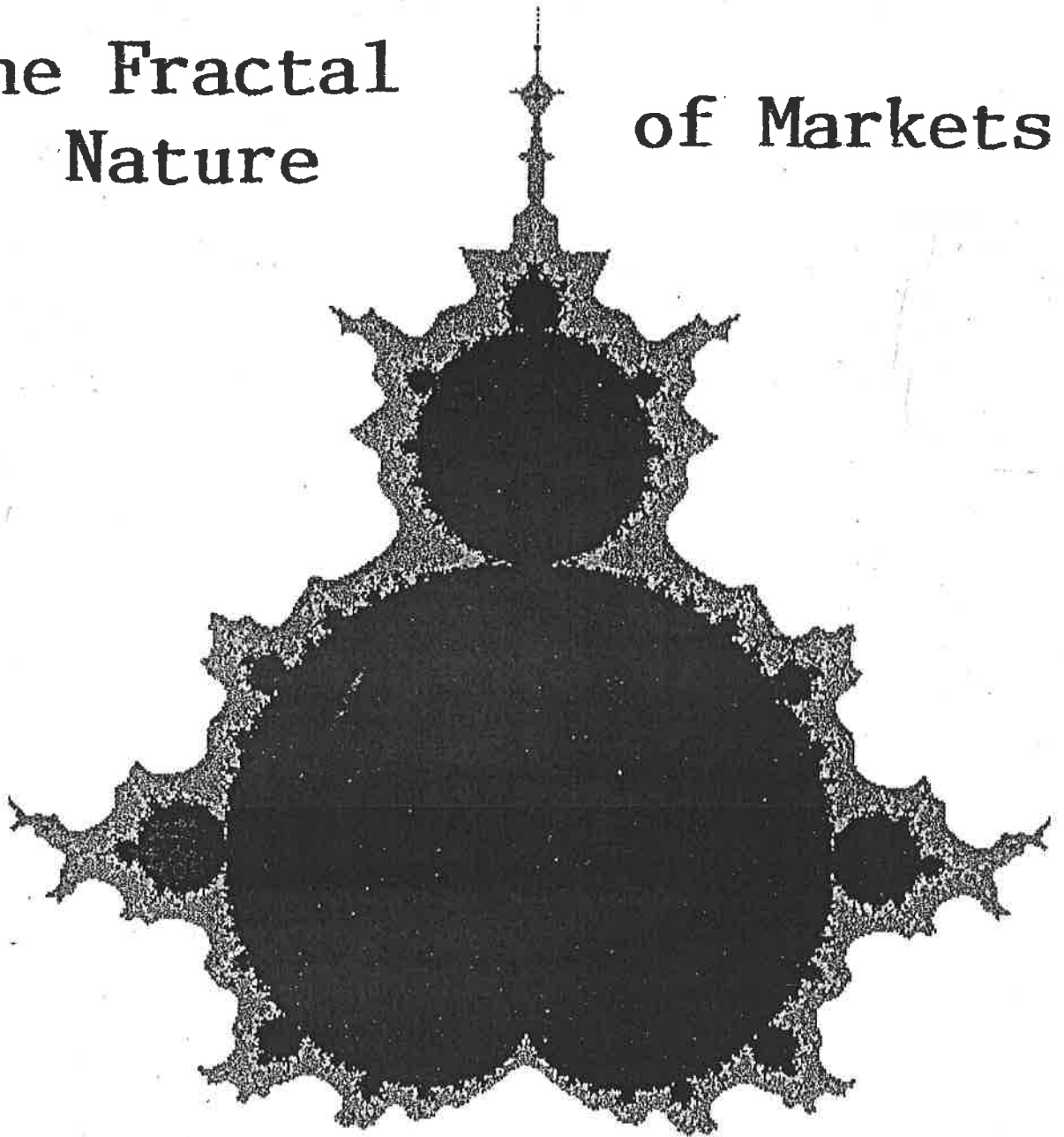


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Forecasting the World

The Fractal Nature of Markets



The Death of Mandelbrot

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Former Chairman of Princeton Economics International, Ltd.

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A C K N O W L E D G E M E N T S

I would like to thank all the former employees, associates, sources, and contacts for their ongoing support and efforts to contribute to the writings I have been able to continue through their great efforts. I would also like to thank those who have looked after not just myself, but my family, and shown them support and kindness.

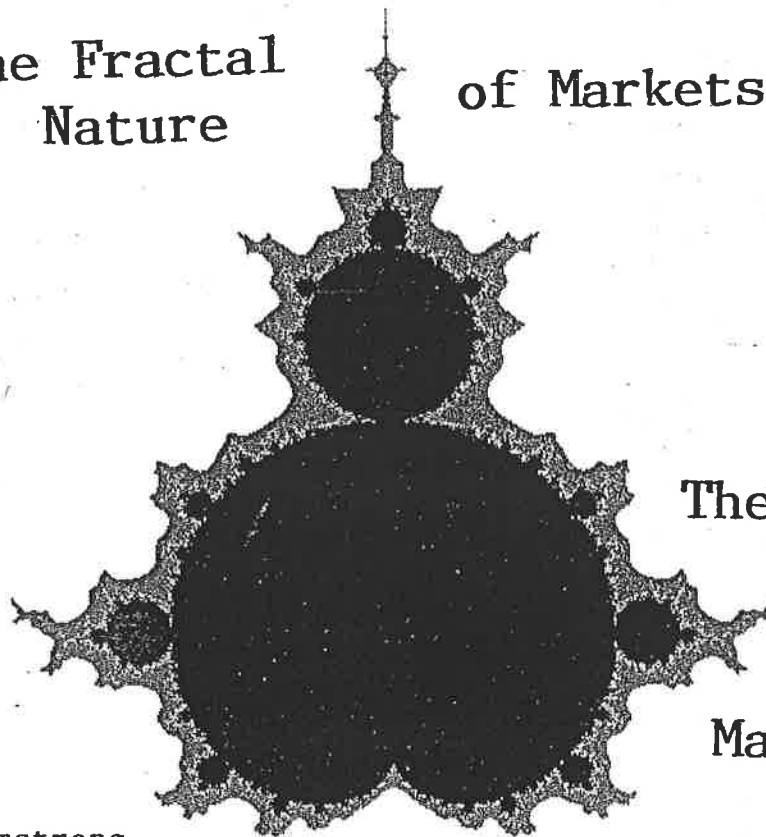
The purpose of these reports is to broaden the understanding that is so vital to our personal survival. Government cannot save us, and will only assist the very economic disaster we face. This is a Sovereign Debt Crisis that threatens our core survival. There is no plan to ever pay off debts. The majority of debt increase is paying interest perpetually to roll over without any long-term plan. What you see in Greece and in the States, we have run out of other people's money. The socialists keep pointing to the rich. But to fund the deficits, we need to borrow now from foreign lands. We ran out of money domestically and to support the current system like Greece, we need foreign capital. But all governments are facing the same crisis and we are on the verge of another widespread government default. Adam Smith warned in his Wealth of Nations that in 1776, no government paid off their debt and had always defaulted. We will have no choice either.

There is no hope that politicians will save us, for they only form committees to investigate after the shit-hits-the-fan. They will NOT risk their career for a future problem that may hit on someone else's watch. There was a politician and a average man standing on top of the Sears' Tower when a gust of wind blew them off. The average man being a realistic-pessimist, immediately sees he is about to die and begins praying. The politicians, the ultimate optimist, can be heard saying "Well so far so good!" as he passes the 4th floor.

At Princeton Economics, our mission was simply to gather global data and to bring that together to create the world's largest and most comprehensive computer system and model that would monitor the world capital flows. By creating that model, all the fallacies of market and economic theories were revealed. The world is far more dynamic and every change even in a distant land can alter the course of the globale economy. Just as has been shown with the turmoil in Greece, a CONTAGION takes place and now capital begins to look around at all countries. We can no more comprehend the future but looking only at domestic issues today than we can do so in every other area, such as disease and the spread of flus.

We live in a NEW DYNAMIC GLOBAL ECONOMY where capital rushes around fleeing political changes and taxes just as it is attracted by prosperity. All the people who migrated to the United States in the 19th and 20th Centuries, came for the same reasons as those still coming from Mexico - jobs and prosperity. In the 19th Century, America was said to have so much wealth, its streets were paved in gold. We must now look to both the past and the entire world to understand where we now are today,

The Fractal Nature of Markets



The Death of

Mandelbrot

by: Martin A. Armstrong

Former Chairman of Princeton Economics International, Ltd.
and the Foundation For The Study of Cycles

"Economics is a science of fashions - Keynes and 'pump-priming' at one time, Friedman and monetarism at another " wrote the Father of Chaos Theory, Benoit Mandelbrot who died last month at the age of 85 in 2004 in his book of market behavior with Richard L. Hudson. Mandelbrot was a brilliant mathematician who could see into the field of Economics while standing outside the cabin looking in from a window. He wrote that "[t]he profession burns through new theories the way a teenager hops from one new date to another: it meets them, spends some time with them, examines them, finds what it thinks are flaws, and then drops them for a newer face." Without a doubt, his keen observation of the field of Economics is right on the mark. Just sometimes, it takes a dispassionate observer to see the truth, but looking in from the outside. It is the story of Socrates when the Oracle at Delphi says he is the most intelligent man in Greece and he fails to comprehend how that is possible and pretty much pisses-off just about everyone by discovering he has an ability to see into that field from the outside with a dispassionate perspective.

Mandelbrot began to teach at Harvard and Yale AFTER his career at IBM. He also taught at the Ecole Polytechnique. He is the father of **Fractal Geometry**. In the 1960s, he showed that Britain's coastline could never be measured in a way that would produce any consensus regarding its actual length. The closer you zoomed in, the greater the length became. A one inch stretch was just as complicated as the whole when observed from a distance. He demonstrated that there was a repeating nature to everything from the small to the great. It is the same pattern over and over.

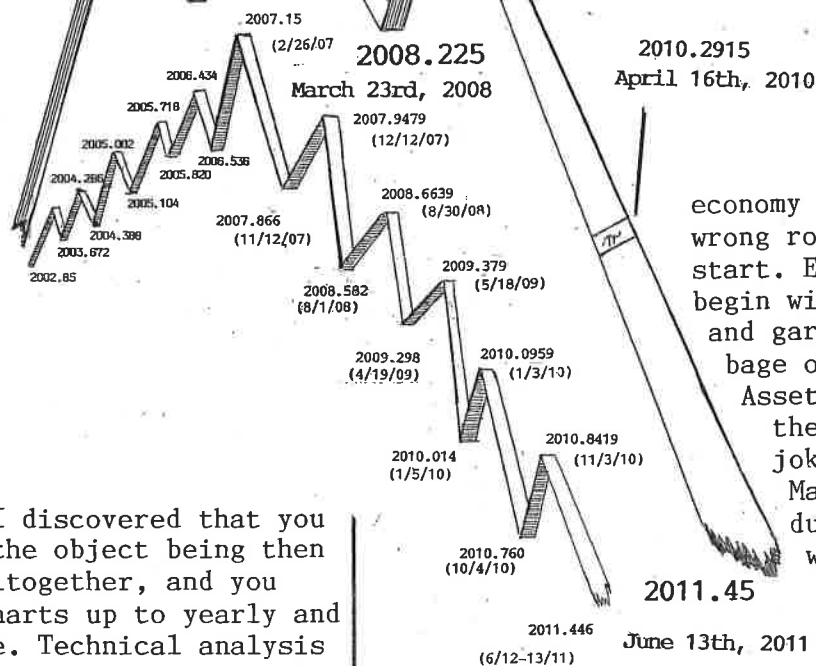
I myself and many others saw this same fractal element in political events and of course history. I saw in the 1970s that the intraday patterns would migrate to the daily and then the weekly, and monthly levels. I began to then chart years, decades, and centuries always seeing the same patterns appeared. While it took Mandelbrot to truly formalize this natural progression calling it fractal, his observations led him to the same conclusion but from a natural science perspective. In reality, there were many who saw the same thing in many different fields.

February 26th, 2007

2007.15

2009.3

April 19th, 2009



economy went off on the wrong road from the very start. Everyone seemed to begin with a false premise and garbage in gives garbage out. The Capital Asset Pricing Model of the 1960s became a joke. The Efficient Market Theory produced nothing that was in anyway even worthwhile. All of these various theories had indeed led to the Black-Scholes

Where in trading, I discovered that you could take the name of the object being then charted off the chart altogether, and you could take intray-day charts up to yearly and they all looked the same. Technical analysis and things like Elliot Wave all attempted to develop rules from patterns, although they crossed-over into the world of subject analysis of opinion that gave substance to the idea that beauty is in the eye of the beholder. It devolved into pattern recognition that to a large extent became an art form.

Mandelbrot was able to reveal that what appeared on the surface to be CHAOS, was in all reality, high complex order. Mandelbrot reduced this to a mathematical world. From there, people without trading experience were then hired as quants on Wall Street who took the world of abstract math and tried to then reduce the markets to a mathematical solution packed into a single equation.

These efforts produced the Orange County California bankruptcy where Merrill got sued for \$1 billion. There was the memorable Long Term Capital Market collapse based upon the Black-Scholes option pricing equation. The developments of Black-Scholes were championed by LTCM and Goldman Sachs.

The problem that emerged was that Wall Street turned to quants, but those quants had no trading experience. It became like going to a trader to consul on physics. The whole world of trying to figure out markets and the

attempt to create an equation were driving the markets and the economy off a cliff and the latest was the formula used to create the mortgage backed securities used by the main credit rating firms who strolled down that same path to oblivion.

All of these models were created by people who had no such idea about trading nor global capital flows. The idea that markets are efficient insofar as they are always a reflection of fair value is absurd. The swing between two extremes always exists.

Edward Dewey who founded the Foundation For the Study of Cycles, had worked for President Hoover and came away from the Great Depression feeling there was something there on a collective basis. The Dust Bowl came and no matter what laws were passed, Congress could not make it rain.

Coming from a trading background and watching things rise and collapse ever since the 1966 Stock Market Crash, I observed the same pattern appeared in all investments. It was this very "fractal" behaviour that had attracted me to studying the field, although I came at it from a different direction than Mandelbrot.

I kind-of backed into the "fractal" nature of markets. My first observation was that the PANIC was not confined to a single market, but appeared in all from stocks, the real estate, and bonds, as well as the more movable tangible objects such as art. All had risen and all had fallen. There were no such exceptions. I saw the same in history and in politics.

As I began to trade in the 1970s, there were no computer screens with charts. I had a paper tape and I plotted tick-by-tick. I began to observe the "fractal" behaviour in the market from one level to the next. What I had observed BETWEEN markets, was taking place within the same market graduating from one level to the next in time. I began to experiment with time, making charts in 15 minute, 30 minute, hourly, and two-hour intervals. The same patterns emerged.

We use to provide daily trading recommendations and in 1983, it had been worked to such a science, we had 96 winning trades in a row. The Wall Street Journal had called me the highest paid analyst in the world and things got even crazier by the day.

Yet through all the chaos, many then began to try to copy what we accomplished by creating computer models. My writings about Chaos Theory back then perhaps misled some into thinking that the model was simply a math based object reducing the complex world down to a few lines of computer code. But those who began to try to mimic Princeton Economics merely hired quants. That was not the answer.

Those who followed us for years will recall that we always had the PANIC CYCLES! I never revealed the formula behind them and perhaps I never really fully explained why they existed. They were to a large extent "fractal" representations of a Great Depression on a scaleable event horizon. In other words, 98% of the time a market trades in what people would call a "normal" pattern. Then comes the tsunami that wipes out everyone. The death toll is tremendous. The Great Depression first wipes out the real estate in the Florida Land Boom. Then comes stocks, and this is followed by the bond defaults in '31, and then weather wipes out agriculture. No one was left standing.

In other words, the PANIC CYCLE was the chaos event that wipes out the traditional analytical models that map the 98% of the normal market movements. So where models cannot see the event such as 2007 or 1929 or the DOT-COM Bubble and the Crash of '89 in Tokyo, the PANIC CYCLE did what other standard models did not. It was ONLY concerned with those wild events of pure chaos.

These were what I came to explain as PHASE TRANSITION. Those extremely volatile events. This was what I had warned President Reagan about when they created G5 in 1985 to manipulate the dollar lower by 40% that manifested itself into the 1987 Crash. This was what Mr. Sprinkle wrote and said that Princeton Economics was the only firm who had such a model and until someone else had such a model, they could not rely on just one.

This was the essence of coping with the reality of markets and the global economy. Predicting the normal course of markets is not difficult. Trying to figure out WHEN that PHASE TRANSITION is going to hit is a completely different thing altogether.

While Mandelbrot was not a trader and was looking from the outside in, he did not understand the global economy for he never had the opportunity to witness international action. He wrote that "I agree with the orthodox economists that stock prices are probably not predictable in any useful sense of the term." I could not disagree more. Yet Mandelbrot came close to defining the problem where he distinguished between what he had called a "Joseph" event in biblical terms of 7 years of the good life and 7 years of the lean times, from what he called a "Noah" event such as the Great Depression or 911. He wrongly assumed that these events would be unpredictable and cause the models to fail. Yes, they do cause the models to fail when the model is based only on the 98% normal trending events. Mandelbrot came close to at least identifying that there is what I have called a PHASE TRANSITION and developed a PANIC CYCLE MODEL.

There is indeed FRACTAL self-similarity with one market from every division of time from great to small. There is also the same similarity among varied markets. But then there

is the PANIC CYCLE that runs through absolutely everything around us. These are the truly great events of alignment from many different segments both instinctively within human behavior as well as within nature.

It is often a mystery why nature seems to kick-in when the economy takes a hit. Just as there was the Dust Bowl of the late 1930s that resulted from a 7 year drought that was of a Biblical frequency, there was the Black Death that hit following the Sovereign Debt defaults of England and Naples in 1342.

Mandelbrot's proof of a new geometry that has had a significant impact not merely upon the mathematics field, but also on such diverse fields as physical chemistry, fluid mechanics, physiology, and then people tried to apply it to markets without understanding the nature of markets to begin with.

Like the medical care in federal prison, they will do absolutely nothing unless they see blood. They investigate nothing and a witch-doctor would be a huge improvement for at least they would pray over you instead of cursing you. There is no respect for HUMAN RIGHTS at all. Adopting the same approach, those who latched on to Mandelbrot's "fractals" understood nothing, and applied it to only their limited mind's view of a market. They did not investigate the dynamic structure of the economy or the global CONTAGIONS and interconnectivity. This is why the models they created failed and there is a higher probability of death in prisons because they do nothing unless they see blood. Both illustrate the dangers of no testing.

Fractal geometry is quite distinct from the simple figures of classical, or Euclidean geometry - the square, circle, sphere for example. Fractals are capable of then describing the many irregularly shaped objects or spatially nonuniform phenomena in nature that simply cannot be accommodated by the components of Euclidean geometry.

Most fractals are self-similar, but not all in nature are precise. A self-similar object is one where its component parts do in fact resemble the whole. This attribute is inherent in economics and market behavior because it can be witnessed on all levels of time.

The mere fact that history repeats is also an example of the self-similar nature of the behavior of man. As Machiavelli said, the one thing that never changes is man's passions. This is why history is fractal at its core.

A self-similar fractal object remains invariant under changes of scale, so a chart intraday cannot be distinguished from a daily, weekly, monthly, or yearly chart. This is scaling symmetry. This inherent trait can be seen in objects like a snowflake. This fractal phenomenon can be readily seen in such objects in nature and in the plain collective behavior of man. They are indeed stochastic meaning there is a randomness to a variable. This allows them to scale in a statistical sense. Hence, markets are very fractal in nature making them much more complex to understand. The fractal phenomenon is a proof of this complexity.

There is also a FRACTAL DIMENSION no matter how much we magnified the object, or even if we change the view. However, the fractal dimension is expressed as a fraction whereas an Euclidean dimension is expressed by a whole number. If we constructed a curve using fractals, the length of the perimeter of such a curve increases in the ratio of 4 to 3. (D) is the fractal dimension and this is the power to which 3 must be raised to produce 4 - i.e. $3^D = 4$. The fractal curve is thus $\log 4 / \log 3$, or roughly 1.26. This illustrates both the complexity and the nuances of the shape.

Fractals have been used to reveal the distribution of galaxy clusters throughout the universe. However, applying fractals to the economy produces a coherent and neat distribution of wealth, but the models that have been adopted by Wall Street that have blown up everything from Long-Term Capital Management to the latest mortgage debacle, failure because they are being applied on the cheap to limited snapshots of the economy, without any comprehension of the true scope and complexity with which they are dealing. It is going to take someone with EXPERIENCE to understand the world economy to solve the problems and it is going to take a true budget not limited by immediate profits as has been the case on Wall Street.