

THE PROBLEMS CAUSING THE REAL ESTATE CRASH-A LEGAL, ETHICAL AND MORAL PROSPECTIVE*

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The collapse of the “real estate bubble” has caused the financial devastation of personal wealth, not only in this country, but around the world. Its effects are still with us as world economies try to grow and return to normalcy in late 2014. It is critical that we understand the events that led to the bubble, and the legal and ethical standards that were violated allowing it to become so inflated. Those that don’t know history are doomed to repeat its mistakes, as it is often said. Investors didn’t learn that from the DOTCOM bubble burst in 2000, and it took just a few short years after that bubble popped to repeat mistakes behind that bubble. There were two primary causes of the boom/bust in real estate. The first was the **necessary** condition and the second were the **sufficient** conditions that came into play once the necessary condition was in place. The necessary condition was the repeal of the Glass Steagall Act of 1933. The sufficient conditions were many. They included fraud in the origination of mortgages, fraudulent real estate appraisals, the use of ARM and Option ARM contracts deceptively sold to naïve investors, the proliferation of exotic mortgage products, the securitization food chain designed in some cases to hide the risk of packages of mortgages, biased bond ratings by Moody’s and Standard & Poor’s, the abject failure of regulators and the Securities and Exchange Commission (SEC) to intervene, overleverage by home buyers and my investment banks, and the immoral use of drugs and sex on Wall Street. This paper will examine these conditions in detail.

Keywords: Real estate crash, Fraud in mortgage origination, Ethical/moral aspects.

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There were two primary causes of the boom/bust in real estate. The first was the **necessary** condition and the second were the **sufficient** conditions that came into play once the necessary condition was allowed to occur. These conditions could not have come to pass without the primary cause. The sufficient conditions were many. They included fraud in the origination of mortgages, fraudulent real

estate appraisals, the use of ARM and Option ARM contracts deceptively sold to naïve investors, the proliferation of exotic mortgage products, the securitization food chain designed in some cases to hide real the risk of packages of mortgages, biased bond ratings by Moody’s and Standard & Poor’s, the abject failure of regulators and the Securities and Exchange Commission (SEC) to intervene, overleverage by homebuyer and investment banks on Wall Street, and the immoral use of drugs and sex on Wall Street. This paper will examine these conditions in detail.

The Necessary Condition

The necessary condition for the real estate crisis was the repeal of the Glass-Steagall Act of 1933. The bill was sponsored by Senators Carter Glass of Virginia, the founder of the U.S. Federal Reserve System, and Henry Bascom Steagall of Alabama, Chairman of the House Banking and Currency Committee. The bill was aimed at rampant abuses in the commercial banking system that contributed greatly to the cause and severity of the Great Depression. Commercial banks were major underwriters of corporate securities during the boom years of the 1920s. In addition, investors could speculate on stocks by margining those stocks with loans from commercial banks, and those banks set the margin requirements, the amount stockholders had to put down to purchase stocks and bonds. What resulted was a house of cards. As soon as one card was pulled, the house collapsed. The imprudent underwriting of corporate securities led to bank failures when the stock market collapsed. Falling stock prices resulted in margin calls and investors couldn’t “mark to the market” further contributing to the economic depression.

In the wake of the Great Depression, pressure on Congress resulted in the passage of the Glass-Steagall Act which constructed a “firewall” between commercial banking and investment banking. In effect, commercial banks could no longer underwrite securities in the primary or new issues market. Subsequently under the Securities Exchange Act of 1934, stock margin controls were given to the Federal Reserve Board.

The firewall was torn down by theGramm-Leach-BlileyAct in 1999. The year before the Act was passed, Citicorp, a commercial bank holding company, merged with the insurance company Travelers Group in 1998 to form Citigroup. The combination included banking (Citibank), securities (Smith Barney) and insurance services(Primerica and Travelers). Because this merger was clearly a violation of the Glass–Steagall Act, as well as the Bank Holding Company Act of 1956, the Federal Reserve gave Citigroup a temporary waiver in September of 1998. Less than a year later, GLB was passed to legalize these types of mergers. The law also repealed Glass–Steagall’s conflict of interest prohibitions against bank officers and directors serving simultaneously as officers or directors of a securities firm. It made legal the merger of Travelers and Merrill Lynch the prior year, thus settling the stage for the many abuses, the secondary conditions that followed. The net result of all the mergers that were now allowed before the crash was the domination of the industry by the following few institutions:¹

Investment Banks	Financial Conglomerates	Securities Insurance Companies	Rating Agencies
Goldman Sach Morgan Stanley Lehman Brothers Merrill Lynch Bears Stern	CitiCorp JP Morgan	AIG MBIA AMBAC	Moody’s Standard &Poor’s Fitch

¹ It should be noted that prior to the mid-1980s, investment banks were partnerships with only limited capital provided by the partners themselves. These firms then went public and raised large amounts of money which allowed for tremendous expansion. In the mid-1970s, Lehman Brothers had only one office-that in NYC- with a staff of just over 100. At the time of its bankruptcy in 2008, it was worldwide with over a 100,000 total employees.

The concentration of the firms in this industry would have serious consequences if/when problems arose. The failure of Lehman Brother froze the U.S. financial system and ushered in the start of the so-called “Great Recession.”

The Sufficient Conditions

There were a large number of conditions that followed in the wake of the passage of Gramm-Leach-Bliley. The blame for the crash can be attributed to a whole host of people and institutions; the Federal Reserve Board, investment banks/commercial banks, loan originators, real estate mortgage brokers, real estate appraisers, real estate brokers, greed on the part of home buyers, greed on the part of the Wall Street elite, over leverage by both individuals and investment banking houses, the fraud by credit rating agencies such as Moody’s and Standard & Poor’s, the failure of the SEC and other regulators to act, etc. What follows is a discussion of each of these factors for it was the sum total of all these factors that led to the severity and persistence of the Great Recession. The U.S. economy is still digging out from the damage caused.

Alan Greenspan and the Fed: Afraid that the US economy would suffer from the DOTCOM bubble burst which siphoned off over a trillion dollars of U.S. investors net worth, Greenspan, Chairman of the Federal Reserve Board, kept interest rates low-very low.² By its very easy monetary policy, the Fed hoped to encourage investment and to help stabilize and grow the U.S. economy. Low interest rates on mortgage loans also made housing far more affordable. For example, the monthly payment on a \$200,000, 30 year mortgage loan at 9% is \$1,609.25; at 5%, that payment is only \$555.56. The lower payments resulting from this easy monetary policy, encouraged people to buy homes. In many cases, however, people bought homes that would normally be beyond their reach (especially when buyers had used ARMs, Adjustable Rate Mortgages). The following charts the mortgage rate for a number of years before the crash.

30 YEAR FIXED MORTGAGE RATE			
YEAR	INT.RATE	YEAR	INT.RATE
1991	9.64%	1999	7.04%
1992	8.76%	2000	7.85%
1993	8.02%	2001	6.95%
1994	7.06%	2002	7.00%
1995	9.10%	2003	5.32%
1996	7.20%	2004	5.45%
1997	7.65%	2005	5.73%
1998	7.13%	2006	5.76%
		2007	5.78%
Source: Federal Reserve Chart Book (various issues)			

² To some extent, the huge inflow of Chinese funds into the U.S., the result of its large trade surpluses with the U.S., did take away some of Greenspan’s ability to control the money supply. The flood of money helped keep interest rates low.

	Mean	St. Dev.
Small Cap Stocks	17.2%	33.7%
Large Cap Stocks	10.8%	23.4%
Treasury Bills	3.8%	3.1%
Inflation	3.1%	
Data from: Ibbotson and Sinquefeld		

Rates were significantly lower after the DOTCOM bubble burst as can be seen from the above. This had one good intended consequence—homes were more affordable. But it also fueled price increases as time went on. It ultimately led to the intense speculation that inflated the housing bubble. Loan payments could also be reduced substantially by using newer loans such as Option ARMs as will be discussed below.

The Search for the Next “Magic” Media for Investment: The end of the Soviet Union in 1989, and the dominance of the U.S. as an unopposed superpower fueled optimism about the future. Many younger investors, especially married DINKS (double income no kids), were flush with cash in the early and mid-1990s. They had never experienced a real market crash. They had little knowledge of the risk return tradeoffs in the marketplace and/or at least were convinced that the U.S. economy had entered a new era of sustained growth. They invested heavily in stocks, especially internet stocks. But “perception” doesn’t necessarily jibe with reality. The following shows the reality of risk vs. return:

Long run returns in the market over the period 1926-2007, were about 11% for large cap stocks and over 17% for smaller stocks, but the standard deviations around these returns were 23% and 34%, respectively. The lesson gullied from this evidence is that stocks are highly risky. The crash of the DOTCOM bubble burned a lot of these young very naïve investors. Having learned a brutal lesson about investing in ethereal ideas like internet stocks, they were easily led to a tangible asset you could physically possess, real estate, and it was highly leverageable. Fear of loss returned. This factor’s contribution to the real estate bubble should not be minimized.

Bending of Loan Standards as Home Prices Rose: Conservative lending practices normally required a borrower have income of 4X the monthly payments on a mortgage; the so-called 25% rule. Some lender pushed that percentage to as high as 40% or more, especially in hot markets like California, Las Vegas and others, thus putting the borrower at a much greater risk of default (see subprime chart below). Many assumed that real estate prices would continue to rise and so the danger seemed small. It wasn’t enter the next factor.

The Ethical and Moral Abuses in the Real Estate Market: NODOC (no documentation or “stated income loans”) and NINJA (no income jobs or assets) loans were pushed on naïve home buyers by unethical mortgage brokers.³ Other practices included predatory lending and the misleading use of ARM and option ARM contracts. The proliferation of exotic mortgage products exploded. ARMs and interest only mortgage products were only intended for a very small subset of mortgage applicants. These included high income sales professionals or other applicants expecting either a quick resale or an impending financial windfall. Most applicants steered into these loans were a poor match for the products. They could never be expected to afford the payments on such loans beyond a year or two if interest rates were to increase. This was unethical, immoral and criminal. Many of these brokers were earning upwards of \$30,000 a month pushing people into housing investments. Because they would sell the loans off to Fannie Mae or to investment banking houses, these brokers didn’t have any liability for the bad loans they originated. They got the reward, their origination fees, but took no risk.

³ For an excellent discussion of all these factors, see; Lawrence McDonald, *The Colossal Failure of Common Sense: The Inside Story of the Collapse of Lehman Brothers*, (N.Y.: Crown Publishing Company, 2009), Ch.5.

Ineffective Mortgage Controls: In a clear violation of ethical principles, many brokers profited by steering applicants into bad loan products *precisely because* these loans (especially subprime mortgages) carried much higher commissions or yield spread premiums. Some brokers crossed the line even further by committing fraud. They lied on loan applications or coached applicants on how to lie to improve acceptance of their application. The fabled NINJA loan is a direct result of such fraud. Others pressured applicants into signing mortgage documents that were for a different loan product than was discussed. Investigations of fraud and convictions for criminal activity were few, while fraudulent acts were widespread. There was a complete failure of regulators to protect homebuyers. The Federal Reserve and the SEC did nothing, in spite of FBI investigations into mortgage fraud in the early 2000s.

The Subprime Loan-Loan to Value Limits Expanded-: To further expand “opportunities” to home buyers/speculators, subprime loans were created. A borrower could actually get a loan for more than a home’s value. The origination of subprime loans increased over 878% from 2000-2006, while prime loans only increased 65% over the same period according to the Mortgage Banker Association.

Lenders assumed that home values would continue to rise at rates higher than they historically had risen. What they failed to account for is that the housing market had become a massive bubble, and that it would soon burst. A conventional mortgage usually limits the loan to value ratio to 80% of the purchase price. Other products such as FHA and other CRA backed programs allowed for up to 100%. These were not the problem. The problem arose from lenders allowing for loan to value ratios of up to 120%. This exacerbated the negative equity situation that many distressed homeowners currently still find themselves locked into. They were “underwater” and could not sell or refinance their mortgages as they owed more than the home was worth.

The following chart shows the proportion of these loans which were dangerous ARMs, Option ARMs and Interest Only loans. DTI is the debt to income ratio. As noted above, the norm for this ratio should have been 25% on prime loans. Ratios this high were clearly imprudent.⁴ To expose borrowers to the risk, without their understanding of those risks, was/is unethical and immoral in the authors’ opinion.

SUBPRIME LOANS				
YEAR	% ARMS	%INT. ONLY	LOW DOC	DTI
2000	70.3%	0	23%	38.6%
2001	72.0%	0	26%	39.1%
2002	73.5%	0.7%	31%	39.4%
2003	67.7%	3.7%	34%	39.7%
2004	76.8%	15.3%	37%	40.3%
2004	80.9%	26.5%	41%	41.0%
2006	76.2%	76.2%	43%	41.8%
Source: Zimmerman UBS report (2007)				

The proportions of these more complex and dangerous contracts grew substantially in the mid-2000s. The chart below shows the major culprits feeding off the home buyer frenzy.⁵

⁴ Richard Gritta, Adams B., and Seal J., "Recipe for a Bubble: Financial Leverage and the Other Variables Behind the Housing Crisis- A Teaching Note." Journal for Advancements in Business Education.I, 1(Summer 2012), 12.

⁵ Ibid.

SUBPRIME LENDER	VOL. (in bil.)
HSBC	\$53
New Century	\$52
Countrywide	\$41
Citi Mortgage	\$38
Ameriquist	\$30
Well Fargo Mortgage	\$28
Washington Mutual	\$26
Top 12 Subprime Lenders	\$410
Total Subprime	\$449

The top 12 subprime lenders accounted for 91.4% of the total amount of subprime loans made. The following chart shows the “advantage” to a borrower by using ARMs and Interest Only loans to make a home more affordable.

Alternative Mortgages and Initial Monthly Payments		
Mortgage Type	Initial Monthly Payment	Payment as Percent of FRMPayment
Fixed Rate Mortgage [FRM]	\$1,079.19	100.0%
Adjustable Rate	903.50	83.7%
Interest-Only/ARM	663.00	61.4%
40-year Amortization ARM	799.98	74.1%
Negative Amortization ARM	150.00	13.9%
Note: Interest rates used in each calculation were 6.00% for FRM and 4.42% for Standard ARMs. A house price of \$225,000 and 20% down were assumed. Source: Freddie Mac for the periods 2003-2006.		

Negative amortization loans can result when a home buyer has an Option ARM loan.⁶ That option gives the borrower the right to pay interest only, some principleor interest, or to make no payments at all for the length of the option period. By using the option, as can be seen above, the borrower could substantially lower the monthly payment for the option period. At the end of that period, the home owner

⁶ The calculation of the Interest Only ARM is fairly simple. The loan would be for \$180,000 or 80% of the \$225,000. Interest only is therefore: $\$180,000 \times 0.0442 \times 1/12 = \663 (or 61.4% of the \$1,079 payment). The calculation of the other payments is far more complex.

would owe *more* than the original balance borrow at the origination of the contract. Many took out Option ARMs and chose the option to pay low payments, therefore accepting the negative amortization, on the grounds that the home price would increase substantially. They figured that all they would be doing was giving up some profits in order to maximize their leverage. This turned out to be disastrous.

The Ethical Standards in Real Estate Appraisal: The faulty, sometimes fraudulent appraisal/valuation of homes, contributed to the crisis. Some appraisers were pushed to value homes at inflated prices because they were pressured by unethical real estate sales people hungry to increase sales, and hence their own commissions. One of the authors interviewed a number of licensed appraisers who admitted to this problem. “I need this house to appraise at \$700,000” one appraiser was told by a real estate agent. In fact, that appraiser’s estimate of fair market value was less than \$500,000 based on traditional appraisal techniques. That appraiser lost his fee when the agent got angry with him.

The Proliferation of “Get Rich Quick” Seminars: The greed of people wanting more than they had, and “ready and willing” to be convinced by unethical lenders and realtors that they “could” have what they wanted—even when they really couldn’t afford it—was a significant influence in the crash. These seminars pitched home ownership to people as a mean of increasing wealth without risk. “Prices will rise unabated”, they claimed. This led to the abuse of leverage. At first, increased house prices, coupled with low interest rates, made this strategy successful. Later, however, it resulted in defaults.

The Effects of Excessive Leverage by Home Buyers: The use of leverage (debt finance) can produce spectacular results as long as asset prices increase. The rate of return on investment in real estate is a function of the rate of return on the underlying asset, its growth over time, the interest rate prevailing in the marketplace, and the amount of debt or financial leverage used to acquire the property. The relationship of the rate of return on equity, r_{oe} , is linked to all these variables. The following equation is useful.

$$r_{oe} = [r_{oa} + (r_{oa} - i)D/E]$$

Where r_{oa} is the return on the asset, i is the interest rate on the mortgage, and D/E is the debt ratio used to finance the asset. An example will help explain. Assume that an investor buys a property at the beginning of the year for \$300,000. Further assume that because of increases in the housing market that investor is able to sell the house for \$360,000 one year later. The investor’s rate of return, or r_{oa} , is therefore 20%, or

$$r_{oa} = \frac{\$360,000 - \$300,000}{\$300,000} = 20.0\%$$

assuming that there were no transaction costs involved. The return to the investors on his/her equity, however, is a function of the amount of debt the investor borrowed to finance that property and the interest rate on that mortgage. If the investor put 5% down and borrowed the rest at an interest rate of 5%, the investor’s D/E ratio would be \$285,000/\$15,000. The rate of return on equity, or r_{oe} , would thus be a spectacular

$$r_{oe} = [20\% + (20\% - 5\%)\$285,000/\$15,000] = 305\%$$

It is worth noting that in Las Vegas, one of the hottest speculative markets in the USA, prices went up 43% on average in one year. If an investor purchased a \$300,000 house that went up 43% in one year and financed it with a 5% mortgage, putting only 5% down, then that investor’s rate of return would have been:

$$r_{oe} = [43\% + (43\% - 5\%)\$285,000/\$15,000] = 765\%$$

It is easy to see how naïve investors could, and more importantly did, see real estate investment as the key to instant wealth. The problem is that there was a real downside. Leverage is a two edge sword-it cuts both ways. The following chart shows what happens when the return on the asset falls below the interest rate on the mortgage:

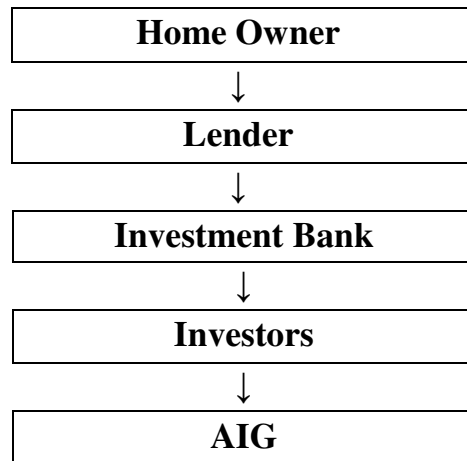
Interest rate at 5% for various ROAs: 5% Down				
ROA	INTRATE	DEBT	EQUITY	ROE
20.00%	5.00%	95	5	305.0%
15.00%	5.00%	95	5	205.0%
10.00%	5.00%	95	5	105.0%
5.00%	5.00%	95	5	5.0%
0.00%	5.00%	95	5	-95.0%
-10.00%	5.00%	95	5	-295.0%
-15.00%	5.00%	95	5	-395.0%
-20.00%	5.00%	95	5	-495.0%

Those at the top of the pyramid who took their gains and got out did very well. But as home prices fell many suffered big losses. This was particularly true of people with ARM and Option ARM loans. The resetting of mortgage interest rate, coupled with declines in home prices was horrendous. Large numbers of home owners found themselves “underwater” or “upside down.” Many abandoned their homes, thus depressing the prices of other houses in the same neighborhood. A downward spiral ensued, and it damaged even those who had been rational in their financial strategies. An ethical question then arose: Do I continue to pay my mortgage when I have negative equity in the house, or do I abandon the house? Many opted for the latter choice.

The House as ATM: Many people treated the increase equity in their homes during the boom times as a cash machine. They used equity as a means to finance vacations, new cars, SUVs, sound systems, and other consumer durable goods. It is a classic financial mistake to use an appreciating home value to finance depreciating assets. The net result was to increase the number of homeowners who were “underwater” and this contributed to further home price declines.

The Securitization Food Chain: Instruments such as collateralized debt obligations (CDOs) or MBS (mortgage backed securities) were created. Once originated by mortgage brokers, these mortgages loans were then package into MBSs. This facilitated the sale of junk mortgages to unsuspecting buyers. Good loans were mixed with subprime mortgages to create these MBSs, and there was no way to tell the good from the bad in any package of loans.⁷ The purchasers of some MBSs blamed the computer models that were supposed to help hedge the risks of such securities (see the discussion of the risk model below). However, what they failed to realize was that the whole purpose of such models often was to hide bad mortgage loans in with other investments so that the buyer was unaware of the junk they were purchasing. They were simply looking to mask the risky loans so they could be unloaded to unsuspecting buyers, aided and abetted by the rating agencies. The “securitization food chain” started with the originators selling the loans to an investment bank which then packaged them in a MBS and sold them to investors (including pension funds).

⁷The MBS is a form of CDO. Alan Sloan, “It’s Getting Hard to Wrap Your Brain around Subprime Mortgages,” *Fortune*, October 29, 2007. Alan Sloan is the Editor of Fortune magazine.



The Creation of CDS: AIG was a prominent player in the “food chain.” In order to hedge against defaults of the MBSs that were sold, AIG sold an insurance plan call the Collateralized Debt Swap or CDS. It sold CDS to investors for a fee, as insurance. If the MBS failed, AIG was at risk to pay the investors. The problem was that anyone could buy a CDS.⁸ An example will help demonstrate the danger. If a person buys insurance to insure his/her car, only that person is able to collect on the policy if the car is damaged. In the world of Wall Street, anyone could buy a CDS. It would be just like five people insuring that one car. When the defaults started, the impact of multiple claims threatened the solvency of AIG and forced its bailout by the government. In some cases, investment banks created MBSs that they knew would fail and then purchased CDS to bet that they would fail.⁹ When they ran out of MBSs to bet against, firms like Lehman simply created more MBSs from the securitization food chain, borrowing heavily to do so (see below).

There were warnings from regulators. Brooksley Born, the head of the Commodities Future Trading Commission (CFTC) at the time, pushed for the regulations of these exotic derivatives. She was opposed by Alan Greenspan and Larry Summers (then Secretary of the Treasury). With their strong support, Congress passed the Commodity Futures Modernization Act of 2000 (H.R. 5660) which specifically banned the regulation of derivatives.

The Moral and Ethical Abuses by the Rating Agencies: By packaging these sub-prime loans into MBSs, Standard & Poor’s, Moody’s and other rating agencies, were conscious contributors to the crisis. These derivatives were often given ratings of AAA, the highest investment grade possible, when clearly they were high risk vehicles. Between the years 2000 and 2007, over 45,000 MBSs were rates AAA by Moody’s. These agencies were trusted by investors, both individual and institutional. Their behavior was unethical. 83% of the AAA rated MBSs were downgraded later, many just weeks before the crisis and the collapse of Lehman in October of 2008. Many investors are now suing. When sued, the agencies argued that their ratings were “largely a matter of opinion” or “just opinions.”¹⁰

Excessive Wall Street Compensation and the Immoral Use of Drugs and Prostitution: The financial rewards for selling what amounted to “junk” were obscene. The average compensation on Wall Street was in the millions for many at firms like Lehman, Goldman Sachs, etc.. The use of cocaine and

⁸ Bill Ackman, Who’s Holding the Bag??” Paper presented at *the Ira Solu Conference*, May 2007. The founder of Pershing Square Capital Management exposed the MBIA and AMBAC shakeout of subprime to come months later.

⁹ Sloan took Goldman Sachs to task for using CDS to hedge against their own MBS that they knew would fail.

¹⁰ A documentation of the ratings agencies behavior can be found on Section II of the video, *The Inside Job*, Sony Picture Classics, 2010.

expensive prostitutes is also well documented.¹¹ Many institutional sales people were making decisions while high on cocaine. Studies at the MIT Financial Engineering Lab have shown that the areas of the brain stimulated by high risk behavior are the same areas that are stimulated by cocaine. They reaped large bonus, but took no risk personally. They did, however, put the solvency of their firms at risk, as the Lehman case demonstrated.

Secondary Mortgage Markets Enabled Risky Loans: Lenders could never justify keeping risky loans on their books. Such a loan portfolio carried too much risk and would ultimately cause their downfall. Instead, they packaged these loans carefully so that the buyers would not fully understand the risky nature of much of the loans included. Additionally, Fannie Mae and Freddie Mac purchased many loans from lenders with the false expectation that reasonable care was taken to ensure creditworthiness and reasonable repayment ability of the applicants.

The Overleverage of Investment Banking Houses-The Bankruptcy of Lehman: While investors were leveraging to the hilt, so were firms like Lehman, Bears Stern, etc. Overleverage by these firms proved even more dangerous, however. The forced bankruptcy filing of Lehman was the result of a debt to equity ratio of over 44:1. Such a high ratio violated every sound principle of finance. The high debt ratios were the result of borrowing heavily so that these institutions could create more MBSs that they could “bet” against by creating the above mentioned CDS. The SEC could have stopped this madness, but it didn’t. The bankruptcy of Lehman shocked the world’s stock exchanges and the credit markets nearly froze up. The U.S. stood at the brink of a depression which would have made the Great Depression seem like a bump in the road. Only last minute action by Congress and the President, in the form of the \$700 billion TARP program, prevented a meltdown and panic of monumental proportions. Richard Fuld, the President and CEO of Lehman, ran his firm into the ground. His penalty was a nice bonus of hundreds of millions of dollars.

Violations of the Securities Laws: The Securities Act of 1933, the Securities Exchange Act of 1934, the Investment Advisers Act of 1940, and the Investment Company Act of 1940, all addressed fraud in the primary and secondary markets. They required “truth in securities” and “rules of fair practice” in investment counseling. They also banned unethical and fraudulent sales of investment vehicles. The sale of these highly risky assets to pension funds and other investors, both individual and institutional, was clearly a violation of all of these investor protection acts. Again, the SEC should have taken action but did not.

Government Guarantees: The federal government guarantees loans purchased by Fannie Mae and Freddie Mac in order to stimulate further lending activity. This promise is what contributed to the rapid expansion of Fannie Mae and Freddie Mac loan pools. As long as the loans were guaranteed, there was less concern about higher rates of default. Accordingly, lenders took greater risks knowing that these risks could be offloaded onto federal agencies and ultimately, the taxpayer. Ironically, the same government interference that increased lending also contributed to its hyperactivity and decline. Because of abuses, these agencies were taken over by the Federal Government. The taxpayers paid the bill.

Too Much Reliance on Mathematic Models: Investors didn’t learn from the Long Term Capital Management debacle in the late 1990s.¹² Mathematical modelling cannot capture all the variables that affect the results of the models, and hedging doesn’t always work as expected. In financial risk management, value at risk (**VaR**) is/was a widely used risk measure of the risk of loss on a specific portfolio of financial assets. It measures historical variances and co-variances among different securities, thus measuring a financial institution’s exposure to risks taken. The following is the model:

¹¹ Ibid.

¹² LTCM tried to hedge their positions such that they believed all the risk was eliminated. The failure of this hedge fund was documented in the video, *The Trillion Dollar Bet*, produced by the National Public Broadcasting System. It can be seen on U-tube by searching for either the Trillion Dollar Bet or the Midas Formula.

$$\text{VaR}_\alpha(L) = \inf\{\lambda \in \mathbf{R} : P(L > \lambda) \leq 1 - \alpha\} = \inf\{\lambda \in \mathbf{R} : F_L(\lambda) \geq \alpha\}$$

By looking at risk across all securities, the model can compare historical levels of risk for any given portfolio, usually with up to a 99% probability that an institution could not lose more than a certain amount of money, the L in the equation. That can be compared to the worst case scenario to make sure that the investors can cover losses.

The **VaR** didn't, and couldn't possibly, reflect the fraud and abuse in the system. No matter how elegant and complete a model may appear to be, it still can lead decision makers astray, and it did. Mathematical models should never be employed, no matter how elegant, without a clear understanding of the limits of the models. Einstein once remarked, "Elegance is for tailors." This model was a key in the crash.

Conclusion

This paper has detailed the necessary and sufficient conditions that led to the real estate crash and the "Great Recession." The Glass-Steagall of 1933 created a firewall between commercial banking and investment banking. Its repeal was the necessary condition for the bubble to inflate. The Gramm-Leach-Bliley Act of 1999 set the stage for all the abuses to follow and they did. There is no one person or institution that can be singled out. A total lack of legal, ethical, and moral standards were responsible. Participants were the Federal Reserve Board, the regulators, such as the SEC and Congress, mortgage brokers, real estate appraisers, real estate agents, Wall Street firms, greed on the part of buyers and sellers, etc. All did their parts to create the crisis that cost trillions of dollars in losses to investors. It has been six years since the "bubble" burst and the U.S., Europe and Asia are still digging their way out. Investors need to be able to accurately assess risk and return, and institutions need to behave legally, ethically and morally if the abuses of the past are to be prevented.

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