Investment Insight

Commodities and Emerging Markets: "The Stone Age did not end for want of stones"[i]

Before the summer break, I happened to book tickets at my local theatre for a new play of the autumn season titled "Oil." This is how it was described:

> The Bronze Age. The Iron Age. The Age of Oil. The Stone Age didn't end for want of stones. What do you do when you know it's going to run out? Oil follows the lives of one woman and her daughter in an epic, hurtling crash of empire, history and family. The world premiere of an explosive new play which drills deep into the world's relationship with this finite resource.[ii]

Not only did the theme arouse my curiosity but the synopsis encouraged me to do some research. I found out that the Almeida Theatre had truncated the second part of Sheikh Ahmed Zaki Yamani's quote. Sheikh Yamani was the Saudi Arabian oil minister from 1962 to 1986 so he could be expected to know a thing or two about oil. What he predicted in March 2000 is just the opposite of what the play is about: Just as "the Stone Age did not end for want of stones, the Oil Age will end long before the world runs out of oil".

It is worth recalling Sheikh Yamani's role during the 1973 oil embargo, when he induced the Organization of Petroleum Exporting Countries (OPEC) to quadruple the price of crude oil. Only years later OPEC realized that it was more sensible to aim for prices that would be set as high as possible, but not so high as to push consuming countries into recession or to favour alternative technologies.

Technology created the 20th century's insatiable demand for commodities with all its political, economic, environmental and social consequences. Sheikh Yamani's prediction from 2000 is our reality today. The seemingly unlimited supply of shale oil and the increasing viability of renewable energy is now hastening the end of the Age of Oil.

But the lesson is not limited to oil. Predictions of depleting resources on the planet leading to scarcity have been as wrong in history as they are today. Research and innovation in energy, metals and agricultural commodities are leading to abundance not scarcity. We are at a turning point that makes us hopeful about humanity's continued ability to prosper despite the myriad of issues we face. The impacts on emerging markets in particular will be profound and are important considerations as we think about the opportunities and the risks we see in our investments.

Scarcity or Abundance?

> The power of population is so superior to the power of the Earth to produce subsistence for man, that premature death must in some shape or other visit the human race.
>
> Reverend Thomas Robert Malthus, *An Essay on the Principle of Population*, 1798-1826

Reverend Malthus, the English cleric and scholar around the turn of the 19th century, argued that increases in population would eventually diminish the ability of the world to feed itself and based this conclusion on the thesis that populations expand in such a way as to overtake the development of sufficient land for crops. Fortunately Malthus and his

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modern devotees have been proven wrong.

Oil is the most conspicuous example. Since the 1970s oil shocks, growth in global oil consumption has slowed overall, with consumption in developed markets stabilising even as consumption in emerging markets has continued to grow. New discoveries have not met the increase in consumption for the past decade. Oil prices soared to $147/bbl and the talk was all about Malthusian "peak oil," a theory developed by M. King Hubbert, a US geologist, in 1974.

Sheikh Yamani

Although the price of oil is often taken to be the main driver of demand, it also affects supply as oil companies expand their production as long as projects are deemed profitable. Improvements in technology are time-consuming and costly but the availability of oil is ultimately a function of its price and higher oil prices ultimately lead to larger reserves.

Sheikh Yamani has been proven right. Increasing oil prices fuelled improvements in exploration and production technologies that have made previously unknown or unviable oil reserves in deep offshore and oil sands locations viable. Improvements in technology have also led to declining production costs that have turned known but unexploited fields profitable. Recovery rates have risen from 25% in the 1970s to 35% today.

Two years ago oil prices plummeted from the $100/bbl level to levels below the break-even costs of those very off-shore and oil sands reserves that were seen as offering the last reprieves from imminent shortages and soaring prices as recently as ten years ago.

Reverend Malthus

The critical US shale oil break-evens have dropped from $80/bbl in 2014 to below $50/bbl in South Texas (Eagle Ford) and even $39 in West Texas (Permian Basin). Since the collapse of high oil prices that paid for the shale innovation, average costs per barrel have dropped by 35% for US shale wells, compared to about 10% for other oil projects.

Reserves have increased as a result of unconventional oil to the point where the world's supply of oil and gas appears limitless within any actionable political or economic timeframe. At the same time advances in technology have enabled economies to reduce their demand for oil and to diversify their energy supplies through renewables, thus diminishing the oil producing countries' grip.

The decline in oil prices was spurred by OPEC's strategy of aggressively boosting its low-cost production, with the specific but erroneous goal of shrinking the importance of shale oil. It is the opposite and yet similar to the ultimately futile boycott of 1973. OPEC

governments are of course highly dependent on oil prices. Their reserves are plentiful and among the lowest cost to produce. However, by allowing prices to rise by so much for so long, OPEC ultimately lost its pricing power.

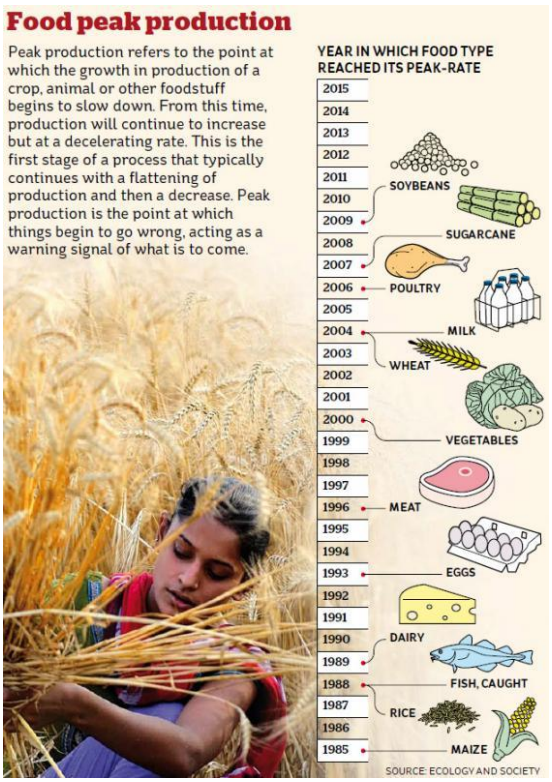
With the lower shale oil break-evens, it is clear that OPEC will not succeed in making it unviable. Instead, its policy to increase volumes and maintain market share must be an attempt to maximize its profits at oil price levels that reflect this new marginal cost of supply and before Sheikh Yamani's prediction is eventually realised in full.

The Age of Oil is coming to an end. We are witnessing the first throes, the collapse of prices and the end of unconstrained pricing power of suppliers. What will finish it for good are the technological advances were are seeing towards better alternative energy sources, the production, storage and transmission of renewable energy on a scale that we can only imagine with the foresight Sheikh Yamani had in 2000.

What about Malthus and peak food?[iii]

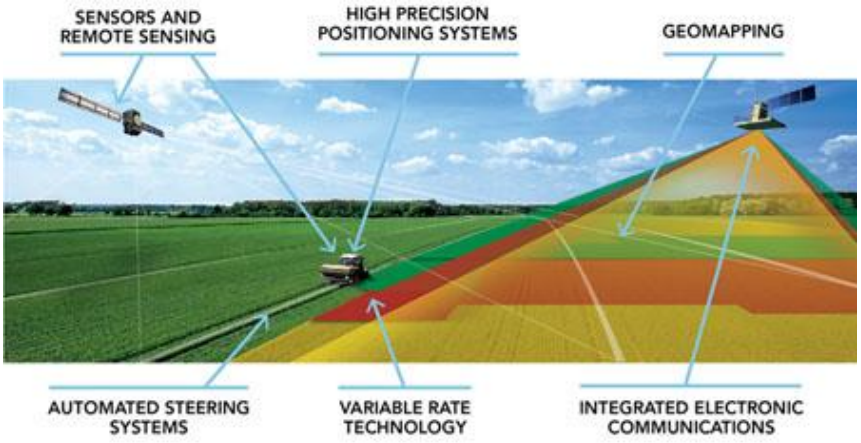
According to the Food and Agriculture Organisation of the United Nations (FAO), the global population will grow by 35% over the next 35 years. Goldman Sachs has calculated that assuming the current pattern in protein consumption, a 1.5% CAGR in food supply will be required to match demand.

While China's consumption of oil, base metals and other commodities is the stuff of daily headlines, its domestic food production issues are relegated to the back pages. China has been a net importer of grain for the last seven years. 20% of the grain consumption of its 1.4 billion population comes from imports, mostly from the US and Brazil. With increasing prosperity their protein/ capita consumption has risen by 150% over the last 25 years. Every 25 kilograms of beef protein consumed requires 150 kilograms of grains or other plant protein, in addition to 2.5 million litres of water and a barrel of oil.



According to various studies, Peak Rice was reached in 1988, Peak Wheat and Milk was in 2004 and Peak Chicken was in 2006. Peak Food is defined as the moment at which the rate of growth of food production declines, not the quantity of the food produced.

Whilst in Malthus' times demand growth was solely met with acreage expansion the FAO expects that cultivated land will only increase by 4% over the next 35 years. The balance (70% of the expected growth in food production) will come from yield. This will be mostly the result of precision farming, which has delivered greater accuracy in planting, fertilizing, spraying and irrigation.



Advances in hardware, software and computing power have delivered cost savings of up to 60%, yield improvements of 15-20% and a 4% reduction in fertilizer consumption.

India, where half of the working population has an occupation in connection with agriculture and only half of the 200 million hectares of arable land is rain-fed, is seeking to apply precision irrigation methods pioneered in the USA. The concept is to use remote analysis to assess soil moisture and crop development. Prime Minister Narendra Modi is promoting his "per drop, more crop" approach to farming, enabling a satellite crop monitoring system to make better use of scarce water, notably during the monsoon season.

So far, human ingenuity and economic incentives applied to farming have proven modern Malthusian doomsters wrong. A strong supply response has largely met the challenges of growing populations, greater demand for protein as income rises and not least, the geopolitical mismatch between supply and demand.

The message is clear however: innovation and technological advances are critical to ensure that food, energy and other supplies are not just sufficient but necessary for the wellbeing of the world's population; and therefore its political and economic stability, and its prosperity.

An Age of Innovation: Emerging market economies and the need to adapt

The consequences of this new age are harsh. Weaker commodity prices are one of the main reasons why the IMF cut its outlook for global growth over last three years. In 2016 it highlighted a number of emerging market countries that have to do more to find growth models to replace the commodities and credit-driven booms since 2000. Brazil and Russia in particular are two of the countries that fall into this category of commodity exporters which are highly dependent on commodity prices.

This is much more easily said than done of course; but the winners will be those countries that are able to capitalize on the competitive advantage offered by their access to cheap commodities, and to transition to more balanced, competitive and diversified economies. They will be the ones able to avoid a repeat of Venezuela's travails, which has been forced to sell its gold reserves to pay for imports and service its external debt despite owning one of the world's biggest crude oil reserves.

As the IMF highlights, government and governance have a critical role to play. Governments can facilitate the transition by investing in infrastructure, human capital and productivity.

For better or for worse, the production of commodities in emerging market countries is often under the direct influence of government policies. Energy companies, for example, tend to be state-owned.

In our Emerging Markets Debt portfolio, two out of three of our energy holdings are bonds issued by government-controlled companies. Petrobras, for example, which we analysed in depth in one of our Insights *O Que Sera Petrobras* earlier this year, clearly epitomizes Brazil's oil sector, accounting for 90% of upstream production and 50% of fuel supply. It is at the centre of Brazil's ambition to become energy self-sufficient.

Over the years, some importing countries have been resourceful in reducing their dependence on exporters and single commodities. Preoccupied by "what to do when you know it is going to run out", they have sought to implement policies to develop alternatives.

Despite its political and economic issues, Brazil has innovated and diversified its energy matrix. Today, renewable energy sources represent 42% of domestic energy supply compared to an average 10-15% in the OECD. In addition to its huge investments in hydroelectricity, Brazil has become the world's largest producer and exporter of sugar with the lowest production cost thanks to a competitive supply chain. Ethanol now supplies 16% of the total domestic energy needs. It is primarily used in vehicles, either in pure form or blended with gasoline.

In a different way Mexico has been successful in limiting its reliance on oil exports, which account for just 6% of total export revenues, with manufacturing at 90% of the total. President-elect Trump has raised the issue of these manufacturing exports into the US, especially in autos, but we suspect this may be a somewhat ill-judged criticism as the US auto majors such as Ford and General Motors have substantial manufacturing operations in Mexico, which export to the US and elsewhere. These two economies are intertwined in many ways.

Governments also have a role to play in terms of the environment, developing environment-friendly policies, establishing regulations and developing sustainable sources of energy.

The US as the consumer of one-quarter of the world's oil has an important example to set it in terms of greater energy conservation. But emerging market countries at the top of the supply chain have to contribute to the change and adapt to the new age whereby

innovation can lead to abundance.

Again, in Brazil today 97% of the sugar production is mechanically harvested compared to 48% in 2009. With manual harvesting, sugarcane leaves were burnt to make cutting the cane easier, which was highly detrimental to air pollution. Similarly, mechanized farming is now 77% of the planting compared to 33% in 2009.

An Age of Opportunities

> If the present growth trends in world population, industrialization, pollution, food production and resource depletion continue unchanged, the limits to growth on this planet will be reached sometime in the next 100 years.
>
> The Club of Rome think tank, 1972

In some respects it seems extraordinary that the harbingers of doom around scarce resources could be so consistently proved wrong over so many centuries. In each case the intellectual logic of their position appeared almost unassailable. But in each case they underestimated the indomitable spirit of mankind to repeatedly innovate and adapt to effectively expunge these threats. This has occurred over just a few decades to end the Age of Oil and over some two hundred years in respect of Peak Food, which still is a concern today.

We believe that our world has now moved into an Age of Innovation, which supports greater confidence in our ability to deal with future scarcity issues. Undoubtedly they will arise and appear insurmountable but in all probability they will be defused with greater speed than in the past.

In our approach to investing we are therefore extremely sceptical of pricing power stimulated by excess demand. We focus on companies that have pricing power based on innovation, enduring competitive advantages, a business model that can withstand disruptive forces, and a restless management culture seeking consistent growth in real value, even in times of uncertainty like we are experiencing.

These are the attributes of companies in developed and emerging markets that can adapt to the challenges, contribute to innovation, growth and sustainable development of their economies, and generate value over time. They are at the core of our conviction in investing with quality and value as a central principle.

Catherine Blanc-Adams

15th November 2016

[i] Sheikh Ahmed Yamani, Saudi Arabia's Minister of Oil and Mineral Resources from 1962 to 1986, coined this since often quoted phrase in a 25 June 2000 *Telegraph* interview.

[ii] Almeida Theatre – 2016/17 Season – *Oil* by Ella Hickson.

[iii] Seppelt, Ralf et al., "Synchrony of peak-rate years suggests challenges to sustainable development", Ecology and Society 20(2):33.