

# The Ghost In The Machine

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# EDITOR'S NOTE

Welcome to the September edition of  
**The Ghost in the Machine**

As an eventful summer draws to a close, welcome to the latest edition of 'The Ghost in the Machine'. This month, we are focusing on Big Data and its likely impact on the way we lead our lives. We are also catching up on what has been happening in the markets while many market participants have been away on vacation.

'Big Data' has, undoubtedly, been the buzz-phrase of the year, but what is it exactly? In fact, Big Data seems to mean different things to different people but there is sufficient agreement that company systems that depend on the storage and analysis of data on a petabyte scale qualify as Big Data. It is the massive expansion of computing power that has created the conditions for a Big Data approach to gathering and using business intelligence.

Yet the potential gains to a business from use of Big Data do not flow automatically. Whereas the data challenge up to now has been to get enough of it, lifting this constraint still leaves a business having to decide what questions to ask of the data. There is still no substitute in business planning for focused thinking.

Access to more data is unlikely to help governments and central banks improve their economic policymaking because they do not know what questions to ask. They are in thrall to models of economic behaviour that are, at best, outdated. Further, the changes in economic processes that are likely to stem from the utilisation of Big Data will tend to undermine the concepts that Economists currently use when they try to get to grips with what is happening.

In short, the possibilities present in the Big Data revolution could well shift business activity on to a different plane as surely as did Henry Ford's adoption of production-line methods. The economic, social and investment implications will likely be profound. It is a challenging prospect.

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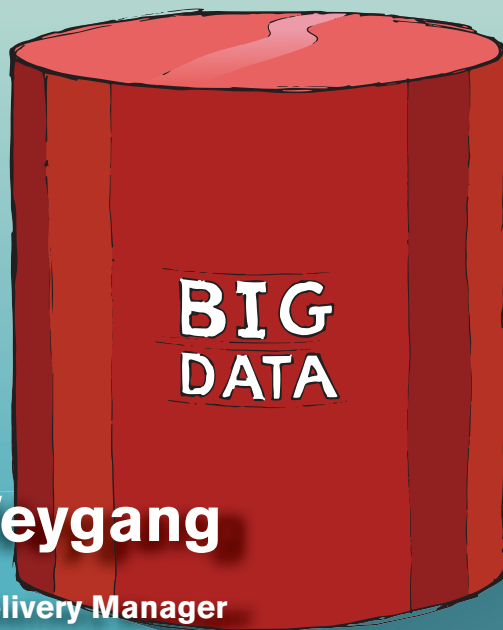


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## SO WHAT DOES BIG DATA MEAN?

Oxford Dictionary Definition - Extremely large data sets that may be analysed computationally to reveal patterns, trends, and associations, especially relating to human behaviour and interactions

IT guy Definition - A buzz word to help an “IT guy” describe to a “non IT guy” that they are having to deal with a lot of complex data that is causing or going to cause IT a daily migraine!

You will often read in the press that big data is a top business priority for most companies and drives enormous opportunities for business improvement. One study projects that big data will be a \$50 billion business by 2017.

With such an ambiguous term, big data can be baffling for people to grasp as it means different things to different people. The manifestation of the big data expression was first used in an academic paper about 16 years ago but the reality is what was considered big data yesterday is today's norm. For example in 1880, United States had a big data problem as the country Census took eight years to process. With ever growing population it was estimated that the 1890 census would take more than 10 years using the then-available methods,

in other words the process would not have been complete before the next census which was due to start in 1900. The solution to the problem was the invention of Hollerith tabulating machine (punch cards) created by Herman Hollerith.

The invention won the competition for the 1890 US census, chosen for its ability to count combined facts. The machines reduced a big data issue and shortened a ten-year job to around 1 year. Hollerith is now widely regarded as the father of modern automatic computation making punched card as the basis for storing and processing information. It turned Hollerith into an entrepreneur and his company eventually became part of what we know as IBM.

So what does “Big Data” mean? Isn't big data just another way of saying ‘business analytics’? There are lots of debates & disagreement around this but analyst firms are now using “business analytics” as an umbrella term for solutions that turn data into value. The big data movement, like analytics before it, seeks to gather business intelligence from data and translate that into business advantage. Gartner state “big data is high-volume, high-velocity and high-variety information assets that demand

cost-effective, innovative forms of information processing for enhanced insight and decision making“. As big data continues to mature and bring new challenges, so does the definitions. More recently some described big data by “5Vs”(Volume, Velocity, Variety, Veracity & Value).

**Volume** – The amount of information being generated, how long is data valid and how long should it be stored. The production of data is growing at an astounding rate; nowadays more data crosses the internet every second than what was stored in the entire internet just 20 years ago.

**Velocity** – The speed at which new data is created and the rapid rate of change. NYSE captures one terabyte of trade information during each trading session and high-tech exchanges can now allow firms to execute more than 100,000 trades in a second for a single customer.

**Variety** – There is now a broad range of information sources including both structured and unstructured data i.e. social media, video, pictures, podcasts, tweets, mobile technology, security trading, market pricing and news. Eighty percent of the world's data is now unstructured and therefore cannot easily be put into tables or relational databases.

**Veracity** – The legitimacy and accuracy of information, for example typing errors, abbreviations/shorthand texting and informal speech are all challenges.

**Value** – The end goal and most importantly, the ability to leverage the information you have and turn the data into real business value. The big data term is commonly used when a company system is collecting, storing, and analysing rapidly changing data on a petabyte-scale normally to help with maximising profits, reducing risk, and meet increasingly stringent regulatory requirements.

What a petabyte? In our ever-growing home & personal technology world most people are now use to hearing term Megabyte (MB) or Gigabyte (GB) relating to the amount of information that can be stored for their music players like Apple iPods. Now Terabyte (TB) is becoming more common for PC hard drives, entertainment units and recording

TV. A petabyte is approximately 1,000 terabytes or one million gigabytes. Just 1 petabyte is equal to over 900 billion pages of plain text and 50 petabytes equals the entire written works of mankind, from the beginning of recorded history in all languages.

The speed at which technology is changing to cope with the ever-increasing demand for more storage with faster response and at a cheaper cost often amazes me. To put this into perspective when I started working in IT in the 80's IBM produced the first hard disk drive to have Gigabyte capacity (2.52 GB), it was as big as a refrigerator and started selling for about £52,000 which equates to about £172,000 in today's money. Roll forward 30 odd years and you can now buy 64 Gigabytes memory sticks that attaches to your key ring for under £15.

# BIG DATA

## Why all the hype with big data?

If you can leverage the data correctly then it becomes the Holy Grail guiding business decisions and strategy, for example, a company could create a strategy that includes weather data, social data or geolocation in real time, coupled with low latency technology, to develop smarter or algorithmic forecasting trading decisions. In fact, IBM revealed in March a strategic partnership with a weather company as part of an overall \$3 billion investment. This will allow IBM to gather information from the combined network of 100,000 weather sensors and the data pulled from mobile devices, connected vehicles, airplanes, and smart buildings, to generate usable business analytics. With historical and current weather data, businesses will be able to pull the information to help with risk management decisions related to weather commodity hedging.

Of course big data is not just being used for financial gain, in 2013 the UK & US regulators fined commodities trader Michael Coscia £2 million for moving the price of commodities, ranging from

oil to wheat. Coscia wrote a computer programme that placed and cancelled bids all in milliseconds with the aim of illegally manipulating the price of commodities. The small needle in haystack type trades brought in less than £260 each, but their high frequency over six weeks netted Coscia £1.8 million profits. Regulators uncovered his spoofing by using big data programs assigned to interpret ubiquitous time-stamping data.

### So why the IT migraine?

Each of the 5 V's presents their own IT challenge:

**Volume** – IT are already dealing with pressure on storage due in part to the lack of data ownership and the ever growing data retention requirements because of regulation and compliance demands. Then there is the new data legislation requirements from directives such as MiFID II with its additional transaction reports and voice recording retention moving from 6 months to 5 years. It is hard enough to predict current growth but how do you start to predict the growth of data generated when new sources of data are growing all the time? Considering most new technology devices and applications are now logging and reporting information be it market information, medical statistics, GPRS location, smart phone app data, fitness accessories, video streams, cars etc. According to one study by Oracle, it estimated that the volume of business data worldwide across all companies doubles every 1.2 years. Therefore, it should not be surprising that data is growing at a faster rate than previously predicted. Currently it is expected that as of 2013, the digital universe would grow from 4.4 trillion gigabytes (in IT terms 4.4 zettabytes) to 44 trillion gigabytes by 2020, i.e. doubling every two years.

Even when you think your big data is focused with predictable sources, where are you going to store it all. Disk storage has become cheap but it is still going to look expensive when you are talking about several million gigabytes. If you start at 5 million gigabytes worth of storage via the cloud, it would cost somewhere in the region of £2 million.

**Velocity** – Today people have got used to an instant response and often get frustrated when they have to wait a while for an answer. The slowest part of the computer is its hard drive storage so IT will need to constantly do maintenance tasks to limit

performance issues as the more you store the longer it can take to search and get a response.

**Variety** – As mentioned earlier, nearly 80% of big data is unstructured which means IT will need to translate/map and integrate all of the relevant internal and external sources. Additionally to avoid a data hole it will be important to keep up with new sources coming online, as you can imagine that is no small task.

**Veracity** – As Forrest Gump said “stupid is as stupid does” i.e. you can have the most powerful system in the world but if you feed into your big data system a lot of unstructured data with no data definition/mapping (i.e. data tagging also known as metadata) added with data errors you will clearly get misleading results. IBM stated that 1 in 3 business leaders do not trust the information they use to make decisions and poor data can cost businesses 20%–35% of operating revenue. It is reported that poor data quality costs the US economy \$3.1 trillion a year.

In 2013, only 22% of the information in the digital universe could be used by an analysis, i.e. because it had been tagged. More often than not, we know little about the data, unless it is somehow characterised or tagged. Out of the 22% that could be analysed less than 5% was actually analysed. By 2020, the useful percentage could grow to more than 35%, mostly because of the growth of data from embedded systems.

### Final thoughts.

This article only gives a very small insight into big data so there is a great deal of decisions and questions a company needs to consider before implementing/using big data effectively to avoid unnecessary expensive IT bills. Such questions like, should my big data system be hosted in house or hosted for me in the cloud? Originally, consultancy firms would have probably guided you to host such a system in house as cloud options/ vendors were rare but today there are more companies offering such solutions. The reality is, unless you are a technology company or a very large enterprise/have almost a bottomless IT budget, you will need to use cloud services. Of course, you can do a hybrid approach such as use the cloud just for storage or concentrate on a more focused cloud solution like



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Eka - Commodity Analytics Cloud. An important issue to consider if you are going to use the cloud is what happens when you want to change vendors or a vendor becomes too expensive, how do you move such large quantities of data? Most vendors are good at letting you import data but make it more cost prohibitive moving the data away. The costs of moving the data and repointing data sources may leave you signed up for life.

Whatever you decide, you will need to look at a whole host of things. For instance -

Data privacy, security and intellectual property, data access, sharing of information, identify and agreeing data owners, data management, data retention, removal of irrelevant data, “the right to be forgotten” legal ruling, data analytical understanding, data structure and metadata requirements, data quality, fault tolerance, backups, scalability, regulatory framework etc.

Everything about big data is big - big project, big budget, big system resources requirement, big amount of human resources and labour. It may be better to think medium data, although whatever you decide never lose sight of the fact that you can have the biggest data lake in the world but computers will only give you the right answer if you ask the right question.



# 'There is no App for thinking'

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**"Economics... is not a body of concrete truth, but an engine for the discovery of truth."**

**- Alfred Marshall (1906)**

This article's title is also the working title of a book that I hope to complete at some point, whose central theme is to ask what risks the "reification" of economics, the empirical imperative in scientific research and our increasing reliance on the genuine marvels of modern technology may pose. This is above all in terms of eroding the capacity for critical and lateral thinking, and how it might impinge on the development of social skills, particularly those related to communication, which remains the cornerstone of everyday life. The era of "Big Data" is indubitably with us, and as with so much technological evolution past and present, it inevitably evokes and provokes both utopian and dystopian assessments and reactions, many of which are rooted in deep-seated, often sub-conscious, beliefs rather than in a rather more dispassionate rational analysis.

As Melvin Kranzberg (1986, *Technology and Culture*, 27(3): 544–560) observed: "Technology is neither good nor bad; nor is it neutral ... technology's interaction with the social ecology is such that technical developments frequently have environmental, social, and human consequences that go far beyond the immediate purposes of the technical devices and practices themselves." As Kranzberg's observation underlines, 'Big Data' is not "in and of itself" a 'threat'. Equally, the supposition that an exponential increase in the volume of data available for research and analysis intrinsically improves our knowledge base on any given subject in terms of accuracy, objectivity and insights, which all too often are couched in linguistic terms that emphasize 'truth', is the stuff of modern-day myths. The term 'Big Data' is in many ways both misleading and a mis-conceptualisation. What is now being described as 'Big Data' is often smaller than some of the 'Big Data' which has been previously collated. For example, population census data, much of which was both cumbersome to manage and required the use of so-called "super computers" to analyse it, and was primarily of interest to social scientists. Therefore, it is important to understand that what has changed is our ability to use PCs and "off the shelf" software packages to collect and cross-reference large quantities of often very complex data. Per se, this enables many more people to investigate, and in many cases to 'wax lyrical' about any number of subjects and their ostensibly associated phenomena; be they legal, psycho-social or related to physical sciences. Such a rapid and very sharp shift does find a degree of precedent in the Enlightenment era that accompanied the nascent Industrial and Scientific Revolution. Specifically, it has a profound impact on research procedures and processes, on the theory of knowledge and belief (i.e. epistemology), as well as having extraordinarily intense ethical implications.



For those that espouse and embrace empiricism, which underlines the importance of sensory experience and evidence and rigorous scientific methodology, and which also leans against explanations which rely on intuition, revelation or indeed a priority reasoning or 'fallacies' (as per John Stuart Mill), a world awash with 'Big Data' would appear to be heaven-sent. This is in so far as the breadth, depth and scale of the data might appear to offer the opportunity for applied mathematics and computational algorithms to largely dispel the need for qualitative and philosophically regulated modes of research and analysis. However, this rides roughshod over the clear need to understand how we engage with such an unprecedented plethora of data, how and why we categorise it and, at a more fundamental level, how it will impact the way we learn, and ultimately how this metamorphoses the multitude of human reaction functions. As Foucault observed: "People know what they do; frequently they know why they do what they do; but what they don't know is what what they do does." (Madness and Civilization: A History of Insanity in the Age of Reason, 1961). In perhaps simpler terms, the point is this, from a theory of research perspective, how do we 'know' what questions we wish to ask of all this data, and of what hypotheses or phenomena do we wish to test the validity of? This applies as much to the area of psycho-social behavioural research, as indeed to those in the sphere of life and physical sciences.

GIGO (Garbage in, garbage out) was an acronym from the early age of computational science and communications technology, though the de nouveau variation of "Garbage in, gospel out" is perhaps a rather better variant, above all in the context of the questions above. The latter form highlights a type of progression whereby the ability to digitally record data to a certain extent mitigates some of the risks of faulty, imperfect or imprecise inputs, but it certainly does not preclude the risk of a faulty processing algorithm. The latter becomes a much more acute risk with regards to 'Big Data', in so far as the only way to generate the data and analyse it is via a computer, per se excluding many from delving into the mechanics of the output from such analyses, even if their individual and collective judgement arouses suspicions about the veracity and validity of the output. If we accept that a key tenet of empiricism is that "knowledge is based on experience" and "knowledge is tentative and probabilistic, subject to continued revision and falsification." (Shelley, M. (2006). Empiricism, in F. English (Ed.), Encyclopedia of educational leadership and administration), then this highlights a possible shift in the paradigm of our investigations, which is potentially, but not necessarily, rather more insidious; namely that the ostensible risk in credibility terms lies less, as it has previously, in faulty data, and rather more in the scope for faulty processing. It must be stressed that this is not about depicting 'Big Data' in a negative light, but rather to underline the need for heightened awareness about the processes of analysing and interpreting the output from 'Big Data', challenging and questioning their underlying assumptions, both from the aspect of this being uncharted terrain, and a more fundamental need for intellectual rigour.

Let us be clear, it is not the models that are problematic, but rather understanding the metaphors, perspectives and paradigms which underpin them, in so far as they are often critical to organising our thinking, investigations and explorations of a given subject, and they will frequently dictate the parameters by which we set and guide our progress towards a goal. A model only becomes problematic when it is allowed to supersede our rational function, and becomes a static article of faith or a rigid procedure, and thus to evolve into what William Pfaff has called 'dead stars'. He defines these as "ideas that people want or need to be true", and as "theoretical formulations that are generally conceded to be false but have become conventional, and for which no replacement is evident, continue to be employed by people who certainly know better... There is a real dissociation of perception from analysis and decision." (Barbarian Sentiments - How The American Century Ends 1989).

Per se, the imperatives with regards to 'Big Data' relate to being conscious of the complex methodological processes that underlie the analysis of the data. As CG Jung observed: "Consciousness is a precondition of being. Any theory based on experience is necessarily statistical; that is to say, it formulates an ideal average which abolishes all exceptions at either end of the scale and replaces them by an abstract mean. This mean is quite valid though it need not necessarily occur in reality. Despite this it figures in the theory as an unassailable fundamental fact. ... If, for instance, I determine the weight of each stone in a bed of pebbles and get an average weight of 145 grams, this tells me very little about the real nature of the pebbles. Anyone who thought, on the basis of these findings, that he could pick up a pebble of 145 grams at the first try would be in for a serious disappointment. Indeed, it might well happen that however long he searched he would not find a single pebble



weighing exactly 145 grams. The statistical method shows the facts in the light of the ideal average but does not give us a picture of their empirical reality. While reflecting an indisputable aspect of reality, it can falsify the actual truth in a most misleading way.” (The Undiscovered Self, 1958). In a similar vein, a further aspect that needs to be borne in mind is that some statistical relationships are in fact casual or coincidental, rather than causal, above all in respect to the phenomenon of ‘apophenia’ (also known as ‘patternicity’), which refers to the human tendency to seek patterns in random information. It highlights a confluence of behavioural tendencies, which Diane Ackerman (An Alchemy of Mind: The Marvel and Mystery of the Brain, 2004) summarized succinctly: “Pattern pleases us, rewards a mind seduced and yet exhausted by complexity. We crave pattern, and find it all around us, in petals, sand dunes, pine cones, contrails. Our buildings, our symphonies, our clothing, our societies - all declare patterns. Even our actions: habits, rules, codes of honour, sports, traditions - we have many names for patterns of conduct. They reassure us that life is orderly.”

Therefore ‘Big Data’ certainly can be said to play into an instinctive form of human behaviour, but such pattern-seeking carries with it very substantial ethical considerations in the social sphere, in the very broadest sense. This is not just a matter of data being collected and mined from sources (e.g. social media such as Facebook or Twitter) where the user is effectively unaware, and has in many cases not consented to it, despite effectively operating in a supposedly ‘public space’, which may legally be seen as a form of tacit consent, but is far from it in ethical terms. More importantly, without due process, it is likely to create differentiated access to any given data set, in other words inequality, which can in turn lead to distortions to how we interact with the data. As but one example, if researcher X is given access to a set of data, but avoids investigating a putative phenomenon or positing certain hypotheses which might jeopardise access to data, by dint of being contentious to the data provider, this imparts an asymmetric skew to research, which goes against the very principles of empiricism. As Jacques Derrida (Archive Fever: A Freudian Impression, 1996) suggested in relationship to archives, the ‘effective democratisation’ of ‘Big Data’ can be measured very simply by ‘the participation in and access to the archive, its constitution, and its interpretation’.

But these various issues and observations should not be construed as a barrier to ‘Big Data’. The more immediate issues are perhaps far more fundamental. Firstly, ‘Big Data’ is in truth a very new phenomenon, per se there is an inherent “skills shortage” and “skills gap” in the workforce, above all in terms of data analysis, which needs to be addressed across the globe, at all levels. Secondly in a very similar and complementary vein, though perhaps at a more “visionary” or lateral thinking level, there would appear to be a renewed opportunity to reinvent how we work, our many knowledge networks and the way we work, and how we learn, in a similar vein to the revolution that Henry Ford’s assembly line brought to the manufacturing sector.



# Economics & Politics

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## NEW CHALLENGE FOR CENTRAL BANKS

Sir Jon Cunliffe, the Bank of England (BoE)'s Deputy Governor for Financial Stability, last month suggested the UK economy was near an inflection-point. Its reserves of spare labour appeared to be running out. That could mean that growth in labour productivity was about to pick up as employers used their existing labour forces more intensively rather than take on extra workers, bidding up wages in a tight market in the process. Sir Jon's underlying assumption was that productivity growth stayed weak in recent years because employers had no strong incentive to economise on the use of labour. In a slack labour market, workers lacked the bargaining power to demand and secure higher wages. His hypothesis gains support from its power in explaining weak productivity growth in many other advanced economies since the global financial crisis of 2007-09. However, as Sir Jon recognised, it does not necessarily follow that, if cheap labour gave employers scant incentive to raise productivity, the prospect of higher wages would lead them to squeeze out productivity gains. They might simply meet whatever pay demands they need to accommodate, and then pass on the extra costs in higher selling prices. If events followed that course, central banks might have to tighten monetary policy to prevent inflation overshooting their targets.

In fact, inflation rates, as conventionally calculated

on a twelve-month historical basis, can change very quickly. For the UK, the twelve-month change in the consumer price index (CPI) was a negative 0.1% in April. Only seventeen months earlier, it had been above the 2% target. Volatility in the annual change in CPI partly reflects statistical base effects. These tend to amplify the impact of transient factors on the published data. Average earnings figures are subject to the same consideration. At least in part, the reported rise in UK average earnings growth since early this year has been attributable to a base effect, though there does appear to have been some underlying acceleration as well. The point is, though, that the statistical series that purport to measure inflation are subject to significant fluctuations. Central bankers need to be alert to incipient trends; they cannot take it for granted that whatever happens to be the inflation rate presently will persist for the foreseeable future.

The deflation threat that transfixed central banks earlier this year has rapidly faded. Published inflation rates have picked up from their low points. In the UK, the annual increase in CPI is back in positive territory. The upturn in recorded inflation has been most marked in the euro zone, however. There, annual CPI inflation has risen from a trough of -0.6% in January to a positive 0.2% in June. ECB policymakers, possibly somewhat embarrassed by a turnaround that began even before they initiated a programme of massive central bank bond-buying in



March, are rather implausibly taking the credit for fending off deflation. Given the lags in the transmission of monetary policy, it seems highly unlikely that anything the ECB has done in the past year could already be influencing the inflation rate. Even so, it is understandable that the ECB should be reluctant to admit that, early this year, it mistook where the euro zone economy was in relation to inflation. Admittedly, in the USA, there has not been much movement in the annual rate of change in the personal consumption expenditure (PCE) deflator since the turn of the year. But the more sensitive six-month annualised 'trimmed mean' PCE deflator, published by the Dallas Fed, has risen significantly from 1.2% in January to 1.7% in May, the latest month for which data are available.

The stabilisation of oil prices since January has helped to quell central banks' anxiety over deflation. Not only will a firmer oil price have a direct arithmetical effect in boosting CPI indices, it could also put a floor under inflation expectations. It is worth noting the greater part of the impact of oil price stabilisation on recorded CPI inflation lies in the future. In the second half of 2015, this factor alone could push 'headline' CPI inflation up by 1.4 percentage points in the USA, provided oil prices stay around current levels. Additional to this, and perhaps taking even longer to register in the data, will be the indirect effects of oil price stability through its impact on the annual change in distribution costs. In Europe, where tax represents a much larger element in prices of oil-related goods than in the USA, the effects will be less dramatic, though still material. Furthermore, an end to oil price falls might not be the only influence tending to push consumer price inflation higher in the months ahead.

Meteorologists now have a high degree of confidence that an El Niño phenomenon, that is, a warming of the sea surface of the central and eastern Pacific, is under way. The initial phase of the process was unusual, though not unprecedented, in that the warming began further to the west than is commonly the case, closer to Australia than to South America. As a result, there was, earlier this year, a degree of uncertainty as to what was happening. The outlook has since become much clearer. An El Niño has developed with 99% certainty. Since food production is dependent on weather conditions, we might expect the chief

impact of El Niño on inflation to come through food prices. According to OECD data, over the past twenty years, the sharpest spikes in food prices (if we take member-states in aggregate) were felt in 2001 and 2008. In 2001, annual food price inflation rose to 4.5% from 2.3% in 2000, while in 2008 it surged to 6.2% from 3.7% in 2007. Since food makes up between 10% and 20% of total household expenditure for OECD countries, those price spikes made an appreciable contribution to overall consumer price inflation rates. Given the likely sensitivity of inflation expectations to the prices of food items, given that food purchases are frequent, the effects on psychology were probably even greater than the inflation numbers alone might suggest. Oddly enough, however, neither of those episodes were associated with El Niño events. It turns out that, while El Niño damages production of some crops in some countries, it enhances it in others. The effect on prices across the broad spectrum of food items has been broadly neutral. The chief effect of El Niño on inflation, according to an IMF research paper published in April, is through oil prices. This at first sight surprising result, comes about through the negative effects of El Niño on hydro-electric power generation in those countries where weather conditions are drier than normal. Power shortages during El Niño events have adversely affected output in mining industries, where operations depend on the availability of energy at economic prices. Disruption of mining output, in turn, exerts upward pressure on the prices of mined commodities.

The US Federal Reserve has already indicated how it might react to a quickening in the pace of inflation. This month's FOMC press release stated, as one of the conditions for raising the federal funds rate target, that the committee should be 'confident that inflation will move back to its 2% objective in the medium term'. Stronger 'headline' inflation numbers might well afford FOMC members some comfort that inflation would not average far below 2% on a medium-term view, though the committee is likely paying most attention to 'core' inflation measures in judging inflation prospects. The Dallas trimmed mean measure, which incorporates no arbitrary judgment as to what is within and outside the 'core', has recently reflected, as we noted above, modest acceleration in consumer prices, though not yet enough to give assurance that a 2%



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annual rate will be sustained.

More conventional measures of 'core' inflation, such as the PCE deflator ex food and energy, have not yet shown signs of picking up. However, this measure, quite arbitrarily, treats as 'core' the prices of items that are not energy but are nevertheless heavily affected, often with a short lag, by changes in energy costs. This category includes the prices of goods and services, such as airline fares, where energy inputs are significant and also those where distribution costs are substantial. These items may well contribute price increases to the overall 'core' indices in the months ahead sufficient to impart upward impetus to inflation measures derived from these indices. This consideration helps underpin the majority FOMC view that the funds rate target will be rising before the end of this year.

The BoE will be in a stronger position to ride out a rise in the annual CPI inflation rate in the months ahead. It has made no particular commitments with regard to inflation apart from the long-term 2% target. Since 2008, the MPC has tolerated relatively wide fluctuations in the twelve-month inflation rate, while relying on its long-term commitment to anchor expectations. Presumably, a sharp rise in the year-on-year rate of increase in the CPI would not, in itself, trigger a policy-response from the MPC. The committee, rather, has set itself a much harder task in effectively linking its actions to movements in unit wage costs. Since unit wage costs are hard to gauge, even in retrospect, it will be exceptionally difficult to judge current trends and future prospects in a statistic that seeks to encapsulate information on output, hours worked and pay received, all three being variables that present problems of measurement. In practice, the MPC seems likely to rely on data relating to wages. Its judgment as to the scale of the productivity offset to rising wages may be stretched to reflect tactical factors, such as market timing and exchange rate concerns. The Fed's policy actions will be an obvious constraining influence on the MPC. Indeed, so anxious is the MPC to maintain confidence in its focus on domestic inflation, that it felt impelled to include in the minutes of its last meeting the statement that its policy 'would not be determined by the actions of other central banks'. Not determined perhaps but, in all probability, heavily influenced.

Of all the central banks though, it is for the ECB that an upturn in inflation will be most awkward in the months ahead. For a time, of course, ECB policymakers will probably continue claiming the rising prices as proof of the wisdom of their monetary actions. But this interpretation of events is likely to lose its credibility if the pick-up in inflation is general across the advanced economies. Then, global influences will be widely seen as more powerful than ECB actions in boosting euro zone CPI. The ECB will then face a serious challenge deciding what to do next. The Fed and the BoE, unlike the ECB, are not presently loosening monetary policy. For those central banks, the policy choice might reasonably be seen to lie between making no change and tightening. For the ECB, though, continuing to loosen the monetary reins might appear a perverse choice in the face of stronger inflation both globally and within the euro zone. The logical response for the ECB might be to end its bond purchases before the currently indicated termination date of September 2016. However, ECB policymakers are still insisting that the programme will run its full course. This has become a key element in the central bank's forward guidance. Loss of credibility and market confusion might now follow if the ECB were to stop its QE-related buying before the due date. Nevertheless, to press on might leave the ECB looking well behind the curve and risking serious financial and economic instability in the euro zone.

There are some other central banks in Europe that face a similar dilemma to the ECB's. The Czech central bank (CNB), for example, is pledged to cap its currency at 27 to the euro at least to the second half of 2016. As economic growth gathers strength in the Czech Republic and inflation tops the CNB's forecast, this is a commitment that is increasingly viewed with incredulity. Elsewhere, Norway's central bank this month cut its key interest rate by 25 bps, while indicating a further rate reduction was in prospect during the autumn, even though CPI inflation had already picked up in May to 2.0%, the most rapid pace so far this year. The problem with forward guidance is the risk it poses to a central bank's credibility. Wisely, the Fed and the BoE bleached out most of the meaning from their guidance a while ago. There are other central banks, though, that will be caught in a policy-bind well before the end of this year.

# India Cotton Scenario

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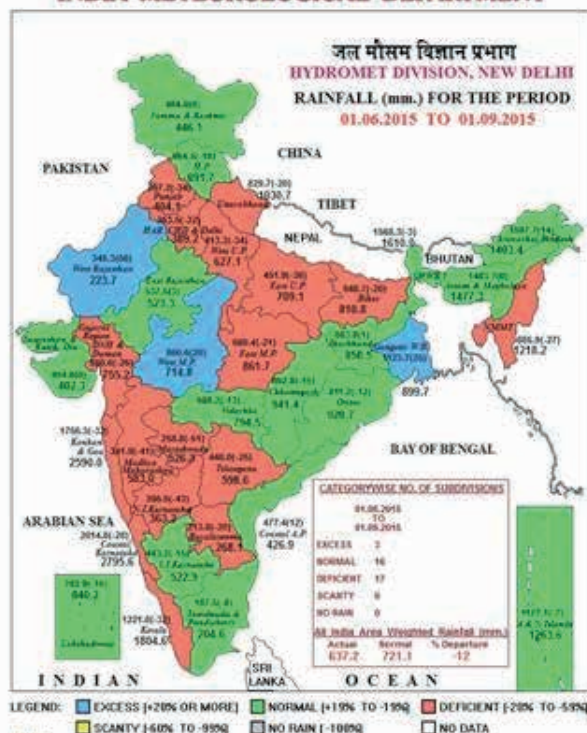
Cotton is an important cash crop in India, which can give substantial returns to the farmers in six months. Cotton is mostly grown in Central and Southern regions of India, in the states of – Gujarat, Maharashtra, Telangana, Andhra Pradesh and Karnataka. It is a summer crop as it is usually sown around June and harvested in December. In the 10 years prior to 2003, India was a net importer of Cotton as the domestic production was not enough to meet the consumption requirement.

Adoption of genetically modified (GM) Cotton variety, since 2002, has helped Indian farmers to increase yield and profitability. As a result, in 2015-16, India will likely become the largest producer of Cotton, dislodging China. India is also the second largest exporter of Cotton, after USA. Apart from GM cotton, the Indian Cotton industry also benefited from strong demand from China from 2003 to 2013.

Around 75% Indian Cotton production is of the long staple variety of Cotton having staple in the range of 27.50 mm – 32.0 mm. Shankar-6, a long staple variety is probably the most famous Indian Cotton variety. India also grows Extra Long staple varieties viz. DCH-32 and Suvin, having staple length above 32.50 mm. However, its production is not sufficient to meet domestic demand and therefore India depends on imports for Extra Long staple Cotton.

In 2014-15, India produced 6.42 million MT of Cotton, almost as much as China's Cotton output. India's annual Cotton consumption is 5.33 million MT. Weaker Cotton demand from China led to falling Cotton prices in the past few months. Large Chinese Cotton inventory, which is near 58% of total global inventory, which it had accumulated over the past few years led to a 42% decline in imports y-o-y in 2014-15 to 1.79 million MT. As a result, Indian Cotton exports also fell by half in 2014-15. Due to a fall in Cotton prices, the Indian Government launched a large-scale Cotton buying program to support prices through the Cotton Corporation of India (CCI). The CCI bought raw Cotton from farmers at the Minimum Support price level of Rs. 4050/ 100 Kg. Due to lower export demand, CCI Cotton inventory increased to above 1.20 million MT, which it tried to dispose in a staggered method through daily auctions from its warehouses.

## भारत मौसम विज्ञान विभाग INDIA METEOROLOGICAL DEPARTMENT



Cotton sowing, this year, is lower at 11.26 million hectares vs. 12.70 million hectares in the previous year. Acreage fell, likely due to lower remuneration to farmers from the previous year's crop. Higher prices of pulses also likely led to diversion of acreage from Cotton to pulses this season. Weather has not been ideal for Cotton crop this season due to rainfall deficiency of 25% to 50% in key Cotton growing regions in India. Overall, all India monsoon rains were 12% below normal in June to August with bleak prospects of a significant increase in rains in September. However, since Cotton can survive low moisture, the output estimates for Indian Cotton crop in 2015-16 are near 6.30 million MT, just slightly lower from the previous year's output.

However, the biggest worry for the Indian Cotton trade this season is not of lower output. It is the possibility of weaker demand from China and continued sluggish Cotton prices. China's Cotton imports are estimated to fall a further 30% y-o-y in 2015-16 to 1.25 million MT. Weak export demand and lower prices may once again force the Indian Government to intervene through CCI to absorb surplus Cotton output and support local Cotton prices in 2015-16 which may lead to higher domestic inventory levels. This may lead to a situation in India similar to the one China is battling today.



# LUCY

# I AM EVERYWHERE



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# 42

## SIMPLE ANSWERS TO COMPLEX QUESTIONS

I have always liked the big films of Luc Besson ever since I saw Nikita (original French soundtrack but with English subtitles of course). They have rich visuals, humour, action, sometimes reflecting topical issues but always a great mirror on the human condition. When Big Data was suggested as a theme for this month's GITMO, the image – I think a lot in images – came to my mind of one of his last films – Lucy! I encourage you to see it if you can but without spoiling it, the story is ultimately of a transhuman, a normal but somewhat vulnerable girl in a strange place who is transformed and enhanced intellectually, physically and psychologically until eventually.... well, you can see the movie for that.

Now you may not see the immediate connection with Big Data in FX markets but the world of FX in the big banks and institutions has fallen in love with the idea of Lucy (I like the idea of calling Big Data by the name Lucy) and they did so many, many years ago. Not in a sudden love-at-first-sight motion but in a gradual evolution to an ultimate goal of taking the human element out of a situation by simulating all the metrics their old school traders exhibited, quantifying it intellectually, physically and psychologically until eventually

they could replicate it again and again without the need of those pesky, ebullient, noisy, arrogant and expensive traders. So on both the sell (and buy side) there developed Expert Advisors and Quantitative Analysis. These started using Lucy to help them get that one slim step ahead of...whatever it was they wanted to get ahead of! This came at the same time that HFT rose to prominence so it is important to differentiate between the two.

Anyway, with the growth of EA's and Quants there were big hopes and also some strange outcomes on some of the rules based systems – an exaggerated example would be if on the 32nd of October when a Full Moon is in line with Uranus... then buy HKD vs NOK one month outright less one day at 04.13.32 GMT... only if it is a Thursday. I jest, but banks have sliced and diced your, my & our FX data so finely that they can tell you when you ask for a price what will be the most likely outcome for them... they think. The problem is Lucy has multiplied and spread throughout the banks. Each has its own version and that is where the problem is, Lucy at bank A has to compete with other Lucy's at banks B, C, D, etc... to get your business. They are not actually viewing the buy side's business; they are fighting against each other and this is where Lucy

has currently failed. Quants who were the darlings a few years ago have not produced the hoped for results, especially post SNBomb. Mind you, human traders would not have done much better but for some this has been an expensive exercise and the winnowing of Quants has started to happen though as in all things, some will still be joining the party whilst others are getting their carriages.

What about the buy side? EAs have proliferated, they have been a boon to some rules based traders who have expanded 24 hours and applied their skills to other markets globally. However, just take a look at some of the comments users who have tried EAs. One of the best I've seen is 'I see no reason selling an EA that makes good profits consistently'. Lucy at the bank(s) has met little Lucy and taken all her money... but neither is REALLY Big Data.

So where do we go from here? To my mind Big Data is a wonderful thing and here is why. EMIR, Dodd-Frank, et al.... has given us all the best access to Big Data that we have ever had until now and then purely as a serendipitous by-product of its main intentions. So much could be learnt to make markets more efficient for all participants but we need some basic principles and then guidelines. May I suggest these...

First off – define proper Big Data. Well... it is data whose scale, diversity, complexity requires NEW architecture, techniques, analytics and yes – even new algos – to manage it. These will extract hidden value and knowledge not readily apparent to market participants. It will accelerate learning and decision making. Big Data IS NOT spreadsheets – if you can run it on Excel then it is not Big Data! The financial services industry is building the components of Big Data but in many cases it has not yet come. The reason is that the sheer volume or aggregated size of information involved and also the ability to adequately perform analysis upon Big Data.

1) Big Data quality – the setup, guidelines of Big Data collection. Remember the old computing rule still applies here. Garbage in = garbage out! Erroneous Big Data is not much of an issue in

Futures and Stock Markets but in a fragmented non-centralised market like FX there is bound to be quite a lot, even if you just have a big moneycentre's Big Data. Quality does not just mean erroneous data, it also means quality. Can you share it, is it secure? For example, larger trades skew the quality of Big Data, we are going to need new calibration techniques to take these into account. When sharing it - who owns the data, the bank, the customer, someone else, does anyone actually own it? It isn't any good if all that is done is collation – knowledge with no understanding?

2) Backing up Big Data – assumption is the mother of all screw-ups. Don't assume it is backed up, question everything. This is a new field in FX, there are few 'experts' yet.

3) Understand what you get back. It is all very well carrying out points 1) & 2) but take the example of 'Deep Thought' in The Hitchhiker's Guide to the Galaxy. When they asked DT the ultimate question they got the right answer back – 42 – but they (the mice) did not understand the original question they asked!

4) Then there is T&C! Who has use of Big Data? How can you access it, is it portable? Whose Intellectual Property is it? Can companies actually 'own' Big Data from their customers or do the customers have an interest – this relates to point 1) above...and I can already see the lawyers ordering their new luxury car on the back of this? Can it be deleted? Who has control on this and how?

Ultimately and very much in conclusion, I will lead you back to my original concept image for this piece. In the last frames of the film Lucy, with an overhead shot of the hero's mobile phone screen, the words 'I AM EVERYWHERE' are seen and Lucy's voice is heard saying 'Life was given to us a billion years ago. Now you know what to do with it'. If that is how we/you/us really ought to see Big Data then I will just add this - there are no simple answers to complex questions.

## Big Data '...now you know what to do with it'





# Option Sleuth

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## MURDER SHE WROTE

We have witnessed some strange market dynamics since the US property bust in 2007. A crash in markets and a near collapse of the whole financial system led the Fed to cut rates to near zero from a level of over 5% in the space of a year. In November 2008, soon after the last rate cut, the Fed embarked on their first round of QE by buying \$600bln in mortgage backed securities. The die was cast. Ever since markets have cheered modest economic data and have yearned for more stimulus and more liquidity and when it has been denied, they have thrown their toys out of the pram. The Fed's attempts to extricate themselves from this spoon feeding policy have caused sell off in equity markets and flare ups in bond yields. The Fed restarted QE after each episode. Why do we now laugh at the Chinese trying to support their stock market -the Fed have been at it for years - indeed we all remember the Greenspan put? So perhaps market dynamics are not strange at all, it is in fact the policy of constantly creating credit cycles and then cleaning up afterwards that is rather perplexing. However this time is different, rather than an emergency tool, to be used in times of crisis, QE became an indispensable way of life, clogging up the supply side of the economy

and boosting asset prices. QE has prolonged the recession. Perhaps I'm being rather disingenuous, QE was probably just about the only thing the Fed could do. Creating another credit cycle and inflating assets was a "hit and hope" after all else had failed. Well I think they just got caught out. The prolonging of QE far beyond its intended motive means that the Fed have missed a cycle. Financial conditions in the US are deteriorating again and profits at US companies are falling. There is no material pick up yet in inflation and the Fed is about to raise rates? It seem that once QE stops, it fails.



Source: Bloomberg

Chart shows GS Financial Conditions Index. Inputs in to the index are equities, the Ted spread, BBB credit spread, the USD, fed funds and 5 and 10 year treasury yields. Note the worsening of conditions pre-dates the recent market turmoil.

Goldman say that, since the equity market sell-off, the worsening in financial conditions represents three Fed hikes in rates. This is one area where investors underestimate the magnitude of a rate rise on 17 September. It's quite clearly not just 25bps anymore. A year ago it would have been but now it will represent an additional tightening and not an

initial move. The Fed have missed their chance. It would seriously question the credibility of the Fed which must be aware that the market have pre-empted their move ...and some. Well we know they are aware. Well we at least know that Mr Dudley of the NY Fed is aware. Dudley used the index for many years as chief US Economist with GS. He has also highlighted the importance of financial conditions in various speeches over the last year. The credibility argument stretches beyond the economic to financial stability considerations. EM administrations are in effect quantitative tightening as they run down their FX reserves adding to a general tightening of US bond yields. Volatility in markets has also highlighted the leverage in certain trading techniques that exists at this time. The Fed can maintain until it is blue in the face that it worries not about the market but a 1994 style crash in bonds which could be the outcome if the Fed tightens when the market is clearly "offside". The importance of all this is trying to gauge the length and scale of the tightening cycle. If financial conditions tighten, the Fed hikes will be shallower with a lower end rate. The cycle will also likely be short because the Fed are going to be an outlier. Any country raising rates at the moment will likely see its currency rise - a further tightening - adding to deflationary pressures. The Fed rate rise cycle will be short and less steep if the market is going to run ahead of the Fed at such a rate.



Source: Bloomberg

EM bond volatility on the move again. Debt not ready for tightening policies?

So I suppose one is left thinking - this is all sounding good for equity markets but alas this may not be the case. The lack of a Fed rate rise on 17 September should not be wholeheartedly cheered. This critical Fed decision comes at a time when

there is, to a large degree, a risk-off sentiment in markets and a big question mark about EM growth, especially China. There are those who feel that China is not directly important to the US. They argue that the US economy is a closed affair. Consumption accounts for 70% of its GDP. It exports a mere 1% of its GDP to China; the Chinese stock market is a sideshow...a game of "smack the rat" for the authorities ; a crisis in China, be it financial or economic, would likely be internal rather than external, they have ample reserves, little of China's debt is held externally and the banking system is tightly regulated. These are the arguments that suggest the US will be insulated from a China swoon. The worry comes from the transmission from China to the rest of the EM space. The worry for China itself comes from its property market that makes up a large part of GDP and takes up a large proportion of debt. A sharp slowdown in China will impact countries that do business with the multinational companies that dominate equity indices in the US. EM countries account for 52% of World GDP. When one considers that in the Asian crisis in the mid 1990s the economies concerned accounted for 6% of global growth, I think that a weakening EM space will have a much bigger impact this time round.

It has become somewhat fashionable to predict a Global recession next year. Yes, that's right a recession. Perhaps not a financial bust or a property collapse type recession but just a bog standard moderate period of negative growth. I'm not sure it's right to predict such a mild outcome. It's the debt levels that are still worrying. That is why the property market is the most important area in China.....the debt levels are colossal and it impacts a wider spectrum of the population.

A property bust in China would be a disaster, and I wouldn't want any STAN.L in such a scenario. But let's go with a mild recession outcome. Looking at the last two short duration recessions in the US, it's interesting to note what happened to VIX. Both the early 1990s and early 2000 recessions saw the VIX average around 25/27. But the volatility of VIX itself during both those periods was very high. We can see today that we are already at those levels and that the volatility of VIX has never been higher. Is VIX/VVIX foretelling a recession? I think not. In fact the usual suspects are dormant but worth keeping an eye on. The yield curve is nowhere near negative

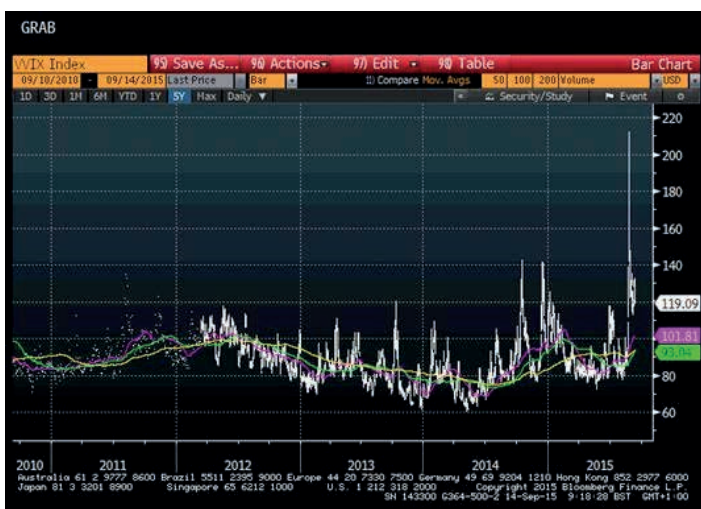




Source: Bloomberg

Recession watch: Transports vs Utilities

Consumer Discretionary vs Staples



Source: Bloomberg

VVIX, doesn't look like a "normal downturn" is being priced in.

There seems to me to be a lot to worry about. Global growth, the instability of EM economies, China

especially its property market, a bond bubble and a material rise in volatility. The Fed does not need to compound global fears. It has missed a cycle. The recent bout of selling in equity markets doesn't happen just because positions are bad...they are symptoms not causes. Big movements in stock markets can be a precursor to how the economy will perform. It's funny that it doesn't seem to happen the other way round. Economic fundamentals don't seem to predict moves in stocks. We can only hope that the next recession is shallow. The rich world economies are coming from a low base, so there is hope that the adjustment to growth will not be too severe. But if the Fed hike or have hiked on 17 September, it could be a disaster on many levels. As Economist Rudi Dornbusch once said, "post war expansions don't die in their beds; they were murdered by the Federal Reserve". Ms Yellen's signature could account for multiple deaths this time round.

Til next time.



# View from under a toadstool

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## It takes many rain drops to cause a flood

**I**n financial markets it is difficult to write anything at the moment without discussing the recent equity market sell-off and pick-up in volatility.

Volatility in itself is a vital driver of fund performance. The lower the volatility the more leverage funds can adopt. Astonishingly, investors still seem to expect the same returns now as they got on their market investments ten years ago, despite being in a zero interest environment. To consistently achieve such a target is highly unlikely and totally unrealistic. Consequently, many new investment styles have evolved since the credit crisis and many of those are underwritten with leverage to achieve the elevated expectations. Although equity volatility remained dormant for the first half of this year, currency volatility has been high throughout 2015 and was a fine 'canary in the coal mine' to the impending market turmoil. Bond volatility (the move index) joined it a couple of months ago but equities in their vainglorious manner decided to ignore them both.

When volatility moves higher, VAR (value at risk) increases and forces de-gearing. Upon getting a major equity sell-off (and the recent one can even be spotted on the chart, unlike previous ones over the last three years), investors rush around asking

all and sundry, what happened and desperately trying to find out why. In reality, most sell-offs have a simple trigger that creates concern amongst over-leveraged funds which then causes them to unwind their risk. During the recent downturn, two or three pieces of analysis have swept to the fore and are seen as explanatory of this process and suggest the main candidates who may have caused it.

These pieces have come from JP Morgan, and from Goldman and from Deutsche. The latter two have both discussed how the intensity of FX reserve selling by EM countries- selling dollars to buy their own currency- has meant there has been a large amount of US bond selling as a consequence of that and this being the reason that bonds did not rally effectively contra to equities. The critical aspect of this equity sell-off unlike most other recent ones, is that the bond markets showed little interest in rallying. In fact, high-yield and junk bond markets did the opposite. Normally, as equities fall and their yields rise, bonds would rally and their yields fall, to a degree that would make bonds unattractive in yield terms to equities and cause long-term institutional switching. The speed of the change in both yields is equally as important as the actual differential. As with growing one's hair, a gentle move in yield differential over six months barely



gets noticed but if one's hair suddenly grows down to your shoulders in three days, everyone would notice straight away. So when the yield ratio moves quickly the change appears more dramatic! But this time so far we haven't seen that intensity.

Some downturns can be driven by 'market neutral' strategies, others by momentum trend-following strategies. A problem arises, however, when both need to unwind at the same time, because of excess gearing. If bond markets don't rally as equities fall, especially when the trigger to the equity move, as in this case, was the Chinese devaluation, which was a global deflationary event, the differential between the yields of the two, doesn't accelerate quickly enough to entice investors to switch.

JP Morgan, on 27 August discussed the profound effect that 'risk parity' funds have had on the markets. MIT 'quant guru' Andrew Lo commented, "the idea behind risk parity is not a bad one, which is to focus on risk and to manage your portfolio so as to try to stabilise that risk. But the problem with equalising it across all asset classes or investments is that not all investments are created equal at all points in time. So there are certain strategies that end up doing worse than others during periods of time. And if you end up equalising your volatility across those strategies, you might end up getting hit pretty hard as some of the equity risk parity strategies got hit over the course of the last few weeks." Adverse volatility moves certainly throw a spanner in the computers' works, especially if, as surmised, the amount of leveraged money in these funds is close to \$1.5 trillion. When all asset classes move in the same direction, it throws most computer-modelled system funds into 'meltdown', which is why perhaps balanced but geared funds, like 'risk parity', have suffered such brickbats.

Certainly, in the last five years, markets have become much more reliant for daily liquidity from algorithmic trading. The influence that investment style has had on markets has become increasingly potent. Most markets are now electronic and few still have market makers to add dealing liquidity as they would have historically. This is due to banks needing greater capital and regulators becoming increasingly stringent. So sell-offs, ironically caused by those new liquidity providers, with the previous ones non-operational, can be highly testing. Certainly, futures flows in August were big. US

equity futures hit multi-year high open interest levels. With these greatly expanded open interests, the implication would be that a lot of new shorts had been taken. If we had only seen shorts closing, that would have lessened open interests. These shorts were likely a combination of selling to cover geared long books, or punts to the downside by the aforementioned momentum funds. The latter have no doubt already been squeezed as the markets have bounced.

JP Morgan suggest momentum CTA funds react quickly to the change in volatility and 'risk parity' has a six month 'look-back' strategy, to avoid volatility spikes. This seems a bit fanciful and the style of some of the selling has been very akin to risk parity. They would have a suite of volatility averages dictating action. As we have said, the movements in virtually all asset classes have been elevated in volatility terms and so are creating a rarer dynamic. We are talking big leverage that promised lower volatility returns and is now desperately struggling to achieve that.

As we have often mentioned, the weeks after equity market falls can cause more damage to fund performance than the downturn itself. Selling, when needed, occurs in the most liquid products, simply to get the fund's exposure down as quickly as possible. We are then left with disjointed books of long illiquid geared positions and against them short futures positions, swiftly taken out to hedge. These 'cross books' then have to be unwound not only to get the gearing down and the overall exposure lower, but also to make the long and short more suitably matched. Consequently in the aftermath of an equity market sell-off, previous market underperformers, that were consensual shorts, have to be bought back and vice versa for market longs. We have already seen a significant upturn in volatility and cross-performance of miners, oils and gold for example.

The indices themselves go into a violent sideways churn, rallying strongly, falling dramatically but staying within the parameters of the ultimate highs and lows that have already been set. Fund managers top and tail these moves painfully as they try to downsize their geared portfolio. This churning could see us through to the Fed rate decision on 16 September and of course on to the September expiry, where dramatic gamma changes to really big new hedging positions can be expected.

# Equities Are Awesome

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**Capital Goods sector:  
- Big Data opportunities  
may not be enough**

**B**ig Data analytics offers major opportunities for value capture in the capital goods and heavy engineering sector. While the hope is that it will offer improved decision-making in general, there is potential in areas such as:

- Better operational efficiency: R&D, supply chain planning, real-time monitoring of production, wastage minimisation and predictive maintenance; and
- Better marketing performance: improved customer insight and demand planning.

Jack Welch, GE's famous chairman during 1981-2001, made Six Sigma central to his company's business strategy way back in 1995. Given this kind of heritage, we were not surprised that GE has been an aggressive adopter of Big Data technologies (e.g. its Predix software platform) over several years. Despite the opportunities for internal efficiency and external revenue generation, we don't think these will be enough to prevent the Capital Goods sector underperforming on a 12-month time horizon. The main reason for our caution is the sector's upstream position in the global manufacturing chain which, in our opinion, renders it vulnerable to the developing macro scenario.

## Time preference...

Time preference is defined as the relative valuation

placed on goods or cash flows at an earlier date compared with their valuation at a later date. For example, an economy with a time preference of 100% would spend all of its income on consumption and would never have any surplus for capital investment in order to increase its standard of living. In no way is it an exaggeration to say that it was only by lowering time preference that civilisation (and the accumulation of wealth) became possible.

As time preference declines, businesses and entrepreneurs react to the higher savings/confidence with new capital investment, particularly in higher orders of production which are more distant from the final consumer.

This was Douglas French writing in "High Rises and High Time Preferences".

**"The lower the time preference rate, the earlier the onset of the process of capital formation, and the faster the roundabout structure of production will be lengthened. Civilization is set in motion by individual saving, investment, and the accumulation of durable consumer goods and capital goods."**

## Time series...

We think of the global production chain for manufacturing and services in terms of a term



structure or time series. It begins with “higher orders” of production, e.g. natural resources, like oil and gas and mining. Next comes major capital goods projects, such as power generation, transport infrastructure, steel and petrochemicals etc. The chain ends with producers of goods which are sold directly to consumers, especially “fast-moving consumer goods”, e.g. soft drinks, snack foods, household and personal care products etc. We want to emphasise the economy-wide impact of upstream production. This is implicit in Say’s “Law of Markets”, which is not something we remember any other client or colleague ever mentioning. The basic idea of the Law of Markets is that when profitable investment made in upstream production translates into wages and flows of goods and services which cascade down through the entire chain. When an individual produces a marketable good or service and gets paid for it, he/she is then able to demand other goods and services (including money which is an intermediate good used in exchange).

In essence, the argument is that it is the production of goods and services that drives consumption, not the other way around. Once a unit of a good or service has been consumed, its value has been eliminated. In order to continue to demand, you need to continue to supply. It’s not that supply creates its own demand, as Keynes mistakenly interpreted, but that supply is a precondition for demand. This is from “Understanding Say’s Law” by Steven Horwitz.

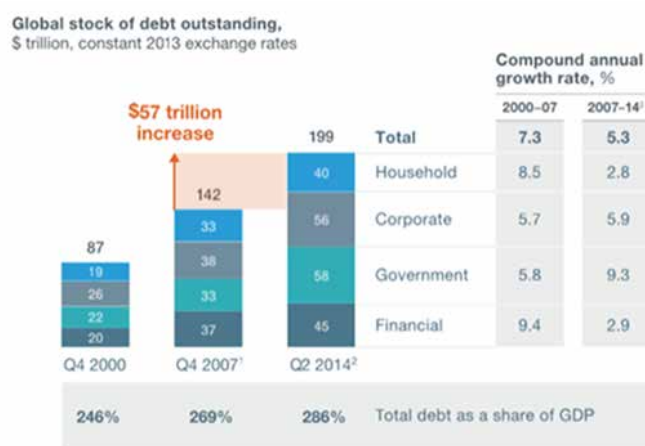
**“Say’s Law has nothing to do with an equilibrium between aggregate supply and aggregate demand, but rather it describes the process by which supplies in general are turned into demands in general. It is always the level of production which determines the ability to demand.”**

Let’s consider this idea from another angle, i.e. savings, which can be thought of as a productive or financial “surplus.” And, in case we forget in these exceptional times of ZIRP and QE, saving/investment is the basis of wealth creation.

Savings provide the source of funding entrepreneurs to invest in productive resources. Wealth and economic progress are created by production – increasing the quantity of goods and services available - not consumption. According to Say.

**“it is the aim of good government to stimulate production, of bad government to encourage consumption.”**

These days we can substitute “governments” with central banks, since it’s the latter which are the key providers of stimulus and have been the principal architects in creating the global debt bubble. The total amount of debt accumulated on a global basis is approximately US\$200 trillion according to a report from the management consulting firm, McKinsey.



Source: McKinsey

## Debt has a time function...

If you think about it, debt has a time function since debt brings forward consumption into the present from a more distant point in the future. Obviously, it does this by removing the need to save the loan value out of disposable income. Debt essentially “buys time”, so borrowers are literally “long” time and short the currency/credit which they must return to the lender at a later date. While lenders lend money, they are also “lending” or “selling” time to the borrowers. Rising debt has a geared effect on economic growth, but “buying” more and more time eventually becomes problematic. As time progresses, what is “the present” begins to catch up with what was “the future.”

This leads us to the fundamental contradiction which exists at the heart of extreme central bank monetary policy.

On the one hand, they are attempting to increase consumption in an already over-leveraged world. This increases time preference and would normally

equate with higher interest rates, shorter time horizons and diminution in wealth.

On the other hand, by forcing down interest rates and substituting savings (real wealth) with cheap credit, they are giving the impression that time preference is lower than it really is. This artificially lengthens time horizons, suggests that current/rising consumption is sustainable and induces incorrect spending decisions on behalf of firms/consumers.

Looked at this way, central banks have artificially lengthened time horizons in the real economy and financial markets by distorting time preference. They have essentially created an illusion. If central banks' ability to lengthen time horizons and induce businesses to make incorrect capital investment decisions begins to fade, the end-result will be that production is out of line with consumer preferences.

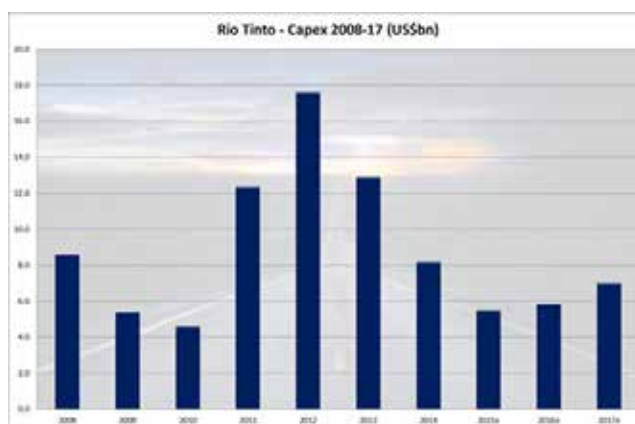
Investment in upstream sectors is particularly vulnerable to a fading of the central bank illusion. In the upstream end of the production chain, capital investment projects tend to be very costly, high-risk and long-term in nature. Distinguishing between a genuinely low level of time preference and an artificial one crafted by the central bank is, therefore, critical. Mistakes can be made which need to be corrected. In such circumstances, some of the increased capacity for capital goods will turn out to be malinvestment and decisions on new investment will be cancelled.

This is exactly what's happened in the Mining and Oil sectors and these industries represent the highest orders of production, located at the top of the production chain. This is very significant. Capital investment trends in Japan illustrate this perfectly. Japanese machinery orders rose strongly after Abe's election victory in December 2012 – exceeding 20% growth year-on-year in January 2013. By the second half of 2014, they had frequently slipped back into negative territory. The TOPIX Machinery Index has given up all and more of its post-Abe victory relative performance.



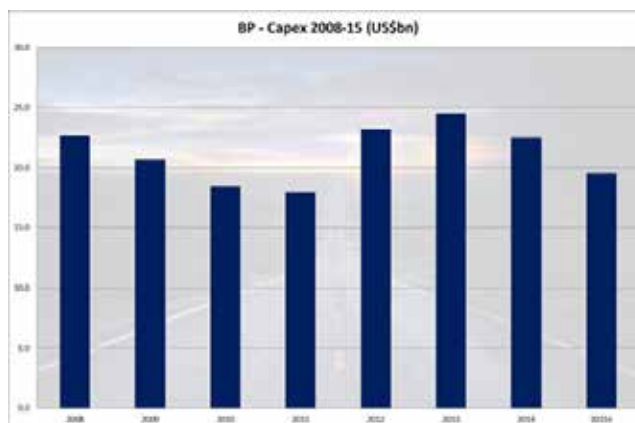
Source: ADMISI, Bloomberg

Mining came first and here is a chart of Rio Tinto's capex since 2010 and its forecasts through 2017.



Source: ADMISI, Bloomberg

Then oil and gas.



Source: ADMISI, Bloomberg

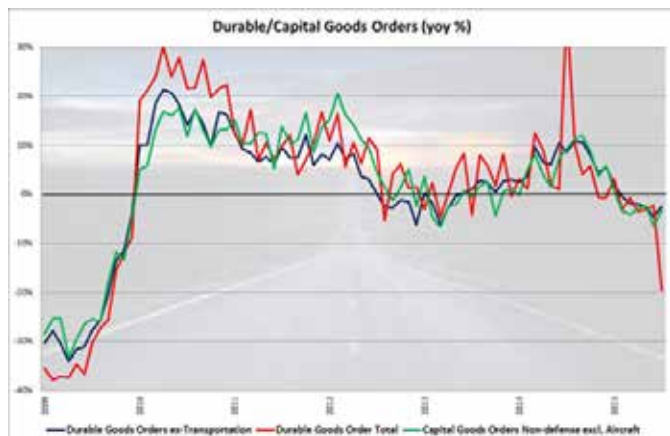
We think that this trend is going to move further down the production chain, beginning with capital goods.

Japan aside currently, capital goods orders are weak globally.

In the USA, all three indicators we use – durable

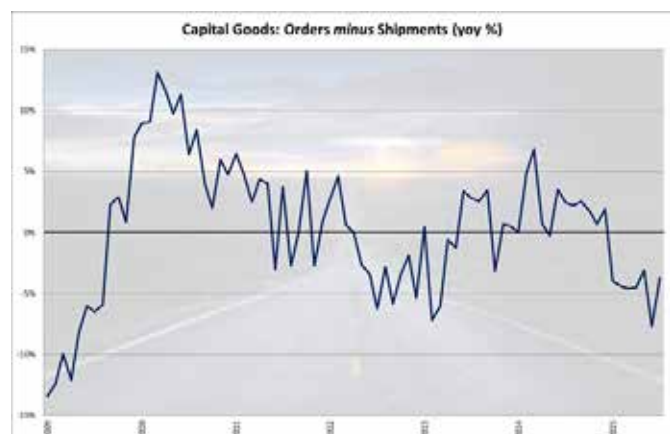


goods, durable goods ex-transportation and non-defence capital goods excluding aircraft – are currently falling year-on-year.



Source: ADMISI, Bloomberg

Besides new orders, capital goods data in the US also include shipments. The differential in growth rates between orders and shipments implies an improvement in prospects when it is positive and a weaker outlook when it's negative.



Source: ADMISI, Bloomberg

Using factory orders as a proxy, German prospects also look subdued. We should note, however, that factory orders include both durable and non-durable goods.



Source: ADMISI, Bloomberg

Switching to China, we find the investment boom is cooling rapidly.

For example, growth in floor space of buildings under construction is at its lowest rates since the National Bureau of Statistics started reporting the data in late 2005.



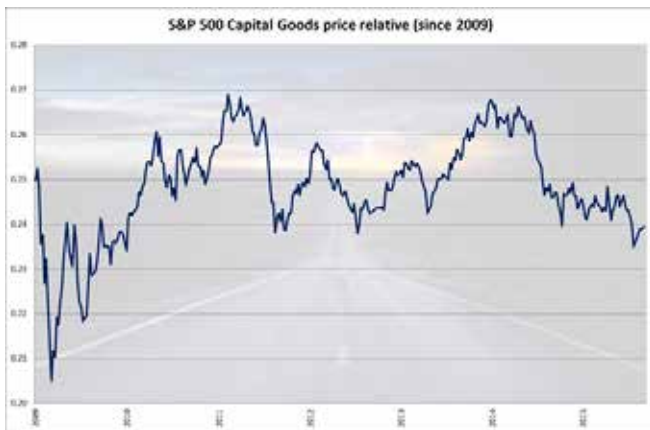
Source: ADMISI, Bloomberg

As far as we can tell, the appetite for long-term capital investment globally continues to weaken and the recent turbulence in financial markets (especially China) has likely reinforced this trend. This makes capital goods stocks vulnerable in our opinion. Here is the price relative performance of the STOXX 600 Industrial Goods & Services since 2009.

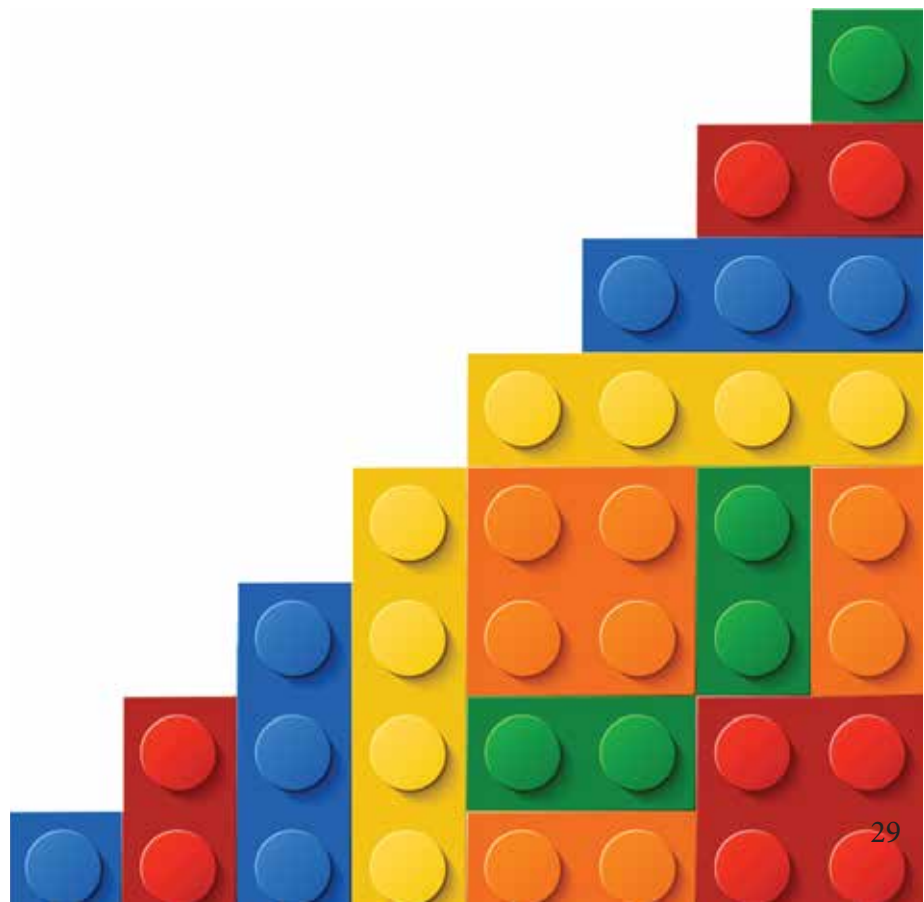


Source: ADMISI, Bloomberg

And the US Capital Goods sector.



Source: ADMISI, Bloomberg





# Our Grains Desk



ADM Investor Services  
International Limited

ADM and its global subsidiaries have a significant involvement in worldwide commodity markets. The ADMISI International Grains Desk has a wealth of experience in servicing investors, users, traders and hedgers in the grain futures markets. Each day, customers take advantage of our swift and accurate trade execution and expert market commentary.

## Discover the Value of a Partnership with Global Experts

Our International Grains Desk offers a full client service, starting with phone broking and access to a number of our Company's trading system providers. We can handle the execution and/or clearing of most global grain and oilseed derivatives and their associated products, including:

- Freight, Biofuels, Coal and Fertiliser

We offer a full commentary on the markets we cover and have a yearly 'foray into the fields' for a comprehensive crop analysis report. Our team of Market Analysts are some of the most highly regarded professionals in the industry and provide customers with timely, accurate and useful market information.

## Benefits of Working With Our International Grains Desk

- Trade access to all major worldwide markets
- Global grains markets expertise and crop analysis
- Market Commentary reports available for all growing and trading regions



**Andy Ash**

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## In search of Caravaggio... an epic road trip

I always have the best intentions, when going on holiday. I strive to sit by the beach, rest my weary body from the non physical exertion of trading financial markets, re-energise my exhausted brain from the fairly simple menial tasks I set it on a daily basis and read many books, all of which looked fascinating on the airport bookshop shelf but, when exposed to sunlight, take on a hideously dull mantra. So it was, two years ago, when we holidayed in Italy, finally coming to rest in Rome. While the family sat by the pool, I strode forth into the city centre to see some art and perhaps craftily sup a couple of chilled lagers.

From our hotel, I walked across the sweeping gardens of the Villa Borghese and entered via the Viale del Muro Torto, into the expansive splendour of the Piazza del Popolo. There I sighted my first church to visit. A lot of tourists sat idly on the steps of the Basilica Santa Maria but very few were actually inside. In fact the place was nearly deserted. I had no idea what I was going to see and certainly had no great spiritual inclination to be there but was astounded when in the furthest corner, to the left of the altar, I found two glorious paintings by one of the most celebrated artists of all time, Michelangelo da Merisi Caravaggio.

There, sitting on their own in the Cerasi Chapel, were The Martyrdom of St Paul and The Conversion of St Peter, albeit in rather sombre lighting, with only me to enjoy them. I literally started giggling. I abandoned the beer and started to track down other Caravaggio paintings across Rome. Next stop was the church of San Luigi dei San Francesi, to gawp at perhaps Caravaggio's greatest masterpiece, The Calling of St Matthew. This painting's profound display of realism as Christ's hand points towards the unknowingly shocked

Matthew, introduced the world to a new intense blend of light and shadow, called chiaroscuro.

I was not only a man on a mini-mission but found myself immersed in this single man's art to an astonishingly deeper level than I had thought possible. Abandoning beer was probably the first clue to my change! Seeing these truly magnificent monuments of art history, still residing in their original place of creation, was totally inspiring.

I knew a reasonable amount about Caravaggio before Rome, through my aborted History of Art degree, but afterwards, I started reading avariciously about him. A few months later, the Ash family, now retrenched back to the more homely winter weather of Kent, were corralled by myself to go and see Mike Leigh's film, Mr Turner. To say I was disappointed was an understatement. However beautifully filmed and scenic it was, the biographical story was inordinately dull. Not the case with my own champion, Caravaggio. A brawler, a pimp, a homosexual (evidently), a murderer, a Knight of Malta, a prison escapee, a fugitive dying destitute at the age of 39 and all that before we even talk about the genius of his art.

We only spent three days in Rome, and I did not get a chance to see all the Caravaggios but the seed of an idea was sown from that holiday. Would it be possible to see every Caravaggio painting in the world? With the wonders of Wikipedia and an abundance of Caravaggio websites, I soon realised that it would be achievable. Of course, for a sporting person, a challenge like this would be no fun at all without a time limit being placed on it,



and so it is that I now set off to see every Caravaggio painting in the world in public ownership (plus a fair few attributed to him). Seventy in all, set across over fifty locations, in three weeks.

From what I thought would be a relatively easy task, this project has turned into a logistical nightmare! To 'lock down' where all the paintings are is incredibly complicated, especially to one so linguistically challenged as myself. Museums and art galleries do not seem to answer emails. A number of paintings are on loan, and even more troublesome were three that were being restored and not on public view for many months. But with much help from friends, contacts, and friends of contacts, I appear to have pinned them all down and am invited in to see those that others cannot. I am incredibly excited.

I shall be travelling from Dublin to Texas, through Detroit (yes, even they have one) to New York, from Madrid to St Petersburg and taking in most major European capital cities along the way. I will finish, hopefully on Sunday 11th October, having finally gone through Malta to Sicily and lastly on to Naples. Fittingly the last leg of Caravaggio's life journey as well. At that stage I will hopefully have raised some good money for my two wonderful charities, Shelterbox and The Royal Academy of Arts.

On most days, I will be travelling from one city on to another but I am lucky to have many friends meeting me along the way for lunches, dinners and some 'serious' Caravaggio hunting. My son is bringing some of his university chums to Dublin, in full fancy dress ready to replicate Caravaggio's "The Taking of Christ". My daughter and my wife, Carol, are coming to Rome for the big tour party (or correctly one of the tour parties). I think Carol is simply relieved that this project might be a better substitute for a mid-life crisis than my buying a Harley Davidson but I have not told her how much it's costing yet. However, my new friend and travel companion Caravaggio died penniless too !



# EVENTS

## CALENDAR 2015

### Events Worth Noting

ADMISI attend and participate in selected global events across commodities and macro economics. Should you require more information regarding these events please do not hesitate to contact your Account Executive.

Event:	Location:	Date / Month:
LME Week	London	12-16 October
ICA International Cotton Industry	San Francisco ICA	October 2015
Sugar Dinner	India	October 2015
Coffee Dinner	Basel	October 2015
Coffee Dinner	London	November 2015

## Information from External Sources

A special thanks to the following non ADMISI contributors in the subsequent pages for their thoughts and analysis. We are truly grateful for their efforts. ADMISI would like to extend the opportunity to receive additional external contributors' analysis for inclusion in subsequent editions of 'The Ghost in the Machine.' Please contact Andy Ash for further information. Tel: +44 (0) 20 7716 8520 or Email: [andy.ash@admisi.com](mailto:andy.ash@admisi.com)

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Maleeha Bengali

# Our Commodity Fund Specialist

## “I’m Not A Commodities Bull, I’m Just A Prudent Bear”

### What to do now?

1. **S&P500 and Eurostoxx 50 (Developed Market Equities), down 9% and 15% respectively from their peaks are a buy, not Emerging Market Equities.**
2. **Time to pick up some quality large cap miners, BHP Billiton (BLT LN Equity) and Rio Tinto (RIO LN Equity). The direction of USD against Emerging Market currencies is key.**
3. **3) BAML Global Fund Manager Survey shows all time lows in allocation towards Commodity and Commodity oriented sectors, but what if the Fed delayed the rate hike? Ouch!**

As August comes around, the bags get packed with all the children’s toys, bucket and spades, ready to head off to the beach. Investors hope for a bit of downtime, confident that August typically heralds “quiet” markets with little opportunity cost being away from their desks for the month. Sods law, August ended up being everything but that!

Since the beginning of last week, the Shanghai Composite has fallen by 19% and now stands 38% below its peak on 12 June 2015. The Eurostoxx 600 index has fallen by more than 12% and is now nearly 17% below its all-time high reached in April, and the S&P 500 has declined by 7% and is almost 9% below its all-time high reached in May. This is all in two weeks time! The moves were so violent that tunes of Asian Currency Crisis of 1997 and Black Monday 2015 were sung across trading floors. Crickey...so what did happen?

Global asset allocation got blind sided by the “carry

trade” unwind. All logical and fundamental trades that take time to work get unwound in one fell swoop. When the market is positioned in such an extreme way in one direction, right or wrong, a single headline can yank the rug underneath one market causing a domino effect in all other markets.

The most consensual trade this year has been long the dollar over all G10 and Emerging Market currencies. The US economy is on a solid growth path and the Fed is about to hike interest rates soon. The market is torn between calling it for September or December, as the probabilities oscillate based on different Fed speakers, dovish one day and hawkish the other. The clear answer is: No one really knows. The Fed is just waiting for the data to be more consistent to decide one way or another. Regardless even if the rate hike is in September, the path may not be as linear as the market thinks.

China devalued its currency on 11 August 2015 and the market was spooked by the suggestion of global currency wars. Emerging market currencies have been on a downward trend for most of the year. This is in sync with the growth profile and monetary policy mapped out in these regions, the need to rebalance their economies via lower currencies, and capital outflows they face. The Yuan's move was a necessary adjustment given the "natural" peg to the USD allowed it to be overvalued for most of this year despite the slower economic growth trend. But this episode does not have the same markings as the Asian Financial Crisis of 1997. The region today has current account surpluses and has built up a sizeable reserve buffer. There are greater backstops in place now, and central banks are not looking to raise rates as their currencies depreciate.

As the exchange rate in Commodity producer countries weakens, their exports become more compelling as their cost of production is lowered, thus increasing the risk of oversupply. Assuming a 10% depreciation for the Renmibi, it would reduce the 90th percentile of Aluminium by only 1% to \$1,935/t and by 2% for copper to \$1.89/lb. It is not China's share of total production that matters in as much as where it is on the cost curve for these products. The higher the domestic exposure, the greater the benefit, as a higher proportion of costs will be denominated in RMB. Hence there is greater pressure on Aluminium prices with China's exports expanding at a rate of +23% YoY so far.

The devaluation only sealed the fate of certain Commodities that faced a supply glut. Lower Commodity prices allow producers to keep producing at lower levels, thus pushing the equilibrium lower. Even Oil and Copper fell victim to this trend as the supply side finally played catch up after all the years of investment. This "rebalancing" process results in lowering the long run marginal cost of production for each Commodity.

All told, Commodities face the triple whammy of higher dollar, increased supply, and lower local currencies.

### **What to do now?**

1) Buy S&P500 and Eurostoxx 50 (Developed Market Equities), down 9% and 15% respectively

from their peaks, not Emerging Market Equities:

It was not the decline itself that was concerning, but how indiscriminate the selling was across the board without any rational or logic behind the moves. Not only were Commodity stocks and those with high EM exposure sold down, but so were quality large cap markets like US and Europe sold aggressively where growth has been solid and on an improving trend. Something broke down in the markets over the last two weeks. Classic risk reduction 101!

It is important to differentiate that recent Chinese Equity market declines have not been driven by a reassessment of Chinese economic risks, much like the preceding rally had little to do with macroeconomic fundamentals. If anything signals from Chinese data had turned a bit more positive over the last month with expectations of policy easing in place. But first China needs to rebalance internally with growth moving from Commodity driven activity towards more consumer driven sectors. In all fairness, August saw a few nasty economic data points from China which exacerbated the investors fears of a global slowdown and caused even more profit taking. The question tormenting investors now is whether China's disinflationary trends will feed into Developed Markets?

European companies generate 9% of their sales from China and 31% from all of EM. Theoretically, a 10% depreciation of the RMB combined with a 5% depreciation across other EM currencies could create a drag on European EPS of 3-5%, absent a significant decline in commodity prices and assuming no positive impact on global growth. Developed Market growth is fundamentally sound, and should not be very sensitive to China and Emerging Market weakness, and should get a decent boost from offsetting oil prices. The early June data, on the whole, was encouraging. Data surprises have turned positive, retail sales have recovered and labour market indicators continue to show signs of improvement. With growth back in the 3% range, a 2015 Fed hike remains likely.

Over the past week (20-26 August 2015) investors pulled out a record high US\$28bn from global Equity funds and injected US\$22bn into global money market funds. Within the US\$28bn equity withdrawals, US equities accounted for half of the

withdrawals while the US\$5.5bn among European equities ended a run of 14 straight weekly inflows. In Asia, the US\$8.9bn foreign selling of equities came in as the heaviest in one-and-a-half year. Investors were also sellers among global bond funds with an outflow of US\$12bn, the largest withdrawal in two years.

Seems a tad bit harsh no? The ECB is committed to reach its inflation target and will provide more quantitative easing if necessary. Hence it is a great time to be long HEDJ Equity as a way to play long European markets but hedged in Dollars, especially after the 7% rally in the Euro recently.

2) Time to pick up some quality large cap miners, BHP Billiton (BLT LN Equity) and Rio Tinto (RIO LN Equity):

As Commodities reach new lows every day, the fund managers are busy running stress test models on their mining companies trying to answer the question "how much lower can they go before they go bust?"

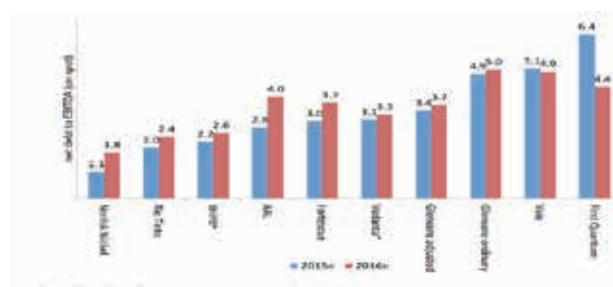
Chart 1 and 2 below outline the large cap miners' Free cash flow yields and Net Debt/Ebitda profile under spot Commodity prices as of mid July levels. Prices are about 5-10% lower, so the comparisons are a lot worse but the relative trend amongst the names still hold. As you can see in chart 1 opposite, BHP Billiton and Rio Tinto stand out as two names with the highest relative free cash flow yield and lowest gearing. Names like Anglo American (-17% Free cash flow yield in '15) and First Quantum (6.4x Net debt / Ebitda in '15) are susceptible to huge Equity raising if Commodity prices do not recover.

With Copper trading below \$5000/t, Brent Oil sub \$50/bbl, Aluminum at \$1600/t, and Iron-ore holding firm around \$45/t, it feels the risk reward is a lot better now as prices have fallen too soon and too fast. Or at least the case for being short here is not as compelling.

Chart 1: Mining Companies Free Cash Flow Yield Less Dividend Yield



Chart 2: Mining Companies Net Debt/Ebitda



3) Global Fund Manager Survey show all time lows in allocation towards Commodity and Commodity oriented sectors:

For the record, I am not bullish Commodities. I am just a prudent bear. There is a time to be short and a time to be flat. If we have learnt anything from this year, extreme positioning can cause violent corrections, despite the fundamental trade being right. The trick is to keep powder dry to be able to monetize on any rallies to re-enter the trade opportunistically.

Sentiment traders EM optimism index has hit very low levels of 34%, a level it has only been in July 2006 and August 2013, both times preceding rallies of over 15%. According to the latest BAML Global Fund Manager Survey, weighting in Global Energy is at a record underweight of 2.6 standard deviations below its long term average (Chart 3 below). Allocation to Global Commodities is at a net 28% underweight (Chart 4 below). The percentage of investors that are aggressively underweight Commodities is at record highs!



Chart 3: Global Energy Weighting

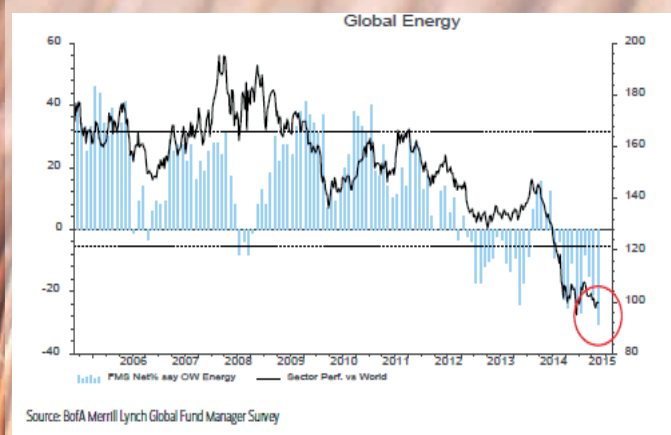
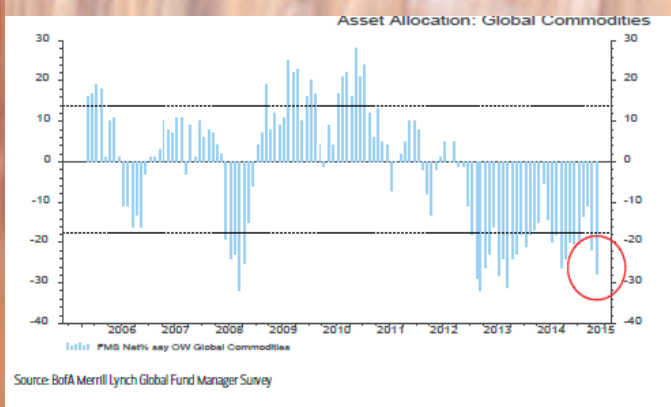


Chart 4: Asset Allocation Towards Global Commodities



Commodity prices lower for longer is the mantra for the sector. However the speed at which it has happened together with the Fed worried about August market developments, any hint of a delay in interest rate hikes could cause the Dollar to fall against Emerging Market currencies, generating a sharp squeeze amongst Commodity prices and shares accordingly.

August has been an extremely costly month away at the beach. But what can cause further agony? European and US market futures rally back to highs, Euro goes back to trending lower vs. the Dollar, the Dollar falls against Emerging Market currencies, and Commodities rally. If that were to happen? Ouch!

#### YTD PERFORMANCE:

Portfolio	% YTD
MBCC Net Return YTD	7.63
SPX YTD	-5.90
Eurostoxx YTD	4.58
SXPP (Basic Resources Index)	-18.90
SXEP (Oil & Gas Index)	-4.91
S&P GSCI Commodity TR Index	-17.80

#### Maleeha Bengali - Founder, MB Commodity Corner

Maleeha Bengali graduated from Cornell University with a Bachelors of Science degree in Engineering in 1997. For the past 14 years, she has worked as a Portfolio Manager/Trader for various Hedge Funds and Proprietary Trading desks across both US and Europe including UBS O'Connor, Goldman Sachs J. Aron, Merrill Lynch Commodities and Noble Group, where she launched and managed their Commodities and Equities investment funds specialising in Energy and Basic Resource Equities and the respective Commodities. Over the past 8 years, her strategy has generated a compound annual growth rate (CAGR) of 12% using systematic delta neutral investment trading strategies; minimising market and directional risk while maximising returns, focusing on alpha generation.

# Algorithm Analyst

## ALGO TECHNOLOGY LIMITED

### Anthony Edwards

#### Methodology:

The basis of our approach to analysing asset prices is that the price of an asset reflects the market's view of all the public information about that asset. By analysing how prices have changed over time, we can gain insight into how market participants typically react to changing information and hence determine how prices are likely to change in the future.

#### What are Algos?

We use algorithms, or 'algos', that we use to identify potential entry and exit points for trading assets. Algos typically look for patterns that are occurring in an asset's price now which have occurred historically. By then looking at those historical occurrences, the algo can determine what typically happens to the asset price. Using this approach, we aim to bring a scientific and statistical approach to determining investment opportunities. Our Algos: The list below shows a brief description of the algos available on this site. For our bespoke services we can create customised algos, so please contact us if this service is of interest.

**SIGNAL ALGO** - The 'Signal Analyser' identifies technical signals that are firing on assets that have a proven track record of success. By 'signals' we mean discrete binary events such as the 2 week price performance being above 10%, or the 20 day Relative Strength Index being below 30. As you raise the performance levels, this algo will identify fewer assets albeit with higher conviction. We suggest using a sharp ratio setting of 2.0 or more to identify high conviction ideas.

**HIGH VOLUME ALGO** - The 'High Volume' algo identifies instances where there has been a significant price movement with significant volume. These tend to occur when news has been released that significantly affects investors' perceptions of asset prices. This algo therefore identifies assets where recent events have altered investor sentiment.

**OVERBOUGHT / OVERSOLD ALGO** - The 'Overbought/Oversold' algo uses a self-scaling relative strength indicator to identify assets which are in either oversold or overbought conditions and at the point when typically the price action begins to mean-revert. This enables the reversal levels to be tuned to the strength of the trend of an asset.

**CORRELATION ALGO** - The 'Correlation Algo' identifies which technical factors are the most highly correlated to future asset price returns. By 'factors' we mean continuously valued variables such as the 2 week price performance and the 20 day Relative Strength Index. The algo then identifies what typical future returns occur when those factors are similar to where they are today.

**TREND ALGO** - The 'Trend' algo identifies the direction and strength of a price trend using a proprietary methodology based on a range of moving averages and the position of the price relative to these moving averages.

Anthony Edwards gained a 1st class honours degree in Electrical and Electronic Engineering at the University of Bath and went on to earn a PhD based on research into power system stability using artificial intelligence techniques. He started working in the City of London in 1998 for Bankers Trust and subsequently became Head of Research IT Development for Deutsche Bank in London. In 2007 Anthony joined Liberum Capital to build out their global quantitative research platform. In 2011 he left Liberum Capital to start AlgoTechnology Limited which specialises in developing bespoke quantitative and technical algorithms and also in developing portfolio strategies.



### + Positive Signals

Positive Signals	Score	Best Signal	Horizon(d)	Avg Return	Sharp
Red Electrica Corp SA	+8	Price crossing up through EMA(89d)	60	11.6%	2.6
Natixis	+5	Commodity Channel Index / CCI(233d) signal	60	28.8%	3.7
Smurfit Kappa Group	+5	Rate Of Change Oscillator(34d) signal	40	5.3%	1.5
Ingenico	+4	Relative Activity Index(34d) less than 30	60	18.9%	7.3
Iberdrola SA	+4	Commodity Channel Index / CCI(144d) signal	60	6.2%	1.5
Kerry Group	+4	Commodity Channel Index / CCI(144d) signal	60	13.5%	2.5
Henkel AG & Co KGaA	+4	Commodity Channel Index / CCI(233d) signal	60	16.9%	2.2
Merck KGaA	+4	Commodity Channel Index / CCI(233d) signal	60	8.4%	2.1
Sodexo	+3	Commodity Channel Index / CCI(233d) signal	60	8.5%	2.4
Henkel AG & Co KGaA	+3	Commodity Channel Index / CCI(233d) signal	60	15.9%	2.0

### - Negative Signals

Negative Signals	Score	Best Signal	Horizon(d)	Avg Return	Sharp
Etablissements Maurel et Prom	-2	RVI(89/10d) less than 70	60	-5.1%	1.0
Mediaset SpA	-2	Exponential Moving Average / EMA(144d) turning downwards	60	-4.1%	1.1
FERRAGAMO	-2	Force Index(55d) signal	40	-8.3%	1.1
Alstom SA	-1	Williams %R(89d) signal	60	-5.3%	1.1
ThromboGenics NV	-1	RVI(144/10d) less than 70	60	-70.6%	3.0
Hargreaves Lansdown	-1	RVI(55/10d) less than 70	60	-5.8%	1.1
TNT Express NV	-1	RSI and RAI(21d) greater than 70	40	-36.4%	1.1
Vienna Insurance Group AG Wiener Versicherung Gruppe	-1	On-Balance Volume / OBV(89d) signal	20	-5.5%	1.3
Anite	-1	RSI(34d) greater than 70	60	-16.5%	1.3

The **AlgoAnalyst** uses a range of bespoke algorithms to identify the probable future direction of asset prices from time horizons from 1 week to 6 months. These algorithms look at a wide range of technical factors and signals and use backtesting to determine patterns and correlations in the data that have yielded consistent returns in the past. The algorithms can be individually tailored to each user's criteria such as investment horizon and risk/reward profile. The system itself covers a wide range of equities and equity indices and clients can create their own portfolios in the system to provide alerts for idea generation and risk management. In addition, the system provides the '**Portfolio Doctor**' which can be used to suggest potential replacement ideas for existing portfolio positions.



## + POSITIVE

**Signal Algo - Top 10**

Red Electrica Corp SA	+8
Natixis	+5
Smurfit Kappa Group	+5
Ingenico	+4
Iberdrola SA	+4
Kerry Group	+4
Henkel AG & Co KGaA	+4
Merck KGaA	+4
Sodexo	+3
Henkel AG & Co KGaA	+3

**Correlation Algo - Top 5**

Enagas SA	+1
Ingenico	+1
Edenred	+1
Bolsas y Mercados Espanoles SA	+1
Klepierre	+1

**Oversold Algo - Top 5**

Ingenico	+1
Edenred	+1
Natixis	+1
Sodexo	+1
Electricite de France SA	+1

**Trend Algo - Top 5**

Ansaldo STS SpA	+2
Rheinmetall AG	+2
Ryanair Holdings	+2
MAN SE	+1
Aixtron SE	+1

**Overall Most Positive**

Red Electrica Corp SA	+9
Smurfit Kappa Group	+5
Ingenico	+4
Natixis	+4
Enagas SA	+3
Iberdrola SA	+3
Kerry Group	+3
Sodexo	+3
Henkel AG & Co KGaA	+3
Merck KGaA	+3
Henkel AG & Co KGaA	+2
MAN SE	+2
Ansaldo STS SpA	+2
Rheinmetall AG	+2
Ryanair Holdings	+2
Edenred	+1

## —NEGATIVE

## Trend Algo - Top 5

Aalberts Industries NV	-2
Banco Santander SA	-2
Bankia SA	-2
Beiersdorf AG	-2
Bilfinger SE	-2



## Signal Algo - Bottom 10

Etablissements Maurel et Prom	-2
Mediaset SpA	-2
FERRAGAMO	-2
Alstom SA	-1
ThromboGenics NV	-1
Hargreaves Lansdown	-1
TNT Express NV	-1
Vienna Insurance Group AG Wiener Versicherung Gruppe	-1
Anite	-1
Raiffeisen Bank International AG	-1



## Overall Most Negative

Etablissements Maurel et Prom	-4
FERRAGAMO	-4
Bankia SA	-3
Mediaset SpA	-3
Aalberts Industries NV	-2
Banco Santander SA	-2
Beiersdorf AG	-2
Bilfinger SE	-2
Hellenic Telecommunications Organization SA	-2
ThromboGenics NV	-2
Deutsche Telekom AG	-1
Fiat Chrysler Automobiles NV	-1
Alstom SA	-1



## Correlation Algo - Bottom 5

Bankia SA	-1
Deutsche Telekom AG	-1
Fiat Chrysler Automobiles NV	-1
Hellenic Telecommunications Organization SA	-1
OPAP SA	-1





# STRENGTH IN DEPTH

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