Why it (sort of) makes sense for the US to impose tariffs

Posted on May 22, 2019 by Gail Tverberg

Nearly everyone wonders, “Why is Donald Trump crazy enough to impose tariffs on imports from other countries? How could this possibly make sense?”

As long as the world economy is growing rapidly, it makes sense for countries to cooperate with each other. With the use of cooperation, scarce resources can become part of supply lines that allow the production of complex goods, such as computers, requiring materials from around the world. The downsides of cooperation include:

(a) The use of more oil to transport goods around the world;

(b) The more rapid exhaustion of resources of all kinds around the world; and

(c) Growing wage disparity as workers from high-wage countries compete more directly with workers from low-wage countries.

These issues can be tolerated as long as the world economy is growing fast enough. As the saying goes, “A rising tide lifts all boats.”

In this post, I will explain what is going wrong and how Donald Trump’s actions fit in with the situation we are facing. Strangely enough, there is a physics aspect to what is happening, even though it is likely that Donald Trump and the voters who elected him would probably not recognize this. In fact, the world economy seems to be on the cusp of a shrinking-back event, with or without the tariffs. Adding tariffs is an indirect way of allowing the US to obtain a better position in the new, shrunken economy, if this is really possible.

The upcoming shrinking-back event is the result of too little energy consumption in relation to total world population. Most researchers have completely missed the possibility that energy limits could manifest themselves as excessive wage disparity. In fact, they have tended to assume that energy limits would manifest themselves as high energy prices, especially for oil.

The world’s networked economy doesn’t work in the simple way that most researchers have assumed. Too much wage disparity tends to lead to low energy prices, rather than high, because of increasing affordability issues. The result is energy prices that are too low for producers, rather than too high for consumers. Producers (such as OPEC nations) willingly cut back on production in an attempt to get prices back up. The resulting shortage can be expected to more closely resemble financial collapse than high prices and a need for rationing. Trump’s tariffs may provide the US a better position, if the world economy should partially collapse.
Let me try to explain some pieces of this story.

1. **Energy is needed to power the world economy. This fact has been missed by politicians and most economists.**

Economist Steven Keen recently developed a graphical explanation of the role energy plays in the world economy. In his graphic, he shows that workers need food (an energy product) just as machines need some sort of energy product to operate. In Steve Keen’s words, “Labor without energy is a corpse; capital without energy is a sculpture.”

![Graphic by Steven Keen](image1.png)

Figure 1. Graphic by Steven Keen, depicting the role of energy in the economy. Energy in the form of food is necessary for human labor, just as energy (in one of its many forms) is needed for physical transformations that make the activities underlying GDP possible. These physical transformations necessarily lead to both the desired products and multiple types of waste.

In fact, there is a physics reason why energy consumption is needed in the economy. Energy “dissipation” is needed for the physical actions underlying GDP. For example, transportation requires a physical movement of people or objects. This can only happen with the use of energy. Even the use of heat or of electricity requires energy dissipation.

2. **China’s huge growth in energy consumption since it joined the World Trade Organization (WTO) in December 2001 is truly amazing. It has changed the world order in a few years.**

China’s energy consumption ramped up very quickly after joining the WTO in late 2001. At the same time, the energy consumption of the US and the EU stagnated, as manufacturing moved to China and other Emerging Markets.
As the shift in energy consumption occurred, jobs shifted elsewhere. Also, the competition with China and other low-wage countries tended to hold down wages of workers whose jobs could be shifted overseas. When we look at labor force participation rates for the US, we see that these seem to have turned down about the same time that China joined the WTO. This suggests that workers started leaving the workforce about the time competition with China ramped up.

3. China is now facing a problem with Peak Coal. Its level of coal production is barely sustainable because of depletion and low coal prices.
If China is to manufacture goods and services for the world economy as well as its own people, it needs a growing supply of cheap-to-produce energy. China’s largest source of energy is coal. China’s coal production hit a peak in 2013 and has been on a bumpy plateau, or falling, since. The problem has been a combination of (a) a higher cost of coal production, because existing mines are depleting, combined with (b) coal prices that do not rise high enough to make production from these mines profitable.

Of course, if coal prices were to rise higher, China would have a different, but equally serious problem: The cost of finished goods created for the world marketplace would be quite a bit higher, making it difficult to export them profitably. If customers’ wages rose at the same time coal prices rose, there would be no problem. The problem could be described in some sense as growing mining inefficiency because of coal depletion. Unfortunately, the world economy does not reward a shift toward inefficiency.

4. **With Peak Coal occurring in China, it makes little sense for the United States, the European Union and others to depend as heavily on China as in the past.**

The economy of every country today is built on debt. If the world economy is growing, this debt pile can rise higher and higher. If interest rates can be brought ever lower, this also helps the pile of debt rise higher and higher.

China’s economy also uses increasing debt to sustain its economic growth. If the economy of China should slow down or start shrinking because of energy limits, debt defaults could start overwhelming the system. Uprisings from laid-off workers might become difficult to quell. The situation could easily spiral out of control.

Economies around the world depend on China for many manufactured goods. In fact, for many minerals, China’s usage amounts to over half of the world’s consumption. This arrangement doesn’t really make sense because (a) China cannot really be depended on for the long term because of coal depletion, (b) jobs that pay well in Advanced Economies are being lost to China and other Emerging Markets, and (c) the level of
concentration of manufacturing in China puts the world system at risk if China has any kind of adverse shift in its economy.

5. The whole idea of buying fuels from other countries only works as long as there is enough to go around.

Many people are of the opinion that if there is not enough fuel of a particular kind, fuel prices will rise, and the market will continue to operate normally. There are at least two reasons why this doesn’t make sense:

**Reason #1.** The issue underlying rising costs of fossil fuels is nearly always *depletion*. For example, with coal mines, the coal closest to the surface in the thickest seams is extracted first. As this is depleted, deeper coal in thinner seams can also be extracted, but the cost tends to be higher. When depletion takes place, it is nearly always possible to extract more of the given fuel if some combination of more human labor and more technology (powered by energy) is used. Of course, adding labor and/or technology leads to a higher *cost of production*.

But the *prices* of commodities are not determined based on the cost of production; prices are determined in the marketplace. They reflect the quantity of finished goods and services made with these commodities, that consumers (in the aggregate) can afford. Extracting coal or another fuel in what is essentially a less efficient manner doesn’t add to what consumers can afford. The combination of flat prices and higher costs leads to unprofitable producers—precisely China’s problem. Producers tend to cut back on production.

We can see that higher energy prices don’t lead to higher wages by looking at what happened when oil prices rose a few years ago in the US. We see that *higher oil prices led to lower average wages because of recession*.  

![Figure 5. Average wages in 2017$ compared to Brent oil price, also in 2017$. Oil prices in 2017 dollars are from BP Statistical Review of World Energy 2018. Average wages are total wages based on BEA data adjusted by the GDP price deflator, divided by total population. Thus, they reflect changes in the proportion of population employed as well as wage levels.](image)

**Reason #2.** If we look back at the timing of Peak Coal in the UK and in Germany, it looks very much as if...
depleting coal supply was one of the causes of both World War I and World War II. Governments know that energy supplies are required to operate their economies. If they cannot get enough energy products internally or through trade, they will fight other countries for access to supplies.

Economists, sitting in their ivory towers, have not stopped to think through the obvious. Their standard supply and demand curve does not work for energy because an adequate supply of cheap energy is needed for both the demand for goods and services (coming from wages workers earn) and the supply of goods and services. Once affordability becomes a problem, because too many people have low wages, the prices of fuels stop rising. It is the fact that prices don’t rise high enough that causes the “peaking” of oil, natural gas, and coal production. Extraction stops, even though there seem to be plenty of resources still available with current technology.

6. A major energy issue today is the fact that China and India have run through their own energy supplies and now need to import energy from outside their countries to supplement domestic supplies.

As shown in Figure 4 (above), China’s coal production stopped rising in 2013, keeping the total amount of energy it produces close to flat. To compensate for this shortfall, China has started to import oil, coal and natural gas. The difference between the thick black line and the top of the “stack” of types of energy produced in China (in Figure 7 below) represents the quantity of fuel that it has needed to import. Clearly, this quantity has been increasing.
India’s coal supply is not yet decreasing, but it is running into a similar problem. It needs to import more and more energy products from abroad, as its energy consumption (thick black line) rises above its energy production “stack.”

7. Worldwide, there is a growing need for imported fuels of many kinds.

Figure 9 shows the imports needed for five major areas of the world. In this analysis, the European Union is treated as a single unit. Thus, in this analysis, the imports it receives are only those from outside the European Union, taken as a whole.
We can see from Figure 9 that the European Union and Japan have been major importers of fuels for a very long time. India and China have only in recent years become energy importers. At the same time, the US is becoming more and more energy sufficient with its own fuel production.

Figure 10 shows the ratio of imported energy to total energy consumption for these five areas.

The US is clearly in a better position than other countries/groups shown, with a smaller share of energy imported in Figure 10 and a declining trend in imported energy in Figure 9. Japan, the EU and India are all subject to substantial risk if available imports should fall.
8. The ramp up of “clean energy” to date has proven to be a major disappointment. The quantities added are far below what the IEA believes is needed.

Partial confirmation of this statement can be seen by observing the tiny orange “Other Ren” bands on Figures 4, 7, and 8 for China and India, which include wind, solar, and other non-hydroelectric renewables. China is the largest user of wind and solar in the world, yet its use of these devices provides only a tiny portion of its total energy consumption.

We have known since the 1950s that fossil fuel supply would eventually become a problem. Academics, with their focus on making models, have been able to come up with hypotheses regarding what might act as substitutes. But these models tend to miss a lot of things, including the following:

- Adverse events, such as Fukushima for nuclear.
- The need for electricity storage and extra long distance transmission lines, as wind and solar usage are ramped up. The cost-benefit analysis is much less favorable with these added.
- Issues that affect only some installations, such as workarounds to keep long-distance transmission lines from starting fires in dry areas, or the high cost of underground transmission lines.
- The best sites are taken early.

It is not until the actual experience arrives that we see how these substitutes are working in practice. If we think back, the nuclear promise of producing electricity that was hoped to be “too cheap to meter” hasn’t really panned out. In fact, many Advanced Economies are cutting back on their use of nuclear.

With respect to “renewables,” (including hydroelectric, wind, solar, and others) the amount of new generation added each year seems to have hit a plateau. It may be that the additional need for storage and transmission lines are already slowing the growth of renewables.

The IEA has started pointing out that far more energy investment is needed if sustainable development goals are to be met—about 300 GW per year, instead of the current 177 per year in additions, on average, between 2018 and 2030.
Donald Trump and his advisors have sensed that the current economic system is not working because of too much wage disparity. If the economic system is destined to break in one way or another, Trump can influence which way the break will occur by the imposition of tariffs.

Trump and his advisors no doubt recognize the importance of a cheap, available energy supply. They also realize that energy is an important enough factor of production to fight over. Furthermore, many past wars have been resource wars. Tariffs are, in some sense, a step toward a resource war.

One of the immediate problems at hand is too much wage disparity. Strange as it may seem, excessive wage disparity can be a sign of inadequate energy supply because in a networked economy, high prices of commodities and low wages of workers are almost “mirror images” of each other. **High commodity prices tend to cut off consumption of commodities (such as oil or coal) by prices of finished goods that are too high for consumers.**

**Excessive wage disparity works in reverse:** It sends prices of commodities (such as coal and oil) too low, cutting off production because prices fall too low for producers of these commodities. Production falls because producers cannot make a profit. When wage disparity is very high, a large share of workers have very low wages, leaving them unable to purchase more than a small amount of high-priced goods (such as cars and homes) made with commodities. It is this low “demand” that holds down commodity prices.

Figure 10 shows that wide income disparities were issues both at the time of the Great Depression and in recent years. Commodity prices have been relatively low each of these times. The problems didn’t look like shortages; they looked like gluts because of issues related to lack of affordability.

![U.S. Income Shares of Top 1% and Top 0.1% Households – Incl. Capital Gains (1913-2013)](image)

*Figure 12. U. S. Income Shares of Top 1% and Top 0.1%. Wikipedia exhibit by Piketty and Saez.*
The US has raised tariffs in the past. One time was immediately before the US Civil War. Tariffs were again raised in 1922 and 1930, when wage disparities were at a high level.

Unfortunately, there is a significant chance that major parts of the world economy will start collapsing, with or without Trump’s tariffs and the trade war, because energy supplies worldwide are not growing sufficiently. In fact, some of these energy supplies are purposely being removed by producers, such as Saudi Arabia, because prices are too low.

By putting tariffs on some goods, Trump is providing a substitute for the missing high oil prices needed to slow the growth of globalization, if the issue of ever-increasing wage disparity is to be solved. The tariffs tend to raise the value of the US dollar relative to other currencies, making the cost of commodities (including fossil fuels) cheaper for US consumers than for other consumers around the world. The tariffs tend to encourage new investment in US production of many types, at the same time that they make investment in other countries, such as China, less appealing.

All of these changes indirectly give the US an advantage if there should be a partial collapse of the world economy. With the benefit of the tariffs, perhaps the partial collapse would leave some combination of countries, including the US and Canada, mostly unaffected. There might be other groups remaining as well. Weak economies, such as Venezuela, Cuba, and Haiti, would likely be pushed aside. Even Europe and Japan would likely have major problems.

**Conclusion**

Most observers have missed the point that excessive wage and wealth disparity can be a sign of serious energy problems, just as high prices can be a sign of short supply. They have also missed the point that coal supply is very important, just as oil supply is very important.

In the real world, when there is not enough to go around, wars are a definite possibility. A trade war is a somewhat reduced version of a war. Trump and his advisors, whether or not they understand the real situation, seem to be trying to guide the US to as good an outcome as possible, in the current situation of excessive wage disparity.

As resources become depleted, it becomes increasingly difficult to maintain economic growth. Industrial output per capita (for example, the number of new cars or number of smartphones per 1000 people) starts falling. The 1972 computer simulations did not consider wages or prices, only physical quantities of various items.

Now, as we can see how the limits are playing out in the real world, it appears that the most prominent manifestation of the world’s low resource problem is excessive wage disparity—an issue most people have never considered as being related to shortages of resource supplies. Few people have stopped to think that goods made with energy products are equally unaffordable whether the problem is prices being too high, or wages of most people being too low.
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 financial problems for oil producers and for oil exporting countries. We are really dealing with a physics problem that affects many parts of the economy at once, including wages and the financial system. I try to look at the overall problem.

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909 Responses to Why it (sort of) makes sense for the US to impose tariffs

Norman Pagett says:
June 2, 2019 at 5:13 am

well worth a half hour to listen to this talk by Jared Diamond

https://www.bbc.co.uk/sounds/play/w3csy937

Duncan Idaho says:
June 2, 2019 at 8:15 am

Diamond is facing reality.

doomphd says:
June 2, 2019 at 5:17 pm

but still not completely. he continues to hold out hope for some solution, if only political leaders would wake up to the problems. he’s still hawking new books at age 80+. perhaps that’s why we needs to sound upbeat about the future. at least he and his publisher apparently feel that way.

Lastcall says:
June 2, 2019 at 4:30 pm

A similar interview from RNZ; obviously book tour time.
No one has changed direction from earlier missives, this will join that collection.

Duncan Idaho says:
June 2, 2019 at 7:04 pm

I agree – we will go until we can’t.
Probably next 10 years.