

THE DEBT MARKETS, UNCERTAINTY, AND WHAT WILL FALL NEXT, THE SEVEN CRISES

The Telmarc Group, WHITE PAPER
No 41

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1 INTRODUCTION

Many analysts and commentators have been speaking on the current market conditions. We have also been considering them as well look to a business which has come virtually to a standstill. The bloggers all too frequently put their 100-500 words together and in a blog type fashion comment without content. Instead we have been working on several fronts and using data which is not as available as we thought it would be and we have asked several questions:

(i) **Why and how did these financial market instabilities arise?** We have seen them in many systems before and we suspect that they are of common origin? We know that the "quants" have entered the financial markets and their presence has generated a multitude of new financial instruments, many collected under the rubric of "Derivatives".

(ii) **How bad is the housing crises and to what extent does it require extraordinary measures as proposed in the TARP?** Just what are the details of the housing collapse and how big is it and what is its basic essence? On November 14, 2004 in testimony before Congress Neel Kashkari, the Interim Assistant Secretary of the Treasury for Financial Stability and Assistant Secretary of the Treasury for International Economics and Development stated that there was 55 million mortgages on residential properties and that 20 million people owned their homes outright. Yet if one looks at HUD data one sees that there is \$12.5 trillion in mortgages and the average mortgage in 2008 was \$225,000. This would account for 53,000,000 mortgages at best and that is assuming that all of them were taken out at the highest market point of \$225,000 per house which we know is not the case.

However, FED data says there is 10.5 trillion in mortgages and using the same \$225,000 we obtain 46.7 million mortgages, which may be increased if we assume that the seven year average is lower, which it is. However, since we know that the mortgage lasts about 7-8 years, and that they have been increasing in total amount each year, we know that 55 million is most likely a reasonable number, albeit lower than what we calculate latter in this White Paper. We also know that 30% of these are ARM, meaning that the holder is a risky buyer. But again only a small percent of even these are what can be called sub-prime.

If we have at best 15 million ARMs and say 10% of them are subprime, we have 1.5 million subprimes at \$225,000 each. Finally, if the subprimes are now 25% under water we calculate the cost as only \$84 billion. But, and this is an important but, the people who obtained the mortgages were allegedly capable of paying them no matter what the house was worth. Under the old Tax code they would suffer a tax liability if they walked

away, under the new code since January 2008, passed by the Democrats; there is no IRS liability so there is no incentive to stay, except possible criminal fraud!

(iii) **What should be done with the auto crisis in American manufacturers?** As regards to the automotive crises, this is a classic example of a company in trouble. As an investor, we would never throw money at a company which was bleeding dollars and had not measurable and monitorable action plan to remedy the bleeding. This is what they made Chapter 11 for. If it were not for the Unions and the Democrats, the market would clear with classic creative destruction. The Unions would be forced to negotiate in a rational manner and the management would change. But given Congress we can expect just the wrong things to occur. Would any investor just pour more money into a bleeding company, knowing that the money will have no effect other than ending up in the pockets of non productive entities?

The Union contracts force the manufacturers to pay the laid off workers for up to eighteen months and in addition to provide continuing benefits plus retraining. This drives the burn rate above what it would cost to just leave them on the payroll, they could at least pick up trash, but I forgot, that is prohibited by the Union contract.

(iv) **Do economists have any clue as to what is happening?** An interesting observation resulting from this crisis is that the economists have demonstrated two major responses. First they had no idea that this crisis was coming. They were to a person clueless. Second, and this is most crucial, is that they to a person have no idea as to how to solve this. They lack a true body of knowledge that can be used going forward. Keynes notwithstanding, they seem like deer in the headlights. The shame is that they award Nobel prizes for this field, yet they do award Nobel prizes for Literature as well, much of which is fiction. As an aside to this observation, there is a symptom of their lack of awareness observed when one attempts to gain data regarding say the home mortgage market. The Fed sends you to another agency which is quite limited and Treasury has nothing to say at all. One wonders what these people use to assess market situations and make decisions. As Federal agencies one would expect the data at least to be available.

(v) **Finally there is the issue as regards to what function Congress and a new Administration can or should play?** John Galbraith, the famous Harvard faculty member and well known Socialist, was a strong advocate of central planning. This is an off shoot of the Marxian view that the dialectic is deterministic in its outcome and that thus several wise people in Washington can control everything with a plan. As seen in the Paulson case regarding the bank bailout, his plan changes weekly if not sometimes by the hour. The world is not deterministic; just ask any military commander, it is a continuing random process, which may even perversely align itself against one's interests.

This in this White Paper we focus on a building set of issues and attempt to make some sense out of what is currently occurring. We specifically see seven crises in the financial markets, some of which we are currently weathering and some yet to come. These seven crises are:

1. **Residential Real Estate Crisis:** This is the bubble and collapse of certain real estate properties focusing primarily on residential real estate.
2. **Liquidity Crisis:** This is the failure of financial institutions to transact between each other.
3. **Money Market Crisis:** This was the brief lack of faith in short term deposits collateralized by short term loans.
4. **Credit Crisis:** This is the general commercial and consumer credit crisis in the failure of the markets to extend credit at levels and with terms as had been done previously.
5. **Hedge Fund Crisis:** This is the dual crisis of Hedge fund having to cash out and secondly of Hedge funds dumping on the markets when such liquidity is demanded.
6. **Commercial Real Estate Crisis:** This is the commercial side of the real estate crisis which involves the inability to rent major commercial new builds as well as the inability to obtain continuing construction and project financing.
7. **High Yield Debt Crisis:** This is the crisis of hundreds of companies having billions of high yield debt, which is coming due, and the inability to roll that debt over.

This paper looks at several of these and concludes that at best the resolution could begin by mid 2009 but the earliest it can be resolved is late 2010. This does not bode well for venture or entrepreneurial investments over this time frame.

2 THINKERS, DOERS, AND MIDDLEMEN

The author Douglas Adams published his book **The Restaurant at the End of the Universe** in 1980. In that novel, and then in the radio and television versions, Adams depicts a fictional planet where there are three groups of people; Thinkers, Doers, and Middlemen. After eons of time the Thinkers and Doers believed that they have contributed all to their civilization and that the Middlemen have been just getting a free ride. These two groups then decide that they should get rid of this group of hangers-on and the assemble them all and ship them to another plant, all the Middlemen. The moral, one could assume is that the middleman is essential.

Consider the world of the entrepreneur. There is the idea generator, sometimes even the founder, who comes up with the idea and then there is the set of doers who implement the idea. Middlemen, in the case of the set of venture investors, such as the venture capitalists, who facilitated the flow of funds into the company, have taken the risk? However the VCs take substantial risk in the deal, they have their own equity in the deal. Then the company evolves and it may seek an IPO, and then the middlemen become the investment banker.

The investment bankers are the most critical of the middlemen. They bring money together with those who use it, namely those who create new industries and businesses. The question is what value to they add to the business, frankly none other than matching those with cash and the entity requiring cash, many companies can raise capital without bankers. Google was an example of a hybrid of such a situation. What the bankers does it allow management to focus on their business rather than getting side tracked with the fund raising process?

A good entrepreneur can oftentimes raise capital. A good entrepreneur also frequently has to prepare all the documents, presentations, and financials and be the critical element of the "road show". The banker just builds on the relationships it has. One need look no further that the mark-up process of an S1 filing for an IPO and having been through this many times one sees that the entrepreneurs spends multiple and repeated sessions educating the banks staff, again and again, line by line, on the business. The presentation to the actual investors is facilitated by the bankers but not led by them.

Thus the bankers, as middlemen, bring efficiency in raising money by allowing management to focus on running and growing the business, and secondly they bring credible contacts. They are like real estate agents; they facilitate the sale of an investment vehicle whereas the real estate agent facilitates the sale of a house. The real estate agent gets 6% of the sale price no matter how much work she may do. It is an oligopoly; the agents sell themselves as being uniquely special and worth the 6% but in reality are just the luck of the draw on the sale. The investment banker may work a bit harder; for example, they may have a call book of investors for high yield debt. They walk the company around this call book and then they "negotiate" the final terms.

3 DAWKINS, THE SELFISH GENE

The geneticist Richard Dawkins wrote in his book, **The Selfish Gene**, that "any altruistic system is inherently unstable, because it is open to abuse by selfish individuals...." Dawkins goes on in his analysis to depict the inherent selfishness of the individual, a genetically preprogrammed trait, and moves that selfish level down to actual genes, transcending the individual per se. Gene are the operative selfish agents.

In a similar fashion the classic work by E. O. Wilson on **Sociobiology** takes this even further. Basically the selfishness is a dominant factor. The bankers, for example, are excessively selfish, maximizing their return while minimizing any risk they take. Banks went and promoted WorldCom, Global Crossing, and many others during the telecom bubble but the risk that they took was de minimis. They received a substantial fee, in cash, from the proceeds raised, and then went to the next deal. The bankers take no risk in what they promote; it is the best of worlds for the selfish gene.

Thus from a primal biological perspective the human is driven to maximize their personal return, they are selfish all over. In contrast to Greenspan's philosophy of the banks really self regulating, if he truly understood human nature, the selfish gene part, you trust no-one, not even a trust but verify strategy would work, you assume every banker is out to line their pockets and you are always looking over their shoulders, with an even smarter team.

My father once said when he was a police officer in New York that the reason the police got so many criminals was that they were dumber than the police. And he then said, we are not really that smart and he wondered how many smart criminals got away. If that applies to overall street crime, then there must be an excellent team for Wall Street criminals.

4 VALUE CREATION, VALUE DESTRUCTION AND VALUE TRANSFER,

The Harvard Professor, William Fruhan, in his 1979 work entitled Financial Strategy, looks at companies in one of three modes; value creators, value destroyers, and value transferors. Value creators are companies which create new value in the market. Example change from generation to generation, but several are companies like Apple, and many high tech companies including those in the genetic area.

In Fruhan's work of thirty years ago he included Avon, GE, and Freeport Minerals. Value destroyers are all too well known. In 1979 Fruhan looked at The Great Atlantic and Pacific Tea Company, the still existent A&P food chain. In today's world we look at the auto makers GM, Ford and the like.

5 MODELS AND STABILITY

In August 1971, after completing my PhD, I was invited to attend a meeting in Chicago, at the University of Chicago, aimed to bringing together stochastic systems researchers from MIT and economists from Chicago and other prominent locations. At the time I was limited in my economics having had the Samuelson course, but little more. I had completed my first book, **Stochastic Systems and State Estimation**, and was allegedly

an expert in the field. I knew the Wiener process, the Ito process, optimal estimation and control.

I entered one of the meeting rooms and there were several economists at the black board discussing some concept of blending a bond and a stock, creating what one would call a hedge. I had seen that several of my colleagues had been dabbling in the stock market and I further had seen them loose as well, Claude Shannon being what I was told to be a great dabbler, for better or worse.

Thus I stepped up and as a brash newly minted faculty type from MIT said,

"Why not use the Wiener process model for the stock, and then use standard estimation theory to get the best estimate. It uses the Kushner-Stratonovich equation, the answer if you linearize the just a normal distribution."

The guys turned and looked at me as if I were from Mars. I believe two of them were Scholes and Black, if memory serves me correct. I then drew the following on the board:

"Let the stock price be given by the following:

$$\frac{dx(t)}{dt} = ax(t) + rw(t)$$

This assumes there is some growth per period, say a , and that there is a random process, a Wiener process, $w(t)$ with variance measured by r . Now your option can be modeled as making money or not, say write it as;

$$g(t) = G(x(t)) = \max (x(t) - K, 0)$$

where G is your option, x the stock price, K the price you paid. Then you make money or you don't. Then one can readily find the function g which can be obtained by Ito's Lemma, it is in my book, it states¹;

$$dg(t) = \sum_{i=1}^n \frac{\partial G}{\partial x_i} dx_i(t) + \frac{1}{2} \sum_{i=1}^n \sum_{j=1}^n \frac{\partial^2 G}{\partial x_i \partial x_j} \sigma_i(x,t) \sigma_j^T(x,t) dt + \frac{\partial G}{\partial t} dt$$

Thus for your option, g you have the equation;

¹ See p 114 of Stochastic Systems and State Estimation.

$$0 = -G(t) + \sum_{i=1}^n \frac{\partial G}{\partial x_i} x_i(t) + \frac{1}{2} \sum_{i=1}^n \sum_{j=1}^n \frac{\partial^2 G}{\partial x_i \partial x_j} \sigma_i(x, t) \sigma_j^T(x, t) + \frac{\partial G}{\partial t}$$

or

$$0 = -G + \frac{\partial G}{\partial x} x(t) + \frac{1}{2} \sigma^2 \frac{\partial^2 G}{\partial x^2} + \frac{\partial G}{\partial t}$$

And then the solution is simply:

$$G(t, T) = SN(h) - KaN(h, T)$$

Where N is the normal distribution and you can find the actual values of the constants by algebra."

I turned feeling smug and walked towards Professor Mike Athans from MIT and then briefly turned around and said as n after thought:

"Oh by the way, watch out with this approach, there are lots of simplifying assumptions and the results can be notoriously unstable."

The group still looked at me as if I had two heads. Long Term Capital Management would happen seventeen years and one Nobel Prize later. So much for economists!

There are two events in American history which portray the lack of stability and the fact that those who created a structure which latter collapsed were totally unaware of what happened. These two are the Tacoma Narrows Bridge collapse and Long Term Capital Management collapse.

On November 7, 1940 the Tacoma Narrows Bridge collapsed as a result of unstable oscillations. Until that time Civil Engineers understood both static and dynamic loads, no moving weights and travelling cars. They failed to analyze and appreciate the impact of oscillatory winds and resonances of structures. The bridge started into a resonance mode and the ultimately just split apart. By the way the Whitestone Bridge in New York City has the same problem, albeit modified shortly after Tacoma. Lack of understanding of second order effects can cause upheaval. Feed back and resonances, linearizing models, and failing to account for the true nature of the statistics of the unknowns are all factors.

As I had said in the Preface of my first book almost forty years ago, *"The world is filled with uncertainty..."* We try to model and then compensate for it. We often model uncertainty as a noise process and then engineer around that. In fact the uncertainty may be much more structural and we cannot engineer around it.

In August of 1998, Long Term Capital Management collapsed requiring the New York Fed to arrange a bail out along with the investment banks. The book, *When Genius Failed*, captured it quite well. Remember my parting comment to Black and Scholes, beware the instabilities. If one cannot understand the main text then the footnotes are totally undecipherable. The comment was a footnote, but a footnote learned by using my equations in real life again and again.

But what are the problems with the models used? There are a few:

1. Long tails: This effect is the one that says that the uncertainties modeled are Gaussian, and their tails, or probabilities of extreme events are very low. In reality we all know that long tailed or high aberrant probabilities of strange events are frequently all too high. As one may see stated, "_____ happens!" Long tailed distributions are the cause of that. A secondary element of long tails is the outlier, the small sets of aberrant events that one all too frequently dismisses as just a mistake. The outliers are what scientists get Nobel prizes for; they are the "black swans" in the financial world. The models must account for these long tails and outliers, not dismiss them.
2. Nonlinearities: There are always in nature nonlinearities. These nonlinearities can result in instabilities. All too often we neither know what these nonlinearities are nor could we adequately model them if we did. It is interesting in Samuelson's classic book *Foundations of Economic Analysis*; in his last chapter he discusses the nonlinear models and issues of stability. He never applies them. The Keynesian world is a world of linearities, small perturbations and multiplier effects. The measurement of the multiplier effects were based upon backward looking data. For that reason, nonlinearities, linearization, and modeling on backward looking data, sets up a situation ripe for unexpected oscillations and perturbations.
3. Non random noise.
4. Undetermined correlations: In 1984 I had built a software based options trading station which we eventually sold. To test the system we saw an opportunity in the introduction by Coke of what was called "New Coke". The issue was really not just Coke but Coke and Pepsi. Namely most models looked at options at that time as uncorrelated single processes. However I saw a set of correlated processes albeit unknown, but I had in the early 1970s obtained ways to estimate the correlations. Thus by using the more robust models.
5. Incorrect Models: Model problems are of two kinds, failure to account for terms or factors and failure to account for feedback.

6. Human Nature: As we will discuss momentarily as the Sorosian concept of reflexivity, human nature often blinds the process, and it can do so by the act of direct human intervention or through the algorithms of an automated trading system.

7. Spy versus Spy Models: One of the most important factors is what I call the "spy versus spy" effect. One investor comes up with a model and for a short while prospers and then the other investors can catch on and they use various methods to determine what the new method is, develop a new and hopefully better one and then compete against the initial innovator. This in many ways is the idea of micro-creative-destruction, a continuing process of Darwinian evolution in the financial markets. This effect is akin to a Schumpeter model of cycles, cycles driven by acknowledgement and adjustment for changes in competitive strategies. There is another factor which plays into the Schumpeter model and is akin to the spy versus spy cycle which is the cycle of change in people, their rotation in and out of the business. In investment banking they move in every six to seven years, the good ones move out, the bad ones are left or rejected and new blood arrives with the opportunity to make new mistakes, sometimes the same, all over again. I believe that it this human change which may in many ways account for what Schumpeter had observed.

These are just a few of the problems which I have personally encountered over the years. They often result in the "Black Swan" events, namely something which was never expected². The question about Black Swans is; are they exogenous, namely just events which happen outside of the power of humans, such as a volcano or hurricane, or are they the proximate result of human micro interventions resulting in the Black Swan. Take the recent market collapse, was this Black Swan a result of some exogenous and purely random collapse of everything, was it a Schumpeterian collection of cycles, or was it a proximate result of a collection of bad decisions. Finally was the Market Collapse inevitable in an almost Marxian manner.

6 MARX, SOROS, REFLEXIVITY, AND HOUSING

Engels at, Marx's funeral, opined that "just as Darwin had discovered the law of evolution in organic nature. So Marx discovered the law of evolution in human history..."³ The evolution of plants, bacteria and other such species is in reality a continuing process between and amongst themselves, their environment and other

² A Black Swan Event has these 3 aspects by definition: (i) Huge cost or payoff , (ii) Exceptionally low probability even after observed and (iii) Completely surprising---not possible to have foreseen except in hindsight.

³ See Heilbroner, Worldly Philosophers p 168.

competing species. Certain characteristics help survival and growth others do not and the result is forthcoming.

In a Darwinian world there is no determinism. A genetic change in one species occurring before that in another species could make the first species survive and the second fail. Thus in a Darwinian world there is great uncertainty, the only certainty being that survival was to the fittest. In contrast Marx was a determinist. He looked at his model as a Newtonian world where once someone had the correct formula the trajectory could be determined, uncertainty did not exist, and there was a well defined end point, the world as he saw it. The dialectic was the fight between materialists systems or economies and the result would be as discovered and espoused by Marx. For this reason there was slow acceptance of Quantum theory in the Marxist USSR as well as the genetics as we now understand it as well as many elements of probability theory, it conjured up doubts to the Marxian determinism.

However what Marx felt to be his major find was the dialectic process attributed to Hegel. The dialectic is simply the thesis, antithesis and then the synthesis. Both Hegel and Marx view this as a deterministic process. One where there is a knowable result, or in the case of Marx a known result. Marx further focused on materialism, namely seeing that the means of production determined the structure of society, that mankind was determined by the material artifacts in which it existed. Dialectic materialism of Marx then was the certain and deterministic conflict between capitalists and the workers with communism being the only know outcome. Marxism focused on processes and systems, it focused on well determinable and more importantly inevitable ends to these systems and processes. Marx was not a chance taker.

In a recent talk at MIT, the Hungarian-American investor George Soros discussed his views and they were recorded and commented upon by many. The comments by Robert Huebscher noted as follows provide significant insight to both the Sorosian world view as well as an introduction to the issues regarding the current housing crisis.

"Fund manager George Soros sought to explain the global financial crisis through his theory of "reflexivity" to a packed auditorium at MIT last week. Soros' October 28 talk was titled "A New Paradigm for the Financial Markets," which is also the title of his recently published book on reflexivity. Reflexivity, originally developed by Soros over 50 years ago, argues that the measurement of valuations in the market affects the valuations themselves, and the result can be a disequilibrium where prices undershoot or overshoot their true values. Traditional economics argues that actors make decisions rationally so as to maximize their personal gains. But Soros' theory is based on inefficient markets, where actors often make mistakes, and those mistakes feed on themselves in a self-reinforcing manner. Many economists dismiss reflexivity as amateurish. "It is difficult to conceive of a more mistaken understanding of the profession's research in the

*last 10-15 years," wrote Christopher Neely, an economist at the Federal Reserve Bank of St. Louis."*⁴

Soros presents an understanding of the market which perhaps well exceeds the competence of those who pretend to explain it. One is reminded of the specialist, say the pathologist, say furthermore the dermatopathologist, They have after an extended career seen thousands of slides of skin tissue, thousands of different lesions, and they can see what even the expert trained eye of a regular pathologist may miss, some small variation in nucleus size on a few cells, some cell wall abnormality, some slight infusion of aberrant melanocytes into the dermis, and the like. Soros appears to have that vision in the world of Finance.

The practioner, who looks at the detail, looks at the small, sees with eyes trained far better than any academic looking at the system from afar. The researcher in medicine sees patients, the economists sees other economists. Thus one may argue that Soros has the distinct disadvantage of experience and what he sees, albeit not articulated for academic digestion, may have more than just a grain of truth. The market feeds upon it, there are those feedback paths, those neural networks of micro comments that set prejudices and trends. Can these be modeled, can they be characterized and measured, the answer is yet to be determined but Soros brings the insight of the working observer.

Huebscher continues:

"Soros recounted the causes of the housing bubble, noting in particular that lenders assumed they could reduce risk with the geographical diversification offered through securitization. In fact, he said, this actually increased risk, because it separated the agent and the principal. Those who loaned money and earned fees – the agent - were disconnected from the homeowners that were on the hook for the payments – the principal. The agent and the principal did not share the incentive to pay the mortgage in a timely manner. "Marx made the same mistake," Soros said: "He didn't understand the agency-principal problems" that would arise when everything was nationalized. Now there are 20 million homes with mortgages that exceed home values, Soros believes. As employment rises, he said, it will be "socially acceptable" for homeowners to walk away from their homes. He believes that mortgage balances need to be reduced to 80% of the current value of homes to provide an equity buffer, in case home values fall by another 10% or so. Soros said the current administration has been "consistently lagging" in its policy responses, specifically singling out Treasury Secretary Henry Paulson. "Paulson did not recognize the severity of the crisis and did not take the necessary steps," Soros said. He also admitted he did not correctly forecast the severity of the crisis himself."

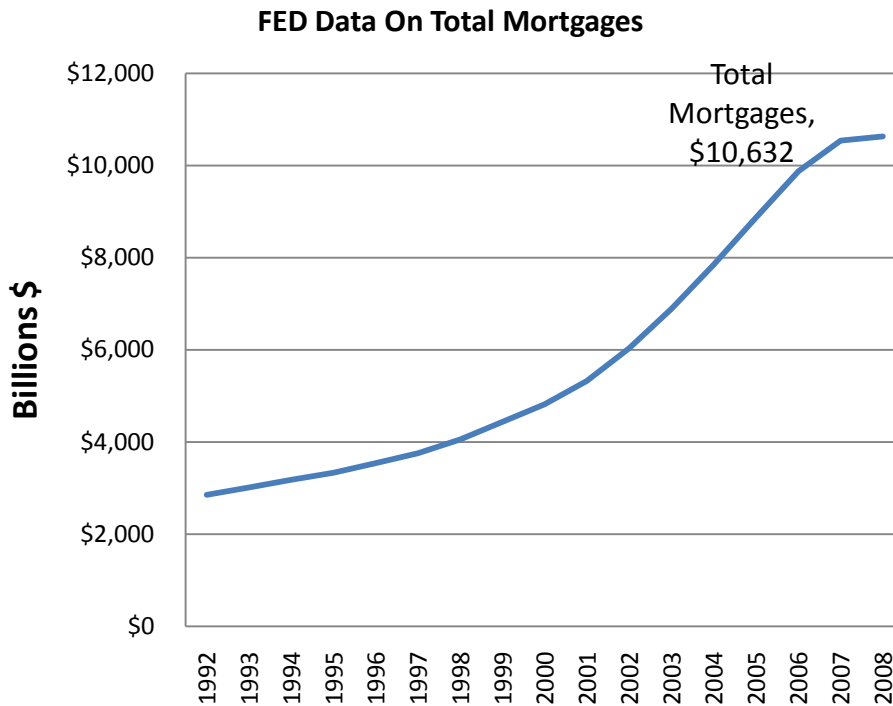
⁴ From: George Soros – "The Authorities have Lost Control" by Robert Huebscher November 4, 2008, Advisor Perspectives.

Let us now examine the Soros conjecture regarding 20 million US homes being worth less than their mortgages. First, that should not be a problem unless one needs to sell the house and do nothing. If one stays where they are then the assumption is that unless there was fraud the owner would be able to pay the mortgage. One does not renegotiate a car loan after leaving the show room because the car is no longer worth what it was a few moments earlier when it was brand new. One keeps the car and pays off the loan. The problem arises if the value of the home has dropped and you need to sell it for some reasonable reason.

Now back to Soros and his 20 million homes. Unlike Soros we will use data, namely facts, a bad habit we seem to be addicted to, and those nasty facts keep getting in the way of the story. So let us proceed. We will provide

First let us see what the total mortgage market is. The following is the Federal Reserve's data on total mortgages in the US as of end Q3 2008⁵. There is about \$10.6 to \$12 trillion. Homes turn over once every 6 to 7 years. GNMA turnover shows about 6.5 to 7.5 years depending on the GNMA notes issued. Another observation regarding this data is that the growth rate for the past three quarters is comparable to that at the beginning of the Clinton years, often looked upon by some as the beginning of the "good times". Thus one wonders what the problem may be.

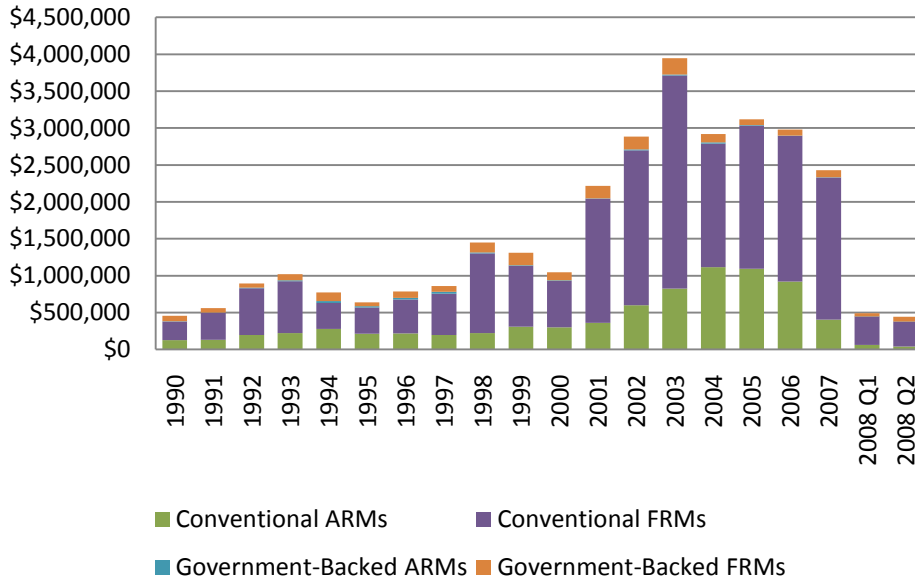
⁵ One observation is worth discussing. To gather this data takes a great deal of effort, even in the day of Google and the Internet. One would assume that the US Government web sites would have this data readily accessible, in usable format, and up to date. One can obtain some from the Fed but when one looks toward Treasury one finds a dearth. Given the fact that one would assume that Treasury and the Administration would want full transparency so as to support their efforts then one would expect Treasury to have the prime data readily available. It is not. Hopefully the next Administration could remedy this.



The following chart depicts the mortgage originations by type over the time window. It presents data on Conventional and Government Fixed and Adjustable Rate Mortgages⁶. One can see the explosion starting in 2003 and continuing through 2006. However the Government initiated ones are still small as compared to the entire pool. One would have assumed that any rational person watching this process in 2003, such as the good Mr. Greenspan would have seen this exuberance. What is lost in the details, however, is the refinancing done at this time. Despite all the detail we cannot adequately determine what percent of the home were refinanced again, wiping out an old mortgage or even second financing for expenses and improvements.

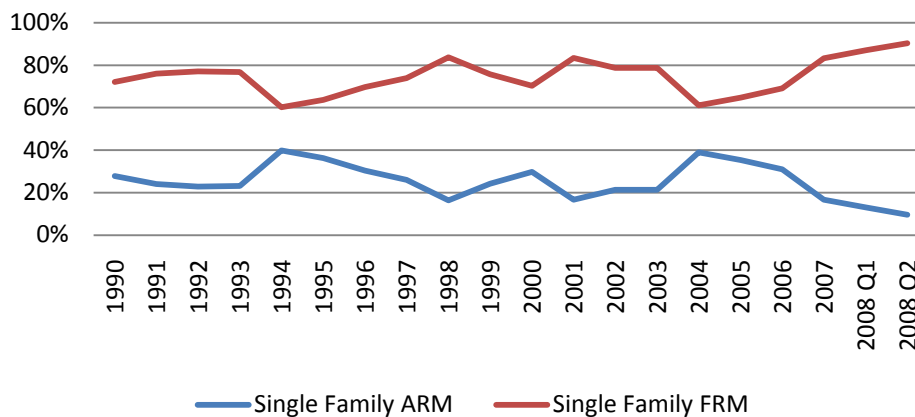
⁶ There are many types of mortgages. The majority are the Fixed Rate Mortgages, FRM, which is the classic case of a fixed term and fixed rate with generally no pre-payment penalty. However the down payment specification is another level of detail and the FRMs generally require a minimum of 5% to 10% down but many exceed that. The Adjustable Rate Mortgage, ARM, is also for a fixed period but the rates adjust to meet the market rates. Generally the ARM may have an initially lowered rate and the bet is that the rates will stay fixed or reduce. However ARMs were typically obtained assuming a short term stay in the property and if the market prevents such by failure to present sale options then there is substantial risk. Graduate Payment Mortgages, GPM, are ones where the payment is low at the front end and then increases substantially over time. The rates on the loan are constant only the amounts change. The Growing Equity Mortgage, GEM, For the GEM the payment equals the first monthly payment but the payment steps up and the equity paid off earlier. Bydown Mortgage is one afforded by builders. Balloon Mortgages are typically of a short duration, say five to seven years and have low payments and then the remainder all due at the end of the period. See F. D. Arditti, Derivatives, Harvard, pp 307-327.

Mortgage Originations 2008 \$000,000

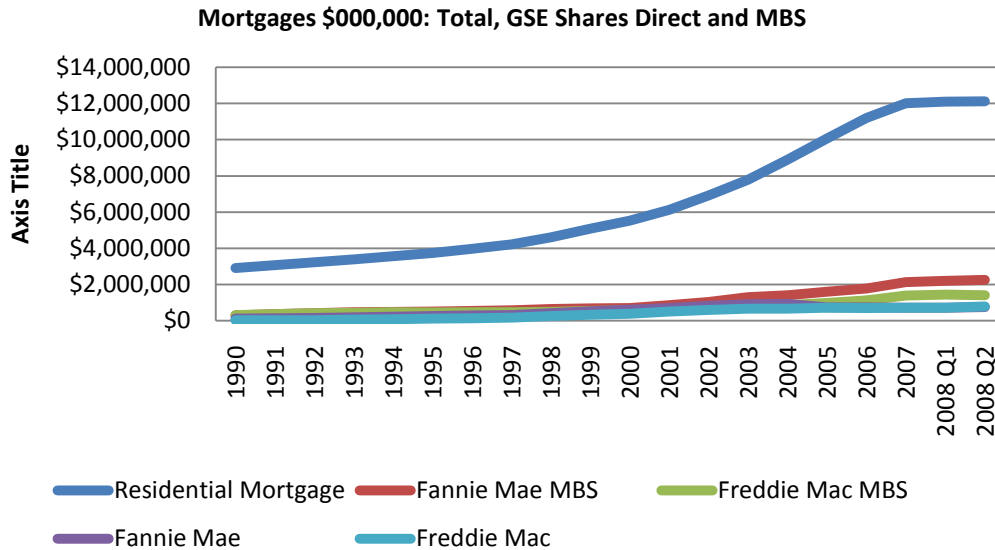


The next issue is how these mortgages are split, who has a reasonable down payment and who the risk taker is. A way to address this is to look at the Fixed Rate Mortgages, FRMs, and the Adjustable Rate Mortgages, ARM. The FRM generally has a down payment and intent to stay put, they are inherently less of a risk taker. The ARMs, especially in this market, are the risk takers and in turn those at risk. They pay little up front, expects to flip the home, and do not anticipate ever paying the full load. They are the ones at risk. The following chart depicts the split between FRM and ARM. Notice that it averages about a 70:30 split, with the more recent split being much more towards an FRM.

Percent ARM and FRM

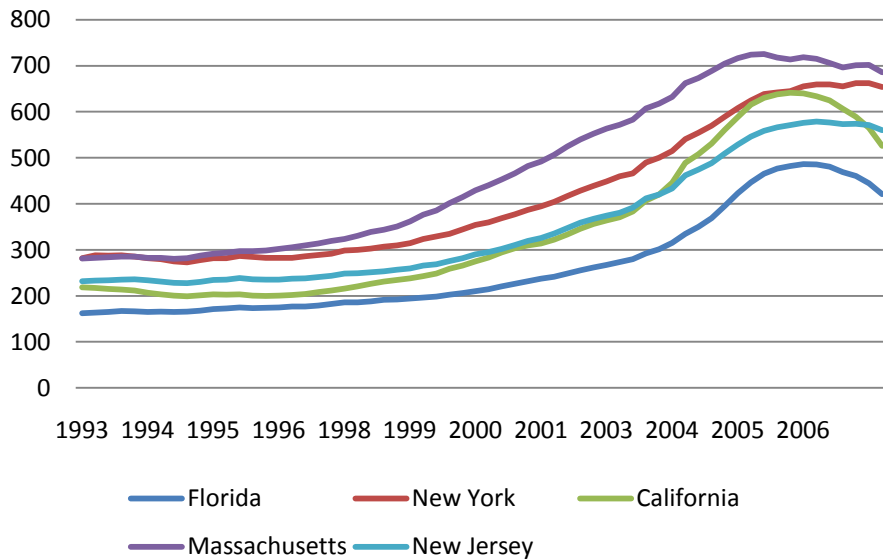


The following is another chart showing total mortgages. This time we see a \$12 trillion number for the total. The numbers held by Fannie Mae and Freddie MAC is small compared to the total but is quite substantial. Fannie MAE MBS, mortgage backed securities, exceed \$2 trillion alone.



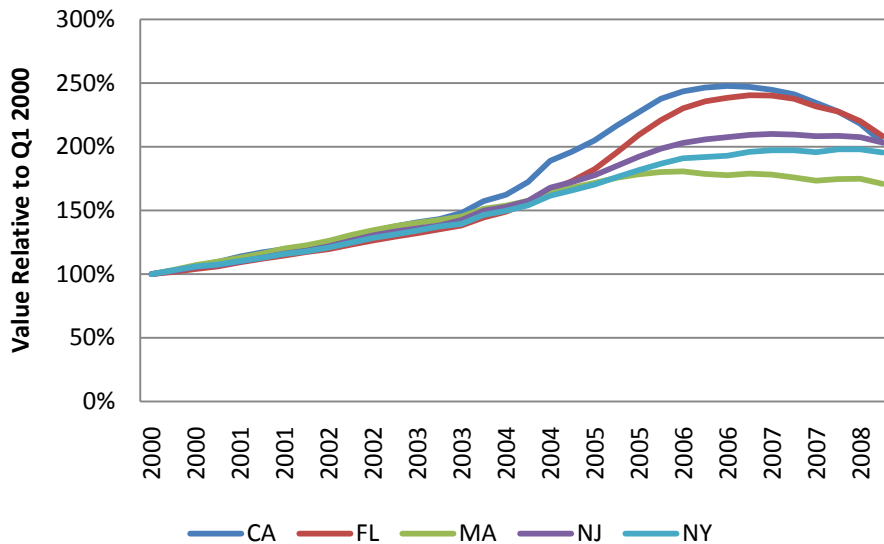
Using the data on markets we look at five states: New York, New Jersey, Massachusetts, Florida and California. They are shown below. There is clearly a bubble effect in California and Florida whereas Massachusetts, New York and New Jersey appear to have just a normal market adjustment.

Relative Pricing of Houses 1993-2008



Now we can look at the homes over the window we have created by the average lifetime of a mortgage. Let us assume we use the 7 year window consistent with GNMA. Then we can look at the data below.

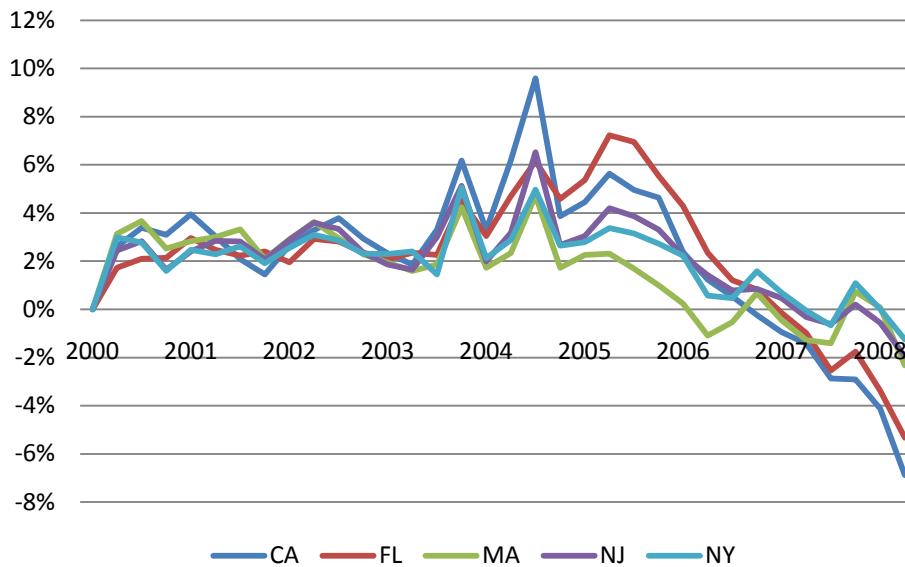
Growth Relative to Q1 2000



The next chart shows the change in house price in percent on a quarter to quarter basis. In 2005 and 2006 there were two bubbles again in Florida but after the second the drop became precipitous. Instead of growing the average of 2% per quarter, a sustainably unreasonable rate, the prices in Florida and California dropped at the rate of 6-8% per

quarter. The canaries were really dying off at this point. But clearly if one looked at 2004 and 2005 in Florida, the bubble was quite obvious. The question is why was the FED not aggressively warning of this bubble at this time? Why did the Government not look deeper into this issue recognizing the potential for instabilities and why did the investment banks themselves not act with more prudence and caution? Clearly the retention of a Glass Stegall may have put some caution into the system.

Change in Quarter to Quarter 2000-2008



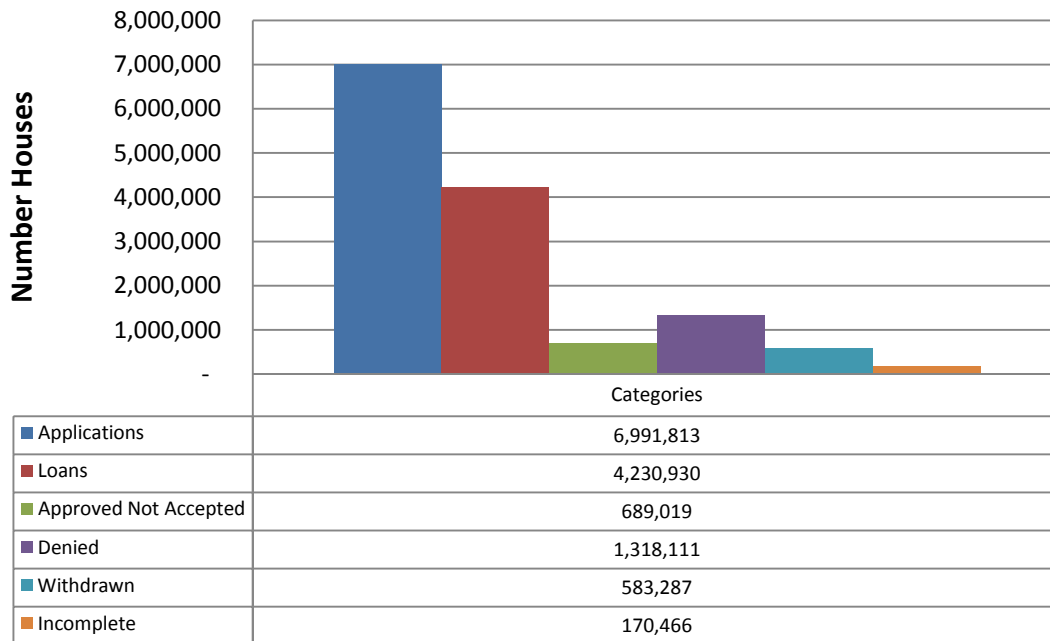
From ⁷ FFIEC data we have the following table which we can use to determine the total number of houses. This Table shows the total mortgages issued and in addition the details of what transpired in toto.

⁷ See <http://www.ffiec.gov/hmdaadwebreport/pdf/2007/Hmda/temp/2007HN4-2.PDF> and <http://www.ffiec.gov/hmdaadwebreport/NatAggWelcome.aspx>

and

2007 Mortgage Data on Number Houses

See <http://www.ffiec.gov/>



The average value per mortgage was \$210,000. Thus we can infer the total number of mortgages from the above data sets. The total mortgages issued was approximately \$877,000,000,000. Namely:

- 1, If in 2007 the average mortgage was \$210,000 and there were 4.2 million mortgages, then with a 7 year life to the average mortgage we would have a base of 29.3 million mortgages.
2. If we have \$877 billion in new mortgages, and we again use the 7 year window we have 6.2 trillion in mortgages assuming no price increase over the seven years.
3. We know that between the Fed data and other Government data that there is about \$10-\$12 trillion in mortgages. Thus either the lifetime number is off by more than a factor of 2 or there is another set of issues.
4. Another approach would be to see that house prices doubled over the seven to eight year window and almost at a linear rate. Thus we can say that the average price and thus average mortgage in this window was 75% of the 210,000 or \$159,000.
5. If we use the 12 trillion in mortgages and we use the average of \$159,000 per mortgage we then obtain about 75 million mortgages.

6. We then look at the ratio of FRM and ARM. We assume the ARM has minimum or no down payment. This is 30% of the total. Thus we see about 22.5 million ARMs. We can assume that the FRMs are with down payment and not under water. Perhaps this is where Soros is trying to get his number but this will not work since most of these were purchased well before the drop.

7. Now if we look at prices we see that generally we are down 20-25% from the peak, except for the cases of Florida and California where there was a true bubble. So look at the numbers and we see that for the period of say 2000-2005 we have almost all still above water. Thus if one mortgaged a house in that period, a first mortgage, then it would generally still be above water. If one did so from mid 2007 to the present the same would apply. Thus we have 1.5 year window where a buyer is at risk. Using a 7.5 year holding time and a 1, 5 year excess window then the chance that anyone is under water is about 20%.

8. Using the results of 6 above along with 7 we have at worst 22.5 million times 20% or 4.5 million homes at risk and then using the worst case value of \$220,000 per home the default number should be \$990 billion. That assumes that each and every person who has a house below market relative to their mortgage just walks away!

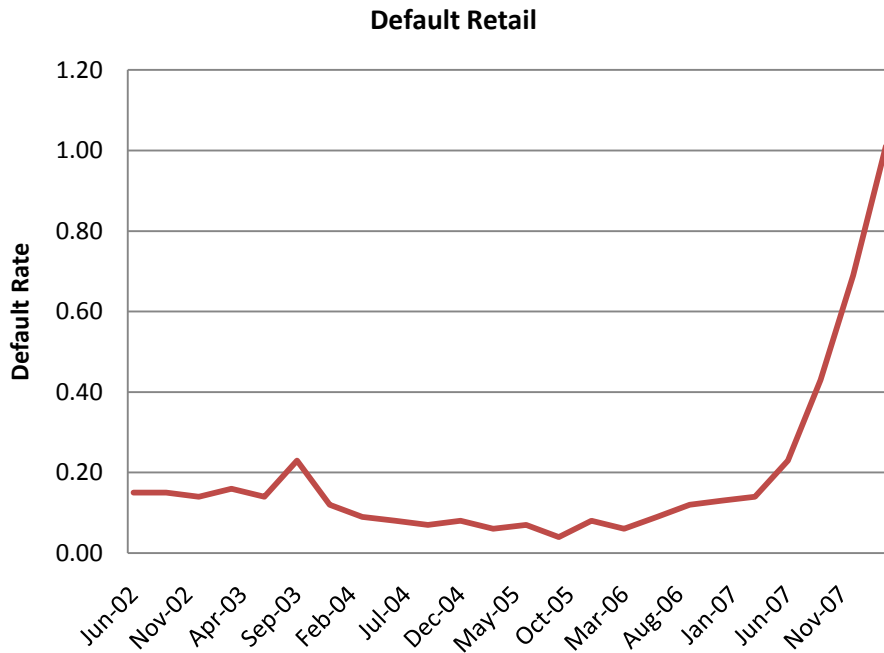
9. Now if we know that the market dropped worse case 25%, then adjusting these by a Government giveaway would cost \$250 billion, way less than the \$700 billion TARP.

Now having seen what has happened in the bubble, a process which was clear to any competent person over the past three to five years, one can ask how painful this is, and one answer is to look at the interest rates. I remember when in 1981 I moved from Washington to New Jersey, the mortgage rate was 18.5%, a gift from President Carter. In the Table below we see those rates and my mortgage was at the peak, it would have been cheaper to put it on my Visa card at the time! But now the rates are at 6% and falling, if available.

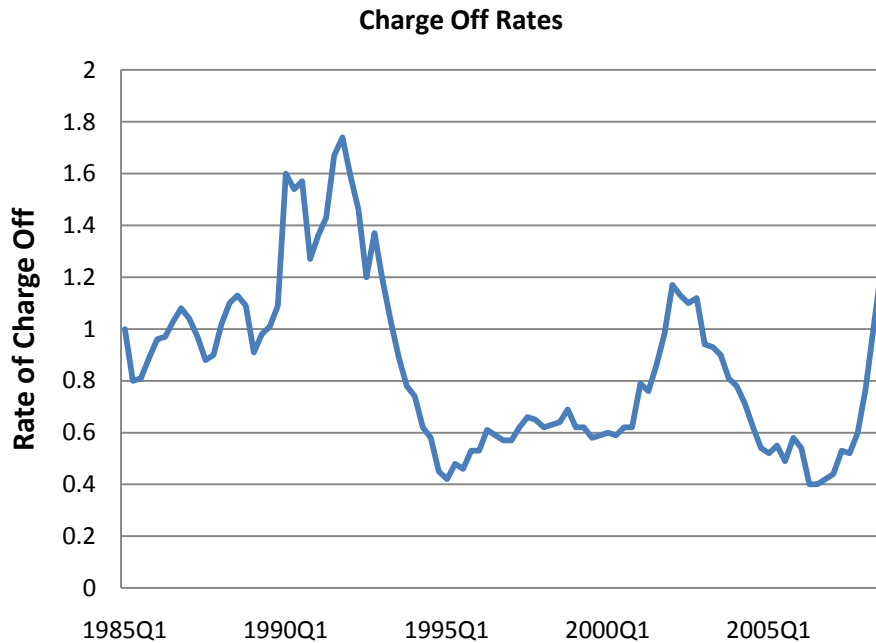


Thus we then ask what the defaults are and why. The Table below depicts the default rate for mortgages. From 2002 to 2007 the default rates have gone up five times, from 0.2% to over 1%.⁸

⁸ NOTES: Charge-offs, which are the value of loans removed from the books and charged against loss reserves, are measured net of recoveries as a percentage of average loans and annualized. Delinquent loans are those past due thirty days or more and still accruing interest as well as those in nonaccrual status. They are measured as a percentage of end-of-period loans. Banks are insured U.S.-chartered commercial banks. Size, where used, is measured by consolidated assets adjusted for mergers; where used, "other" banks are those smaller than the 100 largest. The adoption by some banks of FAS 159, The Fair Value Option for Financial Assets and Financial Liabilities, affected charge-off and delinquency rate data for 2008:1. Because the effects of the accounting change on the dollar volume of loans reported on banks' loan books were small, the effects of the accounting change on banks' charge-off and delinquency rates were presumably small for the industry as a whole. Information on the dollar impacts on banks' loan books can be found on page 14 in the "Notes on the Data" section beginning with the April 11, H.8, Assets and Liabilities of Commercial Bank in the United States, statistical release. For more information on FAS 159, please refer to www.fasb.org/st/summary/stsum159.shtml. SA: Seasonally adjusted., NSA; Not seasonally adjusted. C&I: Commercial and industrial. n.a.: Not available. Source: Federal Financial Institutions Examination Council (FFIEC) Consolidated Reports of Condition and Income (1985-2000: FFIEC 031 through 034; 2001-: FFIEC 031 & 041).



However is one looks at the long term default rate we see in the Table below that the current apparently high rates are indeed not that bad and that in fact appear consistent with the cyclical market clearing trends for the real estate market. The mid 1980s market was significantly higher. Yet even at a 1-1.2% default rate per month , that is almost to be expected and given out prior analysis of \$250 million being required for wholesale defaults even at 2%, the number would reduce to only \$5 billion per month or \$60 billion per year, less than one tenth the TARP!



Thus we started with a Soros comment about 20 million homes being in or near default and then we look at the data, a wretched thing to do for any policy wonk, and we see that this is far from the truth. What was Soros then saying? He is more of a Marxist than Socialist and he is one of many policy influencers who create factoids which the Press picks up undigested and spits them back to the public. One would doubt that Soros went through the detail, even at the simplistic level we have just attempted, to see for him the truth of what's there. In addition, we see the same from the Treasury; the TARP has been both poorly explained and poorly executed. Perhaps just saying that the Government would do something is all that is needed.

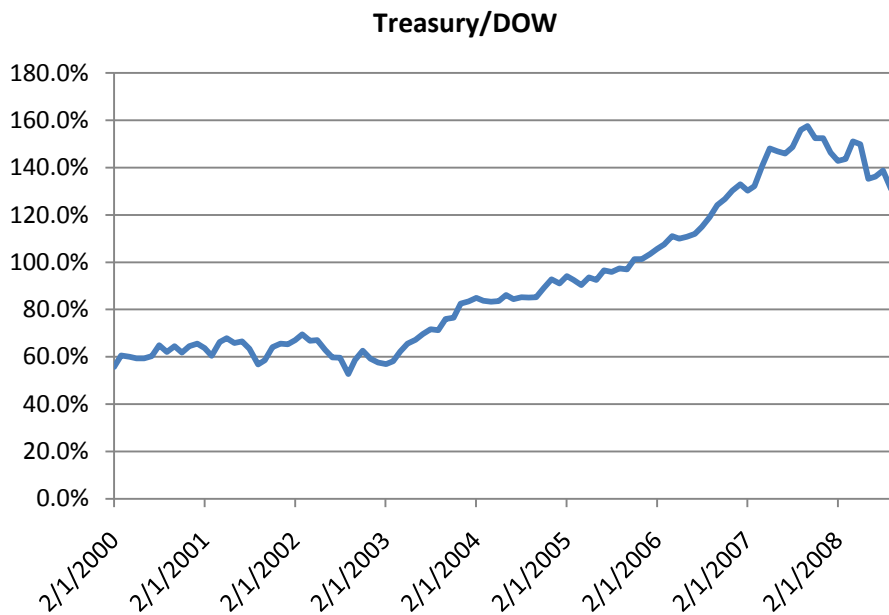
But returning to the mortgage crisis. When we analyze the numbers, there does not really seem to be mortgage crises. It is as best confined to three to four states- Florida, California, Arizona, Nevada- and frankly Florida and California have been boom and bust for ages. There is no surprise there. In fact Florida has been chronically a boom and bust state since Andrew Jackson ejected the Seminoles, perhaps a curse of the Seminoles on the United States.

7 THE RANDOM WALK DOW WALL STREET

In July of 1979 I purchased a copy of Burton Malkiel's book **A Random Walk Down Wall Street**. This was the classic book which told everyone to buy stocks since they perform better than anything else forever. Malkiel went over a great amount of data and analyses to prove his point. He then reissued his book several more times. During this period his suggestions made some sense. Except that a 30 Treasury in 1980 yielded 12.5%! It would pay that until 2010! Frankly try and beat that with any stock. Malkiel also issued his ninth edition in December 2007, great timing!

To look at the Malkiel conjecture we have performed a simple analysis in the following Figure. We assumed the following:

1. Each month for twenty years a person invests \$1,000 in either a 30 year Treasury Note or in a Fund composed of the Dow Jones stocks. The person does this consistently and the buy in price is that at the time of the deposit.
2. At the end of the twenty year period we measure the ratio of the fund of all Treasuries and the DOW Pooled Fund and plot the ratio.
3. We do this assuming that the ratio is measured from some month in 2000 through the present. Namely the twenty years was the twenty years, 240 months, prior to the date at which the ratio was calculated.



The result shown above is that from 2000 thru 2003 one would have been better off in stocks, having only 60% of the money you would have had if you invested in Treasuries. However, starting in 2003, the situation changes rapidly. By 2008 it is clear that Treasuries yield 50% more than stocks, even over a twenty year period. So much for Rand Walks. Also so much for those who have "diversified" their 401-K plans. This analysis show that 401-Ks are thus susceptible to extreme risks and that they are especially so if one invests in one's own company. They all too often go bust, look at WorldCom and Enron!

What does this tell us? The first thing is that anyone with a company managed 401-K knows that there is a limited number of riskless investment opportunities. Most 401-Ks require investment in employer stock and other stock like mutual funds. The result has been that when the market collapses then 401-Ks collapse. Unlike the classic defined benefit pension plan, the 401-K gives the erstwhile pensioner a monthly, and even a daily, statement of how bad they are doing. This negative feedback further driven down any consumer confidence, an unintended consequence of the 401-K program.

8 WHAT NEXT?

This cycle of Market Destruction we believe will have several more cycles. The cycles seem to be: (i) finance and investment entities (Lehman and others), (ii) Credit Markets, (iii) Hedge Funds, (iv) Bloated Corporations, and soon we expect (v) the drop in the major Real Estate Developers and (vi) finally the collapse of the High Yield Debt players. History to date has detailed the first four we comment here on the remaining two. Clearly the drop here has grossly negatively impacted on the Venture Investment market, which from our perspective had come to a stand-still.

8.1 Real Estate

The commercial Real estate market is also due for a major financial restructuring. In New York and other major markets there are two factors which will cause this collapse. First will be the drop in demand, despite what we have seen projected. Second will be the fact that many developers rely on bank loans which may just not be available.

8.2 High Yield Debt

Now let us consider just two of the hundreds of companies awash in unmanageable high yield debt. The two we consider are Sirius and Fairpoint.

8.2.1 Sirius

Sirius merged with XM a few months ago and its performance has been less than stellar. The numbers below are a pre-release set of what may be 10Q for Q3 2008; although at the time of this writing Sirius had requested a delay from the SEC to file its 10 Q.

Simply stated the following is obvious. The company is not making money. It never seemed to; In this quarter it writes off a loss of almost 5B and it still has almost 3B in high yield debt due within 18 to 36 months. This is a recipe for insolvency. There may be no other option other than a total liquidation.

(In millions of USD)	Quarterly (Sep '08)
<u>Income Statement</u>	
Total Revenue	488
Operating Income	-4,827
Net Income	-4,879
<u>Balance Sheet</u>	
Total Current Assets	739
Total Assets Note this includes almost 7 Billion in new assets apparently obtained as a result of the merger such as almost 2 B in goodwill and over 2 B in FCC Licenses	7,503
Total Current Liabilities	2,404
Total Liabilities: The Long Term Liability includes mostly High Yield Debt due within 18-36 months, amounting to almost 3 B.	7,787
Total Equity	16
<u>Cash Flow</u>	
Net Income/Starting Line	-5,067
Cash from Operating Activities	-217
Cash from Investing Activities	767
Cash from Financing Activities	-629
Net Change in Cash	-79

The problem with a Sirius was that it felt that alone it could not be a going concern and the merger with XM, also not a going concern, was essential. The Government spent years on this process, with the FCC being the major laggard. The result was a merger, whose outcome was fundamentally not very different if it had occurred earlier, but from what it appears on its books, in my opinion it does not appear as a company which can remain a going concern.

8.2.2 Fairpoint

Fairpoint was a small company in North Carolina until someone came up with the smart idea to buy the Verizon properties in Vermont, New Hampshire and Maine. We have been flowing that market closely and it has been bleeding access lines to the cable companies and in addition is has old and outdated plant. As with Sirius, the company is at a negative net income, it had 2.5 B in debts, albeit structured via Verizon but still payable unless people play with the repayment terms again, and the market growth is negative. This debt is not repayable under the current business model, another recipe for restructuring. perhaps not liquidation.

The irony is that the Public Utility Commissions in the three states "examined" the economic viability of the deal. In my personal experience there is no competence in any of them to do such a task. This will negatively impact the people of all three states.

(In millions of USD)

	Quarterly (Sep '08)
<u>Income Statement</u>	
Total Revenue	328.25
Gross Profit	175.68
Operating Income	10.23
Net Income	-25.11
<u>Balance Sheet</u>	
Total Current Assets	468.50
Total Assets	3,430.19
Total Current Liabilities	267.24
Total Liabilities	3,219.57
Total Equity	210.62
<u>Cash Flow</u>	
Net Income/Starting Line	-25.11
Cash from Operating Activities	-14.07
Cash from Investing Activities	-89.12
Cash from Financing Activities	260.11
Net Change in Cash	156.92

The following presents some details on the Fairpoint debt. There is a total of 2.5 Billion of debt due and the earnings even under the best of scenarios will not justify any possible payout of this debt, At this point there are three states whose telecommunications rely upon this now shaky firm.

Long-term liabilities:	
Capital lease obligations	7,869
Employee benefit obligations	186,775
Deferred income taxes	248,087
Unamortized investment tax credits	5,759
Other long-term liabilities	37,103
Long-term debt, net of current portion	2,447,608
Interest rate swap agreements	19,123
Total long-term liabilities	2,952,324

These two companies, Sirius and Fairpoint, are just two of hundreds of companies each telling the same story. They have billions in high yield debt and have an earnings profile that makes any resolution of that debt highly problematic. In better markets forms of rollover of the debt would be possible but here such roll over is not possible. Moreover these companies could resolve the problem in some cases by a Chapter 11 and restructuring but in others it would result in liquidation. The classic case was Iridium in the last telecom bubble.

9 RESOLUTION

We can add all of these crises up and schedule them and the following table depicts what we see. There are seven crises and then a resolution. In a Marxian sense these seven crises are the Hegelian antitheses to the existing capitalist thesis. From this, the resolution I yet to be determined. What is clear is that it will be on Obama's watch.

ID	Task Name	Start	Finish	Duration	Q1 08			Q2 08			Q3 08			Q4 08			Q1 09			Q2 09		
1	Residential Real Estate Crisis	6/1/2007	6/1/2009	104w 2d																		
2	Liquidity Crisis	4/1/2008	12/31/2008	39w 2d																		
3	Money Market Crisis	9/15/2008	11/14/2008	9w																		
4	Credit Crisis	9/1/2008	12/15/2008	15w 1d																		
5	Hedge Fund Crisis	10/15/2008	2/27/2009	19w 3d																		
6	Commercial Real Estate Crisis	12/15/2008	12/15/2009	52w 2d																		
7	High Yield Debt Crisis	2/16/2009	12/31/2009	45w 4d																		
8	Resolution	12/31/2009	6/30/2010	26w																		

The question is; are these "crises" nothing more than Schumpeter cycles?⁹ The problem is that all of these crises must clear before we see a resolution¹⁰. This may take as long

⁹ Schumpeter suggested a model in which the four main cycles, Kondratiev (54 years), Kuznets (18 years), Juglar (9 years) and Kitchin (about 4 years) can be added together to form a composite waveform. (Actually there was considerable professional rivalry between Schumpeter and Kuznets. The wave form suggested here did not include the Kuznets Cycle simply because Schumpeter did not recognize it as a valid cycle. See "[Business Cycle](#)" for confirmation.) A Kondratiev wave could consist of three lower degree Kuznets waves. Each Kuznets wave could, itself, be made up of two Juglar waves. Similarly two (or three) Kitchin waves could form a higher degree Juglar wave. If each of these were in phase, more importantly if the downward arc of each was simultaneous so that the nadir of each was coincident it would explain disastrous slumps and consequent depressions. (as far as the segmentation of the Kondratyev Wave, Schumpeter never proposed such a fixed model. He saw these cycles varying in time - although in a tight time frame by coincidence - and for each to serve a specific purpose). see www.wikipedia.com

¹⁰ In a 1996 paper we stated: As for Universal Service, the FCC seems to be focusing on the use of a fund type approach, taking the "taxation" control from the RBOCs and placing it the hands of a Board. This may be the most effective mechanism. The issue that many academic policy analysts have tried to raise is that a wireless provider, in return for the right given them by the government, has a corresponding right to "play fair" with the monopolists and be required to provide universal wireless service. This bizarre set of reasoning goes beyond the wildest dreams of Schumpeter. First, the PCS entrants have risked billions to buy PCS spectrum, which is more than can be said for the monopolist RBOCs, who in many cases usurped their properties at the turn of the nineteenth century. Secondly, if economic efficiencies are of any importance, why not let the market determine who the most efficient provider is. Thirdly, why the monopolist must be protected. In fact if telecommunications is truly commoditized with wireless, then as we have seen in long distance, the market is very efficient without any governmental strictures such as compulsory universal service."

as through 2010. Again the question is; where are our brilliant economist amongst all this carnage?

10 SOME SUGGESTIONS

After laying out these stories in some detail we can make some suggestions, hard as they may be.

10.1 Let the Car Companies Go Into Chapter 11 or Even 7

When company needs money to pay parties who were contractually committed but if paid will result in ultimate total collapse and then they receive nothing, either a renegotiation is due immediately or file for Chapter 11. If in Chapter 11 the Judge reorganizes then these agreements are subject to immediate restructuring on a one sided basis. The Unions do not want a Chapter 11 so why will they not negotiate. Just look at the New York City docks, almost empty, east and west side of Manhattan and most of Brooklyn. Why? The Unions, between their extortionary agreements or criminal influences drove the business out. It went to Baltimore, less crime but more unions. In a similar fashion, management of the automotive companies entered into agreements with the unions that are now crippling the companies. The foreign automotive makers located in the south do not have the problem. Let GM relocate, that had plenty of time to do so. Saturn was sent there, and GM let it wither on the vine. It could have represented the first step in an expansion strategy, yet they never followed through. The management and its lobbyists have been outright falsifying their basis for the fears we see.

An alternative for the auto makers is a Chapter 7 All that is needed is three creditors to file. Then down goes the company. In view of the fact that GM is profitable everywhere other than the US, it would be possible to liquidate tem and lest the US operations collapse, selling the rights to manufacture to the foreign subsidiaries.

10.2 Let the Homeowners Deal with What They Have If It Is a Normalized Mortgage

In a similar manner, many of the homes were fraudulently purchased with subprime mortgages. I have seen several personally where the individual involved apparently provided false information in collusion with the mortgage company to get a loan which was in trouble from the start. Why should the taxpayers bail this out? Secondly, if the mortgage is more than the house value that should be no problem if the owner can pay the mortgage. Prices go up and down, but the owner agreed to pay what they agreed to pay. This could have been reduced as an issue, not even a problem, by reintroducing the tax liability if a person has a mortgage forgiven.

10.3 Do Not Have the Taxpayers Reward the Middlemen aka Bankers

The argument is that the good ones will leave. The retort is to where? It is like saying that you have to pay the Titanic crew for a good job before it sinks, for they have played fine tunes and the deck chaos are arranged so neatly.

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