



## A Few More Thoughts Related to Pedro Prieto's "NINJA" Post

Posted by [Gail the Actuary](#) on May 28, 2009 - 10:00am

Topic: [Economics/Finance](#)

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Pedro Prieto's [post](#) yesterday called "Financial Collapse and Energy - Something Other than a NINJA Problem" was an analogy. As I think about it a little more, there are probably a few refinements that could be made, that don't change the result, but may make the parameters a little different.

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I think that over time, the divergence is between the growth in resources, which Pedro estimates at 3%, and the amount that would need to be paid back *net of inflation*. Thus, the interest rate would be an inflation adjusted interest rate. The inflation adjusted interest would be at least as high as risk free interest rate. It might be higher, if it also includes a margin for failure of a borrower, which needs to be paid back.

If this approach is used, the upper line in Pedro's post would be growing at 3% plus the average interest rate net of inflation. This might be 5% or 6%, rather than the 8.5% used as the upper line in the illustration. I am not sure that this makes any real difference, since over a long period, one ends up with exactly the same result, if one has two compounding diverging rates, whether the spread between the higher and lower one is the spread between 8.5% and 3% or the spread is between 5% and 3%. Compounded over 50 years, 1.03 becomes 4.38, 1.05 becomes 11.47. So there is still a huge difference, so the result is exactly the same as Pedro points out.

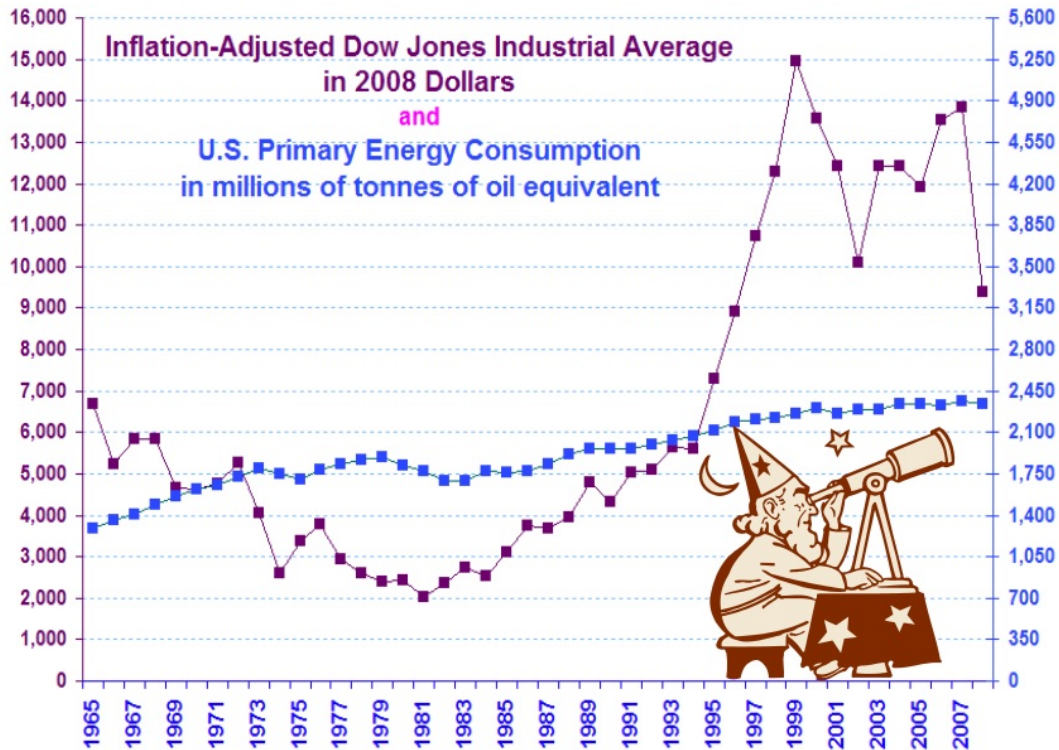
Charlie Hall wrote to me giving his thoughts comparing the inflation adjusted DJIA to the growth in underlying resources. This too still gives a result not too different from Pedro's. Recent stock market growth is unsustainable, if resources begin to decline.

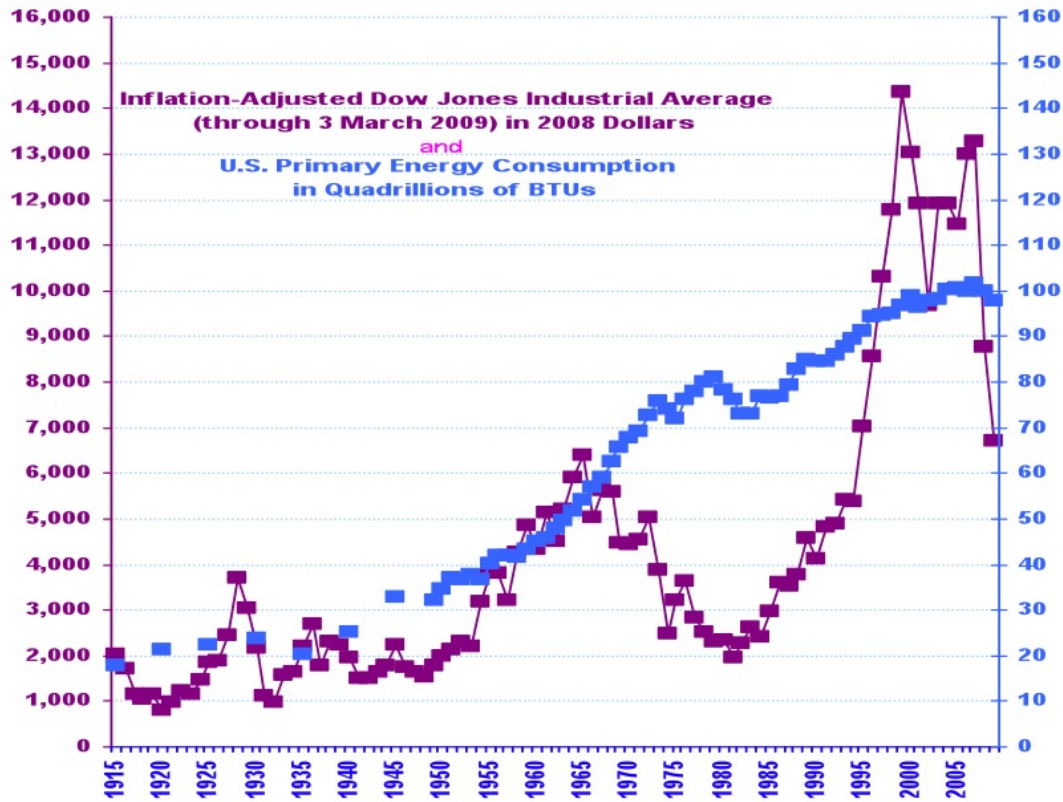
According to an e-mail Charlie sent me:

Charlie Hall agrees very much with Pedro's post (and has with the concept since his graduate school days) as well as with the concept of Biophysical Economics put forth in the comment by George Mobus (see Charlie's own Biophysical Economics website at <http://web.mac.com/biophysicalecon/iWeb/Site/Welcome.html> ). He thought he could add further ammunition to Pedro's post with the following concept and figures:

Charlie (with help from Bill Tamblin) wanted to test the hypothesis that the Dow Jones Industrials as given every day on the news had two components, a psychological one representing mass psychology (i.e. lemming behavior such as irrational exuberance and the converse) and a second one representing real industrial production, which he reasons should be proportional to actual energy use. Thus his hypothesis was that the DJ may move up or down but it eventually has to be constrained by the real energy used (he is not really impressed with "efficiency improvements" as most seem to be just throwing more energy at a problem).

First the DJ must be corrected for inflation, as it is just prices, then the DJ and the total US energy use can be compared by adjusting the scales on each side so that the data overlap: The first attempt, starting in 1961, seemed to show something like that but was not really convincing, the second one, going as far back as 1915 and extending to the DJ's lowest point a few months back (it has since risen to about the energy line), seems to indicate that indeed the Dow Jones industrials has been "snaking around" the biophysical reality of energy use since 1915. This suggests that we may never have extended real growth in the Dow Jones unless we can get an increase in US energy use, which seems doubtful.





Charlie thinks the results give a lot of support to Pedro's post by showing a clear example of the biophysical basis and limits to our economy. This has also been shown clearly in our recent paper in American Scientist "Revisiting the limits to growth after peak oil" which is downloadable from my web site <http://www.esf.edu/EFB/hall/>



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