A working primer on the role of information and information failures in the ongoing financial crisis and the proposed bailout plans

Short title:

Give Us the Information Already

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Spring 2009

Version 1.1

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1. Introduction—History and Purpose

Throughout the Summer and Fall of 2008 I was asked by several people to explain one aspect or another of what was becoming known as a "financial crisis". In most of these discussions, I focused on the inability of various financial institutions to evaluate the assets they held, the lack of faith investors had in the financial prospects of these institutions, and the lack of a reasonable, let alone a coordinated, response by government auditors and regulators. In almost every discussion I was asked to predict where things were headed and to speculate on likely outcomes.

My answers usually started with the disclaimer of the sort "I'm not a macro-economics expert, but I do know something about the economics of risk and uncertainty, and something about markets, market failure, and appropriate regulatory response…." Depending on the background of my conversation partner(s), I would describe some set of recent events and explain either the likely inadequacy of what little governmental response had occurred or was proposed, or how the response was completely off-the-mark (or both). Looking back, I can safely generalize that I usually got a few things correct: that the effects of the crisis would be variable across markets, economic sectors, and geographic areas, and that the problems would continue to unfold across additional parts of the economy. However, I probably also got at least one thing wrong: at first I did not suspect the coming magnitude of the "meltdown," and later I did not stress this point.

By mid-October I decided to write a brief essay with the main points of my view that a major source of the meltdown in the financial markets was the result of information failures and that any "solutions" that did not address the information needs would not be viewed as anything more than holding actions that would eventually fail. In fact, I argued that each of these attempted fixes would only make the overall situation worse by highlighting what we still do not know about the underlying valuations of the assets and derivatives at the heart of the financial side of the problem. In other words, each partial and halting response made the situation worse by making investors, business managers, and taxpayers around the country and the world increasingly doubt that anyone understood the magnitude of the problem. I sent copies of two slightly different drafts to friends and received several useful comments in return. At approximately the same time, on something of a whim, I sent one of the drafts to the office of a Democratic Congressman who had voted against the first financial bailout legislation. I like to think my correspondence with one of his staffers helped develop their position on the TARP bills, and I learned a lot in the process. I also asked someone I trusted whether I should turn my essay into an "op-ed" column. He made useful suggestions about style and length, but with each re-write the piece became longer rather than shorter, so I abandoned that idea.

Since I knew I would be teaching my *Economics of Information* course starting in mid-January, I came up with the idea of turning the information and information-failure aspects of the "economic crisis" (no longer *just* a "financial crisis") into a "learning experience." I tried to separate out the information-related questions from the more general macro-economics. I also tried to avoid having to provide everyone with complete backgrounds in classical, Keynesian, and neo-classical models. This gave rise to a list of (originally) nine questions. The students each chose a question to work on, made a short classroom presentation, and provided a write-up of a couple of pages for each. I told them from the

beginning that I would edit their responses and produce this primer. (I also told them there was a long tradition of professors making use of student work and suggested that they should be proud to be able to continue this tradition.)

I have restricted my editing of the various sections almost entirely to stylistic and citation issues. For the most part, I have removed figures, tables, and photos that were in the original student papers to cut down on space. Where possible we provide references (although the style for the citations may not be completely consistent). In a very few cases I updated a section or added historical references. I was mindful that we could not constantly update the sections as each new event occurred or every proposal was presented. As a result some of the analysis will be out-of-date. My instructions to the students were that they could include both analysis and opinion, but that opinion should be labeled as such. I think they did an exceptionally good job in this respect, but I want to stress that any opinions presented in a section do not necessarily reflect those of any participant in the class other than the author of that section.

2. What We Need Is Information, Not Billions of Dollars

Originally written in October 2008, this short essay lays out the basic premise of this work—the initial conception of the problem by the Fed and the Treasury was faulty and the proposed solutions would not and could not resolve, or even lessen, the crisis. The first paragraph is as valid today as it was then. If I were re-writing the essay today, I suspect I would focus a bit more on the link between the recession and the financial side of things. But given the failure of the government to acknowledge the obvious—regardless of the technical definition we were in a recession—my focus was on the proposed bailout plan.

The Bush administration's response to the current situation is driven by its portrayal of the problems as a "financial" crisis. Taking that view, its proposed remedy is a bailout of major financial institutions with some government entity using taxpayer funds to buy securities of unknown value from supposedly sophisticated money managers. Instead, the focus should be on—first—resolving the information problems to help evaluate the suspect securities and—second—to assist in the renegotiation of mortgages to help keep homeowners in their houses.

We all knew the original three-page draft from Secretary Paulson was both a power grab and likely to have little effect on the underlying causes of the current financial meltdown as it focused too narrowly on "mortgage-backed securities" rather than on housing, mortgages, business and consumer credit, and a number of real problem areas. But was not the 110-page revision, the so-called "compromise", an appropriate fix? After all, it had limits on executive compensation, the ability for mortgages to be re-written, an oversight board—something for everyone. But it still had at its heart the throwing of money at the wrong problem. In the remainder of this short piece I will describe the actual nature of the problem and suggest actions that might actually help resolve the situation.

Let's go back to first principles: banks and other financial institutions used to hold assets—some cash, real estate, securities, and the loans they made to their customers. Some still do, but—for the most part—they now are in the business of earning fees for originating loans, buying and selling obligations of one sort or another, etc. On the other side of the ledger, the liabilities of the financial institutions are the sums they owe others—the depositors in commercial banks and S&Ls, and frequently the deposits of other institutions as well as government agencies. The basic principle of banking was to know the value of one's assets and liabilities, accurately disclosing this to regulators and the public. (Investment banks did not have to follow the same disclosure rules as commercial banks.)

As the business of banking became more fee-based, the functions of loan origination, loan processing, and asset management became more separable. Home buyers no longer dealt with a local bank that would be expected to hold and process their loan into the future. Banks provided consumer credit, via credit cards, "homeowners' lines of credit," and so on, but again often did not hold onto the asset. So long as the packaging and re-packaging of these assets (loans) into financial instruments was done in a transparent fashion, the result was mostly positive. The major loss was the lack of a personal relationship with one's "banker," who was frequently a respected member of the local community. There were gains in this system as loanable funds could more easily flow to growing regions and industries, and the entry of non-bank financial institutions into some

parts of the market provided competition that reduced costs and eliminated pockets of discrimination.

The major problem that did arise was the development of securities and financial instruments that were difficult, and sometimes impossible, to value. Here several "villains" enter the story, with the *Commodity Futures Modernization Act* [1] and the Federal Reserve board under Alan Greenspan[2] the major players. Banks, insurance companies, financial conglomerates, and foreign treasuries acquired literally billions of dollars of securities, the values of which they did not understand and of which they could not know. With only minimal oversight this could have been prevented. Take, for instance the counter example of GNMA ("Ginnie Mae") bonds.[3] These are "pass through" securities that have been around for 40 years and represent packages of insured mortgages. As the mortgages mature or are re-financed, the holders get a monthly statement with a "return of principal." The value of the bond is adjusted accordingly. In the current crisis, one generally hears nothing about Ginnie Mae as it is government owned and doing quite nicely. It is not a coincidence that Ginnie Mae does not issue derivatives or hold them as assets.

Contrast the Ginnie Mae bonds with mortgage-backed derivatives. In *Bonfire of the Vanities*, Tom Wolfe has a scene that is both funny and pathetic (and now oddly prescient) as Sherman McCoy tries to explain to his young daughter what a bond trader does. McCoy hopes to make a killing by introducing the "Giscard," a security somehow tied to both the Euro and to gold (intriguingly many years before the Euro was introduced) into the market. The current situation is more bizarre than anything Wolfe created. Who would have expected investment managers all over the world to first buy securities they could not value and then ask for an almost unlimited bailout to get them off their books?

Given that we can not change history, we are now forced to come up with a solution. But that solution is to resolve the information and valuation problems, not to blindly throw taxpayer money at the financial markets. First, we know the bailouts of commercial banks and S&Ls will continue (yes—there will be more of these). The FDIC is actually doing a rather decent job under the current circumstances. In fact, the takeovers of the past week have likely not increased the pressure on its reserves. The first thing we need to do is to devote significant resources to correctly valuing the suspect securities. This means getting competent people to deal with the information problem. The ongoing experience of Ginnie Mae and others provides hope and direction. Without access to the improved information, there is little chance that any major bailout will do anything other than change the identity of the entities at risk. The second thing is—at least partially—to stabilize the housing market. Identify those that can re-negotiate mortgages when possible. It is likely that legislation (or at least HUD and Fed regulations) will be needed to empower loan processors to enter into binding negotiations with borrowers. This is an area where the use of bailout funds and insurer-of last-resort activities actually has a chance of positive spillover effects for the rest of the economy as they help provide certainty in the valuation of mortgages and the securities that are derived from them.

3. Background on the housing finance market

3a. How do GNMA obligations differ from those of FNMA (Fannie Mae) and FHLMC (Freddie Mac)?

GNMA (Government National Mortgage Association), or Ginnie Mae, obligations differ from FNMA (Federal National Mortgage Association), or Fanny Mae, and FHLMC (Federal Home Loan Mortgage Corporation), or Freddie Mac obligations in several important ways. To begin to understand these differences, it is important to first note that Ginnie Mae is wholly-owned by the United States government, and therefore enjoys the backing of the full faith and credit of the U.S. This explicit guarantee of Ginnie Mae contrasts with the previously in-place implicit or supposed guarantees enjoyed by Fannie Mae and Freddie Mac, which previously-operated as GSEs, or Government-Sponsored Enterprises, as opposed to fully-owned governmental operations. By being completely controlled and backed by the U.S. government, Ginnie Mae experiences no conflict between shareholder profitability and pursuing its mission of increasing affordable housing throughout the U.S.[4] Such a conflict is/was a characteristic of Fannie and Freddie, and some analysts believe that such a conflict ultimately helped to undermine the performance of those two enterprises.

In essence, Ginnie Mae insures mortgage-backed securities, or MBS, wherein the pooled mortgages that underlie the securities consist entirely of mortgages themselves insured, entirely or in part, by one of the following U.S. government agencies: the Federal Housing Authority (FHA), the Department of Veterans Affairs (VA), the Rural Housing Service (RHS, part of the Department of Agriculture), and the Office of Indian and Public Housing (PIH, part of the Department of Housing and Urban Development, or HUD). Because Ginnie Mae only insures MBS built on pools of loans insured or guaranteed by the U.S. government, its obligations are considered very safe, especially as Ginnie Mae itself is backed by the full faith and credit of the United States. In other words, an investor purchasing Ginnie Mae MBS should feel "doubly" safe: on one hand, the payment of interest and principal on their MBS is insured by the U.S. government through Ginnie Mae; even before this "pass-through," however, the underlying loans themselves are insured or guaranteed, in whole or in part, by the aforementioned U.S. agencies.

It should also be emphasized that Ginnie Mae only insures MBS. It does not issue MBS itself, and it does not deal directly with the primary mortgage lending market. Moreover, MBS issuers that wish to purchase Ginnie Mae insurance must conform their loan pools to specific Ginnie Mae criteria—that of GNMA I (more strict), or GNMA II (more flexible—see footnote below). In both cases, the need to meet these specific criteria to qualify for GNMA status makes GNMA loan pools fairly transparent—the included mortgages in any MBS are mostly similar and must conform to GNMA standards.[5] The apparent transparency of Ginnie Mae itself is furthered by the limited securities with which the agency works. On top of the Ginnie Mae I and II MBS mentioned above, GNMA only administers a Real Estate Mortgage Investment Conduit, or REMIC, program, as well as a "Platinum Securities" program.[6] In both cases, the securities are still based on the Ginnie Mae I and II MBS pools. In other words, GNMA offers four types of mortgage-related securities, all of which either are, or are derived from, the well-defined and federally insured, in whole or in part, Ginnie Mae I and II MBS pools.

Ginnie Mae's relatively simple securitization program contrasts markedly with analogous programs of Fannie Mae and Freddie Mac. Fannie Mae, for example, offers at least four types of MBS, two types of REMIC, Stripped Mortgage-Backed Securities (SMBS), and Multifamily Mortgage-Backed Securities. The pools of mortgages that form the basis for these securities are substantially more heterogeneous than those comprising the GNMA I and II pools. For example, Fannie Mae fixed-rate MBS are based on pools of mortgages with fixed interest rates; however, these fixed rate pools may include four different types of fixed rate mortgages ("normal" 30-year fixed mortgages, partial interest-only mortgages, "balloon" mortgages, and biweekly payment mortgages).[7] Freddie Mac also nominally offers eight different types of mortgage securities, including several based on ARMs or interest-only mortgages.[8] Of course, what is of particular note in these cases is the breadth and complexity of the Fannie and Freddie securitization programs with respect to that of GNMA. While it is possible to retrieve specific security information via the Fannie and Freddie websites, just as it is via the Ginnie Mae site, it would be painstaking, if at all possible, to evaluate the quality of the entire loan portfolios of Fannie and Freddie due to their heterogeneity, complexity, and significant use of ARMs and other "variable" (my term) mortgage instruments (the fixed-rate MBS of Fannie Mae are just one example of this). As I will discuss below, this apparent, if not real, opacity of the Fannie and Freddie loan portfolios, tied to the general knowledge that said portfolios were heavily intertwined with lower-credit borrowers, ARMs, and interest-only and balloon payment mortgages, undermined confidence in the stability of Fannie Mae and Freddie Mac.

The relative simplicity of Ginnie Mae's business model also served it well during the recent credit crisis. Ginnie Mae sustains itself through the fees it charges for MBS insurance; it does not play directly in the mortgage market. Ginnie Mae also does not utilize derivatives "to hedge or carry long term debt," allowing investors to ascertain the health of its balance sheet more easily. Such a situation contrasts sharply with Fannie and Freddie, where debt issuance was used regularly to fund operations. This reliance on debt issuance played a key part in the bailout of Fannie and Freddie, as I will discuss shortly. Fannie Mae and Freddie Mac obligations also differ from those of Ginnie Mae in other important aspects. To begin, while Fannie and Freddie do insure certain MBS issued by third-parties, they are also active issuers of their own MBS, and also purchase and keep some mortgages on their own balance sheets, financing such purchases with "short-, medium-, and long-term debt and subordinated debt and equity securities."[9] Importantly, Fannie and Freddie generally work with loans tied to parties with lower credit scores (part of their mission to make mortgages more affordable in the U.S.), but these parties do not enjoy the government guarantees attached to the loans that comprise the GNMA loan pools. Of course, before recently, Fannie and Freddie also did not enjoy the explicit-backing of the U.S. government, as they were owned mostly by private shareholders (as such, their debt securities were "unsecured obligations.")[10]. This private ownership structure created a conflict within these GSEs, as they were simultaneously charged with making mortgages more affordable in the U.S. and generating returns for shareholders. While these two goals are not necessarily mutually exclusive, it is certainly plausible, if not probable, that the impetus to be competitively profitable may have undermined general underwriting standards at the GSEs (which were already working with loans and MBS created around relatively riskier borrowers), initially furthering the aim of more affordable mortgages (as standards were relaxed and initial, adjustable, interest rates lowered), but ultimately undermining the financial health of the agencies themselves and possibly the wider real estate market (at this time, I do not have

specific data on the past and projected future performance of both Fannie and Freddie loan portfolios, though evidence cited below does suggest that at least Fannie was experiencing "payment stability" (my term) from its loans as of summer of 2008).

Why has there been no need to bail out GNMA?

The information presented thus far clearly hints at why there has been no need to bail out Ginnie Mae in the current mortgage-fueled financial crisis. GNMA itself insures MBS that are based on loans guaranteed by the full faith and credit of the United States government. Also, it remains possible to completely track the value of a GNMA security back to the underlying mortgages. And those mortgages were less likely to default or be re-negotiated under duress. As such, GNMA has been more protected from the sub-prime fallout than other players in the mortgage business. GNMA has also itself been protected from investor fear and anxiety by its government ownership and hence explicit backing by the U.S., and perhaps by the relatively simple and transparent nature of its operations as well. In essence, Ginnie Mae MBS are comparable to U.S. Treasury bonds—safe and simple investments backed by the full faith and credit of the U.S. government in a time of extreme uncertainty.

Fannie Mae and Freddie Mac, on the other hand, did not enjoy the explicit backing of the U.S. government and were seen as risks by investors because of their very significant exposure to diverse aspects of the mortgage markets, the opacity of their loan portfolios, and because of their highly leveraged positions—one estimate put their total assets to capital, or leverage ratio, at 20:1 (Fannie Mae) and 70:1 (Freddie Mac, with these ratios increasing significantly if the calculation includes the mortgage-backed assets they guaranteed.[11] While the large majority of at least Fannie Mae's loans were paying on time through the summer of 2008, investors feared that future delinquencies would increase and prevent the GSEs from honoring their financial commitments. The complexity of the two GSEs loan portfolios made the quieting of such fears difficult, and this belief in the future failure of the GSEs in turn prevented them from issuing new debt, thus hampering their ability to maintain liquidity and capital ratios, and hence remain a viable business.[12] As a result, the U.S. government decided to "bailout" Fannie and Freddie in September 2008 by injecting capital into the enterprises, taking senior equity positions in the process.

3b. Closing-Statement Reform

Ownership of a single-family home is often considered to be an integral part of the proverbial "American dream". But the paperwork associated with the purchase or sale of that home probably more closely resembles a nightmare. At the time the deal is scheduled to be finalized, the would-be purchaser is confronted with a pile of documents several inches thick, told to sign multiple copies, and he or she walks away thoroughly confused about all the terms of the purchase, its financing, and the other aspects of the deal. Although disclosure and closing-statement reform continue to be debated, this debate most often occurs in the context of a consumer-protection issue. But two aspects of the home-buying process have failings that are at the heart of the housing-market part of the financial crisis--disclosure of finance terms and property appraisals. The remainder of this section will give a brief history of the efforts at reforming the closing process and then turn to the loan-disclosure and appraisal issues.

Ten years ago Fed Governor Edward Gramlich introduced his testimony to the House Committee on Banking and Financial Services with this statement:

> "Despite a number of Congressional actions designed to give mortgage borrowers greater information and protection, today's mortgage lending process can still be characterized as confusing, costly, and far less than optimal. Hence the Federal Reserve Board and the Department of Housing and Urban Development (HUD) were eager to respond to Congress' request to make recommendations for improvement. At the outset, I should say we have enjoyed our cooperative working relationship with HUD.
>
> "We have spent two years considering possible reforms in the Truth in Lending Act (TILA) and the Real Estate Settlement Procedures Act (RESPA), two related but distinct statutes. We have concluded that meaningful TILA-RESPA reform can only be achieved through new legislation. Recommendations for such legislation are contained in the joint report we are delivering to the Congress."[13]

Legislation was introduced that would have required lenders to offer a single price for the various costs of processing a mortgage, including the expenses of appraisals and title insurance, or to stay much more closely to initial estimates of those costs.[14] The Department of Housing and Urban Development (HUD) issued regulations covering the RESPA aspects of closing in November 2008. These reforms included the following:

- Added a new page on the federal settlement statement allowing consumers to easily compare final loan terms and costs to those on the good faith estimate.
- Each line on the settlement statement will include a reference to the relevant line on the good faith estimate.
- Shortened the new good faith estimate from four pages to three, including an instruction page.[15]

While these changes are expected to save borrowers approximately $700 on each home purchase and financing transaction,[16] they do not address the fundamental issues of whether borrows can afford their loans or understand their terms. This view is nicely captured by a column in *Kiplinger's*:

> Hordes of homeowners are walking away from mortgages they can no longer afford, making it clear that plenty of people closed on loans they didn't understand. It's bad enough that lenders' laundry lists of fees make comparison-shopping a challenge. Insult is added to injury amid the blizzard of paperwork at settlement, when borrowers often find that they must fork over hundreds or even thousands of dollars more than originally estimated. And they may wake up later to an adjusting rate they didn't expect or to a prepayment penalty that limits their ability to refinance or even sell the home.[17]

This is not the place for a debate on whether the fault for entering into a complex and confusing loan agreement that is intrinsically unsuitable for a given financing deal lies with the borrower, the lender, or both. Instead our focus is on why regulators allowed complex instruments such as "payment-option adjustable-rate mortgages (ARMs)" to exist at all. Mortgages such as these have, by definition, uncertain payments. As a result, it becomes easier for the less-credit-worthy borrower to qualify for and obtain these more complex mortgages than it would be to obtain a fixed-rate, or even a traditional variable-rate mortgage. The originator of the mortgage loan is not affected by the increased risk for several reasons:

- It does not plan to hold the mortgage, just to possibly service it after collecting origination fees.
- The origination fees are typically higher for these complex mortgages.
- The risk can be pooled, and even shed to a degree, in the secondary market. (See the next section for a description of this process.)
- The process of validating the borrower's credit may be less, especially if the complex mortgage is also a "low-doc" or "no-doc" loan.[18]

So long as the potential buyer could be convinced that the value of the house would continue to rise, the details became less important. This was true not only for the financing but also for the price to be paid for the property. It was only as recently as January 2009 that federal guidelines were released to reduce the pressure for inflated appraisals.[19] Consider the result of a complex, no-doc mortgage on a home with an inflated appraisal. The outcome is that the underlying value of the property is unknown, the credit-worthiness of the borrower is unknown, and the precise terms of the loan and the stream of payments are also unknown. This is the exact opposite of how a reasonable credit market should operate.

3c. What are CMOs?

Collateralized mortgage obligations (CMOs) are bonds based on home mortgages with a twist that the bonds are categorized into different tranches to redistribute the risk of mortgage prepayment and mortgage default.[20, 21] ("Tranche" is French for "slice", and is used in finance to refer to one portion of a group of related securities.) CMOs are a subset of collateralized debt obligations (CDOs) with the difference that CMOs are based on mortgages instead of other forms of credit. Used properly, CMOs can redistribute risk, allowing investors with different attitudes towards risk to invest together in the same pool. How the risk can be redistributed and how this affects the respective investors will be discussed later in this section. As we will see later, these bonds played a huge role in causing the current financial crisis. This section focuses on the main ideas rather than the complicated mathematical details.

Before diving into the details of CMOs and understanding the severity of their impact in the financial crisis, it is necessary to first have a clear understanding of the basics. Let us first begin with explaining what a mortgage-backed security (MBS) is. A MBS is called security because it is backed by the principal and interest payments of a set of mortgage loans.[22] Should a loan default, its house would be auctioned off and the investor would be able to recover, at least partially, the money invested in the security, hence the name security.

To make the definition more concrete, let's examine a hypothetical market example borrowed from Khan Academy[23], defining MBS and CMO along the way. Suppose there are 1000 people each wanting to buy houses worth $1 million. They each borrow $1 million from a local bank through a ten-year mortgage with an annual interest rate of 10%, totaling $1 billion. To simplify the problem, assume the loan payments are interest only; that is, each borrower would pay $100,000 each year, and at the end of the 10^{th} year he would pay the $1 million principal back. Therefore, at the end of 10^{th} year, the local bank would have collected a total of $1.1 billion. Instead of keeping the mortgages, the local banks now sell the right to the principal and interest payments to an investment bank. The investment bank then sets up a special entity with these funds and equally divides it into 1 million equal parts. They then sell these parts to the public investors. Each part is called a share and entitles its owner to 1 millionth of the $1 billion fund and its associated 10% interest. These shares are precisely what we defined as MBS. (You may wonder why anyone would want to do this, but the reason is simple. Each share is going to priced higher than 1 millionth of 1 billion dollars because they essentially are worth 1 millionth of 1.1 billion dollars, but that's just minor details we need not concern ourselves with.)

Now we are positioned to return to CMOs. The aforementioned system works perfectly in an ideal market. However, in real life, nothing is perfect. Some of the loans would be paid off early, reducing interest payments, and a home owner might lose his job and be forced to default on a loan, causing the property to be auctioned off and receiving less than expected return. One inherent property of MBS is that these risks of prepayment and loan default are shared equally among the shareholders. If a loan defaults, all shareholders will take a dip in the value of their securities. Not every investor is willing to take such risk. In fact, there are investors who are willing to take even more risks (for higher return, of course), and there are investors who like to play it safe and are only willing to accept a lower return. This is where the CMO comes in. Instead of splitting the entire set of

loans into equal value MBS, CMO splits it into categories called tranches. Morningstar Investment Classroom states that "bonds are then issued on each of the tranches, each with a differing maturity date and interest rate. CMO bonds are issued with maturities of 2, 5, 10, and 20 years. Coupon payments from the mortgage pool are paid to the bondholders for each tranche while principal payments are applied first to the bonds with the shortest maturity (the first tranche)."[24] In another words, they are going to pay the investors willing to take more risks higher interest rates than those who are not, but should there be any loss in value (due to default or prepayment) to the bonds, this group of investors will absorb all the loss first, and if there are excessive losses that this group cannot absorb, it will pass on to the next tranche and so on. By doing this, CMOs essentially redistributed the risk in an uneven manner so that people with different attitude towards risks can all invest together, enlarging the investment pool. This also saves the investment bank the trouble of classifying each mortgage's risk in great detail and just tosses them all in one pool and let the tranche structure takes care of the rest.

Now let's turn to the role CMOs played in the financial crisis. In explaining this, I am going to borrow the analogy of champagne glasses came up by Marketplace Senior Editor Paddy Hirsch.[25] Hirsch represented the special entity mentioned above with a champagne bottle. The bottle is filled metaphorically with home mortgages. He then represented the tranche structure with a pyramid of champagne bottles like the ones you see in weddings. The glass on the top represents the group with the lowest risk (and lowest interest rate) and risk increases as you step down the pyramid with the tray representing equity holder. Each month, the foam (interest, say 10% using the same example as we did earlier) pours out from the bottle into the pyramid of glasses. The one at the top gets filled up first, then the second row, and so on. When some of the loan defaults, the top glass is still going to get filled, hence least risky; the second row may get filled, but the third row may or may not depending on how much loss there are. If the loss is large enough, even the second row may not get filled completely. The lower the row, the higher the risk, but the interest rate is going to be higher for them as compensation. Each of these rows, representing tranches, are given a rating, and these ratings are supposed to reflect their respective risks. Now imagine another investment bank manager sets up his own bottle of champagne, but instead of filling it up with mortgages, he fills it up with BBB rated glasses. It works well and everybody is happy when the loans are being paid, but what happens in our economy is that fewer and fewer of the mortgages are being paid, so the lower rows of the original pyramid don't get filled, and consequently, nothing is coming out of the second champagne bottle. Not even the top glass is going to get filled. Yet, the secondary pyramid is given the exact same rating as the original one as if they are as safe as the original ones. This is precisely what caused the problem we are facing in the financial crisis. Thousands and millions of dollars of pension funds, mutual funds, etc. over the world are invested in these highly rated secondary CMOs. As the house market problem persists, less of the primary pyramid gets filled, and more and more of these highly rated CMOs are not going to make the money they were supposed to make. To make the matter worse, there are bottles filled with glasses from the secondary markets as well, and you can imagine it goes on forever like a chain. The domino effect that takes place when the primary market takes a hit is what put us in this devastating situation we are in now.

Evident from the explanation, the main cause of all this is the poorly designed rating system that does not take into account what the CMOs are based on. The resulting financial

crisis has put the world economy in a mess, with thousands of people losing their jobs and lifetime savings. In order to prevent similar situation from happening again in the future, the rating system must be revised.

4. All about Credit Default Swaps

At the surface, a Credit Default Swap (CDS) looks a lot like insurance. It is essentially defined as a contract between two parties, in which one party makes periodic payments, while the other agrees to pay a sum of money if a certain event occurs. A CDS takes place in the world of financial markets, and the "event" that triggers the payoff is when a credit instrument, such as a bond or loan, goes into default.[26]

Investors use CDSs primarily for two reasons: as an insurance vehicle to hedge an investment in a company, or as a gambling mechanism to make a profit if the company fails. There are several technicalities that distinguish a CDS from insurance. The primary one is that the buyer of a CDS does not have to own the credit instrument (bond, loan) for which they are buying protection. Also, the market is not regulated, allowing for transactions to be made "over the counter." These reasons make it extremely easy to trade in CDSs and also provide the primary reason why the CDS market has expanded so quickly in the past decade.

Banks and other financial entities issue credit default swaps. The contract is issued between an individual entity and company with a credit instrument; the bank becomes the counter-party when it issues the CDS. Loosely speaking, the bank is much like an insurer. The large investment banks, such as Lehman Brothers, Bear Stearns, and Merrill Lynch, were heavily involved in the issuing of credit default swaps.

After the so-called credit crisis occurred, the Federal Reserve began to step in and research efforts to regulate the market for CDSs, though it plays no part in issuing the contracts. Part of the Fed's efforts includes creating a central counterparty (or Clearinghouse) in order to trade CDSs and attempting to create transparency in the market.[27] A lack of transparency is one of the criticisms of the CDS market; in that keeping track of contracts and promises became too overwhelming.

An important term in valuation is the "spread" of a CDS. The spread is an annual amount that the buyer must pay to the provider of the CDS over the length of the contract, expressed as a percentage of the notional amount.[28] This is very much like the premium paid in insurance. In general, a company with a higher CDS spread is considered more likely to default by the market, and a higher fee would be charged to protect against this happening.

Beyond this, valuation of a CDS is a very complicated matter, and generally dependent on the length of the contract, the amount of protection, and the health of the agency in question. The Wikipedia definition provides two models of valuation: the probability model and the no-arbitrage model. As the name implies, the probability model is weighted by the expected chance that the target of interest will default during the life of the contract. The no-arbitrage model makes different assumptions regarding risk and can produce a frequently used theoretical price for the CDS. Either model takes into account some form of risk analysis. Even so, the reason that CDSs are difficult to value is that they are bought and sold "over the counter." Records of transactions or promises are not required to be maintained. In most cases, a purchaser of a CDS does not even know if the provider has the capital to cover the payment in the event of a default.

The essential element that distinguishes CDSs from insurance—on one hand—and gambling—on the other—is that the latter two are tightly regulated by the government, while CDSs remain unregulated. CDSs were created in the late nineties, and the initial drafters were very careful not to use the term "insurance," or any related language, specifically to avoid regulation.[29] The lack of regulation and the ability to cover assets that you do not own has led to investors using CDSs heavily in speculation, hedging, and arbitrage. Other than the issue of regulation and the lack of the requirement for an "insurable interest", it is very hard to distinguish a CDS from insurance.

The only thing to distinguish a CDS from gambling is the knowledge that a gambler is certain that they will receive payment in the event they win. For example, people gamble at casinos because they know that the casino will be able to pay them should they win. They have knowledge that the casino has enough capital to cover the odds of a win; otherwise nobody would use casinos. This is contrasted to CDSs. A buyer of a CDS generally does not know if the seller has enough capital to cover their payments should a default occur. The seller of a CDS is not required to set aside any capital for the purpose of a payout. Again, a lack of transparency due to loose regulation is the reason often cited.

Many blame the CDS market for the creating, or at least contributing to, the credit crisis that we are currently facing. There are a number of factors that led to credit crisis, and after researching the links between each factor, it seems that the CDS market did not necessarily cause the collapse, but is responsible for exacerbating the effects. If the housing bubble burst was the force that pushed the economy over the edge, the CDS market was the enormous weight that dragged it all the way to the bottom.

Now analysts and policymakers are faced with resolving the problems of the CDS market in order to alleviate the economic downturn. So what options are available to them to solve this problem? It is important to distinguish between legitimate uses of a CDS and the more questionable uses. As stated above, a CDS allows bondholders and corporations to limit their risks by using this tool as insurance.[30] This is the pool of hedgers, the buyers who bought CDSs to protect themselves because they actually hold the underlying debt.

But recall that the key difference between insurance and a CDS is that the buyer does not have to own any stake in the company or bond. This allows gamblers to enter the market. These are speculators who bought CDSs simply to bet against a troubled company. Herein lies the problem: according to analysts: speculators who use credit protection to bet against companies add instability to the system. These groups underestimated or ignored the possibility of rising defaults.

As of January 2009, the CDS market has been estimated to be worth between $30 and $50 trillion.[31] But some analysts argue that approximately half of that amount may not be problematic because it consists of winning and losing stakes that offset each other. However, this still leaves a very sizeable amount to deal with. Given the gravity of the situation, there is no shortage of outrage or of ideas regarding the problem. One of the more radical ideas is to simply declare all CDSs null and void immediately 10.[32] This type of one-time fix does not address any of the inherent shortcomings in the CDS market, and only leaves the problem to occur again in the future.

One should note the basic complications of any problem of this magnitude: every solution has its pros and cons. There have been a wide variety of solutions and suggestions, each addressing different methods and dictating who should bear the responsibility. Sylvain R. Raynes of RR Consulting,[33] and Christopher Whalen of The Institutional Risk Analyst[34] are two of those who advocate approaches to the solution. Abroad, the EU is currently threatening to regulate CDSs in its region. It desires to use a clearing house among the 27 nations.[35] Also one of the more forward-thinking suggestions is to centralize processing in the United States, saving the cost of setting up multiple systems".[36]

However, nearly all agree that more transparency needs to be brought to the market. Whether by incorporating regulation, by creating a central exchange, or some other means, the lack of or concealment of information is what aided in the runaway rise in defaults.

5. Background on Risk and Attitudes Toward Risk

5a. Adverse Selection and Moral Hazard

Assume a situation involving two parties: one is a principal who pays salary to an agent and wants the agent do something. The other is the agent who takes an action on behalf of the principal. However, the interests of both sides sometimes conflict one another. The fundamental reasons for these conflicts can be generalized into two categories—hidden information and hidden action.

Adverse Selection – Hidden Information

Hidden information means that information about the utility or cost function of the agent is not observable[37]. That is, a principal cannot know exactly what kind of incentive system is needed in order to motivate an agent to work in a certain way. Therefore, the principal needs to just guess what the function is and figure out how to incentivize the agent.

Adverse selection occurs in this case. Adverse selection refers to a market process in which bad results occur when buyers and sellers have asymmetric information. That is, the bad products or customers are more likely to be selected[38].

To illustrate the problem vividly, let me introduce a used car market. Figure 1 shows a distribution of quality of used cars in the market.

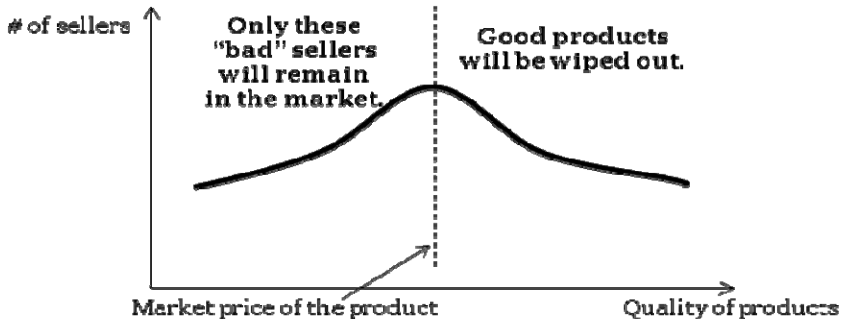

Figure 1. Quality distribution in a used car market

The values of used cars are quite different from each other and dependent on who was the previous owner. A particular car may have defects that cannot be easily recognized. Without any additional information, the market price will be determined as an average of the distribution, because buyers do not know difference between used cars. Then, sellers who have a used car of better quality than the market price will leave the market. The price will drop and a new set of sellers will leave the market. Consequently, the market will fail and cannot exist. (This example comes from the work of George Akerlof.[39])

This is the adverse selection problem. The key problem here is that sellers know the quality of their products better than buyers do. In order to prevent or reduce this problem, there are two major solutions: *signaling* and *screening*.

Signaling is a solution for sellers.[40] It means that sellers can send out signals that their products are better than usual market products in order to differentiate their products from that of other sellers. In this example a used car seller might be able to give buyers a one-year warranty if he/she is confident with one's product. Another possibility is that the seller could obtain a certain certificate issued by a reliable third party. This kind of signal makes buyers recognize and believe in different qualities of products.

Conversely, screening is a measure for buyers. Buyers can ask some proxy questions to sellers to acquire as much information as possible. Continuing with the used car example, the questions could include "How long have you driven this car?" or "How many people have driven this car?"

Moral Hazard – Hidden Action

On the other hand, hidden action means that action of an agent is not directly observable. That is, some actions that the agent takes are not seen to the principal. This leads to a new problem called moral hazard. Moral hazard, especially in an insurance market, is the prospect that a party insulated from risk may behave differently from the way it would behave if it were fully exposed to the risk[41]. In other words, insurance can change the behavior of the insured.

For example, let us suppose that you purchased insurance for your car. Before you became insured, you drove very carefully because you have to take all risks if your car was damaged. The insurance company might have considered your past good driving habits and offered a discount. However, once you bought the insurance plan, you might think that you need not worry about car accidents any more. You would drive more recklessly. Sadly, the insurance company has no way to detect your everyday driving life. It is the hidden action that you become inclined to be more reckless, and the problem here is called moral hazard. In this case, the fundamental reason for the problem is that the party insulated from risk generally has more information about its actions and intentions.

To prevent or reduce moral hazard, insurers usually try to investigate the behavior of the insured carefully when the insured claims its indemnity. The also design policies to have some or all of deductibles, limits, and co-insurance—thereby forcing the driver to share in the risk

Implication for the Financial Crisis

Financial markets, especially mortgage markets, have collapsed since September 2008. To rescue the troubled financial companies, the government has provided bailout money to the companies and also sought to encourage the renegotiation of some mortgages. In this situation, the government can be thought of as a principal who pays money and the companies such as Bank of America and Citigroup are agents. That is, the principal will pay the agents, and the agents will decide what they will do with the bailout money.

Then, there are two questions that arise. Is there a hidden information problem and is there a hidden action problem? I would answer yes to both questions. Financial companies usually know their financial status better than the government. They might have invested their money into very risky assets. They might not be disclosing some internal

troubles. Therefore, this sort of hidden information can cause adverse selection problem in the financial market.

Furthermore, once money is given to financial companies, they are free to use the money in whatever manner they desire. Therefore, moral hazard problems will be inevitably induced by hidden actions. Even in this bad economy, Bank of America reportedly sponsored the Super Bowl Fun Festival and Morgan Stanley hosted a conference at 5-star resort in Palm Beach[42]. News stories of this sort strongly support worries about moral hazard problems.

In the real financial world, FDIC insures retail banks. Risk of bank failures varies. Therefore, well-managed banks have no incentive to join the program, while risky banks welcome the plan. This is a classic adverse selection problem. The standard solution had been to make membership in FDIC required for all national banks. But as additional insurance was made available at a cost, some banks have sought to drop out.[43] Regulators have traditionally relied on an examiner determine how risky a bank is. The examiner goes to the bank and tries to receive signals such as an interview with management team. This is a screening process to mitigate adverse selection problem. But once a bank obtains insurance from FDIC, it will have an incentive to invest in more risky assets because it will be covered by the insurance anyway. This is a moral hazard problem. Healthy banks complain about the increasing cost of the insurance, and the system becomes unstable—similar to the used car market example. (For one regional banker's view see: "A Banker Who Stayed Out of Problem Loans Fumes at a Bailout for Those Who Didn't."[44]

Criticism of the Current Bailout Plan

The current bailout plan will enable Secretary of the Treasury to spend money on financially struggling companies[45]. This actually creates additional layer of principal-agent relationship. Then, there will be three layers of this relationship among taxpayers, the Congress, Treasury Secretary and financial institutions. Having additional layers will decrease end-to-end transparency and hinder taxpayer efforts to obtain information about the financial institution's action. It will eventually aggravate adverse selection and moral hazard problems.

Selecting an institution to be rescued also seems arbitrary. Without any entry barrier for application to the money, every company will apply to the program. The bill also leads to worries about moral hazard problem[46]. However, there is no punishment on failed use of money. No responsibility on exercising the plan exists. Who will use bailout money carefully if one will be never punished by one's action?

Advice on the Current Bailout Plan

To reduce information asymmetry problems in general, the number of layers between taxpayers and financial institutions should be reduced. A special committee in the Congress can be an alternative. This might be controversial because it will slow down the process of giving out the bailout money. However, this should at least be considered.

In regard to adverse selection problem, we need a screening system that can measure how much a company wants the money and how well the company has been managed. To

weed out ill-managed companies from the rescue plan, we need to set up some appropriate index to determine a company has been managed carefully.

Regarding moral hazard, the plan has to enforce some penalties to management teams so that the team has an incentive to overcome the current crisis. If we just pay all loses without any charge, no one is willing to fix the problem. The penalties could be jailing or partial confiscation of management member's personal assets. In other words, if we provide rescue money proportional to the amount of money that management team members give up, the member will not spend the money on buying unnecessary items such as luxurious carpet.

The bailout plan at this time is very important from a historical perspective. If we fail to prevent the moral hazard problem at this time, we might send signals to future bankers to be more reckless and riskier in the future.

5b. Systemic Risk

Systemic risk is the risk of collapse of an entire system or entire market. An event or set of events, such as an economic shock or institutional failure, triggers a chain of negative economic consequences, creating a domino effect. The collapse could be the failure of a chain of markets or institutions or a chain of significant losses to financial institutions, which results in increases in the cost of capital or decreases in its availability, and price volatility in financial markets.

For an individual, a portfolio of perfectly hedged investments nullifies most risk. However the systemic risk to the portfolio exists if there is a downturn in the economy and the entire market sinks, thus rendering the hedges useless. The classic example of a collapse is a "bank run". This occurs when large groups of individuals seek to withdraw their funds simultaneously, creating a run on bank assets that can lead to multiple bank failures.

The start of the current financial crisis is can be blamed on the subprime mortgage crisis, created by the dramatic rise in mortgage delinquencies and foreclosures in the United States. This crisis spread and created major negative consequences for banks and financial markets worldwide. Many recent mortgages were made to subprime borrowers, who were less likely to repay the loan than other more qualified borrowers. As house prices began to decline, mortgage delinquencies spiked, and securities backed with subprime mortgages lost most of their value. These securities were widely held by financial firms, resulting in a large decline in the capital of banks and tightening credit around the world. The effects of the foreclosures spread through groups such as homeowners, commercial banks and savings and loan associations, investment banks and other issuers of MBSs, CDOs, and CDSs, mortgage lenders, brokers, servicers, trustees, insurance companies, investors (hedge funds, pension funds, sovereign wealth funds, mutual funds, endowments, and other investment institutions), government sponsored enterprises, and many more groups.

In the collapse, investors made use of leverage—the aggregate amount of credit extended in the financial system to them, and thus expanded the amount money with which they were dealing. This potentially expanded small profit opportunities into larger ones, and at the same time expanded small losses into larger losses. When the subprime mortgage crisis hit, the market value of homes, MBSs, and other securities sank and credit was withdrawn quickly, forcing liquidation of large positions through the financial markets. The effect spread due to illiquid portfolios: investors had to sell to recover capital. As many investors faced the same situation at the same time, their actions were highly correlated and their small market movements cascaded quickly into a global financial crisis. Before the crisis, the financial system was crowded with amounts of capital deployed into a plethora of investable markets, and thus the liquidity of those markets had declined significantly. Due to the interconnectedness of these financial markets, the systemic risk was held by a variety of sect

Preventing Risk

The role of the government in preventing systemic risk has been through regulation. An example of this is the federal insurance of bank deposits through the Federal Deposit Insurance Corporation ("FDIC"), which is intended to prevent bank runs by alleviating fear that banks will default on depositor accounts. This regulation is specific for the bank run

panic, but does not reduce systemic risk for other possible crises. Any regulation aimed at preventing panics that trigger systemic risk needs to be able to anticipate the causes of the panic to put the correct regulation into place.

Banks are also limited in different ways. One way is the amount they are able to lend to customers, which diminishes the amount of bank exposure to a particular customer's risk. On the other hand, government regulations do not require investors such as hedge funds to reduce leverage or ensure a certain level of liquidity; thus it is up to the individuals themselves to diversify their risks. One method is using credit derivatives to diversify risk. A widely used derivative instrument for this purpose was the credit-default swap in which a party receives payment to assume the credit risk of certain debt obligations of a specified borrower. Theoretically, this facilitates risk-spreading to parties better able to bear the risks, but at the same time, by diversifying the risk through hedging, this increases linkages among multiple parties which may foster systemic risk.

In addition to regulation by the government, disclosing risks has traditionally been viewed as a primary mechanism to regulate the market. This puts a great amount of trust in those performing risk-assessment to correctly rate securities–companies such as Moody's and Standard & Poors. Some allege that a contributing factor to the recent subprime crisis is that a large number of institutional investors bought Mortgage Backed Securities based on ratings without fully understanding what they bought, due to the complexity of these financial instruments.

Shadow banking system's role

It is not well known how to measure systemic risk; there is no single metric or indicator. One major problem is the lack of information about parties in the so-called "shadow banking system".[47] While banks and other regulated financial institutions readily provide financial and investment data, the government does not require the shadow banking system to do so. Thus, a lack of regulation (or inability to regulate) failed to reduce systemic risk, as did the mispricing of assets and the inaccuracy of asset return models.

Securitization opened up new sources of capital to finance various types of borrowing that used to be the job of banks: credit-card debt, auto and student loans, mortgages, small-business loans, and more. This lead to the growth of the shadow banking system, which consists of investment banks, hedge funds, mutual funds, insurance companies, pension funds, and other groups not as tightly regulated as banks, and lacking transparency of their inter-dealings. Leading up to the current crisis, the shadow banking system had a major role in growth and prosperity of the world. These investors and funds in the shadow banking system have become central to the global financial system by providing loans, liquidity, insurance, risk-sharing, and other importance services that used to be the role of banks. Unlike banks, which are highly regulated with requirements such as amount of capital and leverage and risk constraints, hedge funds and other investors are relatively unconstrained. As a result, in the years leading up to the current crisis, hedge-fund investors were able to garner higher returns on their investments in various economic environments, including market downturns and recessions. Because of the dynamic nature of hedge funds, investments in assets shift tactically and quickly, moving into markets when profit opportunities arise, and moving out when those opportunities have been depleted.

Unfortunately because of the lack of transparency of these investments and moves, proper regulations could not be put in place to mitigate systemic risk.

Without a large amount of outside regulation, elements of the shadow banking system hedged risk themselves, based on their own mathematical models of the pricing of assets. Many of these assets such as CDOs were highly complex bundled instruments that needed patterns of payments to be figure out by models run with assumptions from historical data. During the crisis, many of these payout models did not match reality, due to the extreme events occurring around the financial markets.

Proposals for the Future

Recently, the idea of a systemic-risk regulator, has been gaining traction in Congress. In order to do this, Congressman Barney Frank has proposed regulating hedge funds, credit-rating firms and executive compensation as well as merging or strengthening existing regulators, such as the Securities and Exchange Commission, the Commodity Futures Trading Commission and banking regulators.[48]

In order for this reform to work, a formal definition of systemic risk has to be developed, one that captures the linkages and vulnerabilities of the entire financial system, not just those of the banking system. Then, quantitative measures of systemic risk can be developed and monitored to manage the overall level of risk to the financial system. Greater transparency, particularly in the shadow banking system can provide better data to regulators to achieve these metrics. Due to advances in financial innovation and creativity, attempting to eliminate all systemic risk is not feasible, but being able to measure and determine tradeoffs between such risk and rewards is essential.

6. Who Predicted the Financial Crisis?

On October 9, 2007 the Dow Jones Industrial Average closed at an all time high of 14,164.13. In the year-and-a-half since then the Dow has shed 40%, retreating approximately 6,000 points amidst one of the worst economic crises in recent history. At the core of disaster, the collapse of a massive credit bubble.

Although most people were blindsided, a handful were able to foresee the carnage. This section examines the predictions of two of those individuals–Nouriel Roubini and Peter Schiff. It is the reader's job to decide whether each individual was "prescient" or "lucky" and whether they should make financial decisions based on each individual's recommendations. It is worthwhile to mention that forecasting is more of an art than an exact science. As such, all suggestions should be taken with a grain of salt; only hindsight is 20-20.

Nouriel Roubini

Nouriel Roubini, a Harvard University graduate, is a professor of economics at New York University's Stern School of Business. He is also the founder and chairman of Roubini Global Economics (RGE) Monitor, an economics consulting firm. His experience includes service to the White House Council of Economic Advisors and the U.S. Treasury Department during the Clinton administration. Roubini analyzed the basis behind the collapse of emerging economies (such as Mexico, Thailand, and Argentina) in the 1990s. He recognized that most of the doomed countries had significant current account deficits; they imported more than they exported and often financed these debts by borrowing from abroad. Using his analysis to determine the next susceptible candidate, Roubini discovered that the United States, with a $600 billion current account deficit, was in a risky position even though it was the world's largest economy.[49,50] Further examination of the United States' credit bubble led Roubini to the following conclusions, which were presented as early as 2006:[51]

- United States to experience once in a lifetime housing bust.
- Home prices to fall at least 20% in the next few years.
- Housing troubles to start in subprime mortgage market and spill over to other parts of economy resulting in broad credit crunch.
- United States will experience deep recession. Rest of world will not decouple.

Critics questioned the soundness of Roubini's conclusions (since they were heavily rooted in historical precedence rather than mathematical models), but Roubini's 2006 calls have turned out to be highly accurate.[52] July 2008 year-to-date home prices have "dropped in 24 of 25 U.S. metropolitan areas" and the "S&P/Case-Schiller home-price index… has fallen every month since January 2007." [53] The collapse of the housing bubble has wreaked havoc on U.S. financial institutions (especially those with substantial exposure to mortgage backed securities due to the subprime fiasco). To date, the turmoil has contributed to the failures of Bear Stearns, IndyMac, and Lehman Brothers among other institutions. Although the economy has been retreating since December 2007, the extent of the recession is yet to

be determined.[54] In terms of international markets, they have declined about as much as the U.S. market.

Roubini has offered the following forecast for 2009: [55]

- Recession to continue through 2009; worst recession in 50 years. It will be 'U' shaped (instead of 'V' or 'L' shaped).
- Housing prices to drop until mid-2010; cumulative peak-to-trough loss of 30-40%.
- Unemployment peaking at around 9% by 2010.
- He has also offered some advice for investors:
- Stay away from risky assets, stocks, commodities.
- Stay in cash or cash-like investments such as government bonds in order to preserve capital.

Peter Schiff

Peter Schiff, a UC Berkeley graduate, is the founder and president of Euro Pacific Capital. His experience includes financial consulting with Lehman Brothers and service as an economic advisor to Ron Paul's 2008 presidential campaign. Schiff is an adherent of the Austrian School of economics – believing that production is the true driver of the economy.[56]

Schiff's views have been voiced on several CNBC and Fox News segments as well as in his book *Crash Proof: How to Profit from the Coming Economic Collapse*. Specifically, Schiff believes that too much consumption and borrowing coupled with not enough saving and domestic manufacturing has put the U.S. into a tailspin. He reasons that the consumer shift into rebuilding savings forced the economy into a recession because of a consumption imbalance – "our economy is 70% consumption".[57] As early as 2006, Schiff warned of the following:[58]

- Unsustainable asset prices, real estate prices, stock prices. A bubble exists and it will burst.
- Multiyear recession to affect the United States as consumption bubble bursts.
- Phony wealth (i.e. that only on paper) will evaporate and leave the U.S. with only a huge debt.

Schiff's ideas are very similar to Roubini's. Both are founded on the basis that the United States has been gorging itself on goods financed via borrowing/debt. When the appropriate market corrections occur, the consumption party will end and the U.S. economy will find itself retreating. Schiff sees this process as necessary and unavoidable. In fact, he supports the absence of government intervention so that market forces can fully work their magic. Schiff has employed the following long-term investing strategy:

- Get out of the U.S. dollar and into foreign currencies. Hyperinflation due to Fed policy will heavily reduce the value of the U.S. dollar.
- Buy foreign stocks with an emphasis on natural resources companies. After initial downturn, international markets will decouple from the United States thereby allowing them to recover much earlier.

This strategy has not profited investors as of 2009 – a fact that some Schiff critics have pointed out.[59] In fact, several Schiff's investors have underperformed the S&P 500 due to the recent strength of the dollar exacerbating the decline of foreign equities. Schiff has replied that is too early to reach any conclusions. With the country's present course, hyperinflation and decoupling will occur in the future. However, policy shifts will allow the U.S. to avoid hyperinflation (i.e. when they stop printing money to finance bailouts and other spending). The decoupling process is not supposed to happen overnight. In reference to the United States, Schiff has said it will "take time for the world to realize that what… decoupled from the economic train was not the engine but the caboose." [60]

Concluding comments

It is worthwhile to note that Nouriel Roubini's solution to the crisis involves radical government intervention. In particular, it involves massive stimulus packages and interest rate cuts among other things.[61] This solution is at odds with Peter Schiff's hands-off approach. The difference affirms the idea that neither Roubini's nor Schiff's recommendations should be blindly accepted. Due diligence should always be performed before making any investments.

There are others who predicted at least aspects of the current financial crisis. This list includes:

- Christopher Wood, CLSA
- Dean Baker, Center for Economic and Policy Research
- James Hamilton, UC San Diego
- Raghuram Rajan, University of Chicago Booth School of Business
- Robert Schiller, Yale University
- Stephen Roach, Morgan Stanley

7. Proposals for solving the troubled assets problem

The U.S. is currently facing a financial crisis and economic recession precipitated in part by the housing downturn. In this section we review some of the approaches that have been proposed to resolve the financial crisis. For the most part these proposals are aimed at undoing the credit crunch by improving balance sheets and restoring confidence in the solvency of banks. In particular, we focus on proposed solutions that directly target troubled assets. We review the use of reverse auctions for such a purpose and find that while they seem attractive and have undergone some experimental validation, there remain concerns about how well reverse auctions would work in practice.

The burst of the housing bubble around the middle of 2007 has resulted in a near-collapse of the financial industry, bringing down the economy along with it.[62, 63] Property values decreased to a point where in many cases, asset value became lower than outstanding mortgage[64], resulting in an incentive for owners to simply walk away from those mortgages, causing an increase in defaults and foreclosures. This in turn released more properties on the market, causing a further decrease in property prices and feeding a vicious cycle.

The rise in defaults on home mortgages also caused a decrease in the values of mortgage backed securities (MBS) whose owners depend on home mortgages for their revenue stream. In addition, MBS were further securitized into multiple levels of collateralized debt obligations (CDO) which were in turn "insured" by the use of credit default swaps (CDS)[65]. Banks and other financial institutions[66] trade and hold many of these as assets on their balance sheets. Due to the inter-connected nature of mortgages, MBS and CDO, the decrease in value of mortgages and MBS meant a corresponding decrease in value of the related CDOs. Unfortunately, because of the multiple levels of securitization of CDOs and the lack of transparency on their structure, it is not clear which are the "related" CDOs. Furthermore, CDS suddenly became potential huge liabilities for their sellers due to the unclear market value of CDOs.

Thus banks are left holding on to assets, such as CDOs, of questionable value.[67] If the market value of a bank's asset is less than that of its liabilities, it becomes technically insolvent. Again, because nobody is sure of the market values of these assets, it is also not clear which banks, if any, could be technically insolvent. This creates a climate of fear where banks are unwilling to lend due to a perceived need to maintain working capital and to protect their already precarious balance sheets, and a lack of confidence in the ability of borrowers to repay.[68] Investors are also unwilling to deposit or invest in banks due to concern about their solvency. This in turn has created a credit crunch that has slowed down the economy causing a global economic downturn (Uchitelle 2008).[69]

One of the ways proposed to resolve the credit crisis is to restore confidence in the solvency of banks by somehow strengthening their balance sheets.[70] This would hopefully lead banks and investors to be more willing to lend and provide credit for businesses and to one another, hence getting the economy back on track.

Of course, improving the balance sheet of banks can be accomplished by recapitalizing banks and increasing their amount of liquid assets. Since troubled assets such as CDOs are the cause of much of the current uncertainty over the bank's balance sheets,

one popular solution is to remove that uncertainty by either shifting ownership of the troubled assets or insuring them against some pre-determined loss. We will examine this class of approaches in greater detail later in this section.

Another class of approaches side-steps the troubled assets, keeping them on the bank's balance sheet, and has the government provide capital directly in return for debt, equity, warrants or a combination. This turned out to be the approach taken by the U.S. Bush administration and British Brown administration.[71] This assumes that the troubled assets will eventually find stabilized and sustainable prices in the future, and avoids valuing them now–a huge problem as we shall see later. Another proposed approach is to do a debt-for-equity swap overseen by the government where debt holders will be converted into equity holders in the bank, and original equity holders will be wiped out. However, the original equity holder will be given options to repurchase equity from the debt holders.[72] This will remove liabilities from the balance sheet, require no governmental capital infusion and avoid pricing troubled assets. Since these approaches do not address troubled assets, we will not consider them in the remainder of this essay.

The case for removing troubled assets

As mentioned above, the hope in removing troubled assets from banks is that doing so would both directly improve their balance sheet and restore confidence in their solvency. Under the original Troubled Assets Relief Program (TARP), the U.S. government would have either purchased or insured troubled assets from banks. Another closely related approach that has gained traction of late is the creation of so-called "bad banks" –cleaving off the troubled assets along with a proportional amount of liabilities and putting those into a new bank.[73, 74, 75] This approach can be further sub-divided into two possibilities. In the first, each bank with troubled assets will split into a "good bank" and "bad bank". In the second, the U.S. government would form an "aggregator" bank[76], possibly with private investment, which would collect troubled assets along with some liabilities from all banks. In either case, it is hoped that the remaining "good banks" would have a robust balance sheets and would start lending again. Also, at some point in the future when troubled assets have regained value, the government can also stand to gain from liquidation of these assets.

Unfortunately, both solutions suffer from a key problem – that of pricing the troubled assets[77]. This has been a major source of headache in many solutions, both in terms of determining the market value of troubled assets[78] and for public policy.[79] Estimating the market value of troubled assets is difficult because of the complex nature of many of these CDOs, the uncertainty of future mortgage default rates, the lack of information from banks on the composition of these assets, and the collapse of the market for such instruments. Even if this is done somewhat well, due to public policy implications, the U.S. government[80] also has to decide how much to pay to take on such assets, since ultimately, taxpayers' money will be a large part, if not all, of the funding used in such programs. An overly high price would reek of bailing out bank shareholders at significant risk to taxpayers and exact a high political cost on the administration, while an overly low price would either see no uptake or lead to damaging write-downs for both participating and non-participating banks holding troubled assets. Furthermore and depending on execution, there is a danger of adverse selection as banks seek to dump their worst-performing assets.[81] There are also concerns about moral hazard, since it seems that banks can rely on the U.S. government to

bail them out when they are in trouble, but these might be addressed by having punitive measures on assisted banks such as compensation caps (Comlay 2009).[82]

Reverse auctions as a solution for pricing troubled assets

Reverse auctions have been brought up as a possible mechanism to price troubled assets in the absence of a functioning market and lack of information. In a reverse auction, banks compete to sell their troubled assets to the buyer, for example the U.S. government, by bidding on selling price.[83] The key advantages are that this process directly removes illiquid troubled assets from banks in return for capital, finds a price commensurate with the value of the troubled assets, and introduces transparency into the bailout process. On the down side, it takes a longer time to recapitalize banks than a direct capital injection, the actual auction mechanism needs to be well-designed to avoid adverse selection and collusion, and the price discovery may lead to a massive write-down for other banks[84] thereby triggering another round of confidence crisis.[85]

To avoid adverse selection, where overpaying occurs on the worst assets, bidding in reverse auctions can be done on a mark-up or discount basis with respect to a reference price for each asset. Of course, knowing the reference price would nullify part of the need to carry out reverse auctions in the first place. An alternative approach would be to conduct separate auctions for each security[86] (based on its CUSIP[87] number), where the demand is set at a fraction[88] of the total amount of that particular security for competitive bidding. Auctions for different securities would be held simultaneously so that banks can best manage their liquidity needs by choosing the mixture of securities to sell.

Another important auction design choice is between sealed-bid auctions and clock auctions. In a sealed-bid auction, banks essentially provide an entire supply curve for each offered security; the buyer then constructs an aggregate supply curve and matches it with its demand to determine the clearing price.[89] On the other hand, clock auctions consist of dynamic bids, where at each tick of the "clock", the buyer specify the range of prices it is willing to purchase a security at, and banks specify the quantities of each security that they would be willing to supply at each price point in that range. The clock keeps ticking until the supply matches the demand. In addition, at each clock tick, the aggregate supply of securities offered at previous price points is provided to banks, thus offering more information for bidding in future rounds which in turn mitigates the winner's curse[90]. It has been shown that clock auctions do result in better price discovery.

Ausubel and colleagues conducted an experimental study to investigate the use of reverse auctions in the pricing of troubled assets at the University of Maryland.[91] In this study, participants compete to sell their holdings of security by bidding on mark-ups/discounts of a reference price and are incentivized by cash rewards based on both profits and meeting a liquidity target. The study assumes that each security has a common value[92] and is sufficiently dispersed. Furthermore, the buyer knows and distributes an accurate but imprecise reference price while each bank has an independent, accurate but more imprecise valuation of the security. The main relevant findings of the experimental study are that:

- participants, driven by liquidity concerns, sell securities below the common value–this implies that the buyer stands to make a profit when it is able to sell them at the common value, presumably at some time in the future; and
- participants are able to more precisely reach their liquidity target under the clock auction compared to the sealed-bid auction.

Thus, the authors suggest that this shows the feasibility of a well-designed reverse auction in pricing troubled assets.

While interesting, there are three main weaknesses in the study. First, it assumes that both the reference price and the bank's valuation of the asset are accurate albeit imprecise. In reality, due to the lack of transparency on the composition of the securities and possible conflict of interest in pricing these products, there could be a significant bias in the estimated prices. On the other hand, an initial phase of security-by-security reverse auctions may establish a reference price (Ausubel and Cramton 2008). Second, the liquidity incentives do not account for the fact that reaching the liquidity target may be a matter of survival or bankruptcy for the banks. The monetary incentive used in the study gives a dollar for every dollar of sales up to the liquidity target. A more realistic incentive would be to only start paying after a minimum liquidity target is met, up to a maximum liquidity target. Third, the study does not take into account post-auction effects where market prices for the unsold securities have also been established and banks could be driven into insolvency. One possibility would be to assign liabilities to each participant, and only pay a monetary reward if the sum of total sales and value of unsold securities is greater than the liability. In such a scenario, we might see auction failure as participants would rather not have a price determined on their unsold securities.

Conclusion

The current financial crisis is a perplexing problem that has defied attempts at solving it. We have briefly reviewed the causes of the credit crunch and some of the leading approaches for resolving it. In particular, we take a close look at proposals that aim at by recapitalizing banks by removing their illiquid troubled assets in return for capital. Since such solutions involve the transfer of assets, they face the thorny issue of setting a price on troubled assets.

We then consider the use of reverse auctions for pricing troubled assets. Auctions need to be well-designed to achieve efficient price discovery while avoiding adverse selection and the winner's curse. Ausubel and Cramton have suggested that simultaneous clock auctions with uniform pricing on individual securities or similar pools of securities with an asset demand that satisfies a "three pivotal supplier test" would be a good choice (Ausubel and Cramton 2008). This is further supported by an experimental study that simulates such an auction, although the study may not fully reflect reality. In particular, we think that incentives in the auction do not adequately address liabilities concern and post-auction effects are not appreciated.

8. Corporate Structure and Globalization Issues

We now turn to two issues that have emerged after the financial crisis spread to other sectors of the economy. Both are related to the design of appropriate "bailout" responses and both arise from the complex structure of our economy. The first has to do with whether publicly-held and privately-held companies should be treated in the same manner in a bailout. The second relates to the differences between domestic and foreign corporate entities and—in our globalized economy—this distinction is determinable in any meaningful way. We shall show that both of these issues have intriguing information components, as well as obvious economic and political considerations.

The Automotive "Big Three" as a Case Study

With the economy diving deeper and deeper into a recession, it is easy to place blame and point fingers. A far more challenging task is deciding where we need to go from here. While our classmates have discussed both the origins of the financial crisis and some major proposals to mitigate the suffering, we are going to examine the current economic situation from a slightly different perspective–our aim is to determine whether corporate structure and ownership should affect bailout decisions. We will tackle this question by investigating the current hardships of the American auto industry, namely looking into the proposed bailouts for the so-called "Big Three" –General Motors, Ford, and Chrysler.[93] While all three companies are facing similar financial hardships (which we believe is largely the result of same or similar corporate ineptitude and low-quality products), their disparate corporate structures call for unique bailout packages.

In order to lay a foundation for this discussion, we must first introduce the different ownership types available to a corporation. There are two main classes of ownership–a corporation can either be publicly or privately held. A public company is one which has issued securities which are tradable in the open market.[94] These securities are investment instruments that denote equity in the company and for most corporations exist in the form of common stock. A private company, on the other hand, is one whose shares are not tradable in the open market.[95] Private companies typically have far fewer shareholders than public companies. Also, privately-held corporations are not legally required to publicly disclose financial statements,[96] a fact that restricts the free flow of information. The differences between publicly- and privately-held companies are often not considered when determining whether a company is deserving of a bailout.

Beyond simple private and public companies, increasingly complex corporate structures have emerged as divestitures occur and the economic downturn causes companies to look for new ways to obtain government assistance. GMAC, a global financial services company, was founded in 1919 with the mission of providing financing for GM dealers and customers and provides a glimpse at the complexity of some corporate entities.[97] GMAC was previously wholly owned by General Motors; however, in 2006, GM sold a 51% stake in GMAC to a group led by Cerberus Capital Management after previously divesting portions of the sub-companies under GMAC to other investors. Further complicating matters, GMAC recently applied to become a bank holding company so it could be eligible for up to $6 billion in government bailout assistance. This move further complicates the ownership landscape and necessitates the redistribution of shares including a stake reduction by

Cerberus and GM and distribution of shares to passive investors.[98] A number of other companies including Goldman-Sachs, Morgan Stanley, American Express and Discover Financial have also become bank holding groups as the credit crisis forced various financial institutions to morph in order to tap government funds. GMAC is only a single example of how muddled the ownership scheme can become and the impact it can have on government intervention with respect to proper bailout procedures.

Who, then, owns GM, Ford, and Chrysler and what impact should that have when determining who to bailout? General Motors, founded in 1908, is a publicly-traded corporation that manufactures cars and trucks for 34 countries, with the United States as its leading market.[99] Ford Motor Co., also a publicly held company, was founded in 1903 by Henry Ford and the Malcomson Group.[100] Chrysler LLC, however, is a privately-held corporation–it was formed in 1919 when Walter P. Chrysler revived and renamed the Maxwell Motor Corporation. In 1928 Chrysler acquired the Dodge Brothers firm and became the third member of Detroit's "Big Three" automakers.[101] Chrysler is also unique in its hefty foreign ownership. Daimler AG, a German automobile giant, had previously owned 100% of Chrysler, but sold 80.1% of its share to Cerberus Capital Management, the same U.S-based private investment firm that owns GMAC in August 2007. In early 2009, Fiat, an Italian automotive company, announced that it intends to purchase 35% of Chrysler from Cerberus. Fiat also retains the option to buy 20% more of Chrysler, raising its total share to 55%.[102] While the terms have yet to be negotiated, when the dust settles more than half of Chrysler may be foreign owned, further complicating bailout decisions.

Now we turn to the question at hand—do GM, Ford, and Chrysler deserve to be bailed out? Many editorials have been written on the "Big Three Bailout", with most authors either pro-bailout (i.e. they believe GM, Ford, and Chrysler <u>all</u> deserve bailouts) or anti-bailout (none of them do). Pro-bailout individuals cite the massive economic and social impact of the Big Three as their main defense—if these giants fall, many supplier industries (e.g. steel, tires, etc) will be adversely affected and, more importantly, millions of Americans will lose their jobs.[103]. Proponents also cite the need for the survival of domestic automakers, the harm done by the government mandated 35 MPG corporate average fuel economy (CAFE) by 2020, the "success" of the 1979 bailout package given to Chrysler, and the negative global impact the failures would incur as reasons to give the Big Three bailouts.[104] Opponents, on the other hand, often refer to the Big Three's steady decline in market share and their inability to produce well made, desirable cars as the main reason to nix the bailout. Declan McCullagh, the chief political correspondent for CNET, explains the situation beautifully in the following quote:

> "Detroit's problems aren't caused by a one-time slump. They can't be fixed by another infusion of cash. One cause is that union labor and legacy costs are too high and make the so-called Big Three companies uncompetitive. Another is that their profitability is tied to large, heavy trucks and SUVs that Americans no longer want to buy, at least in such large numbers."[105]

McCullagh and others oppose the bailout because they see the Big Three as "unsalvageable"—that their problems are too large to be solved by a simple cash-injection. Other opponents, however, disagree with the bailouts on more moral grounds. They see Congress handing out money first to banks, then to insurance companies, then to

automakers, and ask where the bailouts will stop. In fact, the Treasury is currently preparing new guidelines to grant supplier companies access to the Troubled Assets Relief Program (TARP) funds. In a similar vein, companies large and small are hoping to tap into the $25 billion set aside for the DOE to promote the creation of more energy-efficient vehicles.[106] Opponents see a trend starting to form and they want to stop giving handouts before the situation gets out of hand.

While Washington seems to think that all three should be given aid (whether they will survive in the long run is an entirely different question), additional issues crop up when we consider the differences between the automakers and their different corporate structures, most notably the public and private corporate aspects. There are a number of pros and cons for bailing out both public and private companies and they must be carefully considered before blindly doling out bailout funds.

When looking at public companies, there are a number of different reasons why a government bailout provides a necessary safety net while spending the correct party's money. Government bailout packages ultimately come from the tax dollars of the general public. These taxpayers are the same citizens and corporations who ultimately own a public corporation and have invested in the future of that company. Therefore, using government funds to save GM and Ford means that taxpayers are using their money to save their company. Taxpayers get their paychecks from employers and some of the largest employers in the U.S. are GM, Ford and other large, publicly-traded companies. Bailing out publicly held companies ensures the continuation of that job market which provides taxes for the government through taxed income and ultimately drives the entire economy. This line of reasoning holds that it may be in the government's and public's best interest to save a publicly-held corporation not only for the benefit of its own employees but for the economy as a whole. By some accounts, a failure of GM would cause a ripple effect that would ultimately lead to 2.9 million additional unemployed Americans.[107] Lastly, an additional argument exists relating to the negative effect of large failures on the stock markets. Should a company like GM fail, negative psychological effects would impact the entire auto industry and further propagate into the markets as a whole leading to a severe decline in confidence further weakening the U.S. economy. These two consequences could easily push our current recession into a full blown depression, which would cause immense damage to the U.S. economy (and by extension the world economy) for a protracted period of time.

However, while the bailout is necessary in many people's eyes, there are a number of reasons why government funds should not be loaned out to public companies who have run aground. Public companies disclose large amounts of information each year regarding their finances which provide the public with a proper view of the risk prior to investment. This risk, the risk that the company will fail or falter, is distributed among a large group of investors such that while the impact in aggregate may be large, the risk is spread among a large portion of the populous and the economy. Given that not all taxpayers are investors in these companies, perhaps only those who took the calculated risk should be exposed to it. To bailout a publicly-traded company effectively spreads the risks from those who chose to invest in the company onto the general public. The issues surrounding bailing out a public company like GM or Ford differ greatly from the issues that must be considered when looking at bailing out a private company.

Private companies present a number of conundrums when considering their right to government bailouts. A privately-held company's situation is often difficult to assess due to the lack of information surrounding its operations that inherently comes from being privately-held. On the surface, reasons why private companies such as Chrysler deserve public funds stem from the economic activity created by the corporation. Chrysler drives a large portion of the auto industry, and its subsequent supplier markets provide employment for many Americans. Additionally, the investors in Cerberus, the private equity firm which owns a large portion of Chrysler, are the same investors who are the owners of GM and Ford, the American public and investment funds. The stakeholders are largely the same even if it is harder to notice through the various layers of ownership.[108] Furthermore, when looking at reasons why Chrysler needs bailout funds in the first place, one of the factors impacting their economic decision making process has been government mandated emissions standards, and if the government is partially to blame for their current quandary, perhaps they are responsible for providing funds. Lastly, when looking specifically at Chrysler, government bailout has succeeded in the past and led to a turnaround and rapid repayment for the government.[109] Should such a win-win result happen again, the economy would certainly improve.

However, there are also many reasons why privately-held companies should be left to fend for themselves and clean up their own messes. Especially in the case of Chrysler where Cerberus has a great deal of cash on hand, private companies should receive additional funds from their owners.[110] If the owners have faith in the company, they should be willing to invest additional funds into the corporation such that their interests will be protected and the company can be nursed back to health. A lack of confidence by the owners of a private company speaks volumes about whether the government should be confident when bailing them out. Bailouts to private companies would also set a dangerous precedent for future corporate irresponsibility.[111] If companies believe they can rely on the government in the future, they may take on excess risk and participate in behavior that is counterproductive for future economic growth ultimately hurting the company, the people it employs and the economy as a whole.

Further complicating the bailout of Chrysler are the foreign parties that own a large portion of the company. Foreign ownership and involvement presents yet another set of issues that will be briefly touched upon with regards to bailout decisions. Pros for bailing out foreign-owned companies largely follow reasoning provided for bailing out private companies. The negative impact to the economy, loss of jobs and other aspects interconnected with American well-being speak for bailing out a company such as Chrysler even given its foreign investors. Chrysler is a massive U.S. company, and it helps Americans should Chrysler perform well, regardless of its ownership. However, the cons for bailing out foreign held companies revolve around the lack of involvement by foreign nations. Foreign companies and even foreign governments should wish to invest in foreign held American companies, and therefore the companies' and governments' fates are tied to the fate of the foreign-owned company. Should Chrysler or any other foreign-held company fail, it would create a loss of wealth which would be felt by the parent company in other parts of the world. The interconnectedness of the global economy pushes for assistance from abroad when dealing with saving a globally owned company.

With all this in mind, who specifically among the Big Three should be getting the bailouts? As publicly-traded companies, Ford and GM should be bailed out if they need to be. While they may not deserve it in some sense, their importance to the American economy and the overall effect that either of their failures could have require government interventions. As one teacher put it:

> "In other words, General Motors is far too massive, far too interconnected, and far too important to the American—and, by extension, the world—economy to let fail. The ripple effect would shut down small and giant companies alike, ultimately ending in the collapse of the other two American automotive giants, Ford and Chrysler."[112]

The failure of GM would be catastrophic, not only for themselves, but for the world. Given the nature of the stakeholders of GM and Ford, the government, or the public, would be putting money up to save themselves from their own investment. Government bailout should not come without strings attached, however. Strict government oversight in the future is required as well as equity in the companies. Equity provides the public/government with the ability share in the recovery of the companies and puts more incentives on the government to create an atmosphere conducive for the auto manufacturers. Additionally, executive perks should be curtailed; however, it must be done in such a way that the auto manufacturers are still able to attract top talent. Chrysler presents an interesting scenario by being both foreign owned and privately held. On the surface, the argument appears to present a case for not bailing out Chrysler. As the smallest of the Big Three, it would create the least disruption to the economy should it fail and might serve as a spark plug to fire the other two into action. However, a failure of Chrysler is still not in the interest of the economy as a whole. A possible solution would be to have the government match further investments by Cerberus or foreign companies such that the risk would fall on both parties and the private owners of Chrysler would have to demonstrate their dedication to the success of the company. Any arrangement should ensure that Chrysler provide equity to the government and thus become partially publicly owned. This would improve the public's access to information surrounding Chrysler's operations and allow for further oversight. With these provisions, it could prove advisable to bailout Chrysler as well and look to receive a return on the investment made by the government sometime in the future.

Now that we have laid out our position, it is worthwhile to mention an interesting alternative to the government bailout packages–specifically, a plan for General Motors. Edward Altman and Thomas Philippon, professors at NYU's Stern School of Business, believe that a bailout, no matter how large, could not save GM from bankruptcy. GM's operations are simply too expensive, and with the recession expected to last approximately two years, GM simply can not survive long enough to weather the storm. Altman and Philippon suggest giving GM a massive debtor-in-possession (DIP) loan that would allow GM to restructure itself *while in bankruptcy.*[113] This would (a) provide a rationale for government intervention, (b) give GM sufficient time to restructure (Chapter 11 of the Bankruptcy Code would grant GM 18-24 months to restructure), (c) minimize the cost to taxpayers by having the government provide DIP financing, and (d) minimize moral hazard, because restructure in bankruptcy need not reward poor management. It remains to be seen if further bailouts will be needed in the future and whether the lessons from today will help to structure better packages in the days to come.

9. Concluding Remarks

We have attempted to demonstrate that the lack of creditable information has been, and continues to be, a key factory in the current economic situation. Although originally billed as a "financial crisis," it should have been clear from the start that bank bailouts, whether by asset purchases or credit infusions would not "solve" anything. Each proposal only highlighted how much we did not know about the nature and depth of the problem. Investors and consumers alike not only assumed the worst, they actively discounted any estimate of what it might take to fix the situation as additional "troubled assets" emerged on the balance sheets of financial institutions. The debate over "mark-to-market" requirements was particularly instructive: if banks and financial institutions did not have to disclose the current values of their assets, why should we believe anything they (or their regulators) might tell us?

The February 14 issue of *The Economist* tries to put this in perspective. While their approach mixes stock and flow concepts, it is nevertheless informative:

> "Judged by standard measures of banking distress, such as the amount of non-performing loans, America's troubles are probably worse than those in any developed-country crash bar Japan's. According to the IMF, non-performing loans in Sweden reached 13% of GDP at the peak of the crisis. In Japan they hit 35% of GDP. A recent estimate by Goldman Sachs suggests that American banks held some $5.7 trillion-worth of loans in "troubled" categories, such as subprime mortgages and commercial property. That is equivalent to almost 40% of GDP."[114]

An obvious structural issue that needs to be addressed is the appropriate roles for financial institutions and complex financial instruments in the future. UK Prime Minister (and former Chancellor of the Exchequer) Gordon Brown has called for a return to "prudent" retail banking.[115] Although the specifics are unclear, the press takes this as a call to end greater-than-100% mortgages and limits on loan-to-borrower's-income ratios. A more comprehensive approach would be to look at the failure of fee-based banking to provide useful incentives for risk avoidance in the first instance. Would banks and "non-bank" financial institutions be as willing to originate risky loans if they had to hold, say, 5% or 10% of them when they sold them off in packages of one sort or another? And would not a requirement along these lines encourage the originating institution to put in place a mechanism to track the value of the obligations they originate?

However, an approach such as that of Mr. Brown does nothing to address the current fact that an unknown number of the largest retail and investment banks are probably technically insolvent. As dire as it appears, the Citibank situation shows that providing a bailout in the form of non-voting preferred stock could not keep the common equity value at a reasonable positive level.[116] It is time to deal with financial institutions out in the open. A reasonable, multi-part strategy should include:

- Valuing whatever assets have credible values, even if this necessitates write-downs
- Isolating non-performing assets whose values are unobtainable
- Providing funds where necessary (or bringing in receivers)
- Bringing in new management.

But all this does not mean that "unfreezing" the credit markets will be sufficient to "jump start" the economy. (I should state that I intensely dislike these meteorological and automotive metaphors almost as much I dislike the medical precision implied by the latest idea—the "stress test".) No rational, risk averse bankers—which is what we hope we shall see emerge—will lend unless they believe there are productive growth opportunities ahead. This does not come about by complaining that banks are hoarding bailout funds and refusing to make loans. It comes about from credible prospects for growth in the economy. So, although we have tried to make the case for more, and more credible, information through asset valuations, securities registration, unwinding non-productive instruments such as credit default swaps with no insurable interest or underlying reserves, and other similar measures, we fully understand that these necessary actions are just a part of an overall approach to economic revival.

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Revision history

There is no version 1.0. Several working drafts with dates in their filenames were edited to produce version 1.1, the first public version.

Version 1.1 Released February 26, 2009.

Endnotes

[1] Public Law 106–554, §1(a)(5); enacted December 21, 2000.

[2] Greenspan's role continues to be debated. At this point I only want to focus on his statement that variable rate mortgages were under-utilized and the reliance on traditional fixed rate loans was costing home buyers money. While the second part was technically correct, it ignored the increased risk to both borrowers and society of an increased reliance on variable-rate products. See his speech to the Credit Union National Association, February 23, 2004:

> "homeowners might have saved tens of thousands of dollars had they held adjustable-rate mortgages rather than fixed-rate mortgages during the past decade….American consumers might benefit if lenders provided greater mortgage-product alternatives to the traditional fixed-rate mortgage."

[3] More on GNMA is presented in Section 3a.

[4] "About Ginnie Mae." http://www.ginniemae.gov/about/about.asp?Section=About. Accessed February 2, 2009.

[5] From "About Ginnie Mae":

"Ginnie Mae I MBS requires all mortgages in a pool to be the same type (i.e. single-family). Each mortgage must be, and must remain, insured or guaranteed by FHA, VA, RHS, or PIH. In addition, the mortgage interest rates must all be the same and the mortgages must be issued by the same issuer. The minimum pool size is $1 million; payments on Ginnie Mae I MBS have a stated 14-day delay (payment is made on the 15th day of each month).

"Ginnie Mae II MBS allows multiple-issuer pools to be assembled, which in turn allows for larger and more geographically dispersed pools as well as the securitization of smaller portfolios. A wider range of coupons is permitted in a Ginnie Mae II MBS pool, and issuers are permitted to take greater servicing fees—ranging from 25 to 75 basis points. The minimum pool size is $250,000 for multi-lender pools and $1 million for single-lender pools. Ginnie Mae II MBS have an additional five-day payment delay because issuer payments are consolidated by a central paying agent (payment is made on the 20th day of each month).

[6] "For Investors." http://www.ginniemae.gov/investors/inv_programs.asp?subTitle=Investors. Accessed February 16, 2009. "REMICs direct principal and interest payments from underlying mortgage-backed securities to classes with different principal balances, interest rates, average lives, prepayment characteristics and final maturities." This would be the "slicing and dicing" of GNMA MBS. The "Platinum Securities" program allows holders of different GNMA pools to merge their holdings into a single security.

[7] "An Introduction to Fannie Mae." http://www.fanniemae.com/media/pdf/fannie_mae_introduction.pdf pp. 13-17. Accessed February 2, 2009.

[8] "Doing Business with Freddie Mac: Mortgage Securities Products." http://www.freddiemac.com/mbs/html/product/ Accessed February 16, 2009.

[9] "Freddie Mac: Our Business." http://www.freddiemac.com/corporate/company_profile/our_business/ Accessed February 2, 2009.

[10] "An Introduction to Fannie Mae." http://www.fanniemae.com/media/pdf/fannie_mae_introduction.pdf. Accessed February 2, 2009.

[11] "Federal takeover of Fannie Mae and Freddie Mac." http://en.wikipedia.org/wiki/Federal_takeover_of_Fannie_Mae_and_Freddie_Mac Accessed February 2,2009.

[12] "Federal takeover of Fannie Mae and Freddie Mac." *Ibid.*

[13] http://financialservices.house.gov/banking/72298fed.htm

[14] Jennifer Bayot, http://query.nytimes.com/gst/fullpage.html?res=9E02E7DB1031F934A35752C0A9629C8B63

[15] Audrey Cohen, http://blog.seattlepi.nwsource.com/realestatenews/archives/154175.asp

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