

## Introduction to Economics Blog

By Richard Olsen

Modern society is divided. On the one hand people have access to advanced technologies in medicine, computers, Internet communication and mobile phones. We make telephone calls around the world from one remote place and frequently do things that appear miraculous. On the other hand, many face abject poverty; one half of the world population subsists on an income of less than USD 2.50 a day as measured in 2005, see World Bank Development Indicators 2008. This is not all; there are other negative factors, such as profligate use of non-renewable resources, large loss of biodiversity, pollution of the atmosphere, and chronic armed conflict and suppression of human rights in many different areas of the world. There is a mismatch: We need to redress the imbalance between technological prowess and poverty and bring the global economy into sync with the environment.

How did this technological inequality come about?

The success story of modern science can be traced back to the courage and imagination of individuals, usually working in supportive institutions which gave them the freedom to overcome preconceived ideas and be highly ingenious. Technological development has flourished when entrepreneurship or warfare has provided a motivation for following ideas up. We get a feeling of just how radical their thinking has been and continues to be: one of most important catalysts of innovation is physics, Albert Einstein, who himself had made the most remarkable discoveries, did not come to terms with all the new ideas: he scorned quantum theory as testified by his quote; I am convinced that He (God) does not play dice; Today, quantum theory is the corner stone of our modern technology. If we want to progress and innovate, we have to be ready to push the envelope of our thinking and follow up the positive new ideas.

The basic principles of economics and politics, of how markets operate and how political states function, were described by people like Adam Smith, David Ricardo and John Stuart Mill or in politics by Jean-Jacques Rousseau, Baron de Montesquieu and John Locke. They developed their theories in the 17th, 18th and early 19th centuries, at the start of the industrial revolution before there was electricity let alone computer technology. When they wrote their articles and books, they did so with an oil lamp; they wrote their texts with quill and ink, quite different to today, where we are equipped with laptops. It is not how they wrote the books that are relevant, but the fact that society was far less developed; it was only partially urbanized. How could they have envisioned all consequences of economic development?

Yes, there followed other major economists, such as John Maynard Keynes and Milton Friedman, or in political theory as Hannah Arendt and Karl Popper. However they did not transform the foundations of economics and politics, but only expanded on the framework established by the founders of economic and political theory.

In natural science this was quite different. There were major discoveries that broke with the past: quantum theory cannot be derived from classical physics; it is a new departure. The same is true for other areas; the theory of evolution is just one example.

To transform economics and politics and set these disciplines on par with the other modern technologies, we have to free ourselves from earlier ideas.

## The Credit Crisis and its Aftermath

The outlook for the economy has deteriorated over the past year and the hardship due to increased unemployment, poverty, environmental degradation and potential military conflicts are growing.

Governments are pulling out all the stops to prop up the financial institutions. They have launched new stimulus programs and are increasing the debt level of the government to prop up demand and reactivate the credit markets. They hope that their programs will be temporary and that the economy overcomes the current lull in production, and economic growth will eventually resume and bring the public finances back into balance. The chances of this strategy succeeding appear slim. One of the key reasons is the large amount of debt relative to GDP (Gross Domestic Product).

The paradigm of growth by burning fossil fuels is also deeply flawed because it leads to runaway climatic warming. A switch is also required because the hydrocarbon reserves are limited and may be more valuable as a source for plastics and chemicals than for energy.

In 2009, for the US economy, for example, the total indebtedness of the private and public sector is close to 400 % of GDP. As long as interest rates are close to zero, interest rate payments have a marginal impact on economic activity and the size of the debt is immaterial. If interest rates rise, however, then this situation changes dramatically. With interest rates at 5 percent, approximately 20 percent of GDP (5 percent interest on 400 percent of debt) is devoted to interest rate payments assuming that there are no investors from abroad ready to buy up the additional debt. This has a knock on effect of depressing asset prices. Leveraged investors, who have been taking advantage of low interest rates to make leveraged bets on increasing asset values, are forced to liquidate their investments. Their sales will propagate the downward spiral.

To date, governments have succeeded in lowering short-term interest rates to historic lows and also reducing long-term interest rates. The central banks have been buying long-term government bonds to lower longer-term interest rates. They have also provided massive help to large financial institutions and in many cases taken public ownership of the banks to provide them with the required equity. The great danger is that the big banks and government as well are funding long-term commitments with short-term debt. As long as the government can keep a lid on interest rates, then this strategy will work. As soon as the investor community balks, then the house of cards can fall together. A likely scenario is as follows: If investors come to the realization that their risk is higher than previously assumed, they will require an increased risk premium for buying government debt, after all the future is very uncertain and there is inflationary pressure and the possibility of default. As this concern spreads, interest rates will start to rise. Governments can delay the onslaught by intervening in the market, as they are currently doing, but this will inflate the balance sheets of the central banks even more, which already look like highly leveraged hedge funds rather than staid government institutions.

The need for increased interest rate payments reduces the scope for regular spending thus depressing economic activity and will make it harder for companies and governments to service their debt. There is a downward spiral, where it will become ever harder for everyone to reach his revenue targets. Asset sales will be made to cover the shortfall in revenue depressing asset prices further and putting additional downward pressure on the economy.

There is another threat that our economy faces: the exponential impact of leverage during a down turn. Leverage is the ratio between assets and equity. If assets are a multiple of equity, then a small change in the value of the assets has a multiple impact on the underlying equity. If an individual buys a house for say 1.1 Mio USD with a mortgage of 1 Mio USD and 0.1 Mio USD of cash, his leverage factor is 10. If another individual buys a house for 0.5 Mio USD with a mortgage of 0.4 Mio USD and 0.1 Mio USD as cash his leverage is only a factor of 4.

If property values drop by 5 percent, then the individual with a leverage of 10 loses 50% ( $10 \times 5\% = 50\%$ ) of his equity and has only 0.05 Mio USD left as equity. The other individual with 4 times leverage loses 20 percent of his equity ( $4 \times 5\% = 20\%$ ). Importantly the leverage of the first individual has increased from a factor of 10 to a whopping factor of 20. However the individual who started with leverage of 4 has increased his leverage only to 4.75.

If there is an additional drop of 5 percent in property prices, the individual with leverage 20 loses all of his equity and is wiped out and forced to sell his house. The individual with a leverage of 4.75 loses 23.75% of his equity; bad, but not disastrous.

The highly leveraged individual has to sell the house during a decline in house prices; the down move occurred precisely because other people were also selling. So he has to sell at precisely the wrong moment, thus further depressing house prices, which might wipe out other owners as well.

If the market price had dropped slightly less, say only 2.5%, the highly leveraged person would not have had to sell. So in effect, it is just this last move; or final straw of 2.5% that brought about the sale. Because he did not have an additional 25000 USD to absorb the final price move, he was forced to sell the house valued at 1m CHF there is a multiplier effect: an initial loss of 25000 USD leads to a sale of an asset 20 times the size of the initial loss.

If the down move of prices is gradual, individuals will be able to sell their assets in an orderly fashion. If the price move is abrupt and they have negative equity, where obligations exceed the value of assets, there is a high likelihood of bankruptcy. In the case of bankruptcy, they have to sell all their assets driving down prices of assets across all markets.

In early 2009, many individuals and large companies are being driven into bankruptcy. These liquidations lead to a sudden increase in selling volume and is a large release of energy; an initial shortfall of  $x$  has a multiple of  $x$  impact. In the example of above, a shortfall of 25000 USD leads to the sale of a house valued at 1 Mio CHF. In 2008, Lehman Brothers failed to raise an extra 5 billion USD and was forced to file for bankruptcy on the 15th of September 2008, causing a sell off in the stock market and a further freezing of the credit markets, which ultimately forced governments around the world to prop up their banking sectors. All told the explosive impact of the Lehman bankruptcy is in the trillions of USD causing a lot of damage.

This is simple mathematics: the impact of leverage is highly non-linear. When losses accelerate, leverage levels increase, amplifying the impact of subsequent changes of market prices. At critical levels, relative small additional price moves can bring about liquidations of the underlying assets or in more extreme cases bankruptcies: when this happens a relatively small shortfall has an explosive impact.

The current economic situation is precarious: governments are stemming the tide of collapsing economies by massively increasing expenditures and buying troubled assets

thus increasing leverage. The nonlinear leverage effect applies to all players, individuals, and corporations and last but not least to governments themselves. We are running the risk that whole countries will go bankrupt. If this happens, it will bring about a detonation that will force massive asset sales, disrupting regular business, threatening the basic social fabric of society; there might be poverty not just in developing countries, but suddenly in the industrialized world.

Unfortunately, the hardship will not be contained there, on the contrary. The developing countries and poorest regions of the world will be hit the hardest, remittances will collapse, aid will be cut back and last but not least the markets for export products of developing countries will collapse as well. Let us hope that this scenario does not come to pass. The mere fact that the outlined sequence of events is possible should increase our resolve to transform our economic and political systems and come up with more innovative solutions than increasing debt that may ultimately lead to a leverage squeeze.

The impact of the credit crisis has not uniform around the world: it has depended on the cycle of the local economy, its reliance on revenue from commodities and degree of development of the financial system. South America has remained relatively unscathed, but this is likely to change, as the crisis spreads,

The inequality of society and the environmental issues are exacerbated by the economic crisis. The cost of redressing the imbalances increases, if action is delayed. In the planned contributions a whole array of initiatives across many different dimensions are sketched out: my hope is that their interactivity will reinforce their impact.

The planned contributions will be interdisciplinary: there are proposals for the financial markets, labor markets and organization of politics. On a more general level, I plan to discuss our understanding of society and its evolution and sketch out a theory of interaction. This theory sheds light on some of the central issues that philosophers have been discussing.

There are lots of topics to discuss, so let us get started. I invite you to ask questions: this will enrich the blog. Thank you for participating.

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Richard Olsen is founder and chief executive of Olsen Ltd and the Chairman of OANDA, a leading foreign exchange broker and market maker.

# OLSEN

Olsen Ltd is a research and development company and investment manager based in Zurich, Switzerland. Olsen has yielded practical applications and managed accounts and third-party products, investing in currencies as a separate asset class or as an overlay to an existing currency exposure.

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Olsen Ltd  
Seefeldstrasse 233  
8008 Zürich, Switzerland

Phone +41 44 386 4848  
Fax +41 44 422 2282

[www.olsen.ch](http://www.olsen.ch)