

Backgrounder: Cyclical? Structural? Secular?

PortfolioConstruction Forum | 09 February 2015

This PortfolioConstruction Forum Backgrounder was conceived and published by PortfolioConstruction Forum as core pre-reading and to set the scene for PortfolioConstruction Forum Markets Summit 2015, whether attending the live onstage program or after the fact via the [online Markets Summit 2015 Resources Kit](#). Markets Summit facilitates debate on the drivers of and outlook for the markets, one of the three pillars of portfolio construction (the other two being, Strategies and Investing). This Backgrounder will materially assist in maximising your continuing professional development outcome.

PREFACE

The US is winding down its QE program, but Japan and Europe are ramping up. Australia's golden era of prosperity is over. Oil prices have fallen over 50% in the last 12 months. Currency wars are well underway. With divergence a global theme, which cyclical, structural and secular issues are really driving the outlook for markets?

This Backgrounder first defines the terms "cyclical", "structural" and "secular" and then provides examples of each. The aim is to increase the clarity of debate about what's really driving the outlook for markets. Intentionally, this Backgrounder does not attempt to answer the question "which cyclical, structural, and secular issues are really driving the outlook for markets" – that is the arena for PortfolioConstruction Markets Summit 2015 (<http://portfolioconstruction.com.au/markets-summit/2015-markets-summit-resources-kit/>).

This Backgrounder was researched and authored by PortfolioConstruction Forum's Research Editor, Angela Ashton and edited by Partner & Managing Editor, Deirdre Keown.

We trust this Backgrounder helps you to further development your portfolio construction philosophy, by enhancing your clarity of what cyclical, structural and secular issues – and, combined with the materials available in the online Markets Summit 2015 Resources Kit, it helps you better understand the key market and asset class opportunities (and risks) ahead, to aid in your search for return and in building better quality investor portfolios.



Graham Rich, Managing Partner & Publisher, PortfolioConstruction Forum

INTRODUCTION

Investor Ralph Wagoner once explained how markets work:

"He likens the market to an excitable dog on a very long leash in New York City, darting randomly in every direction. The dog's owner is walking from Columbus Circle, through Central Park, to the Metropolitan Museum. At any one moment, there is no predicting which way the pooch will lurch. But in the long run, you know he's heading northeast at an average speed of three miles per hour. What is astonishing is that almost all of the market players, big and small, seem to have their eye on the dog, and not the owner."¹

The world we live in is a funny place. In attempting to settle on something that is primarily cyclical to discuss in this white paper, we observed that most of the standard partial indicators (unemployment, industrial production, inflation and so forth) are being affected not just by the standard business cycle at present – many are also facing significant structural and secular forces.

For example, unemployment faces headwinds associated with a secular technological unemployment trend. How is our ability to decipher the meaning of unemployment statistics and wage data affected by not fully understanding how those cyclical and secular trends are interacting? Is there a new level for full employment being set, or is part-time and casual employment the new norm? Is this good or bad?

Interest rates and monetary policy – good cyclical indicators – are being stretched in new and wonderful ways by many of the developed nations. Is there a structural element to this? Will it have secular implications? Or is the cycle just deeper and longer than most that have come before? It's certainly not normal. How does this new approach to monetary policy affect the previously simple cyclical nature of our interest rate cycle?

And commodities? They were a simple guide to the state of global growth. However, until recently, prices and demand were held hostage by structural change in the Chinese economy, only to now be dumped to levels not seen in decades as China and other economies continue to slow. Cyclical? Structural? Secular?

In this paper, we have considered one indicator or trend that fits into each box in a little more depth. Short-term interest rates are an important gauge to the outlook in today's markets, while oil prices provide a good structural trend to delve into. Lastly, we consider an important secular trend, the digitisation of business processes and introduce the idea of widespread technological unemployment. It is a world full of challenges, with many trends having elements of being cyclical, structural and secular.

1. CYCLICAL TRENDS

Cyclical issues are those related to the state of the economic cycle, influenced by the business cycle, measured in quarters or years.
(e.g. short-term interest rates)

There are many indicators that have at least some cyclical component to them. One of the most obvious is short-term interest rates.

Interest rates are usually set by a country's central bank. Central banks will have a range of objectives that they need to meet by using this, their only real, lever. Objectives vary between countries. For example, in Australia, the one primary objective the Reserve Bank (RBA) focuses on is keeping inflation within its nominated band, which is between 2% and 3%. It has been remarkably successful in doing this.

The US Federal Reserve (the Fed), on the other hand, has a range of objectives – maximum employment (they believe the natural rate of unemployment is about 5.5%), stable prices (inflation of about 2%) and moderate long-term interest rates (ie bond yields).²

The European Central Bank (ECB), responsible for monetary policy throughout the Euro area, has the primary objective of "maintaining price stability, safeguarding the value of the Euro".³

Monetary policy and interest rates have been a major point of focus for many in the markets since the Global Financial Crisis (GFC). Interest rates fell to rarely-before-seen lows in many countries in the years following the GFC as central banks tried to revive failing economies. In the vast majority of cases, interest rates remain there still.

Countries such as the US, Japan and the UK also resorted to unconventional monetary policy, including quantitative easing (QE), being monetary stimulus that can be used when interest rates are already at or around 0%. QE is considered quite risky as it has only been undertaken in a handful of cases,⁴ in order to provide even more stimulus. Very low levels of inflation, bordering on deflation, and high levels of unemployment (which we will talk more about later) that continue in much of the world has allowed these extraordinary monetary conditions to remain.

Even over the past few weeks, the ECB has surprised markets by the size of its new QE programme, India, Canada and Denmark have cut rates, while the Singapore dollar has been managed unexpectedly lower.⁵ China, the only real engine of global growth through the GFC, cut its interest rates in November 2014 – for the first time in over two years – by 0.4% to 5.6%, still very high by global standards.⁶

Here in Australia, the majority of market commentators believe interest rates will continue to fall this year. Inflation now sits below the RBA's preferred range at 1.7%. Recent falls in the oil price may lead to even lower levels. Growth has remained below potential since the GFC and the even the RBA recently lowered its growth forecast for 2015 to a lacklustre 2.75%,

based at least partly on falling commodity prices.⁷ Some argue that the only real issue holding the RBA back in cutting interest rates is the spectre of the residential property market becoming even hotter.⁸

Given the Fed has been signalling the end of its easing cycle for at least 12 months, it is now positioned as the outlier in an otherwise fairly synchronised global interest rate cycle.

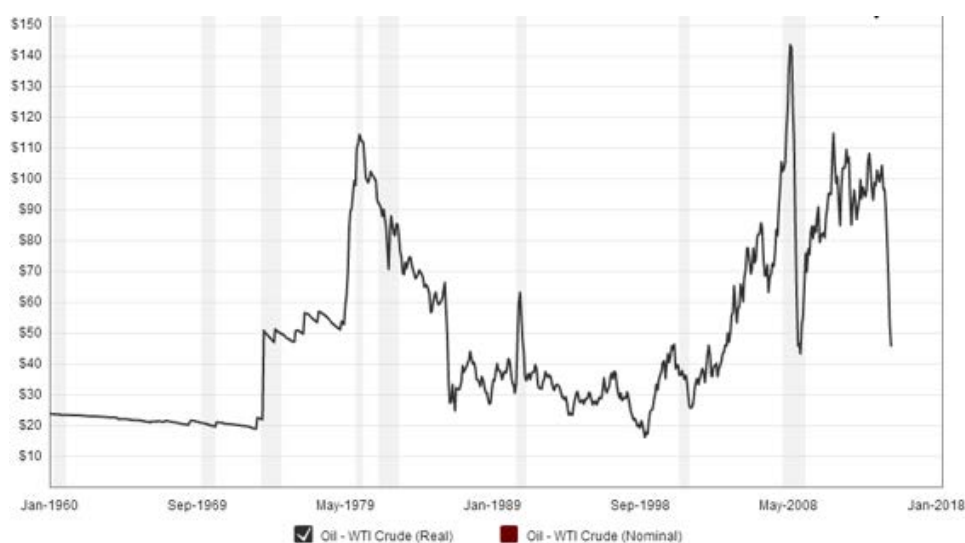
What does this mean for other cyclical indicators such as global bond yields? And currencies? And what about the old adage about when the US sneezes, the rest of the world catches a cold? Can the US sneeze the world into rosier health this year?

2. STRUCTURAL TRENDS

Structural issues relate to the composition or operation of an economy, industry or market. Structural issues can emerge from sustained cyclical issues that are left unchecked. Similarly, structural issues can emerge from secular issues. Structural issues include deficits, household debt, labour force composition, composition of government spending, taxation, immigration, composition of economic growth, acts of nature (e.g. the Japanese earthquake, oil prices).

One of the most important structural issues that has come to the fore over the past six months or so has been the fall in the price of oil. As shown in Figure 1, the inflation-adjusted price of oil since the formation of OPEC⁹, real oil prices are now at levels not seen since around 2005.

Figure 1: The Inflation Adjusted Price of Oil 1960–2014¹⁰



Sources: Macrotrends

There are a number of theories as to why oil prices have fallen to the extent they have. In this Backgrounder, we examine the economic fundamentals of oil supply and demand, geopolitical issues and some other macroeconomic indicators.

Global production of oil currently stands at approximately 93 billion barrels per day (93bbl/day),¹¹ up from 84bbl/day in 2004.¹² Figure 2 shows the top 10 producers, at various points in time.¹³

Figure 2: Top 10 Global Oil Producers – production as a % of global production and amount (bbl/day)
(those underlined are OPEC members)

December 20014		December 2009		September 2014	
Country	% (bbl/day)	Country	% (bbl/day)	Country	% (bbl/day)
<u>S Arabia</u>	<u>13.0% (10.9)</u>	Russia	11.7% (10.0)	US	15.3% (14.0)
Russia	11.2% (9.4)	<u>S Arabia</u>	<u>11.5% (9.9)</u>	<u>S Arabia</u>	<u>12.4% (11.6)</u>
US	10.6% (8.9)	US	11.0% (9.4)	Russia	11.3% (10.6)
<u>Iran</u>	<u>5.0% (4.2)</u>	<u>Iran</u>	<u>4.9% (4.2)</u>	Canada	5.0% (4.6)
China	4.5% (3.8)	China	4.7% (4.1)	<u>Iraq</u>	<u>3.8% (3.5)</u>
Mexico	4.4% (3.7)	Canada	3.9% (3.3)	Brazil	3.6% (3.3)
Canada	3.7% (3.1)	Mexico	3.5% (3.0)	<u>Iran</u>	<u>3.6% (3.4)</u>
Norway	3.6% (3.1)	<u>UAE</u>	<u>3.3% (2.8)</u>	<u>UAE</u>	<u>3.5% (3.2)</u>
<u>Venezuela</u>	<u>3.5% (2.9)</u>	Brazil	3.0% (2.5)	<u>Kuwait</u>	<u>3.0% (2.8)</u>
<u>Kuwait</u>	<u>3.0% (2.5)</u>	<u>Kuwait</u>	<u>2.9% (2.5)</u>	Mexico	<u>3.0% (2.8)</u>

Source: US Energy Information Administration. Author's own analysis.

The US's unconventional oil¹⁴ production boom has led to it becoming the world's largest producer and has increased US production by about 40% since the end of 2009. However, the cost of US production¹⁵ is much higher than 'conventional' oil.

It is difficult to source good cost of production data, but some simplified data appears below.

Figure 3: Approximate current cost of oil production¹⁶

Region/Country	Approx average cost per barrel (\$US)
Middle East	27 (Saudi Arabia is cheapest, African countries most expensive in OPEC)
Russia	50
North America Shale	60 – 65
Oil sands	70

Source: Ro 2014

At the beginning of 2014, OPEC estimated that supply of oil would grow around 10% for the decade 2010 to 2020, or around 0.7% per annum,¹⁷ so slow growth in supply is expected.

The largest net importers of oil in the world are the US (even with its increased production), China, India, Japan and Korea.¹⁸ In these countries, stockpiles have been growing. Chinese stockpiles grew 9% last year to about 244m barrels,¹⁹ while the US now has its highest level of reserves in 80 years, at over 400m barrels.²⁰

The World Bank estimates oil demand will fall about 0.8m bbl/day (around 1% per annum). On the other hand, OPEC forecasts suggest a small annual rise in demand of a similar magnitude. Regardless, peak oil demand in North America, Europe and the Pacific occurred in 2005.²¹ OPEC suggests that 71% of any growth in demand is expected to be in Asia, while China accounted for about half of all the increase in demand over the past decade.²² Regardless of the exact dynamics of demand, the World Bank states the size of the changes to demand and supply in 2014 are similar to 2012 and 2013.

So why has the price of oil collapsed? Over the past year, a number of other issues have impacted oil prices.

- The US dollar rose about 10% during the second half of 2014, so some commodity price adjustment could reasonably be expected.
- A number of supply side issues did constrain supply somewhat until early 2014. This included the rise of Islamic State (IS) in Iraq and protests in Libya, as well as theft and sabotage in Nigeria. As at least some of these issues were resolved, supply came back on line.
- A range of other geopolitical concerns, centred on Russia and the Middle East, also helped to hold prices up. Many of these concerns also eased during the second half of 2014.

- Most importantly, OPEC changed its objectives in late 2014. It moved from providing price stability to the market to wanting to maintain market share.²³

At its November 2014 meeting, OPEC formally decided to change its long-standing objective of keeping oil prices fairly consistent by manipulating its own production, to instead signaling that it would allow market forces to dictate the price. It would instead attempt to maintain market share. In the medium term, it expects higher cost producers to eventually exit the market, thus allowing prices to eventually rise. The decision was led very much by Saudi Arabia, the most important and influential member of OPEC.

OPEC stated at the time that it is undertaking this action to combat the US shale boom.²⁴ However, there are a number of influential commentators who believe that the US is actually not the main target of these actions. After all, Saudi Arabia and the US remain allies and the US is still the world's largest importer of oil. Further, US oil production (being light crude) has primarily displaced production from the African nations of Nigeria, Angola and Algeria, rather than Middle Eastern oil.

OPEC's actions also harm Russia, Iran and Venezuela, with all of whom the US has issues. Russia, being a higher cost producer of oil and already facing a range of economic sanctions due to its actions in the Ukraine, has suffered significantly since oil prices began falling, with the rouble collapsing. Iran, with whom Saudi Arabia has issues based on the Syrian and IS conflicts, is also a comparatively high cost producer within OPEC and it lobbied for prices to be held high. Coupled with the sanctions it currently faces, the price fall represents a significantly negative impact on its economy.^{25 26 27}

Since OPEC was formed, there have been a number of times when oil prices has halved and stayed down for at least six months. Each time this has happened, a major acceleration of global growth has occurred.²⁸ This is expected to occur again.²⁹ This current event, which is regarded as a supply-side shock, is similar to 1985/86. A sluggish global economy, recovering from "the recession we had to have" with inflation and bond yields beginning their long march downward, found new technologies (deep sea drilling) that led to a glut in oil. OPEC chose to protect market share by not stabilising prices, leading to an oil price collapse. Price levels remained well under those that had prevailed previously for around 15 years,³⁰ till 2004 when Chinese demand began to push prices up again. Global growth through that period was quite strong.

In the years immediately after the 1985/86 oil price drop, the global economy did slow overall, particularly in developing nations. However, growth did remain at generally good levels, at 3.5% in 1986 and 2.8% in 1987 and was likely to have been lower without the stimulus of lower oil prices.^{31 32} Negative effects were generally considered to be contained to those industries, while much of the broader economy benefitted. However, more expensive oil producers and those countries more dependent on oil revenues such as Mexico, Venezuela and Canada did suffer from significantly falling revenues. The USSR was even more negatively affected.

This time, it is expected that, for consumers, lower oil prices will stimulate demand overall. It is estimated the average US citizen will save US\$800 on fuel based on the year-on-year change, equivalent to a 2% pay rise.³³

Lower oil prices will also act to limit inflation and, possibly, provide weaker nations with further opportunity to use monetary policy or other unconventional monetary policy tools to further stimulate economies, if required.

On a country by country basis, there will be some divergence in the effect of lower oil prices, depending on whether countries produce or import oil. For countries such as Canada, the outlook is weaker. For countries whose budgets depend on higher oil prices such as Russia, Nigeria and Venezuela, the outlook is grim.³⁴ For the US, the effect is two-fold. Some fracking-related businesses may find drilling uneconomical. However, it is estimated that the average price of oil produced through fracking is about US\$60 per barrel, so many will remain viable at lower levels. The fact that the US remains the world's largest net importer of oil should mean that the lower price will be an overall positive.

Most commentators believe oil prices will now remain low for some significant period. The World Bank's recent Commodity Markets Outlook forecasts an average price of US\$53/barrel, around 45% lower than 2014, slowly rising in real terms each year to a level of US\$83 by 2025. The IMF's forecasts remain subdued as well. The most bearish credible forecasts, the author found forecasts around \$80/barrel³⁵, based on futures markets. This is still well below levels of early 2014.

It is likely that lower oil prices will act to stimulate the global economy, assisting many regions to finally recover from the GFC. However, it is likely to also exacerbate issues associated with climate change (which can be viewed seen as a secular issue).

3. SECULAR TRENDS

Secular trends are long-term, deep-rooted changes that are external to the markets. They are measured in one or more decades, and the timing is uncertain – they happen when they happen. (e.g. the ageing demographic, lower fertility, technology, the entry of women into the labour force in the 1970s, baby boomer exiting the labour force from the 1990s, digitisation of business processes, etc). Secular issues can lead to structural issues – for example, the ageing demographic has and will continue to change the structure of government spending and taxation.

Some of the most important secular trends of the past few centuries include railroads, telephones, cars, modern sanitation. All generally encompass the idea of networks – that is, many of these important advancements changed the world is because they allowed people to connect with each other, or with a network of some sort, more easily. Many of these

innovations have another similarity – they have been often characterised by large fixed costs (water pipes, roads, airports, the NBN) with little variable cost.³⁸ So once they are set up, people can join easily. They lead to profound economic and market change.

For example, the introduction of the railway in the US led it growing from being an economy smaller than Italy to being the largest economy in the world in only 40 years (over the period 1850–90).^{36 37} Of course, as a result, the structure of the world economy changed forever.

On the other hand, after the introduction of electricity into factories, it took 30 years for productivity to improve – but then it improved dramatically. Initially, machines were electrified, meaning work became easier, but processes did not change. It took a new generation of managers to fully understand how processes could change in order to take full advantage of electricity.³⁹

So, effects are generally long and slow,, often with a few booms and busts throughout as people and markets anticipate change too quickly, or in the wrong form.⁴⁰ Nonetheless, secular trends leave an indelible mark – society is never the same again.

Some of the secular trends taking place in the world today are based in new technologies such as nano–technology, bio–technology and information technology. Facets of these over–arching technologies will lead to structural changes. But exactly what facet is important?

Consider digital technologies. They clearly allow networks and connectivity between people to be created more easily. However, these networks are different to many of the networks that have come before – fixed costs are very low. This means that their proliferation has been and will be much quicker than other physical networks that have come before.

There are currently six billion mobile phones in the world. This sounds staggering, but most are 2G only, so they do not provide internet access. Although this is still a remarkable statistic, it pales in comparison to forecasts that by 2020, 90% of the world's population will have a phone and approximately 95% of these will be 3G or 4G.⁴¹

It's expected this connectivity will allow us to manage some of the world's biggest problems more easily. Issues such as carbon emissions and healthcare will be remarkably improved by our ability to communicate throughout the world more easily and cheaply. It will create jobs and will raise the productivity of those who are currently unable to contribute to global production.⁴² Even if their contributions remain marginal, the increase from current very low levels, will mean the potential global workforce will explode. This is clearly a positive.

However, while this may be the beginnings of our next cheap unskilled workforce, it also carries the seeds of their obsolescence. Automation or, more correctly, digitisation of many simple business processes is occurring at a rapid rate. This is the "New Machine Age".⁴³ Digitisation of processes has the potential to revolutionise many of our everyday work practices, and has already done so. Many lower–level jobs have already been digitised (telephone operators, typists, secretaries, factory workers). In fact, it is estimated that 80% of our current economic growth is from this second digital economy, with human beings

stagnant.⁴⁴ Even roles that could be considered somewhat "skilled" such as tax return preparation, are now being digitised. Since the introduction of TurboTax by Intuit in the US, 17% of tax preparers are no longer employed in this field.⁴⁵

Nonetheless, much of the digital technology being created is still so new, its full effects are far from being realised, let alone being integrated into the economy.

A key issue that has emerged in the past few years is that our machines are now intelligent.⁴⁶ This may sound like science fiction but consider some illustrations.

Consider the driverless car, currently being used by Google to compile Google maps. Mercedes, Audi, Nissan and BMW all expect to sell driverless cars by 2020. This is a clear example of an intelligent machine – it will sense other cars on the road and will react accordingly. It is expected that this will herald the end of the truck driver and the cab driver, probably within a decade (so a secular change – digitisation – may lead to a structural change i.e. it may change the composition of employment). It is also expected to lower the incidence of car accidents by 90%.⁴⁷

Overall, it's predicted that 45% of current jobs in the US will be done digitally within 10 years.⁴⁸ Again, digitisation will lead to structural change (e.g. to employment composition).

There is evidence that this trend is already affecting society. Global unemployment has not improved since the GFC and is, in fact, increasing. Levels of youth unemployment are high in most countries. Participation rates are falling and remain below pre-GFC levels.⁴⁹ In particular, the length of time to find a job is high and there are growing signs of people are leaving the labour market or finding only part-time work. Those most affected in developed countries are men with little or no college-level education – the traditional blue-collar or lower-level white collar worker.⁵⁰

Most commentators believe that the highly skilled will continue to find employment, while those "in the middle" will find it more difficult. Those at the lower levels of employment (cleaning, aged care, etc) will continue to find opportunities.⁵¹ This may have some cyclical, or structural, elements – albeit that is touted as being a secular trend by those in this field of expertise.⁵²

Beyond changing the composition of employment, and likely increasing unemployment and therefore, potentially, increasing inequality if this change is not managed well in a societal sense, what are the other potential outcomes of the New Machine Age?

- There will be a decoupling of productivity and labour, wealth and work. Fewer people will work, but their productivity will be extremely high.
- The New Machine Age has the potential to provide an abundance of 'things'.
- It may lead to a world where we don't need to undertake drudgery or toil.

- It creates a world where the returns to labour (and potentially capital) are low, but the returns to ideas can potentially be high. Creativity and entrepreneurship will be valued more highly.
- It is potentially a world of significant amounts of leisure time, or potentially significant amounts of unrest, if some people are left behind and they become disenfranchised.

If we accept that at least some of this potentially astounding secular change will come to pass, one of the most important questions becomes – how do we ensure shared affluence? There are no easy answers. However, it is not technology that is creating inequality. Our institutions and current ways of rewarding people are the cause. The industrial revolution changed the world's approach to school and taxes⁵³ (i.e. more structural change). Similarly, we must consider how society will change to accommodate people in the new digital age given we will not be able to stop it.

SUMMARY & CONCLUSION

Cyclical issues are those related to the state of the economic cycle, influenced by the business cycle. They can be measured in quarters or years.

Structural issues relate to the composition or operation of an economy, industry or market. Structural trends can emerge from sustained cyclical issues that are left unchecked. Similarly, structural issues can emerge from secular issues. Structural issues include deficits, household debt, labour force composition, composition of government spending, taxation, immigration, composition of economic growth, acts of nature (e.g. the Japanese earthquake).

Secular trends are long-term, deep-rooted changes that are external to the markets. They are measured in one or more decades, and the timing is uncertain – they happen when they happen. For example, the ageing demographic, lower fertility, technology, the entry of women into the labour force in the 1970s, baby boomer exiting the labour force from the 1990s, etc. Secular issues can lead to structural issues – for example, the ageing demographic has and will continue to change the structure of government spending and taxation. Effects of secular trends are generally long and slow, often with a few booms and busts throughout as people and markets anticipate change too quickly, or in the wrong form. Nonetheless, secular trends leave an indelible mark – society is never the same again.

Understanding cyclical, structural and secular trends, how they related to each other and how they drive the outlook for investment markets, is essential to building better quality investor portfolios. The challenge is to remain informed, and to apply that information to portfolios through a robust portfolio construction philosophy and decision-making framework.

ENDNOTES – REFER REFERENCES FOR SPECIFICS OF EACH SOURCE.

1. Housel, 2014
2. US Federal Reserve
3. ECB
4. Japan over the past few decades is the most important example
5. Singapore uses its currency to effect monetary policy change
<http://business.asiaone.com/news/malaysian-ringgit-hit-singapore-easing-monetary-policy>
6. The Economist Nov 2014
7. Evans 2015
8. Mitchell 2015
9. OPEC is the Organisation of Petroleum Exporting Countries. It unifies and co-ordinates members' petroleum policies. It currently consists of 12 member states including Saudi Arabia, Iran, Iraq, Venezuela and Nigeria.
10. Macrotrends
11. US Energy Information Administration – please note that different sources seem to have different amounts. For example, OPEC quote current global production of about 85m bbl/day. In any case, the order of size of production seems to be generally agreed upon.
12. There is lots of commentary that suggests oil production is falling. That is not true. The composition of types of oil produced has changed, however.
13. US Energy Information Administration and author's own work
14. Which includes fracking and oil sands
15. Ro 2014
16. Ro 2014
17. OPEC, 2014
18. US International Energy Agency, 2014
19. Rudinsky, 2015
20. US International Energy Agency 2015

21. OPEC, 2014
22. Swanson, 2015
23. World Bank, 2015
24. Reuters 2014
25. Carpenter 2015
26. Moran 2014
27. Plumer 2014
28. Kaletsky 2015
29. Arezki and Blanchard, 2014.
30. They ranged between \$50-\$120 up to 1985, and then averaged in the \$20-\$40 range till 2005ish, when Chinese demand pushed them back up
31. www.economywatch.com
32. Keohane, 2015.
33. The Economist Dec 2014
34. The Economist Dec 2014.
35. O'Neill 2015
36. Arthur 2011
37. Gordon, 2013
38. World Economic Forum 2015
39. Brynjolfsson 2013
40. World Economic Forum 2015
41. World Economic Forum, 2015
42. World Economic Forum 2015
43. The word and time constraints of this paper, as well as the intellectual constraints of the author necessarily limit our analysis.
44. Arthur 2011
45. Brynjolfsson 2013
46. based on the definition that intelligence is the ability to react appropriately to a change in state. Even EColi bacteria do this – they move towards food sources, for example.
47. Shapiro 2015
48. World Economic Forum 2015

49. International Labour Office 2014
50. Gordon 2013
51. Arthur 2011
52. Gordon 2013, Brynjolfsson 2013, McAfee 2013
53. Brynjolfsson 2013

REFERENCES

Arezki, R. and Blanchard, O., "Seven Questions about the Recent Oil Price Slump", IMF blog, 2014. Found at <http://blog-imfdirect.imf.org>.

Arthur, B., "How Technology is recreating the 21st Century Economy", Seminar at Palo Alto Research Centre 2011. Found at <https://www.parc.com/event/1499/how-technology-is-recreating-the-21st-century-economy.html>

Brynjolfsson, E., "The key to growth? Race with the machines", TedX talk, February 2013.

Found at

http://www.ted.com/talks/erik_brynjolfsson_the_key_to_growth_race_em_with_em_the_machines?language=en

Carpenter, T.G., "Washington and the Geopolitical Benefits of Plunging Oil Prices: Real but Limited", Cato Institute, January 2015. Found at

<http://www.cato.org/publications/commentary/washington-geopolitical-benefits-plunging-oil-prices-real-limited>

Economy Watch. Found at www.economywatch.com

European Central Bank website. Found at

<https://www.ecb.europa.eu/ecb/tasks/html/index.en.html>

Evans, B., "RBA to cut next week", Macrobusiness blog, January 2015. Found at

<http://www.macrobusiness.com.au/2015/01/bill-evans-rba-cut-next-week/>

Gordon, R.J., "The Death of Innovation, the End of Growth", TedX, February 2013. Found at

http://www.ted.com/talks/robert_gordon_the_death_of_innovation_the_end_of_growth?language=en

Housel, M., "122 Things Everyone Should Know About Investing and the Economy", The Motley Fool, December 12, 2014. Found at

<http://www.fool.com/investing/general/2014/12/12/122-things-everyone-should-know-about-investing-an.aspx>

International Energy Agency, "2014 Key World Energy Statistics", 2014. Found at

<http://www.iea.org/publications/freepublications/publication/KeyWorld2014.pdf>

International Energy Agency, “Summary of Weekly Petroleum Data for the Week Ending January 23, 2015”, 2015. Found at <http://ir.eia.gov/wpsr/wpsrsummary.pdf>

International Labour Office, “Global Employment Trends 2014: Risk of a Jobless Recovery”, Geneva 2014. Found at http://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_233953.pdf

Kaletsy, A., “A New Ceiling For Oil Prices”, Project Syndicate, January 2015. Found at <http://www.project-syndicate.org/commentary/oil-prices-ceiling-and-floor-by-anatole-kaletsy-2015-01>

Keohane, D., “Re-re-visiting the 1986 oil crash”, FTAlphaville blog, January 2015. Found at <http://ftalphaville.ft.com/2015/01/21/2095432/re-re-visiting-the-1986-oil-crash/>

Macrotrends, www.macrotrends.net Found at <http://www.macrotrends.net/1369/crude-oil-price-history-chart>

McAfee, A., “What Will Future Jobs Look Like?” Ted. X talk, February 2013. Found at https://www.ted.com/talks/andrew_mcafee_what_will_future_jobs_look_like

Mitchell, A., “Interest rate cuts held back by property”, The Australian Financial Review, January 2015. Found at http://www.afr.com/p/national/interest_rate_cuts_held_back_by_dsFGQkPYrs2x4GGYZkwBdN

Moran, M., “Is Saudi Arabia Trying to Cripple American Fracking?” ForeignPolicy.com, December 2014. Found at <http://foreignpolicy.com/2014/12/23/is-saudi-arabia-trying-to-cripple-american-fracking-oil-iran/>

O’Neill, J., “The Price of Oil in 2015”, Project Syndicate, January 2015. Found at <http://www.project-syndicate.org/commentary/price-of-oil-in-2015-by-jim-o-neill-2015-01>

OPEC, “2014 World Oil Outlook”, 2014. Found at www.opec.org

Plumer, B., “Why oil prices keep falling – and throwing the world into turmoil”, Vox, January 2015. Found at <http://www.vox.com/2014/12/16/7401705/oil-prices-falling>

Reuters, “Al-Naimi: OPEC ‘must combat US shale boom’”, www.arabnews.com, 29 November 2014. Found at <http://www.arabnews.com/featured/news/667156>

Ro, Sam, “The Middle East has a huge advantage in the Global Oil Market”, Business Insider Australia, May 2014. Found at <http://www.businessinsider.com.au/crude-oil-cost-of->

[production-2014-5](#)

Rudinsky, J., “Oil Slides to Near 6 Year Low: Saudi Arabia Holds Firm Despite Supply Glut”, Bloomberg, Jan 26 2015. <http://www.bloomberg.com/news/2015-01-26/oil-slides-to-near-6-year-low-as-u-s-supply-seen-worsening-glut.html>

Shapiro, J., “Carnegie Asset Management’s Bo Knudsen explains his picks”, Australian Financial Review, January 29, 2015. Found at http://www.afr.com/p/markets/market_wrap/carnegie_asset_management_bo_knudsen_Uai_dVNBBKH0I2iLS5EIMHI

Swanson, A., “The Oil Price Tag that Investors Say Would Signal a Global Recession”, Forbes, 22 January 2015. Found at <http://www.forbes.com/sites/anaswanson/2015/01/22/the-magic-number-that-investors-say-will-signal-a-global-recession/?ss=energy>

The Economist, “The right call”, The Economist, November 2014. Found at <http://www.economist.com/blogs/freexchange/2014/11/chinas-interest-rates>

The Economist, “Sheikhs v Shale”, The Economist, December 2014. Found at <http://www.economist.com/news/leaders/21635472-economics-oil-have-changed-some-businesses-will-go-bust-market-will-be>

US Energy Information Administration

<http://www.eia.gov/cfapps/ipdbproject/iedindex3.cfm?tid=50&pid=53&aid=1&cid=&syid=2014&eyid=2014&freq=M&unit=TBPD>

US Federal Reserve, “What are the Federal Reserve’s objectives in conducting monetary policy?”. Found at http://www.federalreserve.gov/faqs/money_12848.htm

World Bank “Commodity Markets Outlook”, January 2015. Found at

http://www.worldbank.org/content/dam/Worldbank/GEP/GEPcommodities/GEP2015a_commodity_Jan2015.pdf

World Economic Forum, “Inclusive Growth in the Digital Age “, Seminar at World Economic Forum, Davos Switzerland, January 2015. Found at <http://www.weforum.org/events/world-economic-forum-annual-meeting-2015>