# HindeSight

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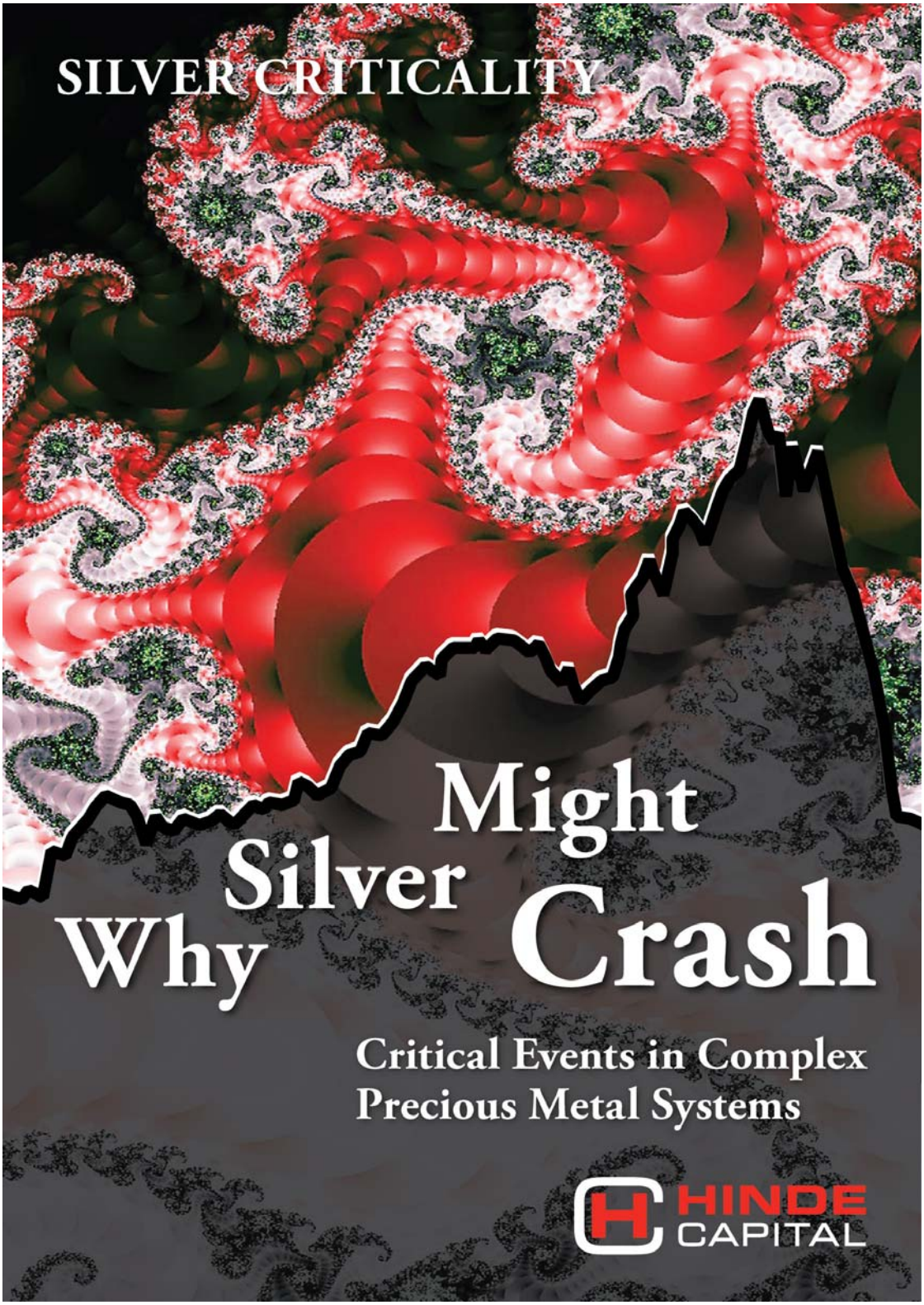
April 11



"Errors of Nature, Sports and Monsters correct the understanding in regard to ordinary things, and reveal general forms. For whoever knows the ways of Nature will more easily notice her deviations; and, on the other hand, whoever knows here deviations will more accurately describe her ways."

**Novum Organum (Sir Francis Bacon, 1620)**

"On Wall Street, the term 'random walk' is an obscenity. It is an epithet coined by the academic world and hurled insultingly at the professional soothsayers. Take to its logical extreme, it means that a blindfolded monkey throwing dates at a newspaper's financial pages could select a portfolio that would do just as well as one carefully selected by the experts."

**Burton Malkiel** (A Random Walk Down Wall Street, revised 1996)

"Not only have individual financial institutions become less vulnerable to shocks from underlying risk factors, but also the financial system as a whole has become more resilient."

**Alan Greenspan**

"The crisis takes a much longer time coming than you think, and then it happens much faster than you would have thought."

**Rudiger Dornbusch, MIT Economist**

"A theory is more impressive the greater the simplicity of its premises, the more different the kind of things it relates and the more extended its range of applicability."

**Albert Einstein**

"Res tantum valet quantum vendi potest...A thing is worth only what someone else will pay for it."

**Oskar Morgenstern**

**EconoPhysics**

Didier Sornette published arguably a seminal piece of work, 'Why Stock Markets Crash? Critical Events in Complex Financial Systems.' It is a study of a complex system - financial markets. It draws from a wide range of disciplines, both natural and social sciences.

**Complex Systems**

Financial markets constitute one among many other *systems* which exhibit such complex organisation and similar behavioural dynamics.

**Self-Organised Criticality**

Self-organized criticality (SOC) is one of a number of important discoveries made in statistical physics and related fields over the second half of the 20th century, discoveries which relate particularly to the **study of complexity** in nature.

**Californication**

The earthquakes and wildfires of California are the propagation of such self-organised criticality.

**Random Walk Hypothesis and Outliers**

Random placement of grains, appeared to generate random slope failure. But the existence of self-organising phenomena, which arrives at a critical state, has enabled Sornette et al. to make predictions about when the failure will likely occur.

**The World According to GARCH or GAUSSIAN**

In the Bachelier - random walk world , financial markets follow a Gaussian (or bellcurve) distribution. But do they?

**The Law of Rare Events**

*Poisson distribution* is sometimes called the *law of rare events or small numbers* because it is the probability distribution of the number of occurrences of an event that happens rarely but has very many opportunities to happen.

**Power Law, Imitation and the Internet**

The power law is seen as an alternative to the normal (Gaussian) distribution or bell curve. It seems highly intuitive. It's often mentioned as the 80:20 rule or Pareto Principle (the law of the vital few).

**Silver Criticality - Japan Criticality –Hyper-Criticality**

**Silver Criticality Introduction:**

Financial markets provide constant fascination for individuals; each and everyone one of us derives, often subconsciously, certain needs or outcomes from them. These are usually personal and specific to the individual, but every now and again market participants can observe imitative or herding behaviour which can lead to the phenomena widely known as 'bubbles'. Bubbles usually reflect a disconnect between fundamentals and human perception. The outcome of such disequilibria can lead to severe corrections, or even a 'crash' as the bubble bursts.

Discussion on whether markets are in a bubble invariably appear to be very subjective, with both bubble diviners and naysayers justifying their polar opposite stances. In the past few years we have put the case, we believe with a subjective and empirical analysis of the precious metals markets, as to why they were (and are) not exhibiting the signs of bubble behaviour.

Specifically last August 2010 we published our HindeSight Investor Letter - Silver Velocity, The Coming Bullet, in which we outlined the fundamental case, both in terms of macroeconomic relevance and the structural supply demand imbalances for much higher prices. Now these factors had been in confluence for some time, but we believed an oligopoly (price control) had artificially suppressed prices. Our proprietary models, finally alerted us to the very high probability of an explosive price movement. This has come to pass.

We now want to examine the trajectory and sustainability of recent price action. We want to draw on work done by some leading physicists and mathematicians, such as Didier Sornette, Anders Johansen, and Benoit Mandelbrot to provide us with some insights into the internal dynamics of complex systems. Sornette specifically drew on human and natural phenomena to predict the trajectory of stock markets and predict turning points where a crash occurred. He termed these 'Critical Points'. The question we ask ourselves today is, has silver, as an example of a complex system, reached such a point of *criticality*?

**Before examining the complex precious metals system, in this case silver, we will seek some guidance from the natural world.**

**EconoPhysics**

In 2003 Didier Sornette published what was arguably a seminal piece of work, 'Why Stock Markets Crash? Critical Events in Complex Financial Systems.' It is a study of a complex system - financial markets. It draws from a wide range of disciplines, both natural and social sciences. Sornette has set out to disprove the theory that complex systems are not predictable and that to comprehend them you have to look at them in their entirety, not compartmentalised into their single components. It is a case of the sum is truly greater than the parts.

It was his work as a geophysicist that led him to understand that 'failures' in natural phenomena were observable and translatable empirically to the 'failures' that occur in financial markets. In 1991, whilst working on Arianne 4 and 5 space rockets, he realised that the rupturing of the composite materials, Kevlar-matrix and carbon-matrix that constituted the pressure tanks on the rockets, was a cooperative phenomenon. The 'ruptures' in the bonding structure of these materials, were analogous to financial crises. They were the 'ruptures' of the market.

Sornette showed empirically what many of us who traded or invested in markets for these past few decades intuitively believe. The underlying causes of market crashes will be found in the preceding months and years, in the progressively cooperative behaviour of participants. Effective interactions between investors and speculators alike, lead to accelerating price point higher: the bubble. This is the *critical* point at which the market crashes.

A crash will occur because the market has entered an unstable phase and is not dependent on external disturbances (trigger) to do so (although associated triggers are observed). An analogy will help to illuminate this concept:

A car travelling up a mild gradient is relatively stable in its traction. As the car moves into a steeper gradient on uneven ground, some kindly by-passers get behind the car helping it to move higher on its journey. At some point the slope becomes too critical or steep and at 90 degrees, the car is highly unstable and simply falls off the now vertical incline. It drops off the proverbial cliff, a description often used in association with crashes.

Likewise if one holds a ruler vertically on one's hand, without constant adjustment the ruler is clearly unstable and an innocuous movement or breath of air can send the ruler earthward bound. The proximate action is not really the cause but the endogenous structure that has prevailed in the months before, is. It is an internal process not an external one that enables the crash. It is a process constructed by the *self-organising dynamic* of the market as a whole.

## Complex Systems

**A central property of a complex system is the possible occurrence of coherent large-scale collective behaviours with a very rich structure resulting from the repeated non-linear interactions among its constituents: the whole turns out to be much more than the sum of the parts.**

Financial markets constitute one among many other *systems* which exhibit such complex organisation and similar behavioural dynamics. Systems with a large number of mutually interacting parts, often with open environment, **self-organise their internal structure** and their dynamics with quite novel and surprising macroscopic, ie emergent, properties.

**Emergent Natural Process: Water Crystals form on a glass:**



## Self-Organized Criticality

Self-organized criticality (SOC) is one of a number of important discoveries made in statistical physics and related fields (econophysics) over the second half of the 20th century, discoveries which relate particularly to the **study of complexity** in nature.

The concept was put forward by Per Bak, Chao Tang and Kurt Wiesenfeld in a paper[1] published in 1987 in Physics Review Letters, and is considered to be one of the mechanisms by which complexity arises in nature.

The key result of their paper was its discovery of a mechanism by which the emergence of complexity from simple local interactions could be *spontaneous* - and therefore plausible as a source of natural complexity - rather than something that was only possible on the laboratory computer, where it was possible to tune control parameters to precise values.

[1]Bak, P., Tang, C. and Wiesenfeld, K. (1987). "Self-organized criticality: an explanation of 1 / f noise". Physical Review Letters 59 (4): 381–384. Bibcode 1987PhRvL..59..381B. doi:10.1103/PhysRevLett.59.381.

Over a similar period of time, Benoit Mandelbrot's body of work on *fractals* showed that much complexity in nature could be described by certain ubiquitous (universal) mathematical laws, while the extensive study of *phase transitions* carried out in the 1960s and 1970s showed how *scale invariant* phenomena such as *fractals* and *power laws* emerged at the *critical point* between phases.

**Californication**

Landsides, wildfires and earthquakes are examples of self-organised critical behaviour.

Despite the many complexities concerning their initiation and propagation, forest fires exhibit power-law frequency-area statistics (see later) over many orders of magnitude. A simple forest fire model, which is an example of self-organized criticality, exhibits similar behaviour. One practical implication of this result is that the frequency-area distribution of small and medium fires can be used to quantify the risk of large fires, as is routinely done for earthquakes.

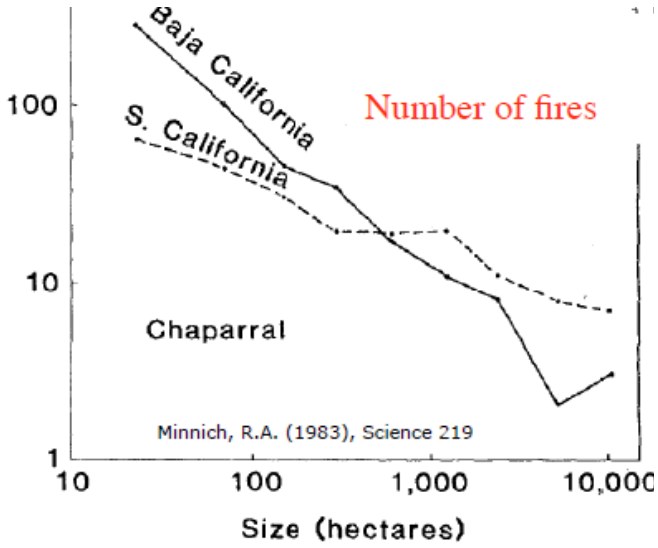
**Wildfires: California**



*The primary response from government has been to initiate aggressive fire suppression and management in an attempt to eliminate fire from native lands. In spite of these aggressive fire suppression efforts large wildfires continue to consume vast acreages of Chaparral in Southern California. Minnich (1983, 1997) comparing the chaparral fire regimes in southern California and Baja California found that in Baja California numerous small fire events fragment stands into a fine mixture of age classes, a process which appears to help preclude large fires. While the pattern of large fires in Southern California appears to be an artefact of suppression.* (Malamud and Turcotte, 1998)

- Log-periodic behaviour in a forest-fire model (Malamud and Turcotte, June 2005) http://www.nonlin-processes-geophys.net/12/575/2005/npg-12-575-2005.pdf

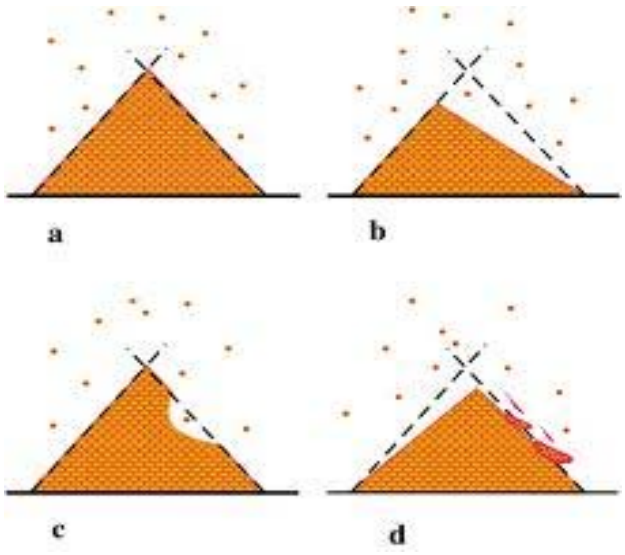
**California wildfires per hectare**




Source: Malamud et al, 2005

Bak et al are most notably known for their sandpile model, which was a dynamical system that displayed SOC. A pile of sand builds up as grains of sand are randomly placed on the pile, until the slope exceeds a specific threshold value at which time the slope collapses transferring sand to adjacent sites, increasing their slope. This random transference may have no effect or it may cause a *cascade* reaction.

The sandpile system is deemed to have reached a state of SOC.




[1]Bak, P., Tang, C. and Wiesenfeld, K. (1987). "Self-organized criticality: an explanation of 1 / f noise". Physical Review Letters 59 (4): 381–384. Bibcode 1987PhRvL..59..381B. doi:10.1103/PhysRevLett.59.381.

**Random Walk Hypothesis and Outliers**

We have observed that seemingly discrete, random events lead to catastrophic events. Random placement of grains, appeared to generate random slope failure. But the existence of self-organising phenomena, which arrives at a critical state, has enabled Sornette et al to make predictions about when the failure will likely occur. In financial markets such a collapse would be considered a statistical *drawdown*. A drawdown is defined as a persistent decrease in the price over consecutive days.

Although the presence of large drawdowns (falling prices) in financial markets have been shown to be *outliers* (eg crashes), they in fact have ubiquitous properties. Outliers are defined as data that is unexpectedly far from the mean, due to exceptional circumstances, observational error, etc. Sornette has used mathematical models, extrapolated from his observations of outliers in nature to predict crashes. His work could have predicted most stock market crashes, as well as currency collapses, including the gold price rise and fall in 1980.

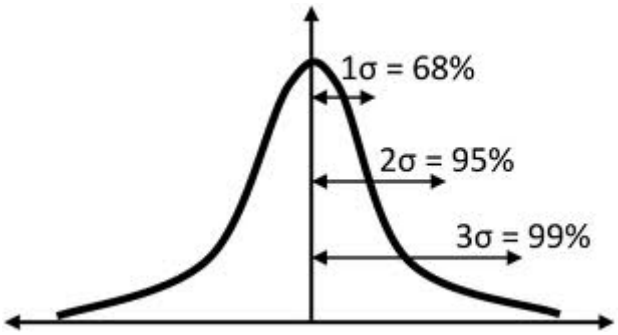
The random walk concept is a core founding principle of physics. It is the bedrock of theories of elementary particles, the very building blocks of our universe, the most complex system of them all. Louis Bachelier, the French mathematician was one of the first to link the world of physics and financial markets in his work 'The Theory of Speculation'. He modelled stock option pricing off the random stochastic processes of Brownian motion. He believed price trajectories were random walks.

Efficient Market Hypothesis (EMH) and the Random Walk Hypothesis (RWH) are consistent with each other. Eugene Fama's EMH claims that markets are informationally efficient and RWH implies that price movements will be random. But how do these account for persistent price movements up or down beyond the statistical normality?

Sornette has used fractal concepts and behavioural finance and trading dynamics to show these are far from random, but actually predictable, and predicated on endogenous processes.

**The Word According to GARCH and Gaussian**

In the Bachelier - Random walk world , financial markets follow a Gaussian (or bellcurve) distribution. This is the same as tossing a coin up and down to predict price movements, which also observe this distribution.




About 68% of values drawn from a normal distribution are within one standard deviation $\sigma$ away from the mean; about 95% of the values lie within two standard deviations; and about 99.7% are within three standard deviations. This fact is known as the 68-95-99.7 rule, or the *empirical rule*, or the *3-sigma rule*.

This distribution, as we all know too well, is known as the normal distribution. But there is nothing 'normal' about outliers. Quantities that grow exponentially, such as prices, incomes or populations, are often skewed to the right, and hence may be better described by other distributions, such as the log-normal distribution or Pareto distribution.

In addition, the probability of seeing a normally-distributed value that is far (i.e. more than a few standard deviations) from the mean drops off extremely rapidly. As a result, statistical inference using a normal distribution is not robust to the presence of *outliers* (data that is unexpectedly far from the mean, due to exceptional circumstances, observational error, etc).

When outliers are expected, data may be better described using a heavy-tailed distribution such as the GARCH, (Generalized Autoregressive Conditional Heteroskedasticity). For you math guru's:

The GARCH(p, q) model (where p is the order of the GARCH terms $\sigma^2$ and q is the order of the ARCH terms $\epsilon^2$) is given by,

$$\sigma_t^2 = \alpha_0 + \alpha_1 \epsilon_{t-1}^2 + \cdots + \alpha_q \epsilon_{t-q}^2 + \beta_1 \sigma_{t-1}^2 + \cdots + \beta_p \sigma_{t-p}^2 = \alpha_0 + \sum_{i=1}^{q} \alpha_i \epsilon_{t-i}^2 + \sum_{i=1}^{p} \beta_i \sigma_{t-i}^2$$

## The Law of Rare Events

In probability theory and statistics, the *Poisson distribution* is sometimes called the *law of rare events or small numbers* because it is the probability distribution of the number of occurrences of an event that happens rarely but has very many opportunities to happen. *The Law of Small Numbers* is actually the title of a book by Ladislaus Bortkiewicz about the Poisson distribution, published in 1898.

In this book he first noted that events with low frequency in a large population follow a Poisson distribution even when the probabilities of the events varied. It was that book that made the Prussian horse-kick data famous. The data give the number of soldiers killed by being kicked by a horse each year in each of 14 cavalry corps over a 20-year period. Bortkiewicz showed that those numbers follow a Poisson distribution.

The Poisson distribution can be applied to systems with a large number of possible events, each of which is rare. A classic example is the nuclear decay of atoms or the number of mutations in a given stretch of DNA, after a certain amount of radiation.

One can compute more precisely, approximating the number of extreme moves of a given magnitude or greater by a Poisson distribution, but simply, if one has multiple 4 standard deviation moves in a sample of size 1,000, one has strong reason to consider these outliers or question the assumed normality of the distribution.

| Range | Population in range | Expected frequency outside range | Approx. frequency for daily event |
|---|---|---|---|
| $\mu \pm 1\sigma$ | 0.682689492137 | 1 in 3 | Twice a week |
| $\mu \pm 2\sigma$ | 0.954499736104 | 1 in 22 | Every three weeks |
| $\mu \pm 3\sigma$ | 0.997300203937 | 1 in 370 | Yearly |
| $\mu \pm 4\sigma$ | 0.999936657516 | 1 in 15,787 | Every 43 years (twice in a lifetime) |
| $\mu \pm 5\sigma$ | 0.999999426697 | 1 in 1,744,278 | Every 5,000 years (once in history) |
| $\mu \pm 6\sigma$ | 0.999999998027 | 1 in 506,842,372 | Every 1.5 million years |
| $\mu \pm x\sigma$ | $\text{erf}(x/\sqrt{2})$ | 1 in $1/(1-\text{erf}(x/\sqrt{2}))$ | Every $1/(1-\text{erf}(x/\sqrt{2}))$ days |

Thus for a daily process, a $6\sigma$ event is expected to happen less than once in a million years. This gives a simple normality test: if one witnesses a $6\sigma$ in daily data and significantly fewer than 1 million years have passed, then a normal distribution most likely does not provide a good model for the magnitude or frequency of large deviations in this respect.

Sornette criticised both the Poisson distribution, and also the GARCH because the fat tails from this distribution and statistical significance test weren't fat enough. So he turned his

attention to power laws, or log periodic behaviour to examine financial markets. Those very same laws he found evident in wildfires, sandpiles, earthquakes and other natural phenomena.

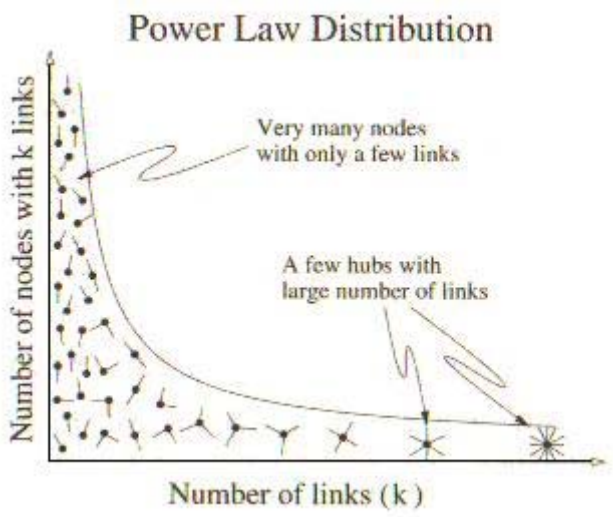
**Power Law, Imitation and the Internet**

The power law is seen as an alternative to the normal (Gaussian) distribution or bell curve. It seems highly intuitive. It's often mentioned as the 80:20 rule or Pareto Principle (the law of the vital few). It was named after the Italian economist Vilfredo Pareto, who observed that 80% of the land in Italy was owned by 20% of the population. So for many events we can observe that roughly 80% of the effects come from 20% of the causes.

Also according to the economist, Arthur De Vany, the 80-20 rule also applies to major motion pictures - about 20% of the films will grab about 80% of the market share (the research is contained in his book *Hollywood Economics*). To help explain the difference between Gaussian and Power Law outcomes, here is an example:

The American mean income is $45,000 a year. Warren Buffet or Bill Gates make many multiples of that a year. Their wealth is at an extreme proportion to the average Joe's income. The 'extremeness' (in terms of magnitude) of their wealth essentially makes the notion of an 'average' wealth or income much less useful in describing the distributions. Having a Bill or Warren in the wealth distribution is like having a ten foot tall human being; it just can't happen if the distribution of wealth was Gaussian.

So the Pareto Principle is really an illustration of a *power law* relationship, because it is *self-similar* over a wide range of magnitudes, it produces outcomes completely different from the Gaussian phenomena. This fact explains the frequent breakdowns of sophisticated financial instruments, which are modeled on the assumption that a Gaussian relationship is appropriate to, for example, stock movement sizes.



**Destabilizing Imitation Process**

Behavioural economics is a central part of financial markets, as after all we are dealing with human beings, so examining participants is a must. One area that has seen substantial research is in imitative processes, which cause positive feedbacks that become 'destabilising'.

Positive feedbacks, when unchecked, can produce runaways until the deviation from equilibrium or 'fundamental' prices is so large that other effects can be abruptly triggered and lead to rupture or crashes. A general mechanism for positive feedback, is now known as the 'herd' or 'crowd' effect, based on imitation processes. **Repetition of these imitative interactions may lead to a remarkable cooperative phenomenon in which the market can suddenly 'solidify' a global opinion, leading to large price variations.**

- *Informational cascades* occur when individuals choose to ignore or downplay their private information and instead jump on the bandwagon by mimicking the actions of individuals who acted previously. Informational cascades occur when the existing aggregate information becomes so overwhelming that an individual's single piece of private information is not strong enough to reverse the decision of the crowd. (Devenow and Welch 1996)

- *Reputational herding*, like cascades, takes place when an agent chooses to ignore his or her private information and mimics the action of another agent who has acted previously. However, reputational herding models have an additional layer of mimicking, resulting from positive reputational properties that can be obtained by acting as part of a group or choosing a certain project, eg investment letter writers, (Graham, 1999)

- *Imitative behaviour* is optimal when lacking information.

Sornette's key assumption is that a crash may be caused by local *self-reinforcing imitation* between traders. This self-reinforcing imitation process leads to the blossoming of a bubble. If the tendency for traders to 'imitate' their 'friends' increases up to a certain point called the 'critical' point, many traders may place the same order (sell) at the same time, thus causing a crash. The interplay between the progressive strengthening of imitation and the ubiquity of noise requires a probabilistic description: a crash is not a certain outcome of the bubble but can be characterised by its hazard rate, ie the probability per unit time that the crash will happen in the next instant provided it has not happened yet.

Models that combine the following features would display the same characteristics, in particular apparent coordinated buying and selling periods, leading eventually to several financial crashes. These features are:

1. *A system of traders who are influenced by their 'neighbours'.*

2. *Local imitation propagating spontaneously into global cooperation.*

3. *Global cooperation among noise traders causing collective behaviour.*

4. *Prices related to the properties of this system.*

5. *System parameters evolving slowly through time.*

(Sornette, 2003)

The structure of financial markets can be thought of as hierarchical systems or networks, which are self-similar. (In mathematics, a self-similar object is exactly or approximately similar to a part of itself (ie the whole has the same shape as one or more of the parts).)

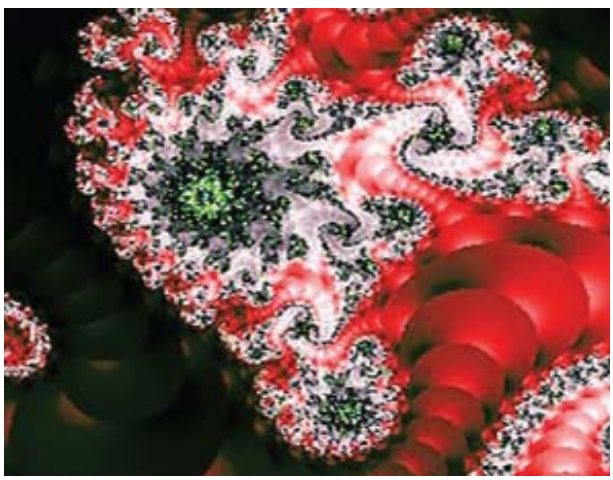
Many objects in the real world, such as coastlines or snowflakes, are statistically self-similar: parts of them show the same statistical properties at many scales. Self-similarity is a typical property of fractals. Scale invariance is an exact form of self-similarity where at any magnification there is a smaller piece of the object that is similar to the whole. For instance, a side of the Koch snowflake is both symmetrical and scale-invariant; it can be continually magnified 3x without changing shape.

**Intuitively speaking, critical self-similarity is why local imitation cascades up the scales from small networks into global coordination. This is when markets experience Self-Organised Criticality.**

Since the crash is not a certain deterministic outcome of the bubble, it remains rational for investors to remain in the market provided they are compensated by a higher rate of growth of the bubble for taking the risk of a crash, because there is a finite probability of 'landing smoothly', ie of attaining the end of the bubble without crash.

Sornette shows how these astonishing geometric and mathematical shapes/objects (fractals) enable one to codify the information contained in the *precursory patterns* before large crashes.

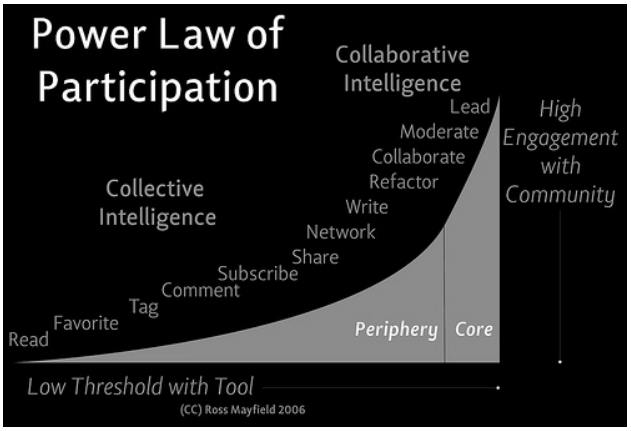
**Hinde Capital 'Silver' fractals**



**Internet and Power Law of Participation**

In Wikipedia, 500 people, or 0.5% of users, account for 50% of the edits. Participation in communities on the internet plots along a power law with a solid core/periphery model - provided social software supports both low threshold participation and high engagement.

The internet has enabled the propagation of information by a few to a large number by networks and hierarchical structures that are self-similar. As Sornette has shown in his work, markets can experience power law distributions at a critical point. We believe that work by a few participants, vis-a-vis the internet has created a self-reinforcing belief that has propagated in an exponential distribution which we derive to be a precursor to a mini-crash.




Source: Slide Share

The silver market is not frequented by a plethora of market experts, unlike stock markets, and it is much easier to be an 'authoritative' figure in this asset class, amongst a few. Most notable of those figures are Sprott Asset Management's crew, GATA, James Turk, David Morgan and Theodore Butler. No disrespect to those who we are remiss in mentioning. These individuals cover largely retail money (of which there is not an insignificant amount) and although their customer base is increasingly well-read, their knowledge is, we would guess, based around the information these experts impart.

Now these gentlemen have discussed silver's potential merits for a number of years, and most have explored the issue of its manipulation. For years these were in the main discarded as insane conspiracy theories. But March 2010 event's changed all of that irrevocably, with the instigation of the CFTC hearings and the arrival of a 'whistleblower' calling out the alleged perpetrators of the market rigging in silver - JPM and HSBC.

For us as a firm we believed this to be a seminal moment and later that year in August we posted a timely report on positioning for a price explosion in silver. For years we have felt strongly about the fundamentals based on a information gathered these past 5 years. But

we understand as well as most that comprehending the true supply (and demand) numbers for silver is a complex reality. It's like looking for the holy grail. You need some faith (and faith is not a good basis for investment); although we believe you can deduce by reasoning and logic the overall picture. We can garner the macro-concept that there is a deficiency of supply relative to demand of silver, but the granularity of the details is not fine.

The affirmation of manipulation and reputations have grown as exponentially as the market has risen. The more silver rises the more these experts are right; this is what participants are in effect stating by buying more silver. The CFTC hearing provided the credibility.

Concomitant with this manipulation is the belief that there is now not a readily available supply of physical silver. We sincerely believe that participants do not fully understand the dynamics at hand. We have believed the market to be run as an oligopoly with all that price controls potentially entail. So, yes, one of the US banks has too large a Comex position relative to Comex open interest and also annual supply. But investors misinterpret the nature of the short. **We have never believed this to be a naked short**. We believe that the short Comex is against unallocated long positions, ie OTC vs COMEX. Now is the readily available supply of physical supply enough to meet a 'run' on unallocated silver? Absolutely not*. But JPM will not be experiencing a loss on their physical/paper metal books. Those who think otherwise do not understand the nature of the bullion bank positioning.

{*Please see our conclusionary paragraph on OTC and Comex scenario.}

Curiously enough it only occurred to us most recently that the drive up in price from the $26 oz lows $49.85, some 98%, could in fact be mostly down to the handy work of Max Keiser (plus Stacy) and his personal campaign to bring down JPMorgan. He has rallied the disenfranchised retail masses, angered by the banks (and possibly some large surplus countries) to purchase real physical silver with the hope of inflicting a Comex delivery default by JPM. This is a classic example of **the power law of participation** at work. Certainly a combination of King World News, and the others have played their part, but the evidence points to this one remarkable outcome.

Max Keiser is the agent provocateur, leader of the 'SLA - Silver Liberation Army' as he coined it. He is now the darling of the silver buying masses. Max is a loveable 'rogue'. He is both satirically clever and humorous. He makes great political points in a refreshing manner, although until now it was hard to take him wholly seriously, despite his often reasoned underlying message.

Max Keiser has skillfully availed himself of the credibility of these other men and exploited the 'silver short(age)' concept because of the credibility CFTC afforded to the subject, when they undertook to investigate the 'egregious' shorts in silver Comex. This investigation has possibly gone on behind closed doors, but this would seem odd in light of all the public interest.

Individuals pursuing his call to arms, are missing the point they are potentially going to be victims of the behavioural aspects discussed earlier, namely, herding. If they are levered it

will end badly for them. As Max even writes himself in the UK Guardian online he is whipping up a self-reinforcing situation:

http://www.guardian.co.uk/commentisfree/2010/dec/02/jp-morgan-silver-short-selling-crash

*On my show, Keiser Report, I recently invited Michael Krieger, a regular contributor of Zero Hedge (the WikiLeaks of finance). We posited that if 5% of the world's population each bought a one-ounce coin of silver, JP Morgan would be forced to cover their shorts – an estimated $1.5tn liability – against their market capital of $150bn, and the company would therefore go bankrupt. A few days later, I suggested on the Alex Jones show that he launch a 'Google bomb' with the key phrase "crash jp morgan buy silver".*

*Within a couple of hours, it went viral and hundreds of videos have been made to support the campaign.*

*Right now, silver eagle sales for the month of November hit an all-time record high and the availability of silver on a wholesale level is drying up. The most important indicator is the price itself – holding just under a 30-year high. With each uptick JP Morgan gets closer to going bust or requiring a bailout.*

*Here's how the campaign works: wealth tied to a fiat currency is easily overwhelmed by wealth tied to silver and gold. And the world is waking up to the fact that they have the ability, without government assistance or other interference, to create a new precious metals-based backed currency system by simply converting their fiat paper into* real *money.*

*This campaign has 100% chance of working; it falls into the category of a self-fulfilling prophecy. As more individuals buy silver and gold, all attempts to replenish the system with more paper money will only cause the purchasing power of the silver and gold to increase – thus prompting more people to buy more. Any attempts to bail out JP Morgan would have the same effect. If the US Fed was to flood the system with bailout money for JP Morgan to cover their silver short position (as they did after the collapse of Long-Term Capital Management), more inflation will ensue and the price of silver and gold will rise more, triggering more purchases. A virtuous circle is born. If anyone is interested in helping to crash JP Morgan, buy silver. In the end, it's about transferring wealth back to the people from where it came.*

So there you have it, he says it himself he is creating what he sees as a self-fulfilling prophecy. A self-fulfilling prophecy is an example of a social positive feedback loop between beliefs and behaviour: if enough people believe that something is true, their behaviour can make it true, and observations of their behaviour may turn increase belief. A classic example is a bank run = may be he will get a JPM run. Of course he is advocating silver purchases and many are turning to the poor man's metal because of its relative cheapness to gold.

If you go into the Google trend analytics in detail, one can see that Max Keiser has indeed achieved a Google bomb, and spread the word to buy silver.

**Buy Silver**




A to F are the lead stories - note the proliferation and amplitude of links to Max Keiser.

A Silvercorp to buy silver-lead-zinc project for $15M
Victoria Times Colonist - Feb 22 2010

B Avon To Buy Silver Jewelry Seller Silpada For At Least $650 Million
FOX Business - Jul 12 2010

C Time to buy silver, a safe-haven Cinderella
Financial Post - Sep 2 2010

D Keiser Report: Alex Jones joins 'Buy Silver' campaign
RT - Nov 17 2010

E Want JP Morgan to crash? Buy silver
The Guardian, Max Keiser- Dec 2 2010

F Buy silver around 50000-51000: Ashwani Gujral
Economic Times - Mar 11 2011

**We would suggest that participants in the market are guilty of 'reputational herding' , ie ignoring one's own private information and mimicking well-known agents.**

Remember imitative behaviour that can lead to critical ruptures in markets because of self-organized behaviour is optimal when participants have limited information, and at best information based on fallacies.

We spend our wakening hours exploring the dynamics of the market and we confess wholly that the precious metals market is a truly complex system. We talk to numerous participants, refiners, bullion dealers, hedge fund players, coin dealers, and producers. We have imperfect knowledge. We believe most participants of late have a self-reinforced belief that is misguided.

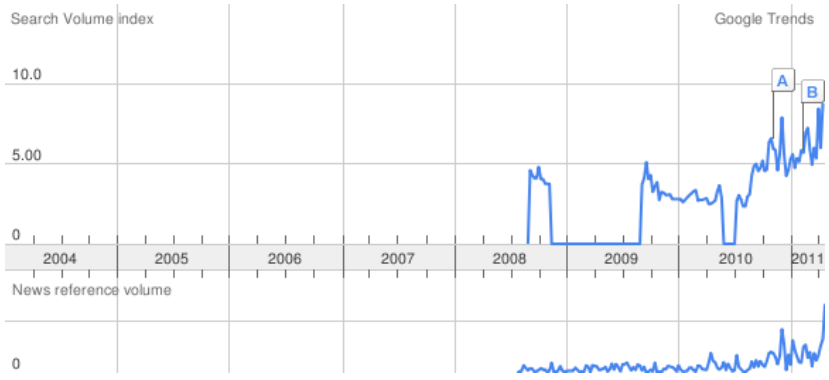
The number of individuals that have contacted us about silver when prices hit $35 was alarming. These were new participants by their own admission who questioned our stated desire to reduce our over allocation to silver back to gold. We had been running from $18 to $30 at double our core holding and were content to go back to our core holding which, because of our trend model, we were happy to do as it gave us no reason to get out of the silver market altogether..

We want to offer returns commensurate with the gold bullion spot price. When a position of 12.5% of your fund trades equivalent to 4x your dollar value in gold risk, as risk managers we have to adjust our position lower accordingly. We employ no borrowed leverage but to achieve outperformance we on average move between 75% and 125% of AUM.

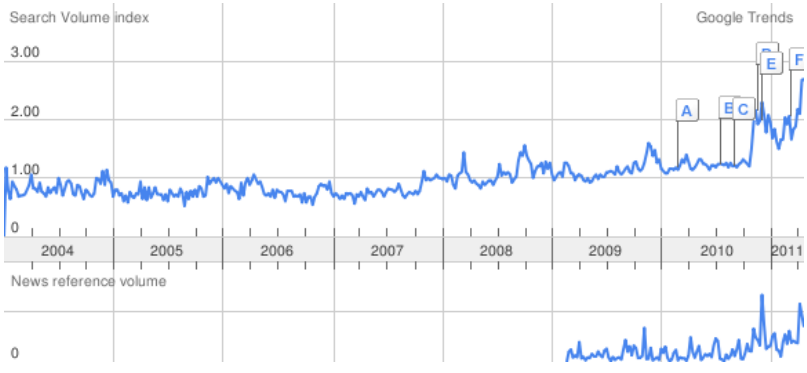
The anecdotal evidence is that the market is attracting 'thrill seekers' - the volatility of silver has lured all manner of traders from other markets. Traders go where they perceive the action to be. For every winner there is a loser. That will not change for a small or big range. So if you lost consistently in a small range market you will lose 'big' in a larger range market.

We attach some more interesting sentiment insights from Google Trends.

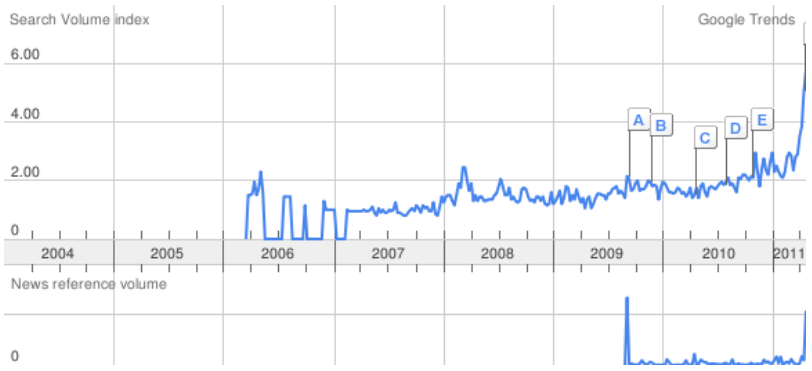
**Physical Silver**



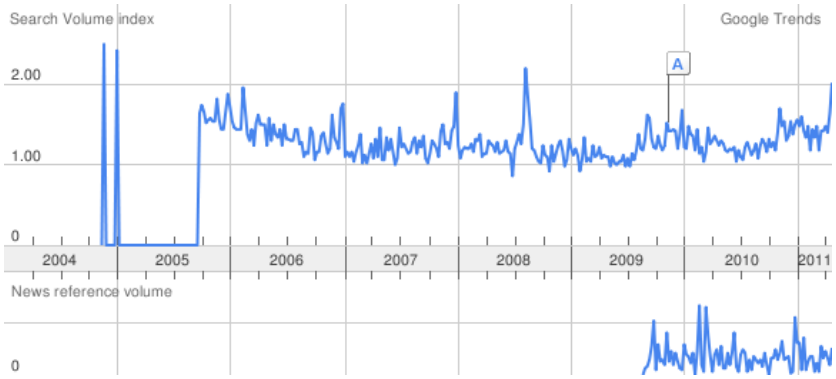

**Buy Silver**



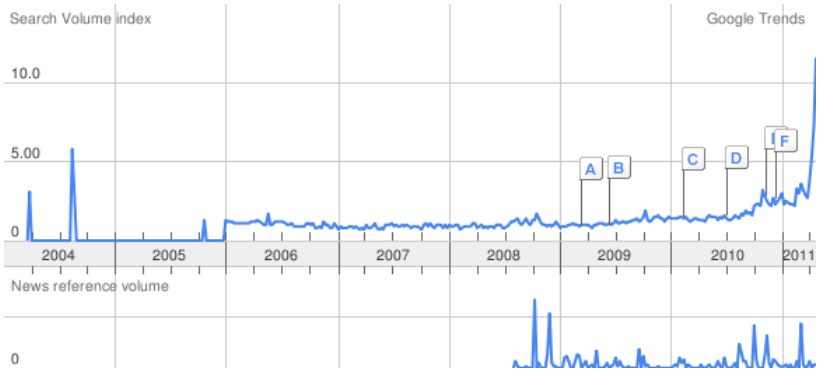
### Sell Silver




### China Silver



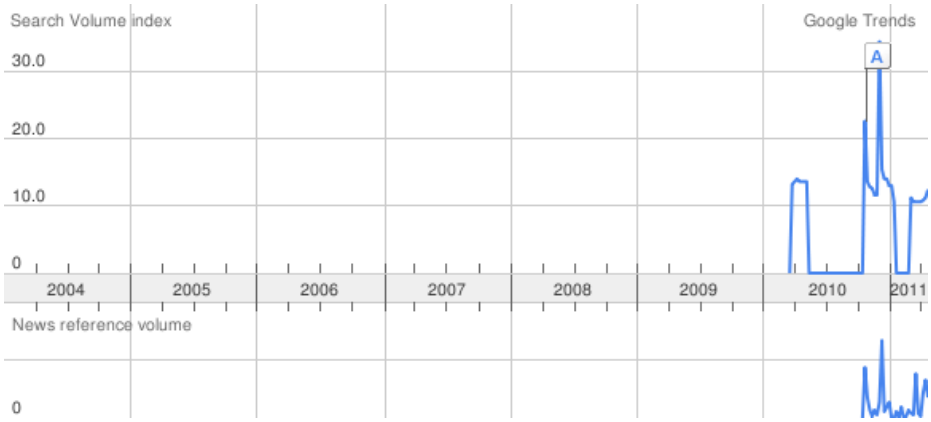

### India Silver



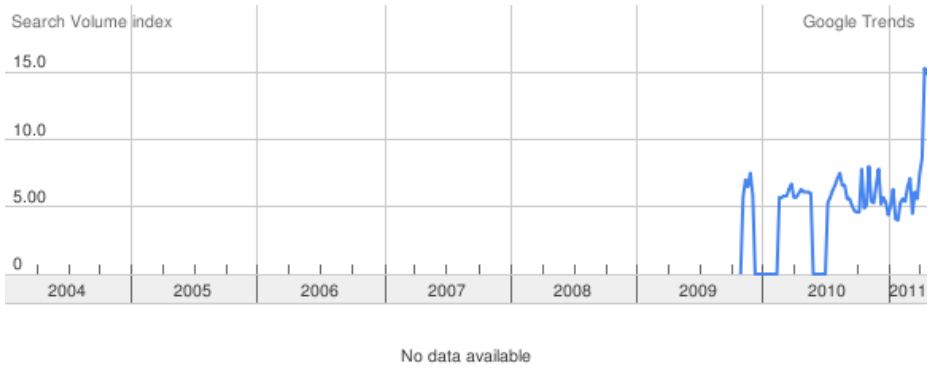
News reference volume is interestingly lower for “sell silver” stories, despite higher volume index numbers. Physical silver hits have grown exponentially - a good sign. We encourage physical ownership. At the margin physical silver buy needs outweigh sell needs, which is possibly a bearish slant. Interestingly, India news flow on silver seems higher than China. This is partially down to media outlet and routing. But we would say two months ago silver purchases from India were rising, but this month we have heard of muted demand.

We put these charts in for yours and our curiosity. We clearly can't rely on such vague insights, but it is interesting nonetheless. We speak to end users and refiners and it is clear there is demand, and these 'agents' reinforce this, but it is location specific physical shortages that we note. Bottlenecks have occurred in the manufacturing process whether it be tola bars for Asia, and 1 kilo bars for Australia, or Eagles for the US. There is a considerable amount of 0.9995 bars and non-LBMA silver available. Of late, premiums for kilo bars in some countries in Australasia have been at 35 to 45%. $65 plus to spot equivalent. This is indicative of a market frothy in sentiment, not a chronic failure of medium-term supply.

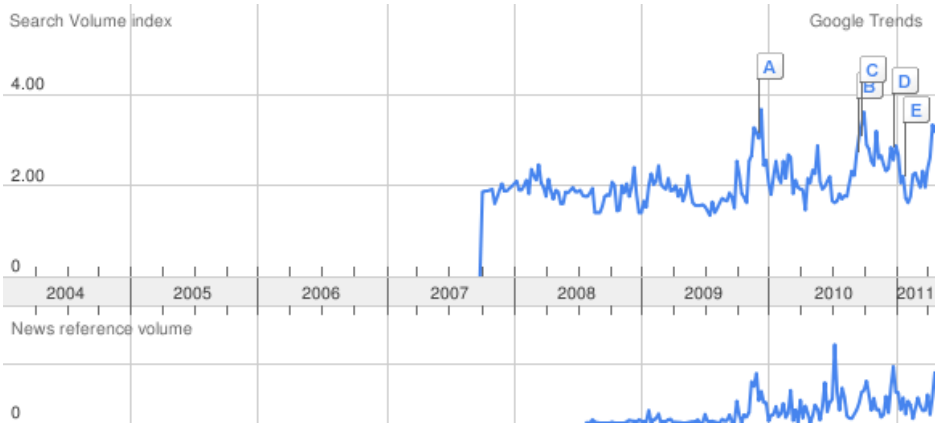
**Silver Manipulation**



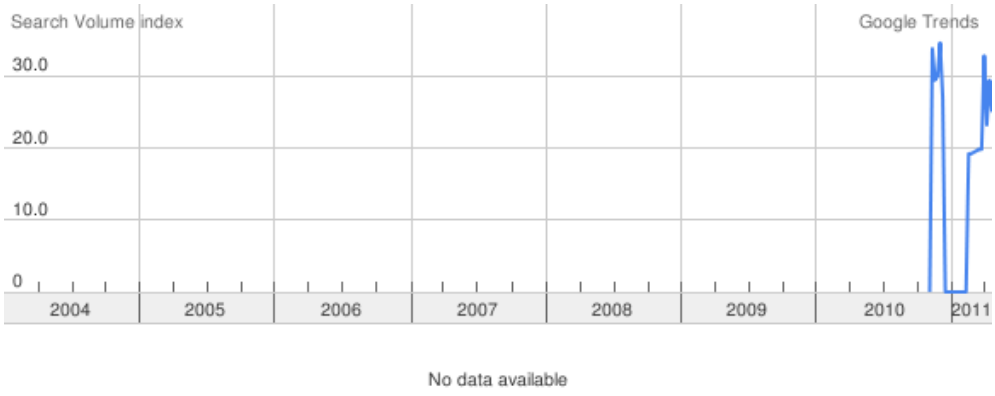

**Silver Bubble**



### Gold Bubble




### Keiser Silver



**Silver Criticality**

For the purposes of this letter we were particularly interested in the study of the premonitory phases before a crash, in our case, applicable to silver. **Have we been experiencing the endogenous formation of 'ruptures', that is, sudden transitions from a quiescent state to a crisis or catastrophic event?** Such ruptures involve interactions between structures at many different scales.

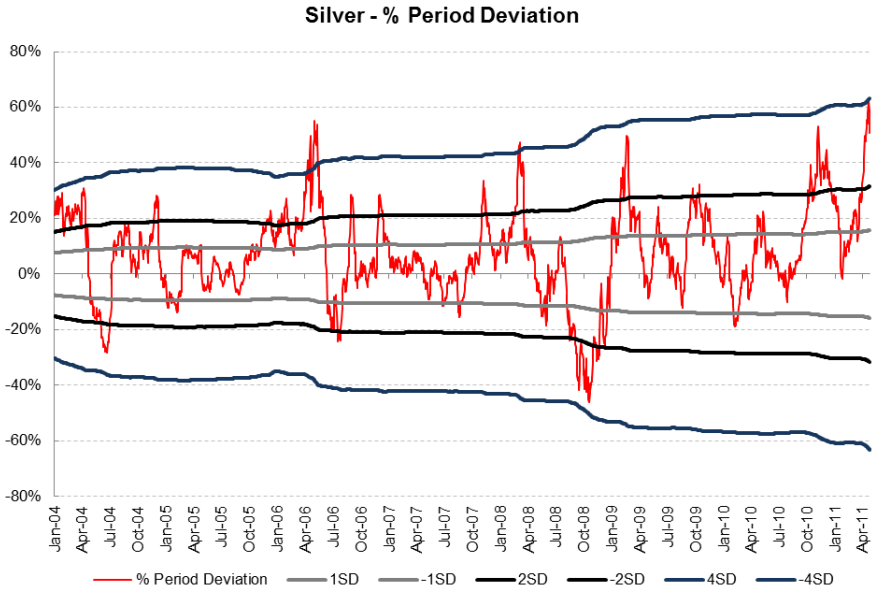
We believe that the market has been exhibiting the precursory signatures of power law behaviour, and that the internet power law of participation phenomena has produced a point of criticality whereby we have seen the top in silver for this half of the year. We believe a real shake out is imminent*, in the order of $15 dollars over 3 to 5 days.

We are not going to examine any of the fundamentals here in this piece, although in following months we will address this, as they are in a fluid state, both on the demand and supply side.

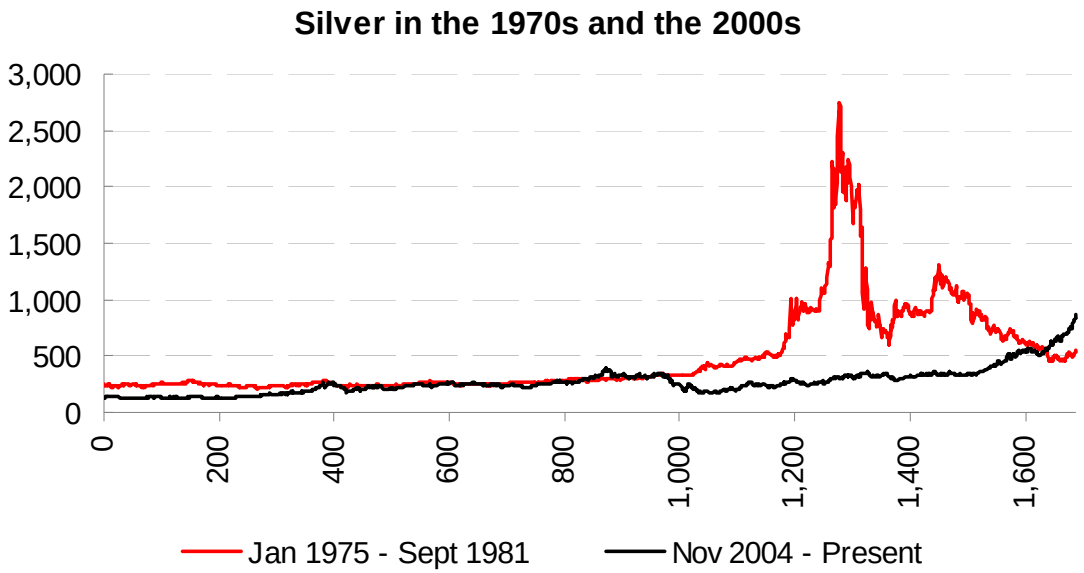
We believe that physical and paper sellers have begun to undergo a serious transfer of risk. The market after many years of suppression has begun to rise to facilitate new physical supply in the form of scrap and moderate mining hedging.

* We had been working on this piece on and off over last week and as we were just going to edit when the overnight session produced what we have been awaiting: an earth shuddering rupture.

The likely rate of positive return on our 'log-normal' indicators is not high here. We are in a statistical fat tail not applicable to our Gaussian curve, but the 'richness' is consistent with outliers for this 2000 to 2011 bull market thus far.



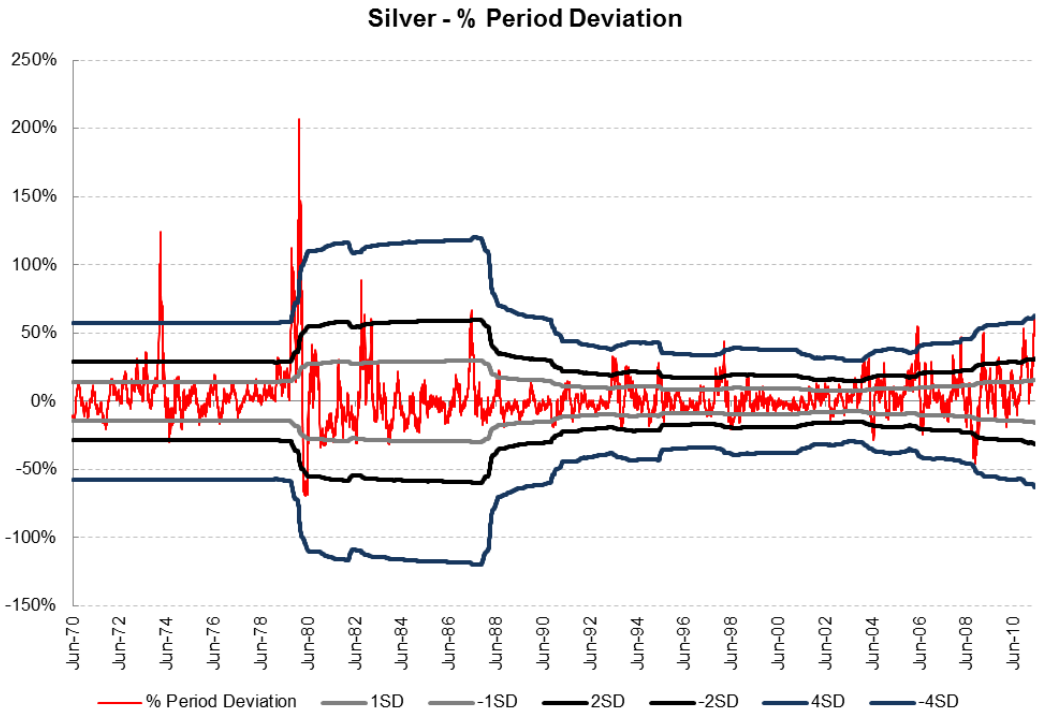
Perspective in markets is everything. The rate of acceleration is not consistent with the precursory signatures for a crash to end this market. It is, though, a mini-version of this. The big parabola is yet to come.



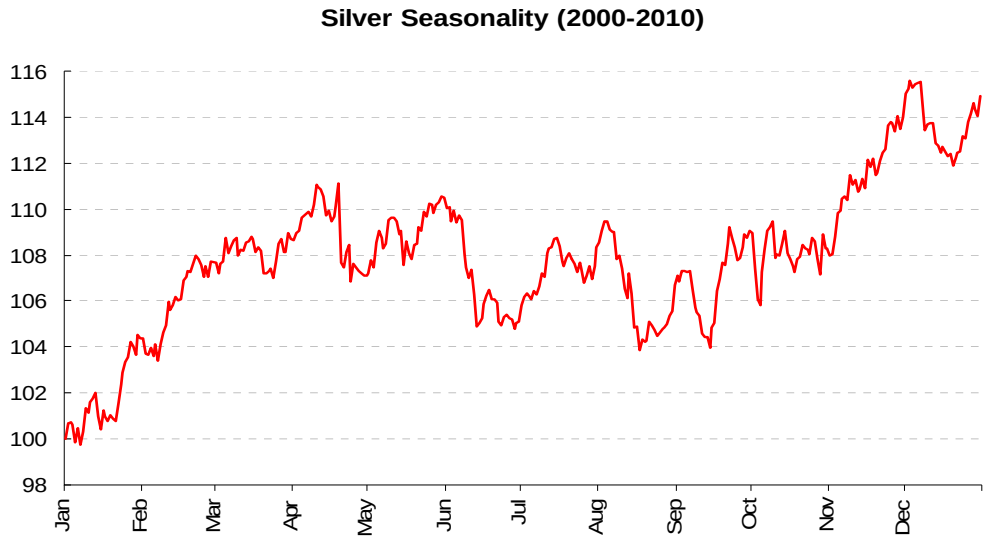

A period of sideways to down action in silver would be consistent with seasonality (chart next page), and would not be inconsistent with past trajectories; although both these variables are merely a guide.



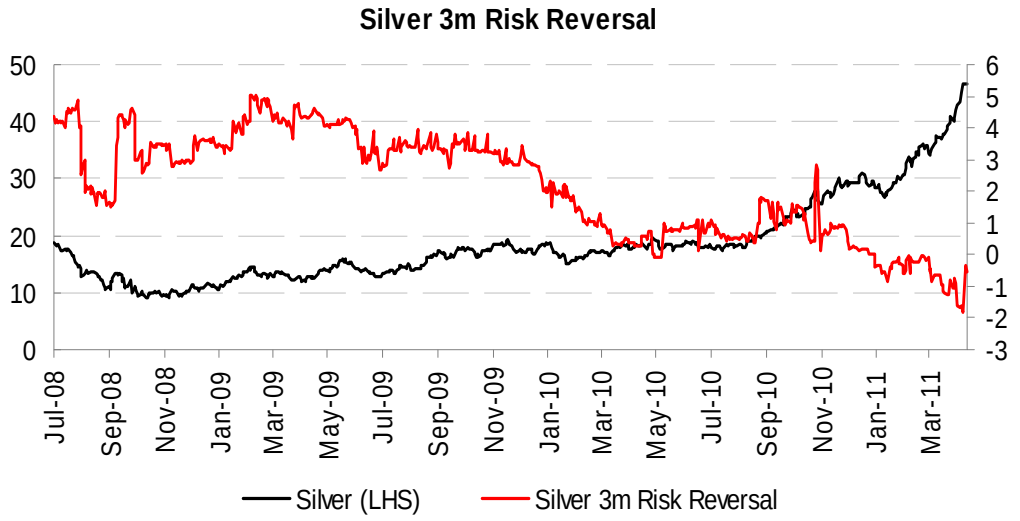
We are not experiencing an 'outlier' set up similar to 1980, yet:



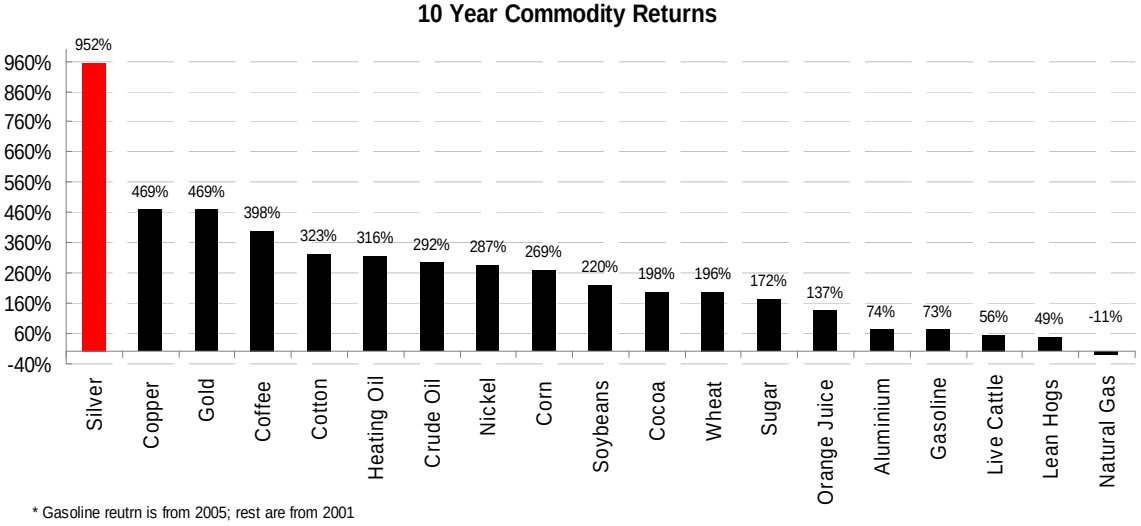

Sell in May? Or reduce to core holdings?



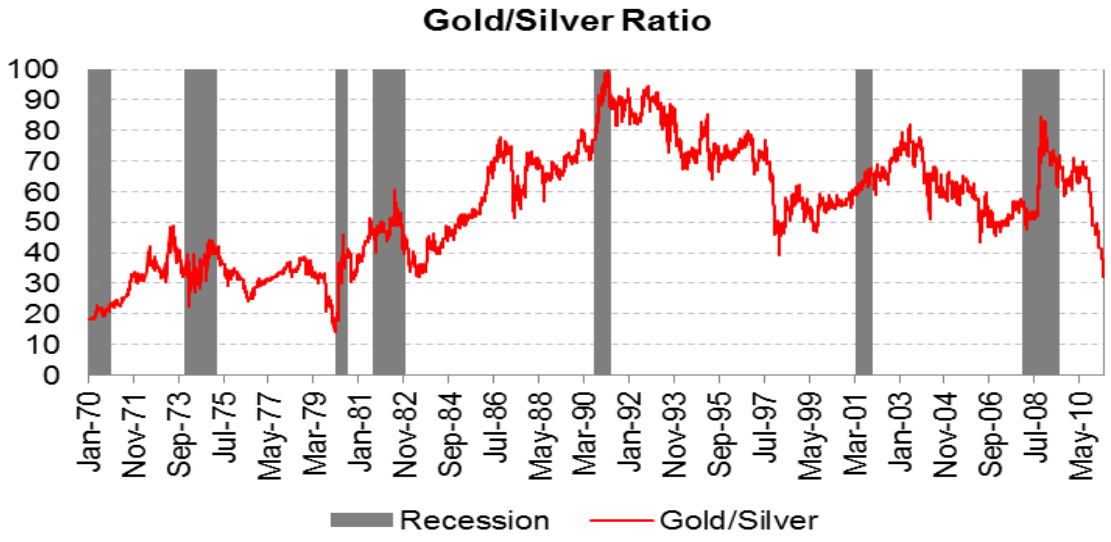
25 delta 3 month risk-reversals (call minus put volatility on +- 25 delta strikes from the at-the-money strike) have been trending down, indicating the market has been charging more for downside plays. Although this shifted back dramatically as short (gamma) call positions have been bought back as volatility has risen dramatically, especially on Comex (vs OTC).



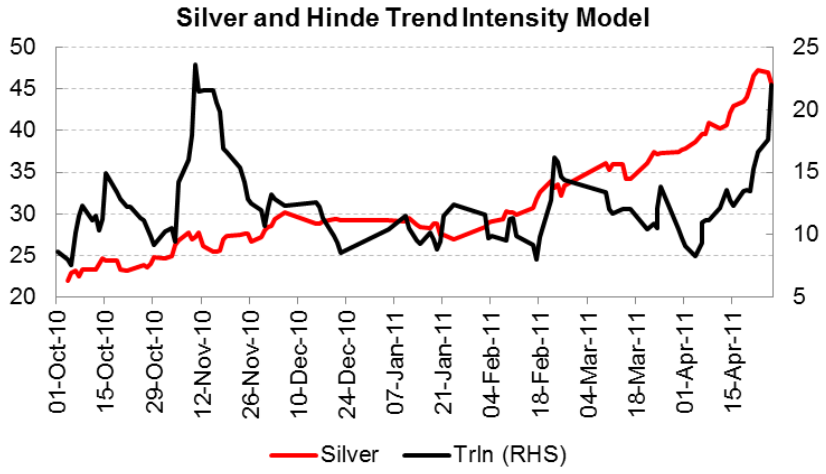

Let's not forget how we arrived here. We need to pause for thought, which will be much healthier for the market.



The gold/silver ratio reached just below 31 intraday, and we suspect a revisit of the 40 zone is very viable, with a lot of ranging between 33 and 39. The retouch of the silver highs back to the post-Easter weekend highs on the day after FOMC did not see a new low in the spread, perhaps signalling internal strife with the silver market. We say because, at this point, gold had not leapt higher until the Friday (29th of April), again with silver struggling almost a dollar below the recent silver highs.




Our Hinde Trend Intensity weighting is pointing to a cessation in this recent trend for up to 4 months.



**We have experienced a high volume (incidentally higher than gold volumes for first time) transfer of risk, with collapsing Open Interest (roll period aside).** Note the red ellipse on the falling OI and rising volume. A bearish signal. Retrace levels, which do not play any part of our model make-up, are placed here for visual effect, and are as follows:

0.382 = $40.83/ 0.500 = $38.06 and 0.618 = $35.28 (based on Fibonacci retrace of Jan low to Apr high).

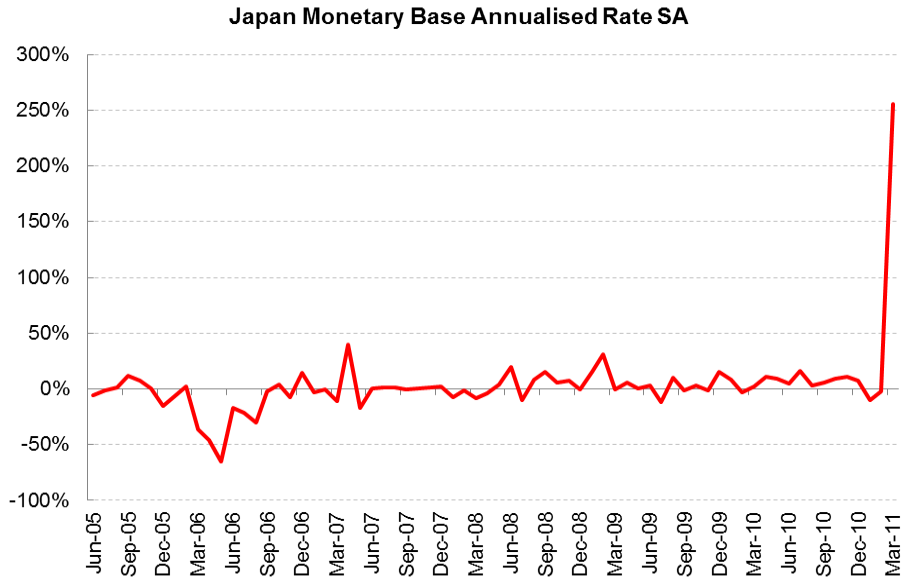



## Japan Criticality

Japan has sadly been experiencing a very real criticality event. The Fukushima 1 nuclear accidents are arguably close to such a state that has already unleashed horrendous radiation leaks to the environment. Sadly the containment will lead what we understand to be an almost paralysed country to rather desperate funding measures. There is no productivity. The country is stil consumed with fear.

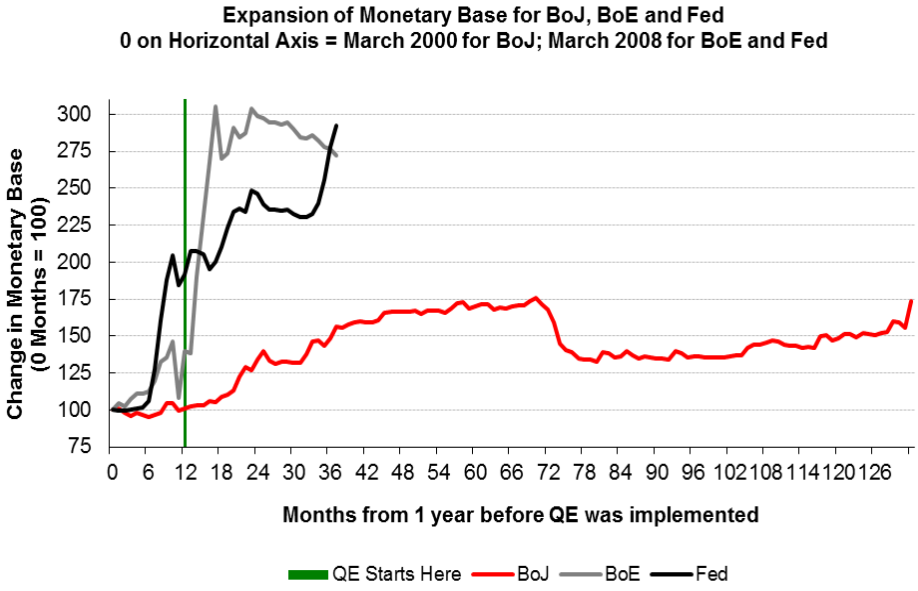
The BoJ sees the outlook for Japan's economy as very severe. The BoJ's Shirakawa stated over the weekend: “We'd like to take appropriate policy steps as needed”. Asked by a lawmaker whether the BoJ would consider buying more government bonds to support the economy, Shirakawa said only: “We'd like to consider in earnest what would be the desirable step to take”.

The GDP drop could well be in order of 10 to 15% and we suspect that the BoJ will expand the balance sheet aggressively at the next meeting. The balance sheet has already begun a swift trajectory higher, rising over 250% (annualized rate) since the tsunami hit.




Source: Variant Perception

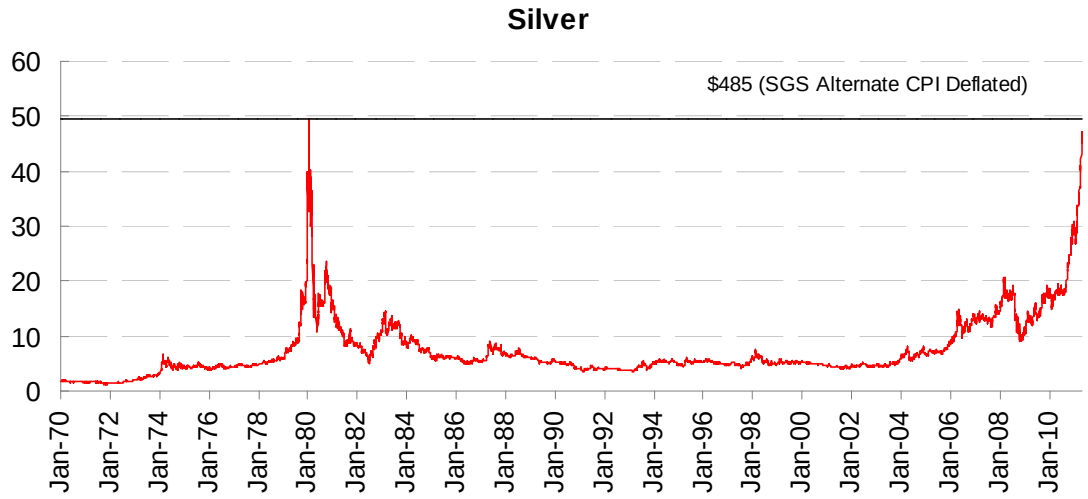
The earthquake and tsunami led the Bank of Japan to expand its balance sheet more than it has done for many years. The BoJ's balance sheet is growing faster even than during the initial period of quantitative easing.




Source: Variant Perception

When we consistently see this type of fiscal monetisation, one realises that real-adjusted targets for silver of $142, admittedly an outlier price associated with precursory signatures before a crash, will be surpassed. This is because, in reality, as John William's Shadow Government Statistics points out, $490 silver is the real outlier high. That leaves a lot of price discovery in between, and after years of price controls we are seeing the swift correction to these controls.




The price action we have since witnessed on Sunday night (1st May), suggests to us there are now some trapped 'come late to the party' longs and upticks will be sold. Although one cannot underestimate the unravelling shortness of the market. We just don't expect to be at new highs.

We would like to say we are in awe of Sornette's work and whilst we shamelessly observe it in the context of financial gain for our precious metals investors - we still believe this to be a noble function, at least by financial standards - his work has huge ramifications for the understanding of complex socio-economic and natural systems.

We would like to leave you with the mission statement of a remarkable institute ETH (Swiss Federal Institute of Technology) that he belongs to, a body no doubt bounded by men with *self-similar* aspirations for good. Their mission statement reads as such:

Social systems typically feature crises, ie unstable and dangerous situations that are characterized by abrupt and large-scale changes. Such disruptions are very hard to predict with any precision and even harder to control. Indeed, crises often convey an impression that key decision makers have lost control and that events unfold in an unstoppable and even catastrophic way. Examples include environmental crises, the collapse of transportation systems, as well as financial and social crises such as poverty, social conflicts or wars.

http://www.ccss.ethz.ch/about/mission - Coping with Crises in Complex Socio-Economic Systems.

The truth does remain that we have to be ever mindful of the 'crack up' phase of a hyperinflationary episode. This would manifest itself in higher physical precious metals prices at a demonstrative rate we all cannot imagine. **Hyper-metal Criticality.**

We would note that Comex precious metals futures would not participate, but arguably languish in price, with much initial volatility. OTC failure would result in specific bullion bank / dealer defaults as these swaps could not be met. So if you have OTC swaps to 'own' physical, choose your dealer wisely; although eventually if one OTC swaps starts failing all will.

We would like to add, did key decision makers ever have control? And to Max Keiser we commend him his efforts to place physical metals in the hands of the people, but perhaps not in the way we would have envisaged. As Burton Malkiel has so rightly pointed out of Wall Street, maybe we don't know any more than a blindfolded monkey. At least our one was smart enough to take the blindfold off.



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