), it is likely related to the inadequate wages of non-elite workers.
- **Mandatory payments required of non-elite workers, such as taxes, health care, and education**

- It is not just wages of non-elite workers that are important. So are required payments, such as payments for taxes, healthcare and education. Clearly, the lower these payments are for non-elite workers, the better the economy functions.
- **Interest rates** – Low interest rates are helpful for some parts of the economy, while high interest rates are good for other parts. Low interest rates help create affordable monthly payments for goods such as homes and cars. If interest rates decline, the market prices of assets such as real estate, shares of stock, and bonds tend to rise. These rising values are of great benefit to owners of these assets, since they can sell these assets and use the proceeds to add to current consumption. Conversely, high interest rates are important to pension plans and to others depending on investment income. Banks have a problem if there is not a big enough “spread” between short and long interest rates.
- **Increase in debt** – An increase in debt indirectly makes the economy “look” much better. Increasing debt acts to raise wages, since some of this growing debt adds to funds available for wages. The higher wages tend to increase demand for goods, and thus indirectly raise commodity prices. A virtuous circle starts, pushing up economic growth, provided an adequate quantity of very cheap energy products is available (under \$20 barrel oil, for example) that can be used to make goods and services. Increased debt works less and less well, as the price of energy products increases.
- **Inflation rates** – The higher the inflation rate, the easier it is to repay debt with interest, since most debt is not adjusted for inflation. Also, high inflation rates help keep prices of homes and other buildings from falling as they age, making the use of mortgages more feasible. If the price of a commodity, such as oil or coal, is high and then falls, debt based on the prior high value of the commodity is likely to become a problem.
- **Quantity of energy products affordable by economy** – It takes energy products to produce goods and services. If the price of commodities is low, it is possible for buyers to purchase a large quantity of these products, even on a low budget. Current relatively low prices tend to help the economy, even if producers cannot afford to make adequate investment in new production with such low prices. Thus, today’s low energy prices make the economy look good for at a short time. Afterwards, the outlook is less rosy.

Ultimately, **the issue at hand in determining whether the “circus will leave town” is *whether non-elite workers are able to adequately make a living***. We know from biology that the return on the labor of animals must be adequate (animals must be able to get enough food by walking, swimming, or flying) or their populations will collapse. The same thing is true for humans. We also know that prior civilizations that collapsed often had wage disparity problems. When this happened, non-elite workers were no longer able to pay adequate taxes. Their nutrition became poorer. They tended to become more susceptible to epidemics. These were things that pushed the economy toward collapse.

The goods and services that non-elite workers can buy with their wages represent the benefits of our fossil fuel powered energy system, as distributed to the most vulnerable workers in the system. Once these benefits start falling too low, the system can no longer function.

There are some indications that benefits are already too low for the economy to keep functioning in a “normal”

manner. A major such indication is the fact that energy prices have remained far too low since mid-2014. It is becoming increasingly clear that there really is no oil price which is both high enough for producers and low enough for consumers. We may be living on “borrowed time,” using an increasing amount of debt to support energy producers.

Thus, world economic growth rates may already be too low to keep the world economy operating. Regulators who consider only the US do not seem to understand the world situation. Because of this, they can easily make moves that make the situation worse, rather than better. For example, they have already started raising interest rates and are planning to sell securities currently held by the Federal Reserve.

A Few Graphs Giving Hints of Our Problem

Economists have not understood what our problems really are, so they have tended to omit some important issues from their analyses. I put together a few graphs that might give a little insight as to what is happening.

Interest Paid by Households

Interest paid by households is important because this money is transferred to banks, insurance companies, and pension plans. It leaves the households who paid this interest poorer. Buying goods using debt is convenient, but it has a cost involved.

BEA Table 7.11 shows a category called, “Interest Paid by Households.” If we compare this to BEA “Wages and Salaries,” we find the relationship shown in Figure 1. Admittedly this is not an exact comparison; there are some people who are not wage earners who are making interest payments, for example. I have not tried to offset “interest paid by households” against “interest received by households,” because the households benefiting from interest payments are likely very different households from those making interest payments. They are likely richer, and at a later stage in their lives.

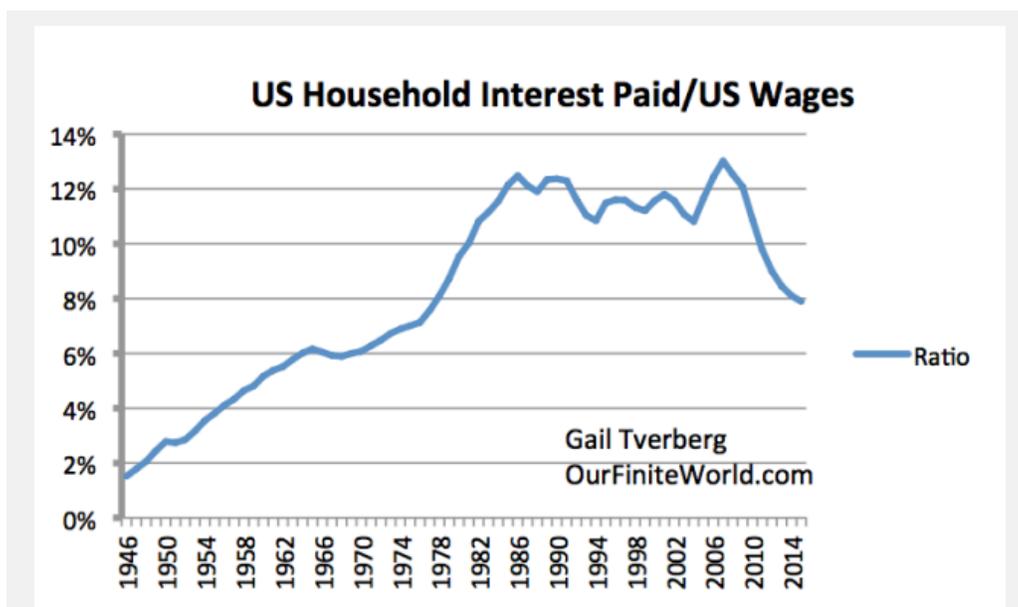
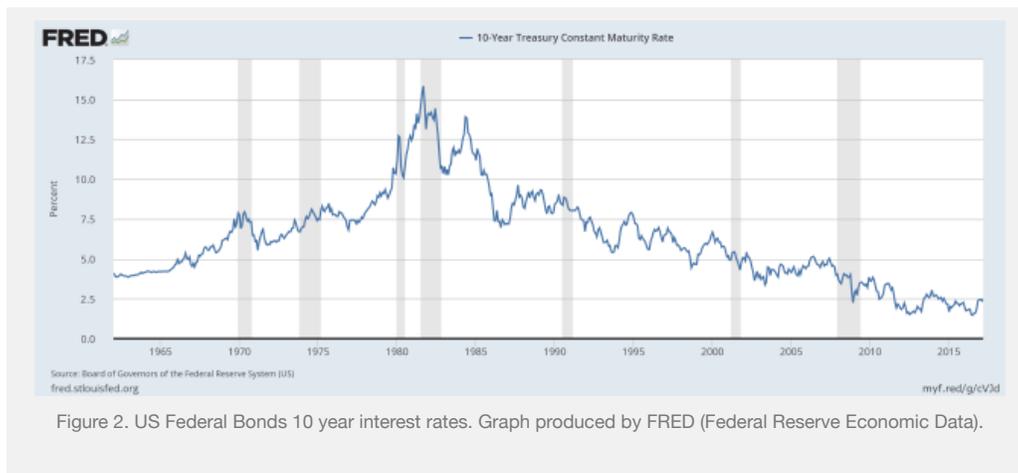


Figure 1. US Household Interest Paid (from BEA Table 7.11 Interest Paid and Received by Sector and Legal Form of Organization) divided by Wages and Salaries from BEA Table 2.11, "Personal Income and its Disposition."

The pattern might be described as follows:

- A rapid run-up in interest payments that took place until about 1986
- A general flattening, with new peak in 2007
- A rapid fall starting in 2008

It seems to me that the pattern up to 1986 reflects the general run-up in consumer debt levels during this period. The amount of interest paid is also affected by interest rates, such as ten-year treasury rates.



Interest rates started falling in 1981. These higher rates only gradually worked their way into the system because many people had bought houses earlier and were able to keep their existing mortgages at low interest rates. The amount of debt outstanding continued to rise, allowing the total amount of interest paid to continue to rise until 1986.

After 1986, rising debt amounts and falling interest rates came closer to offsetting each other (Figure 1). By 2008, the economy was in a severe recession. In order to help get out of the recession, interest rates were lowered through Quantitative Easing. These lower interest rates, besides helping the economy in general, helped oil prices gradually increase back to the \$100+ per barrel price level that they needed to be profitable. Oil prices had temporarily dropped below \$40 per barrel in December 2008.

Figure 1 shows that interest payments for several years amounted to about 12% of wages for households. Interest payments are now down to 8% of wages. Even at this level they are significant. They are likely higher than this for those with low wages and high debt. If interest rates rise significantly, the most vulnerable are likely to find their discretionary income reduced.

Rising Healthcare Costs

Figure 3 shows a comparison of US healthcare costs to GDP and to wages. A huge increase in costs is evident in the 2001-2005 periods, and also in the 2008-2010 period, especially compared to wages.

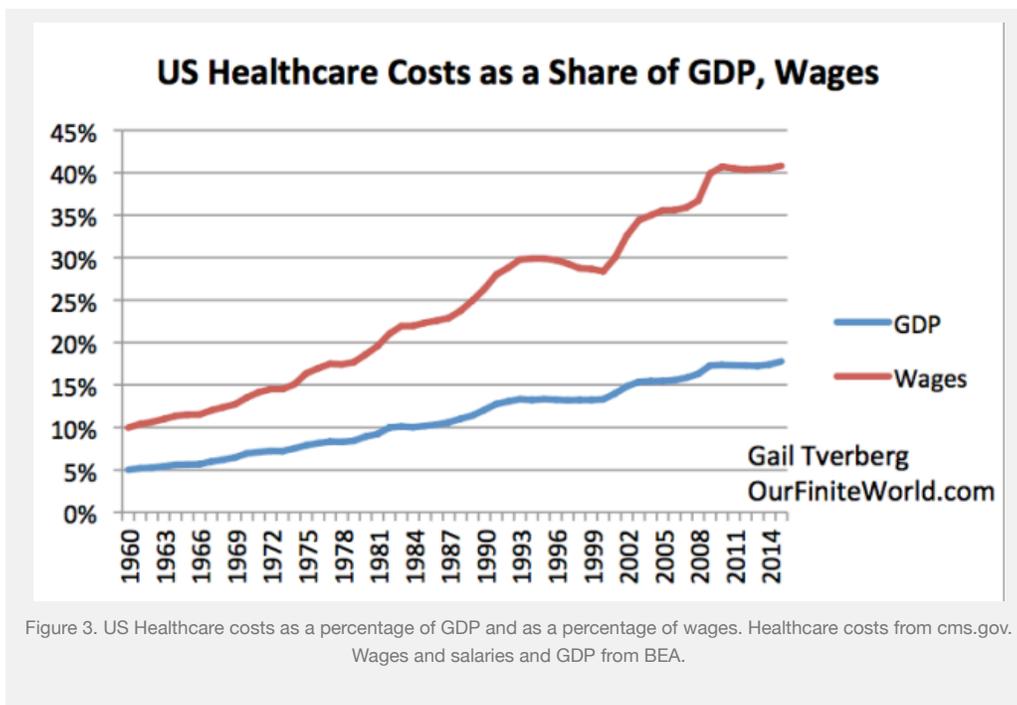
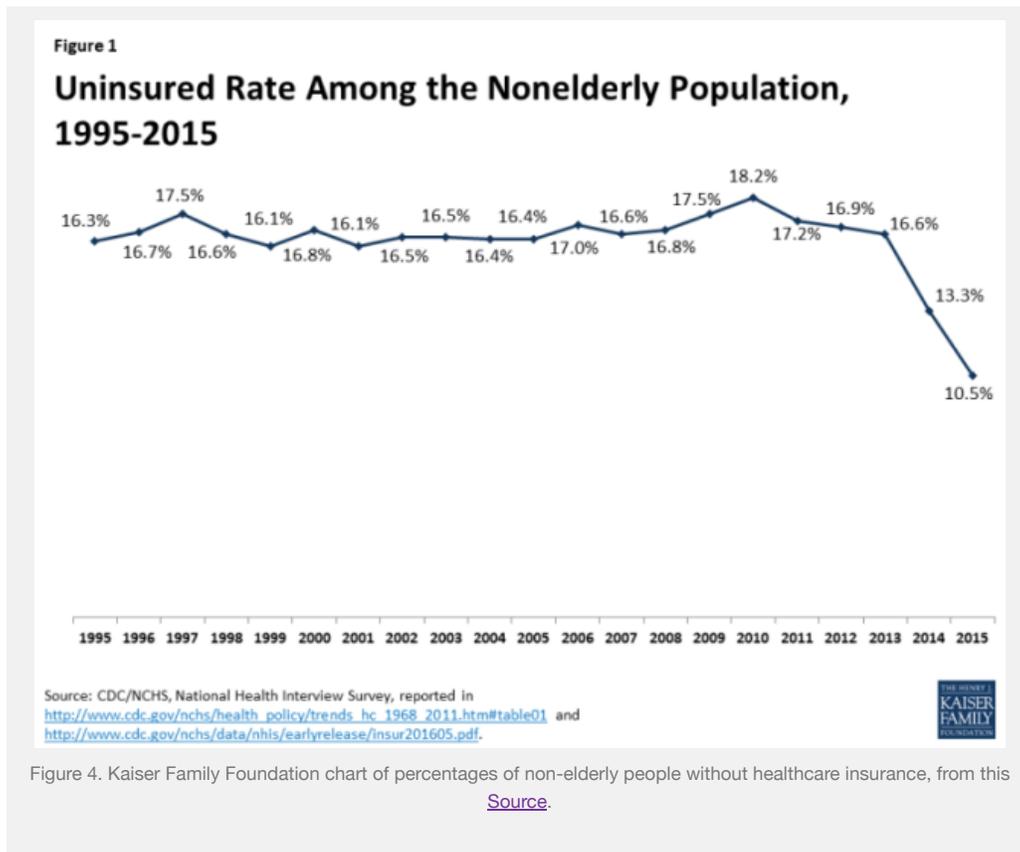


Figure 3. US Healthcare costs as a percentage of GDP and as a percentage of wages. Healthcare costs from cms.gov. Wages and salaries and GDP from BEA.

The increase in healthcare costs since 2008 is one of the costs putting pressure on the economy, and leading to a need for lower interest rates.

The Affordable Care Act should be affecting amounts for the latest years, since the ACA started increasing the number of people with insurance starting about 2014.



A person might wonder why 2014 and 2015 costs didn't rise more, with so many more people added to the system. Perhaps care that was being given "free" by hospitals is now being charged back to patients. Or perhaps many of the people choosing to purchase coverage through the program were already insured elsewhere in the system, so were not really added to the healthcare system through the Affordable Care Act.

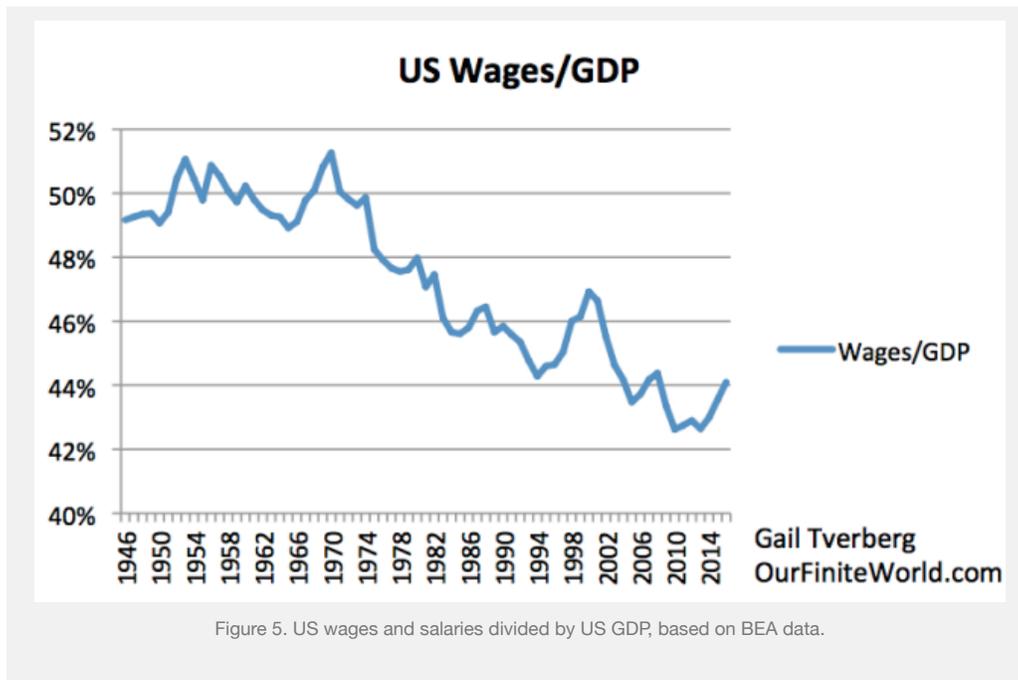
One very recent US healthcare change is the addition of an automatic penalty for not having healthcare insurance. This penalty began for tax year 2016, filed in the beginning of 2017. This provision particularly hurts young people, because rates are structured in such a way that the rates for young people subsidize the rates for older people. Thus, young people often find that buying health insurance is far more expensive than their out of pocket costs for health care would have been, without insurance.

Young people who are affected by this new requirement will find that they need to cut back on other expenditures (such as restaurant visits), if they are meet the requirements of the law—either buy healthcare insurance or pay the mandated penalty. This change will begin to adversely affect the economy in 2016. Bigger impacts are likely in early 2017, when taxes are filed.

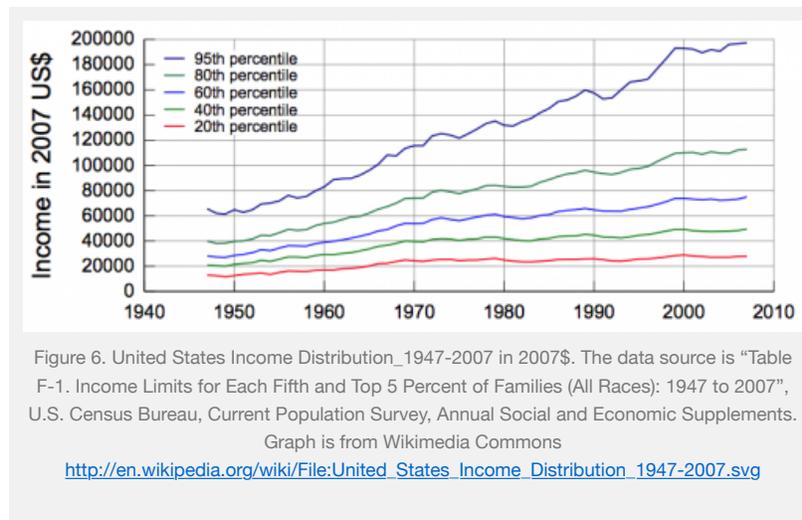
Falling Wages Relative to GDP, and Rising Wage Disparity

The path to lower wages as a percentage of GDP has been a bumpy one. The general pattern is that when the economy is booming, wages tend to grow as a percentage of GDP. Recession tends to send wages down as a percentage of GDP. US wages seem to have increased somewhat since 2013, perhaps because the price of oil is

down, and the US dollar has risen to a relatively high level. This is part of what allows some people to talk about the “tightening labor market,” and gives them confidence in the economy.



There has been significant growth in wage disparity since about 1980, both in the US and in many other developed countries. Figure 6 shows some data for the US.



As the economy becomes more “complex,” in other words, “specialized,” wage disparity tends to be more of a problem. Work that could previously be done by manual laborers is done by machinery, or is transferred to low wage countries. Many people lose their jobs, and have difficulty finding good-paying replacement jobs. All of this contributes to inadequate wages for non-elite workers.

Role of Inflation and Rising Commodity Prices in the Economy

We rarely stop to think how important inflation is to the economy. For example, if inflation is sufficiently high, it will slightly offset normal depreciation in values of homes and business properties. Thus, home and business property values will tend to slightly rise over time. If banks can count on values of structures rising, rather than falling, over time, lenders can assume that mortgage loans are fairly risk-free, because the lender can count on getting its money back through the sale of the property, if the mortgage-holder defaults.

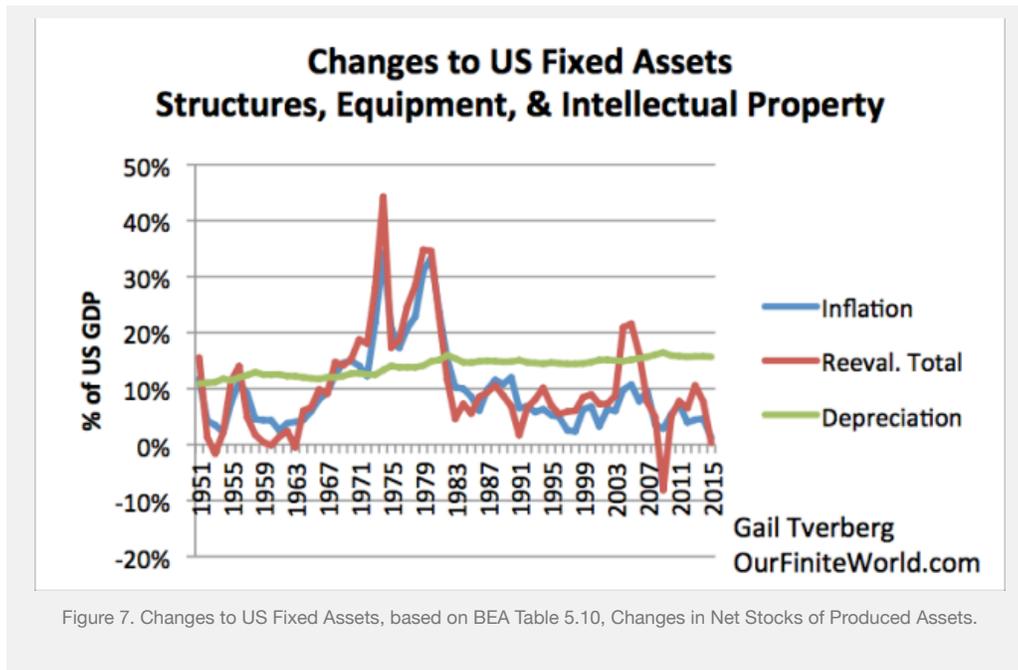
This same principle holds when energy properties, such as coal mines and oil fields, are financed. As long as energy prices keep rising, there is a good chance loans can be repaid. Once energy prices fall, debt defaults become a problem. Oil exporting countries also find that the taxes they can collect fall significantly. As a result, energy-exporting countries are in a far worse economic position once energy prices fall. Exporters of other commodities, such as metals, have a similar problem if prices fall.

In the last two paragraphs, I mentioned the impact on lenders and governments of rising or falling prices. *Owners* of properties are also affected by rising or falling prices. If prices rise, these owners can sell their assets, and make a profit. In fact, these owners have often purchased their properties with debt. If the price of the property rises, but the amount of debt is unaffected by inflation, the owner of the property can often get a disproportionate benefit of the price rise. Of course, if the value of a property falls, the property-owner is disproportionately affected by the fall of the price.

We are so used to a rising-price scenario that we have little understanding of how a flat or falling price scenario might work.

To get a little idea of how much inflation has in the past been working through to asset prices in the United States, I looked at some information provided by the US Bureau of Economic Analysis. I compared these amounts to GDP, rather than asset prices, to get an idea of how much impact they have, relative to each current year's activities (Figure 7). There is about \$3 of assets of the types BEA analyzes for every dollar of GDP, so the impact, relative to GDP, is about three times as high it would be, relative to the asset prices themselves.

If this same relationship holds elsewhere, a person can see why a commodity-producing country might have a big problem, if the price of that commodity suddenly falls. There is huge "balance sheet" impact that doesn't directly affect current GDP as reported (since GDP has to do with current goods and services produced). But it can have a major impact on the country, as it goes forward, because affected loans are much less likely to be repaid. Countries often try to be lenient with lenders, hoping that commodity prices will rise again. But if the drop in prices is permanent, countries must use more and more extreme measures to hide the problem of loans that have a low probability of repayment in a low-priced commodity environment. Eventually, these loans seem likely to default, if prices do not rise sufficiently. China and many commodity-exporting countries seem to be affected by this problem.



BEA shows three amounts of interest with respect to US assets (Figure 7):

1. Inflation – Changes in asset values based on changes in the general price level
2. Re-evaluation total – Changes to asset prices in particular; includes changes because assets are taken out of service because of disaster or because a business is no longer profitable. Note the spikes related to the housing bubble of the 2003-2006 period and the corresponding dip during the Great Recession of 2007-2009.
3. Depreciation – Expected amount of new investment needed to offset “consumption of fixed capital.” This rate is quite high, (about 15.7% of GDP recently) because the asset base includes fairly rapidly depreciating assets, such as cars and computers, besides buildings of all types, and intellectual property such as computer programs.

The last year shown is 2015. Inflation (relative to GDP) was only 1.2%, and the re-evaluation total was only 0.3% of GDP. (Calculated as percentages of the assets involved, these inflation rates would be only a third of these amounts.) These low inflation rates make it very difficult to operate a debt-based economy. A shift from inflation to deflation would be a major problem. Unfortunately, it is very difficult to get much inflation, if the wages of non-elite workers remain very low.

Conclusion

We have kept our economy expanding through growing debt use and growing energy use. I described this process in my post, [What has gone wrong with oil prices, debt, and GDP growth?](#)

Now we seem to be reaching the end of the line. The economy is getting very close to shrinking. When this happens, we are getting close to economic collapse—the economic circus is starting to “leave town.”

People who think our only problem is “running out” and “high oil prices” don’t see the problems the economy is developing right now. These problems are much more subtle, but they can have a devastating effect. The Federal Reserve talks about inflation rates above 2% being too high, but inflation rates below 2% are at least equally problematic. Somehow, the debt system needs to keep operating for the whole system to work.

We are now at the point where the economy is decidedly unstable. Little things can affect it, like the Affordable Care Act requirement that uninsured people buy healthcare insurance, or pay a penalty. Low commodity prices make debt repayment more difficult in countries producing those commodities.

We should not be too surprised if the economic circus starts to leave town. There are simply too many pieces that are now unstable. The US Government is facing a shutdown in the near future, unless its debt ceiling can be raised and funding can be enacted. The world is depending on China for economic growth, but China’s debt is becoming unmanageably high. Japan’s debt is also unreasonably high. Oil exporters are becoming increasingly unstable, with continued low prices. We can find problems in almost every country of the world. It looks like it is only a matter of time, until one of these problems starts a downward spiral.

Note:

[1] Thanks to commenter “Lastcall” for this analogy.

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About Gail Tverberg

My name is Gail Tverberg. I am an actuary interested in finite world issues - oil depletion, natural gas depletion, water shortages, and climate change. Oil limits look very different from what most expect, with high prices leading to recession, and low prices leading to inadequate supply.

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