The Mortgage Market Crisis: A Game Theory Analysis

Raquel Mato, Florida State University
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Abstract

The mortgage market experienced a global bubble during the early 2000s. The bubble burst in 2006, creating a global financial crisis with widespread repercussions. In this paper, I will discuss how the mortgage market normally works and what changes occurred leading up to the 2000s that allowed for the rapid expansion of the mortgage market. I will talk about contributing factors such as: deregulation of the market, government encouragement of homeownership, the mortgage backed securities market, existing legislation, and a general lack of responsibility by all parties involved. I will use various aspects of game theory to explain how this crisis occurred and whether current and new legislation will help prevent a future bubble. I will also address what is still needed to help prevent or minimize a future bubble.

I. History

A. How the Market Normally Works

   The mortgage market allows people with limited cash flows and assets to make a large investment in a home by making affordable payments over time. When someone wants to buy a home, he or she goes to a local bank and requests to take out a mortgage. The bank performs a credit check on the person, as well as verifying income and the value of the house he or she is trying to buy. Assuming this all checks out to be acceptable, the bank will issue a mortgage. A “mortgage” actually consists of two parts, a loan and a mortgage. The loan is the actual monetary transaction where the borrower agrees to pay back the money in installments at a fixed interest rate. The mortgage is a promise that if the borrower fails to make a payment, the bank has the

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right to foreclose on the property and take the house. This system worked because the loan amount was traditionally less than the value of the house and so the bank can sell the house for less than it is worth and get its money.

This system worked sufficiently, but created a liquidity problem, as banks did not have enough cash to make loans. Historically, only commercial banks made loans. Commercial banks fund their loan portfolios using deposits they received from customers. Therefore, the bank could only loan out the amount it had in deposits, which limited the banks’ ability to make loans. The capital market was the solution to this problem. In the 1930s, the federal government passed legislation, which created the Federal National Mortgage Association, hereinafter Fannie Mae, and Federal Home Loan Mortgage Corporation, hereinafter Freddie Mac. Banks could now bundle up loans of similar amounts of risk, and sell the loans, at a discount, to these entities. The bank would make money by charging fees for originating the loan and servicing it, while Fannie Mae and Freddie Mac made money by buying the packaged loans at a discount and creating a mortgage backed security with it. Fannie Mae and Freddie Mac sell the mortgage backed security to investors, providing a relatively safe investment. This was considered a safe investment since it was expected that everyone would pay off their home as part of the American dream and so money would always be flowing into these securities backed by Fannie Mae and Freddie Mac, as discussed below. The payments from loans were used to pay dividends on the investment. Investors were happy to have a safe investment with a steady flow of income and

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banks were happy because they now had more money to lend. The more mortgage backed securities Wall Street demanded, the more liquidity was provided for banks.

1. Traditional Loans

Fannie Mae and Freddie Mac could offer a safe investment because they had very strict requirements before they would purchase a loan from a bank. These loans are known as “traditional” or “conforming” loans. Conforming loans require that borrower’s income be verified, the borrower needed a credit score of 720 or higher, the mortgage principal must be 80% or less of the value of the home, the amount of the monthly payment must not be more than 28% of the borrower’s gross monthly income, the borrower cannot have other large loans or debt and the total payments on debt, including student and car loans, cannot be more than 35% of the borrower’s gross monthly income. These conforming loans formed the original mortgage backed securities and are still considered a safe investment. Only 1% of conforming loans are in default.

2. Alt-A Loans

The next level of risk in mortgages is the “Alt-A” loans. These loans fail to meet the rules of a conforming loan by one or more of the requirements, such as a low credit score or high loan-to-value ratio. These Alt-A loans also include “jumbo” loans for very expensive houses. To make up for this additional risk, lenders often charge higher interest rates and higher fees. While

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5 *Id.* at 716-17
these loans had additional risk, they were not a major contributor to the crisis. The default rate for these loans in 2006 was 4.2%.

3. Subprime Loans

Subprime loans were the major cause of the mortgage crisis. Subprime loans fail to meet one or more of the requirements for a conforming loan by a substantial margin. These loans were made at 100% or more of the value of the home, with the notion that home prices would always continue to rise at these rapid rates. They were often made with little to no income verification and to people with low credit scores. “No doc” loans became very popular and required little to no paperwork for the borrower or income and credit verification by the lender. These were also a popular tool with speculators, who had high levels of debt from multiple mortgages in hopes of “flipping” properties for quick profit. Interest rates and fees for subprime loans are significantly higher than those of conforming loans. The default rate among these loans was expected to be higher than those of conforming loans, but in December 2007, these loans reached an astonishing 17.4% seriously delinquent and 47.1% behind on at least one payment. This high default rate spawned problems in the mortgage-backed securities market and caused home values to decline sharply when foreclosures began.

7 Schmudde, supra note 3, at 718-19
9 Wayne Klein, Lawyers are Needed to Clean Up Wall Street’s Mess and Rebuild the Economy, UTAH B. J. 25, 28 (2009).
10 Id.
11 Flipping is defined as buying an asset and quickly reselling it for profit. Flipping, http://en.wikipedia.org/wiki/Flipping (last visited on November 11, 2009).
13 Schmudde, supra note 3, at 720,728.
Subprime mortgages came in many variations and were significantly more complex than conforming loans. Conforming mortgages are based on a fixed interest rate, which requires the same payment every month. Some subprime mortgages were also based on fixed rates, but many were based on more complex and confusing payment structures.

The most popular of these new, complex mortgage products is an adjustable rate mortgage. The adjustable rate mortgage is blamed as one of the leading causes of the mortgage crisis. In an adjustable rate mortgage, the interest rate, as well as the monthly payment, is tied to an index such as the U.S. Treasury Rate and adjust periodically.  

These loans are advertised with “teaser rates” which are artificially low for a set period and then begin to adjust based on the index. These loans were often confusing to borrowers and the low teaser rate was used to qualify borrowers for the loan, without accounting for future higher payments. This meant many borrowers qualified for loans they could afford only for a few months. When the federal reserve adjusted interest rates higher, many people could no longer afford payments on these loans and foreclosures began.

Likewise, other mortgage products also confused borrowers and made repayment difficult. Products like interest-only payment, negative amortization and balloon mortgages were used frequently for speculation. These products offered low payments up front with much higher payments in later years of the loan. These loans were created for young people to qualify for a loan and afford a higher payment later in life as income increased; however, they were mostly used to speculate on properties that the borrower had no intention of keeping for any length of

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14 LING & ARCHER, supra note 1, at 248.
15 Id.
16 Schmudde, supra note 3, at 723.
17 LING & ARCHER, supra note 1, at 248.
time. When the market collapsed, and the speculators could no longer sell off their property, many simply walked away from these loans causing more foreclosures.

Subprime loans, confusing mortgage products, and the failure of the lending industry to adhere to standards caused the market to collapse. As rates adjusted and speculators could not unload their inventory of homes, many people chose to walk away from their mortgages. As this occurred more frequently, it caused the value of surrounding homes to decline sharply. Other homeowners, even those with good credit and the ability to make payments, now owed more money on their loan than the house was worth. This is known as being “under water” on the mortgage. Many homeowners were faced with the difficult decision of paying more for their house than it was worth or walking away and hurting their credit. This perpetuated the cycle of foreclosures and declining home values. The sense of personal responsibility that once attached to homeownership weakened dramatically in the last few years.

B. What Changed

After the collapse during the Great Depression, the government heavily regulated banks. Commercial banks were forbidden from investing in risky assets and lending money at the same time due to fear of abuses. As discussed above, commercial banks made loans solely off depositors’ money until Fannie Mae and Freddie Mac were created to provide liquidity in the market. Even after the introduction of Fannie Mae and Freddie Mac, the mortgage industry was highly regulated to prevent fraud and risk of large loss.

18 Schmudde, supra note 3, at 724.
19 Fanniemae.com, About us, supra note 2; Freddiemac.com, About Freddie Mac, supra note 2.
1. The Government

However, starting in the 1970s, the federal government began to deregulate banks and pass legislation encouraging banks to take on more risk. It is a politically desirable to support homeownership as part of the American dream. A high percentage of homeownership in a country results in a higher standard of living, less crime, and more tax revenue. Legislation to encourage homeownership, discussed below, meant giving loans to less qualified borrowers and created more risk. Also, more home buyers entered the market to bid up prices. Other legislation also set the groundwork for subprime mortgages with riskier types of loans and higher interest rates and fees.20

2. Wall Street and Mortgage Backed Securities

Additionally, as these new, riskier mortgages became popular, Wall Street created securities out of them. These new securities looked similar to a traditional mortgage backed security based on a conforming loan, but were far more complex. Very few people truly understood how these complex mortgage products, with varying monthly payments and expectation of refinancing, backed up the security.21 Often not even the insurers or credit rating agencies charged with rating the security fully understood the product, contributing to its riskiness.22

These complex products were marketed worldwide as safe investments, just like their conforming mortgage backed security counterparts. Investors, banks, and governments alike invested in these products without understanding what they were investing in. Eventually even

21 Schmudde, supra note 3, at 730.
22 Id. at 735-39.
Fannie Mae and Freddie Mac were deregulated to the point they were allowed to invest in these subprime loans and take on great amounts of risk.\(^{23}\)

When the foreclosures began, and money stopped flowing into mortgage backed securities, these assets lost all or almost all of their value. These products became “toxic assets.” There is not yet an agreed upon definition of a toxic asset, but it is commonly understood to be a financial asset that has lost all or most of its value and for which there is no longer a functioning market, so that it cannot be sold at a reasonable price.\(^{24}\) Demand for these assets evaporated, destroying the liquidity available to banks to make new loans. Since banks could no longer liquidate any new loans, they were not able to continue lending. This meant that borrowers could not refinance mortgages they could not afford after adjustment and went into foreclosure as well. Banks could not make new loans, hurting the demand for homes and further driving down values. Likewise, banks could not make loans to businesses causing many businesses to fail, jobs to be lost, and more people not to be able to pay their mortgage. This vicious cycle sent the economy into a crisis.

3. Speculation

Furthermore, in the late 1990s and early 2000s, a significant amount of speculation and fraud took place in the market. This created more demand for houses, artificially inflating prices and putting more people into mortgages they could not afford.\(^{25}\)


\(^{25}\) Schmudde, supra note 3, at 732.
Speculation is defined as financial action that does not promise safety of the initial investment along with the return on the principal. Speculation involves higher risk than normal investing. Speculation is sometimes beneficial to the markets. For example:

When a harvest is too small to satisfy consumption at its normal rate, speculators come in, hoping to profit from the scarcity by buying. Their purchases raise the price, thereby checking consumption so that the smaller supply will last longer. Producers encouraged by the high price further lessen the shortage by growing or importing to reduce the shortage. On the other side, when the price is higher than the speculators think the facts warrant, they sell. This reduces prices, encouraging consumption and exports and helping to reduce the surplus.

In the housing market, speculators bought houses and raised prices.

However, speculation can also cause problems when speculators take on too much risk. Some speculators are not rational decision makers and are motivated by excessive greed instead of additional return on investment. To these speculators, excessive risk is acceptable.

Many speculators took out multiple mortgages to buy existing and new construction homes and condominiums. They financed 100% or more of the value of the home. Some hoped to be able to sell the new construction for a profit before the building was even complete. Others bought dilapidated houses to refurbish and sell at profit. They counted on the prices of homes continuing to rise at a rapid rate to pay off the mortgage. However, if the speculator could not sell off the underlying asset, they had little to no ability to pay off the mortgage.

Speculation caused a herding effect, discussed below, in the market. As people saw others make money by buying property and reselling it shortly at large profits more people joined in. Also, popular television shows such as “Flip That House” on TLC, and other similar

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28 Schmudde, supra note 3, at 732
shows, made buying and repairing houses for profit look simple.\textsuperscript{30} Many people thought they too could make such an easy profit and were confident they could sell off all of their property before the market took a downturn.

4. Fraud

Additionally, there was a sizable increase in the amount of mortgage fraud and predatory lending that occurred in the early to mid 2000s. Government legislation that allowed for lower down payments and adjustable rates targeted at low-income borrowers also encouraged predatory lending. Lenders would target lower income individuals, who often were not sophisticated and did not understand the product they were being offered. Many borrowers were talked into loans they did not understand and were often qualified for these loans based on low teaser interest rates without the explanation that the payment would adjust higher after the initial period. This led to many of these borrowers not being able to afford their loan within a few years of taking it out.\textsuperscript{31}

5. Underwater Homeowners

As more and more homes went into foreclosure, housing prices declined sharply. In the last year alone home values have dropped an average of 11\% and as high as 40\% in some


\textsuperscript{31} Schmudde, supra note 3, at 730.
areas.\textsuperscript{32} This put good borrowers in a dilemma. Many people who could afford to continue to make payments on their house were now forced to choose between paying off a $300,000 mortgage on a house only worth $200,000 or hurting their credit by going into foreclosure. As discussed above, owing more on a home than the home is worth is called being “under water” on a mortgage.\textsuperscript{33} Being under water dried up credit in the form of home equity loans, which many small business and families rely on to pay bills. With this line of credit gone, even more jobs were lost stemming even more foreclosures and digging deeper into the financial crisis.

Many people knew there was a bubble in the real estate market, but they did not know that everyone else had the same information. Therefore, there was no incentive for them to stop bidding up prices when they thought they could find someone to buy at a higher price. The Federal Reserve and many investors knew this was occurring, but no one publicized it and so there was a common knowledge problem, discussed below.\textsuperscript{34} Once newspapers began to print about the bubble, it became common knowledge and the bubble collapsed. Additionally, other economic factors, such as a weakening dollar, high oil prices, and the Federal Reserve raising interest rates, caused many people to not be able to afford their mortgages. Once foreclosure began a domino effect occurred.

6. Responsibility

At every level, there was a failure of responsibility. Borrowers failed to understand and evaluate the mortgage they were undertaking. Lenders failed to adhere to tried standards to prevent risky loans and failed to understand the risks that speculators posed. Appraisers also

\textsuperscript{32} Constance Mitchell Ford, \textit{Foreclosures Continue to Put a Damper on Home Prices}, \textit{WALL STREET J.} November 11, 2009.

\textsuperscript{33} Klien, \textit{supra} note 8, at 26.

failed to stick to industry standards and inflated housing prices. Investors failed to fully understand riskiness of the products they were investing in and the government failed to predict the additional risk the popular legislation would impose. This lack of responsibility, and common sense, at every level caused the market to collapse.

C. Repercussions

The market collapse let to severe and wide spread repercussions that will likely last for several years or even decades. Many people lost their homes and their ability to get credit. Many banks lost the ability to give out credit and collapsed. People lost their jobs. Risky types of mortgage backed securities lost all or most of their value, sometimes wiping out billions of dollars in value. Foreign banks and governments that had invested in these securities failed at record levels. Today, lawsuits relating to every aspect of this collapse have begun from suing the lender to the credit rating agency and everyone in between. These lawsuits will realign incentives and have a lasting effect on the mortgage industry for years to come.

II. Game Theory and Government Regulations

A. Game Theory Definitions

1. Herding Behavior

Herding behavior is always present in market bubbles and bursts. Herding behavior is defined as following the trend or “behavior [that], although individually rational, produces group

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behavior that is, in a well-defined sense, irrational.” 36 It pertains to how a group can act without planned guidance much like herds of animals. It is seen in human activities like bubbles, street demonstrations, sporting events, religious gatherings, and mob violence. As discussed above, people saw their friends get rich through flipping houses and investing in mortgage backed securities, herd behavior occurred. Similarly, the common urge to invest in real estate related products during this time period was a form of herd behavior.

2. Common Knowledge Problem

A common knowledge problem exists when everyone in the group knows something, but does not know that everyone else knows. Until everyone knows that everyone else knows, people think they can still find someone who does not know and so will continue the cycle. When the common knowledge becomes known, there is an incentive to stop. 37

Common knowledge is a phenomenon, which underwrites much of social life. In order to communicate or otherwise coordinate their behavior successfully, individuals typically require mutual or common understandings or background knowledge. Indeed, if a particular interaction results in “failure”, the usual explanation for this is that the agents involved did not have the common knowledge that would have resulted in success. 38

This was seen in the bidding up of house prices by speculators who may have known a bubble was occurring but believed they could find someone to sell their inventory of houses to until everyone else knew of the bubble.

38 Id.
3. Informational Asymmetry

Informational asymmetry occurs where one party has more, or better, information than the other, creating an imbalance of power in the bargaining process. Informational asymmetry was abundant in the mortgage crisis. In many subprime transactions, one party was significantly more sophisticated than the other was, and had a large advantage in the bargaining process. Lenders had better information than borrowers did on the type of loan, payment structure, and risk involved, putting unsophisticated borrowers in a weak position. Borrowers had more information than lenders about how the money was to be used and how qualified the borrower was to repay the loan, putting the holder of the loan at risk of nonpayment. Speculators knew how much debt they had and that some had no intention of paying off the loan if they could not sell the property underlying it. These speculators also created informational asymmetry when their much riskier loans were tied into mortgage backed securities. Also, there was informational asymmetry between the creator of the complex mortgage backed securities based on subprime loans and the investors and credit rating agencies of these products. All of this informational asymmetry created problems in the market that led to the crash.

4. Prisoners’ Dilemma

There was also prisoners’ dilemma present during the mortgage crisis. Prisoners’ dilemma is explained:

In the classic form of this game, cooperating is strictly dominated by defecting, so that the only possible equilibrium for the game is for all players to defect. No matter what the other player does, one player will always gain a greater payoff by playing defect. Since in any situation playing defect is more beneficial than cooperating, all rational players will play defect, all things being equal.\(^{40}\)

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In the current crisis lenders were faced with such a dilemma. In the past lenders were forced to adhere to certain standards in order to have a loan qualify to be bought by Fannie Mae or Freddie Mac. Banks needed to have their loans purchased, and so had no choice but to adhere to standards. However, when deregulation occurred, banks were given more freedom. Banks were forced to make the choice between adhering to proven standards or giving loans with little to no documentation in order to make more money. To defect and provide no document loans is more beneficial to them, and so they will choose to defect. Of course, in the end, this made all banks worse off and led to many bank failures. Loans that conformed to standards only have a default rate of 1%.\(^1\)

5. Overconfidence Problem

Also, people were faced with an overconfidence problem during this crisis, and the overconfidence problem is possibly being made worse by new legislation such as the Troubled Asset Relief Program, discussed below. Overconfidence occurs when one over estimate one’s own abilities.\(^2\) Overconfidence affected speculator’s ability to judge when to get out of the market. It also affected investors’ ability to examine the securities and to judge when to exit the market. Additionally, large institutions were confident that they would not fail.

These are the important game theory concepts relating to the mortgage crisis. In the next section I will apply these concepts to various government regulations in place both before the crisis began and in response to the meltdown.

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\(^1\) Schmudde, \textit{supra} note 3, at 717.
B. Government Regulations – Before the Crisis

1. Glass Steagall Act

The Glass Steagall Act separated commercial and investment banks to prevent commercial banks from making risky investments with depositors’ money. This was done after the depression to foster trust in the bank’s ability to pay off any depositor that might demand their money and to prevent bank managers from taking risk with money that was supposed to be safely deposited. The Act also set tight standards for the types of investments that commercial banks could make.\(^{43}\)

This act helped in two ways. First, it prevented an over confidence problem with the bank manager’s ability to decide on the appropriate level of risk for the bank. Second, it eliminated the prisoners’ dilemma by eliminating any possibility of defecting by choosing to take on risk. The strict standards of Glass Steagall kept banks relatively in check for several decades, but unfortunately, from the 1970s through the 1990s were repealed by various acts of Congress.\(^{44}\) Had this act still been in place, it likely would have prevented some, if not a large amount, of the bad loans and unnecessary risk leading up to the crisis.

2. The Community Reinvestment Act

The Community Reinvestment Act encouraged homeownership amongst minorities, which is a good political policy with many benefits. It required that all banking institutions be evaluated to determine if they were adequately meeting the credit needs of their community and to adjust appropriately.\(^{45}\) It directed that “the evaluation should accommodate the situation and

\(^{43}\) Glass Steagall Act, 12 U.S.C. 378
\(^{45}\) Schmudde, supra note 3, at 728-29.
context of each situation.” The goal was to promote the American dream. The act allowed reduced down payments and lowered credit standards to broaden the pool of borrowers. The government hoped to increase household wealth through home equity. Subprime mortgages were perfect for this and initially targeted at minorities. Banks expected higher default rates and charged higher interest rates and fees in response. This caused the number of subprime loans to grow dramatically from 1995-2006.

I believe this act was based on the overconfidence of the government of the personal responsibility of Americans. In theory, it was a socially desirable act, but the government failed to account for the irrational behavior and fraud that occurred. Additionally, it often created informational asymmetry. Targeting these loans at minorities or low-income neighborhoods often meant dealing with unsophisticated borrowers who did not understand the product they were being given. This act contributed to the crisis.

3. Truth in Lending Act and Real Estate Settlement Practices Act

The Truth in Lending Act and the Real Estate Settlement Practices Act were meant to require disclosure. The Truth in Lending Act is a consumer credit law designed to protect consumers by requiring disclosures on credit transactions. It includes things like disclosing all fees up front, limiting high interest rates, and requiring disclosure of the annual percentage rate, which is the interest rate the buyer actually pays if they hold the loan for its entire life including all fees. However, this act does not allow a borrower to get out of the mortgage if these standards were not met. “This law has had little effect on borrowers decision-making: the

\[\text{id.}\]
\[\text{id.}\]
\[\text{id.}\]
\[\text{LING \& ARCHER, supra note 1, at 277-78.}\]
documents provided to the borrowers were simply too complex. Many mortgages – especially ARMs and balloon payment mortgages – are difficult for a lay person to understand without additional explanation.”

Likewise, the Real Estate Settlement Practices Act requires certain disclosures including “1. a special info booklet; a good faith estimate of charges; 2. the actual settlement costs known on the day before the transaction is completed; 3. actual settlement costs; and 5. escrow payments scheduled for the first year of the mortgage.” These also are often inaccurate and confuse the buyer.

These acts attempted to deal with the informational asymmetry present in taking out a loan. Requiring full disclosure, in theory, does help borrowers beware before they enter into a mortgage. However, the average person does not understand the financial calculations and complex language used in these disclosures, making them useless. These are the right idea, but do not solve enough of the informational asymmetry problem.

C. Government Regulations – After the Crisis

There has been much legislation in response to the mortgage crisis targeting everything from interest rates to predatory lending. Some of these acts will be helpful while others will make the situation worse.

50 Schmudde, supra note 3, at 751-52.
51 Id.
1. Troubled Asset Relief Program (TARP)

The Troubled Asset Relief Program, which purchases troubled assets and equity from financial institutions to strengthen troubled banks, will make the situation worse. As discussed above, this response will foster more overconfidence and does not attach responsibility to the decision maker. Government response to this crisis has likely contributed to this last overconfidence problem instead of eliminating it. Several high level officials have said that it is the “policy of our government …not [to] allow another Lehman Brothers, which means that the government will do whatever it takes to prevent the collapse of a large, complex, systemically important financial institution.” If this is true, banks now have less incentive to carefully manage risk because they know the government will be there to back them up if they make a mistake. The market can no longer check these banks and they can take large amounts of risk at taxpayers’ expense.

2. Mortgage Forgiveness Debt Relief Act

The Mortgage Forgiveness Debt Relief Act and freezing interest rates have good intentions, but likely will not have much effect. The Mortgage Forgiveness Debt Relief Act of 2007 helped people who took out adjustable rate mortgages and other mortgages they couldn’t afford. Prior to this act if a lender forgave the debt it was taxed as income, so even if a person could get out of their loan they were going to get a large tax bill by the government which

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54 Id.
destroyed the benefit to the borrower of working out the loan. Since its better for the borrower and lender to avoid foreclosure, the government eliminated this tax rule.\textsuperscript{55}

Likewise, the government told lenders to freeze the low teaser rates for longer than the contract period. However this only applied to borrowers who were current on their payments but wouldn’t be able to afford a higher payment.\textsuperscript{56}

These actions attempted to align incentives of lenders to assist borrowers. However, these acts only affect a small number of borrowers, and in the case of freezing interest rates, are only temporary.\textsuperscript{57} When the stay on interest rates expires, rates will adjust and people will no longer be able to afford their payments. These acts do nothing to address informational asymmetry, common knowledge, prisoners’ dilemma, or overconfidence problems. In fact, this might actually create more of an overconfidence problem as the government sends the message that it will protect anyone who takes on more risk than they can handle.

3. The Federal Reserve

The Federal Reserve had the power to regulate the mortgage market, but until recently, chose not to do so. This was likely do to lobbying efforts by the banks and Fannie Mae and Freddie Mac. However, the Federal Reserve promogulated “Regulation Z” in response to the crisis. This regulation applies to subprime loans and attempts to create similar lending standards as conforming loans. The Regulation requires:

- The lender must consider the borrower’s ability to repay the loan from income and assets other than the home’s value. In computing the ability to pay, the lender must use the highest scheduled payment in the first seven years of the loan;

\textsuperscript{55} Schmudde, supra note 3, at 754.
\textsuperscript{56} Id.
\textsuperscript{57} Id.
A creditor must verify the income and assets which are relied upon to determine repayment ability; and

Prepayment penalties are prohibited if the payment can change any time during the first four years of the loan. For other higher priced loans, the prepayment penalty must expire after two years.

Lenders must also establish escrow accounts for property taxes and homeowner’s insurance for all first lien mortgages. 58

This protects borrowers because:

- creditors are prohibited from engaging in a pattern or practice of extending credit without considering borrowers’ ability to repay the loan
- creditors would be required to verify the income and assets they rely upon in making the loan;
- if a consumer’s payment can change during the first four years following consummation of the mortgage, prepayment penalties are prohibited outright. If the payment is fixed for four years, any prepayment penalty period is limited to two years; and
- creditors must establish escrow accounts for taxes and insurance.
- lenders could not compensate mortgage brokers for selling “yield spread” mortgages to the borrower, unless the borrower has previously agreed to such compensation. These “yield spread” payments are fees generated by higher priced mortgages;
- creditors and mortgage brokers would be prohibited from coercing an appraiser while the appraiser performs the appraisal
- mortgage servicing companies would be subject to a number of restrictions. For example, the servicer must credit any payment on the day it is received, and must provide the borrower with a schedule of fees; and
- creditors would be required to give the borrower a good faith estimate of closing costs within three days of the application for the loan. 59

This act does a lot with respect to game theory. It addresses informational asymmetry on several levels. First, between the lender and borrower, by requiring the lender to verify the borrower’s income and ability to repay the loan. This will also help identify speculators and eliminate that informational asymmetry between the speculator, the lender, and the investors of mortgage backed securities backed by speculator loans. Second, it eliminates the informational

58 Id. at 758-59.
59 Id.
asymmetry between the borrower and the lender by requiring more disclosure, although this still may be too complex.

Also, this eliminates the prisoners’ dilemma between lenders. There is no longer a choice to defect, all banks must adhere to these standards or face penalties. While this does not address the common knowledge or overconfidence problems, it likely would have done a lot to prevent bad loans and the ensuing crisis had it been in place sooner.

4. The Mortgage Reform and Anti-Predatory Lending Act of 2007

The Mortgage Reform and Anti-Predatory Lending Act of 2007 also does a lot to protect borrowers. It includes provisions for registering mortgage originators to prevent abuses, requiring lenders to provide full disclosures, and presenting consumers with appropriate mortgages. “This means that the originator will have to ensure that a consumer who receives a mortgage loan: 1) has a reasonable ability to repay the loan; and 2) will receive a net tangible benefit from the loan in the case of a refinancing.”60 The act also prohibits the undisclosed and unfair compensation to lenders that disadvantage borrowers, and requires regulations to prevent predatory lending.

Mortgage originators who engage in predatory practices will be subject to strict penalties. It also contains unprecedented federal consumer protections that will subject Wall Street firms to liability if they buy, sell and securitize loans that consumers cannot repay. They will be held accountable by consumers and will have the ability for loans to be rewritten and reworked.61

Additionally, practices that increase the risk of foreclosure, such as balloon payments, are prohibited and more pre-loan counseling is required.62

61 Id.
62 Id.
This act goes a long way towards preventing a future crisis and making responsibility attach to the decision maker. This act helps reduce informational asymmetry by requiring disclosure and preventing predatory lending, but does not eliminate the informational asymmetry between the borrower and the investor. It helps eliminate the prisoners’ dilemma by giving harsh penalties for defecting. The main issue this act lacks deals with the common knowledge problem which leads to the herd behavior in bubbles.

III. What is still needed?

While the actions of Congress so far have alleviated some of the game theory problems that caused this crisis, there is still more that could be done. The government could do more to eliminate informational asymmetry, common knowledge, overconfidence, and prisoners’ dilemma.

A. Education

Education is the key to preventing a future crisis. Many people did not understand the loans or the securities they were buying. By educating the public about loans, we protect both the borrower and the investor.

My proposal is that there should be financial education in both high school and college as part of every degree program, in the student’s last semester. Often, if there is any financial training given to student at all, it is given too early and the material is forgotten by graduation. These classes should focus on financial institutions, how credit works, what affects credit, and the different types of mortgages available. These classes need to be taught at a very basic level to be understood thoroughly.
In addition to financial training in school, banks should also be required to give financial training before giving out a loan. This could be accomplished through a variety of ways. Perhaps an information video that borrowers must watch in the presence of a bank employee or through a booklet explaining each type of loan. The bank would need to explain the loan in clear terms on a fourth grade reading level and disclose how payments may change up to an extremely high interest rate. The bank should also inform the borrower of the effect on their credit if they do not repay the loan. This could be enforced through a signed certification, which alerts the borrower that if they fail to repay the loan they will not be “bailed out.” Likewise, including the information about how this could hurt their credit and other repercussions first might encourage the borrower to continue reading. Small font could be used to attract the borrowers attention. By giving people the information before they need it, they are much more likely to be able to process the information fully and use it correctly later.

B. Counsel

Additionally, advice of counsel might be used. This would be especially helpful for unsophisticated borrowers. Independent counsel could carefully review the borrower’s situation and advise them of their best interests. This would likely have to be set up through a state agency due to the limited income of some unsophisticated borrowers, but would protect the public and investors alike from borrowers who do not understand their mortgage and later default.

C. Fix Incentives

Likewise, the government should strive to align the incentives of borrowers and lenders. The government attempted this through the Mortgage Debt Relief Act and freezing interest rates,
but it did not go far enough. Legislation should give incentives for lenders to renegotiate any loan given to a borrower who clearly could not afford the loan at the time. The should do this through tax incentives, such as changing accounting practices for write-offs and through subsidies. While this may contribute to an overconfidence problem in the future, it will help alleviate the current financial crisis. The overconfidence problem, however, should be limited since the only loans that will qualify are those obtained through predatory lending.

D. Disclosure

Also, the government should encourage more disclosure in many aspects. By requiring disclosure, informational asymmetry and common knowledge problems can be prevented. Banks should be required to disclose all the terms and fees of the loan, similar to the Truth in Lending Act, but on a much lower reading level as to be understood by more people. Simple and clear terms are needed. Definitions should be provided in nothing above a fourth grade reading level. All possible payments that the loan could adjust to should be disclosed so borrowers will see how the loan may affect them.

Additionally, lenders should disclose to investors any possible speculator loans. Any borrower who qualifies for a loan, but appears to be a speculator, should be flagged. It may be wise to bundle speculator loans separately from other loans. This would allow more disclosure to investors about the risk level of the investment they are making.

E. Punishment

Moreover, punishment should be harsher for those who give out bad loans and those who chose to walk away from their loan. By making lenders responsible for their decisions they will
put more due diligence into making a loan. By making borrowers suffer the consequences of walking away from a loan, especially speculators, they will be more careful before taking out a loan.

F. The Federal Reserve’s Responsibilities

Furthermore, Congress should require the Federal Reserve to make a public announcement as soon as possible after suspecting a bubble. In the current crisis, the Federal Reserve tried to prevent the bubble by raising interest rates, but failed to inform the public of the presence of the bubble. If the Federal Reserve is wrong, no harm is done, but if they are right, then the common knowledge problem is eliminated, ending the herding behavior and further creation of the bubble.

IV. Conclusion

In conclusion, the current mortgage crisis may not have been preventable, but if proper regulations had been in place, the severity could have been greatly reduced. By using game theory, we can write legislation so it effectively prevents future crisis by eliminating informational asymmetries, common knowledge problems, prisoners’ dilemmas and overconfidence problems.

Legislation should seek to make responsibility attach to the decision maker. If a lender makes a bad loan knowing the borrower cannot make the payments, it should bear the cost of that loan. If a speculator takes out too many loans they cannot pay back, they should bear the cost by not being able to get future loans. By making responsibility attach to the decision maker,
people are given an incentive to take more care in their decision. When people take more care, they take less risk. Responsibility is the key to preventing future crisis.