Financial Engineering and Deregulation: The biggest causes of financial crisis

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****Dedication***

****I dedicate this paper to family and friends who have always kept faith in me when I haven't. Special thanks to my parents who have always encouraged me to go above and beyond. ***

Brief Author Biography: Suneha Bamboli, chartered accountant by profession, was a master's student at Saint Peter's University who graduated in May 2022. She graduated from the Master's of Science in Finance from Saint Peter's University with a concentration in Quantitative Finance.

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1. Introduction

Lot of American who witnessed the financial crisis of 2008 will think of the staggering events that occurred during that time: too big to fail banks being bailed out by Fed, regulators struggling to stabilize the economy, reducing the interest rates to almost zero, falling stock markets, balance sheets full of trashy MBS, CDOs, government pumping money into the economy for its survival. It would be so easy to write this crisis off the Wall Street and say that it only affected large investors., but that would not be true. The effects of it were felt by all income class communities. There were jobs being taken away, no income to spend, people lost their houses, all due to excessive risk taking and short term greed of the whale banks. What started as subprime crisis in 2007 grew into the biggest financial crisis of all times.

The root of crisis goes back to many decades and if we want to understand what really started the crisis then we will have to go to twenty and thirty years and understand the context in which decisions were made in the years leading up to the crisis. The seed of the 2008 crisis were sown infact in the policy responses to prevent another financial crisis after the Great Depression. Attempting to understand and decode the 2008 crisis without looking into the history, evolution of regulations and financial instruments will not give any useful insights about the crisis. A full analysis of crisis would start with understanding two of the main causes one being deregulation and another being excessive financial engineering, the latter being promoted as a result of the former one.

The illusions of the market participants during the time leading to crisis led to the crisis. The market participants had too much confidence in the movement of housing prices. They were confident that it will only go up. Lenders had excessive confidence that the loans they were giving will never turn bad.

Credit rating agencies had the same confidence and marked all these instruments as AAA. Investors had excessive confidence in these instruments marked as triple A and assumed their money is invested in the safest instruments. However, it would be wrong to say, that "Market discipline broke down as investors relied excessively on credit rating agencies." This statement does not consider the fact that the government regulators themselves promoted over reliance on financial intermediaries for capital adequacy compliance, on credit agencies for ratings. It is important to note that regulators also were living in the illusions as the key market participants. Regulators themselves had lot of confidence in financial engineering. Regulators too thought by diversifying, banks have distributed their risk appetite, their ability to get impacted by slightest of the tremors of the economic crisis. Regulators themselves had confidence in collateralised mortgage lending.

This paper highlights the two major factors that led to the financial crisis of 2008. First one being financial engineering, as observed at least in the last two decades, financial engineering has not only changed the way of doing business in the finance world, but also has changed the daily life of average citizens in the leading economies. Structured products named as weapons of mass destruction led to the Great Financial Crisis. Resulting from the downturn in U.S. subprime mortgages since mid-2007, the financial crisis seriously damaged real estate markets and related financial institutions, and this in turn has resulted in the economic recession. However, this alone would not have had the impact it did if it was not combined with the deregulation of the financial intermediaries. The weak government policies in regard to excessive risk taking, minimum equity requirements, off balance sheet items led to the biggest financial crisis of the decade.

This paper examines the history of the evolution of deregulation in the financial markets in Chapter One. It talks about how this deregulation led to excessive financial engineering in Chapter two. In Chapter two, the author has also tried to bring in alternative points of view concerning the causes of the crisis that states that not deregulation but excessive regulation caused the financial crisis. The author concludes chapter two by proving with the support of corroborative evidence that it was the other way round. In Chapter three the author examines how regulators made a comeback through various policy responses to the financial crisis. Specifically, it emphasizes the role played by bank capital regulations in promoting the practices that produced an unstable financial system and later how the treasury responded with various policies to bring back the stability in the economy. Finally, the author presents her final remarks about the crisis.

Chapter One: Hands off Regulation!

Background

Interest rate regulation goes back to the formation of the United States. In 18th century, at the time of US independence, the interest rate could maximum be 8 percent per annum [1] (interest rate regulations). This was in place until the next century till problems triggered around certain salary lenders, or loan sharks. These individuals were working outside the regulator's purview and were charging very high interest rates equivalent to triple-digit annual rates on loans. Many reformers wanted the passage of a Small Loan Law which would permit mainstream businesses to compete with salary lenders by charging higher rates, with some disclosure requirements. Then comes the biggest milestone of the 20th Century, the nation's central bank was established in 1913 under the Federal Reserve Act. The Uniform Small Loan Law, 1916, allowed these lenders covered under these regulations to charge interest rate to borrowers in the range of 24 and 42 percent interest, letting these small businesses to prosper in these small loans market[2].

The world was then hit with the Great Depression, which changed many different perspectives regarding the regulation of financial markets. In 1933, Congress reformed banking with the Glass-Steagall Act which served three main functions. First, it placed caps on the interest rates banks could offer on deposits. The federal control then removed the possibility of competitive rate wars and kept rates from soaring to exorbitant levels. Second, Glass-Steagall also set up a system of deposit

[1] Peterson, Christopher L., "Usury Law, Payday Loans, and Statutory Sleight of Hand: An Empirical Analysis of American Credit Pricing Limits," Minnesota Law Review, vol. 92, no. 4, April 2008. http://works.bepress.com/cgi/viewcontent.cgi?article=1000&context=christopher_peterson

[2] Carruthers, Bruce G., Timothy W. Guinnane and Yoonseok Lee, "The Passage of the Uniform Small Loan Law," paper presented at the annual meeting of the American Sociological Association, 2007. http://www.lse.ac.uk/collections/economicHistory/seminars/Guinnane.pdf

insurance with the creation of the Federal Deposit Insurance Corporation (FDIC), which guaranteed consumer deposits up to a certain level, quieting the widespread fears of bank failures. Third, the act prohibited banks from being "engaged principally" in non-banking activities, such as the securities or insurance business. Firms were thus forced to choose between becoming a bank engaged in simple lending or an investment bank engaged in securities underwriting and dealing[3].

There were many critical regulations that were enacted to protect investors in the securities market The Securities Act of 1933 called for Companies to register the initial offer or subsequent sale of any security with the government, increasing disclosure and transparency in the primary securities market. Later, the Securities Exchange Act was approved in 1934. It established the Securities and Exchange Commission (SEC) to regulate secondary trading of securities by regulating stock exchanges and enforcing against criminal acts of fraud. Due to this, now companies were required to furnish periodical results and submit them to the SEC. In the futures market, the Commodity Exchange Act of 1936 set rules for exchanges for commodities and futures trading.[4]

There were a complete set of separate regulations that were established for businesses like depository institutions that specifically dealt with accepting deposits and lending money making home mortgage loans, such as savings and loan associations and credit unions. Congress in 1933 created a governing body called the Federal Home Loan Bank Board. Its function was to regulate and oversee

[3] Later legislation in 1956 would extend this restriction to bank holding companies.

[4] Later revisions to the Act in 1974 would result in the creation of the Commodity Futures Trading Commission (CFTC) as a federal regulator for the market, though nowadays both largely relyon private self-regulation.

the savings and loan associations, also known as thrifts. Similar legislation in 1934 created the Bureau of Federal Credit Unions to oversee the operation of credit unions[5].

Insurance companies have been subject to regulation only at the state level until a Supreme Court decision in 1944 mandated insurance activities be subject to interstate commercial law. However Congress returned insurance regulation to the states with the McCarran- Ferguson Act of 1945[6].

However, in the next three decades, technological advances, as well as shifts in ideology and political power, would help to transform the system of financial regulation in America.

Loan-sharking

In the 1970s, the interest rate ceiling imposed by these laws imposed little constraint on lending in the first decades after World War II. When inflation began to accelerate in the 1970s, the ceilings set by usury laws were acting as a major constraint.

In 1978, usury regulation changed significantly with the Supreme Court's decision in Marquette National Bank v. First of Omaha Service Corp. The Supreme Court for the first time evaluated which state law will be applicable to these national banks that lend across states. Should the state law of the borrower apply or the usury law of the state the lender is from? The Court finally

[5] Later reforms in 1970 would transfer oversight of credit unions to the National Credit Union Administration.
[6] Government Accountability Office (GAO), "Financial Regulation: A Framework for Crafting and Assessing Proposals
to Modernize the Outdated U.S. Financial Regulatory System," January 2009.
http://www.gao.gov/new.items/d09216.pdf

adjudicated that the lender's state law will be applicable. This allowed the banks to set up in a state where the interest rates were highest, this way they could charge higher interest rates irrespective of the location of the borrower/ cost of living of the borrower's state. Soon, most of the banks relocated their operations to the states with laws having maximum rates in the favor of the banks. ruled that the bank's home state law applied, allowing national banks to effectively export the maximum interest rate regulations from one state to their operations nationwide.

This background shows how these small mutations/ reforms can impact the financial market evolution significantly The history of usury ceilings demonstrates how small reforms can end up producing much larger transformations. The actions of a few small states effectively changed the regulatory framework of the entire nation.

Boycotting interest rate caps

The Great Recession of 1929 caused changes in a lot of financial regulation, specifically interest rate regulations. Financial intermediaries were prohibited from charging a maximum rate of interest on different deposit accounts. There was a new Regulation Q set under the Banking Act of 1933. This Regulation required banks to cap interest rate on savings accounts at 5.25 percent, and time deposits were between 5.75 and 7.75 percent, depending on maturity. Checking accounts were made zero interest rate accounts. The rationale behind this regulation was intended to ward off outrageous rate wars. However, this regulation exempted mortgage lending intermediaries. Several cooperative banking models similar to thrift institutions were exempted too, to offer deposit accounts at interest

rates a quarter-percent higher than banks. This was done to encourage mortgage lending within local communities[7].

Despite this new regulation of 1933, interest rates rose above the restrictions mentioned by the banking act when America was hit by inflation in the 1970s. These restrictions were good enough to be working had the inflation been around three to four percent. Unfortunately, in the 1970's the inflation rose to two digits around ten to eleven percent. Due to this, a lot of investors were now looking around for different instruments to put their money into. Commercial papers gained popularity. Investors were lending directly to the company in need of money without the interference of these banks who acted as broker/agent. To profit from this, financial institutions engineered money market mutual funds that collected funds from small investors to buy these commercial paper. These money market funds operated without reserve requirements or restrictions on rates of return, which caused them to rapidly become popular among small investors who shifted their money out of the regulated accounts in depository institutions, which paid considerably lower interest rates.

In the early 1980's there was another regulation that was enacted by Congress called Garn-St. Germain Act to promote the thrift industry. This Act allowed them to provide commercial loans up to ten percent of assets and create a new account in this process to fight against money market mutual funds. The main intention of this Act was to give an advantage to the thrift industry specifically, however, it also led to various firms taking up new risks in the financial markets. Finally, this led to the deregulation indicators that were primarily enacted to protect the depository institutions, specifically the thrift industry, but it also changed the entire composition of the financial market. The

[7] Beebe, Jack, "Deposit Deregulation," Federal Reserve Bank of San Francisco, April 10, 1981. http://www.frbsf.org/publications/economics/letter/1981/el81-15.pdf

"Depository Institutions Deregulation and Monetary Control Act" removed interest rate ceilings on deposits, which removed the interest rate advantage that thrifts had held over banks.

In the mid-1980s, when Congress passed the Tax Reform Act, real estate investments were no longer attracting investors. These became popular initially because of the tax benefits the government gave on investments in real estate. But due to the tax cuts all these benefits were taken away and the deposits from thrift institutions moved to other lucrative investments. "The total thrift industry declined from 3,234 to 1,645 institutions, a decrease of almost 50 percent. The savings and loan crisis was estimated to cost taxpayers around $210 billion, with the thrift industry itself providing another $50 billion"[8].

The main cause of the savings and loan crisis was the inappropriate public policy. These reforms in the financial markets changed the intention of the thrift industry. There were multiple control frauds at these institutions as most of them were run by corrupt CEOs. "Institutions entered markets in which they had little experience, and a vulnerable industry expanded beyond the reach of its federal safety net".

Repealing Glass Steagall

The Glass-Steagall Act established in 1933 had created a wall between commercial and investment banking in the banking world. This Act did not allow institutions that were lending /

[8] Curry, Timothy and Lynn Shibut, "The Cost of the Savings and Loan Crisis: Truth and Consequences," December
2000. http://www.fdic.gov/bank/analytical/banking/2000dec/brv13n2_2.pdf

accepting deposits to engage in any kind of underwriting activities or dealing in securities and vice versa. The Bank Holding Act of 1956 created this separation to bank holding companies. After the American economy was under the great depression, regulators wanted to review the way the banks were doing businesses. They placed these restrictions to prevent conflicts of interest and immoderate risk-taking for both commercial banking and investment banking organizations. Glass-Steagall created a very efficient model of doing business reducing bank failures to a great extent till mid-twentieth century[9].

This also led to confusion with regard to complex instruments like money market mutual funds as bankers did not know whether they come under deposits or under securities dealing. Hence, banking industry pressured the regulators to repeal the Act as it did not keep the ever changing financial producst . Their main motive behind it was completely different though. Also, banks wanted to penetrate other instrument market like the municipal bond market to maintain their profits. Further, regulators were scared that more relaxed regulations in foreign countries would encourage firms to take their capital abroad.

Due to this, the Federal Reserve revisited the Glass-Steagall restrictions in 1986 and came up with a rule that a commercial bank can have upto five percent of their revenue from investment banking business. The Federal Reserve permitted these banks to deal in different kind of securities including commercial paper, municipal bonds, and mortgage-backed securities.

[9] Jackson, William D., "Glass-Steagall Act: Commercial vs. Investment Banking," Congressional Research Service, June 29, 1987. http://digital.library.unt.edu/govdocs/crs/permalink/meta-crs-9065:1

Later, in 1996, the Federal Reserve also permitted the holding companies of the bank to have twenty five percent of their revenue from investment activities like underwriting and dealing in securities. Now this decision rendered the entire Glass-Steagall ineffective as every bank came up with a method to do investment activity and remain under the twenty five percent level[10].

This led to the diversification in banking industry. Banking industry also moved towards consolidations. Fed in a way promoted this diversification by relaxing the rules. The banks were now so big that even the Board of Directors did not have complete oversight and control over its operations. Though this process was already underway, it increased significantly after the passage of the Riegle-Neal Interstate Banking and Branching Efficiency Act of 1994, which eliminated previous restrictions on interstate banking and branching.

An eminent example of consolidation came in April of 1998 when Travelers Insurance Group and Citicorp, the parent of Citibank, announced their plans to merge and form Citigroup, Inc. This deal was illegal due to the presence of Glass-Steagall Act but the then CEO knew that the deal will at minimum need two years to be fully executed and by that time Glass-Steagall Act would not be in force. They were so sure about this that they signed the deal. Citigroup became the world's largest financial services company, formed by the largest corporate merger in history, at that time.

Finally, in 1999, Glass-Steagall received a final blow in 1999 when Congress passed the Financial Modernization Act, also known as the Gramm-Leach-Bliley Act. This basically put an end to all restrictions that were imposed on banks to have investment, banking and insurance operations

[10] PBS Frontline, "The Long Demise of Glass-Steagall," The Wall Street Fix, May 8, 2003. http://www.pbs.org/wgbh/pages/frontline/shows/wallstreet/weill/demise.html

together. This was a result of decades of pressure and millions of dollars spent by the large banks with the intent to escape these regulations. This freed the finance industry and regulators lost their power in having a say over the structure of these banks. This evolutionarise the entire finance industry. “The repeal of Glass-Steagall was a monumental piece of deregulation, but in many ways it highlighted the status quo of the time”[11].

Financial innovation

A lot of people were of the opinion that there was a long time unavoidable need for consolidation in the banking sector. When this happened it led to the much awaited financial modernization but it came with multiple challenges under banking sector supervision. Different operations such as insurance, securities and banking were all put under one organization. However, to regulate this, regulators from various agencies were held accountable for inspecting various sections of the same institution. Such a plan could be complicated and unproductive as regulators struggled to keep up with the speed when innovations were happening all over in the financial markets.

The instant rise of new kinds of derivative instruments created difficulty for regulators. Derivatives are financial instruments that derive their value on their claim to another asset, such as an option to purchase commodities such as wheat or oil. This can be used as a barrier against risk and safeguard against a diminishing value of the underlying asset. A variety of derivative instruments were created by the financial industry in the 90s of which many were not controlled. Majority of these were also used for the purpose of speculation. The credit default swaps, a form of bond insurance in which the

[11] Barth, James R., R. Dan Brumbaugh Jr. and James A. Wilcox, “The Repeal of Glass-Steagall and the Advent of Broad
Banking,” Journal of Economic Perspectives, vol. 14, no. 2, Spring 2000.
http://www.business.auburn.edu/~barthjr/papers/The%20Repeal%20of%20Glass-Steagall.pdf

issuer would incur the cost for the defaulted bond, was the most significant derivative developed. In many of the new derivative instruments there was no compensation for trades unlike options, bonds and stocks. Complex derivative trades could become the center of debates by financial professionals due to their unreliability and no transparency[12].

Derivative trading grew rapidly, surging from a total face value of $106 trillion in 2001, to a value of $531 trillion in 2008. No one was aware of their indebtedness to the other party. No one knew exactly the composition of these instruments too. Even during this time, the regulators trusted the self regulating mechanism, and believed the investment banks to follow them by book to disclose and avoid possible risks.[14]

Large banks like Bank of America, Goldman Sacks, etc wanted easing of capital adequacy in 2004 that would permit them to own few reserves and add more debt to their balance sheets. The SEC granted an ease in the net capital rule. The brokerage firms were no more mandated by SEC to submit reports about their assets and operations. They would voluntarily submit reports and the system of voluntary regulation relied on the internal value-at-risk (VaR) computer models of these firms, essentially outsourcing the job of monitoring risk to the firms themselves[13].

This set the backdrop for the Financial Crisis 2007-2009. This history of continuous deregulation caused financial institutions to be consumed in 'innovations' and delude themselves that they were

[12] Tijoe, Lily, "Credit Derivatives: Regulatory Challenges in an Exploding Industry," Boston University Law School, April 2007.
http://www.bu.edu/law/central/jd/organizations/journals/banking/archives/documents/vloume26/tijoe.pdf

[13] Labaton, Stephen, "Agency's '04 Rule Let Banks Pile Up New Debt," New York Times, October 3, 2008.
http://www.nytimes.com/2008/10/03/business/03sec.html.

individually solvent and liquid despite this being impossible in the aggregate, which led to the biggest financial crisis of all times.

Chapter 2: Financial innovation promoted by excessive deregulation

"I wish somebody would give me some shred of evidence linking financial innovation with a benefit to the economy."

–Paul Volcker, former Chairman of the Federal Reserve[14]

The financial crisis would have been avoided ,or atleast would have been much less grave, despite the deregulatory environment, had it not been for the second cause—excessive financial innovation, or financial engineering. Indeed, this phenomenon contributed to the excessive leverage and proliferation of shadow bank asset-backed securities that ultimately led to the subprime crisis.

1. **Low interest rates:**

The Fed did not want a crisis after the stock market collapse of the 1990s or after the internet boom, hence, it began to cut interest rates and continued to hold them at record low numbers. Due to this, financial firms were now borrowing at a very cheap rate which if directed properly would have transmitted into productive capital investment but it did not.

Instead this decision to have lowest possible interest rates fueled mortgage lending and it led to growth of the credit industry and real estate industry. This further led the financial institutions to promote aggressive credit lending and this resulted in the creation of highly opaque financial instruments through shadow banks and off-balance sheet entities named Special Purpose Vehicles

[14] Quoted in "Paul Volcker: Think More Boldly," The Wall Street Journal, December 14, 2009, p. R7.

(SPVs). Hence, while low interest rates promoted economic activity, reduced the unemployment rate, and did not incite excessive commodity inflation, it nonetheless made regulators miss how these low interest rates cause asset price and real estate inflation rather than the more conventional goods-and-services inflation as reflected by the CPI.

2. **Non-regulating the leverage:** For almost 25 years upto 2003, the US Securities and Exchange Commission (SEC) had a cap on investment bank leverage which was 12 times of their capital. However, the SEC came under pressure from the Treasury Secretary who was also Goldma Sachs Chairman (Henry paulson) to increase the leverage ratio by almost 40 times. Over and above this, the compliance to this rule was made voluntary.[15] In 2004, due to pressure from Goldman Sachs Chairman and later Treasury Secretary Henry Paulson, the SEC raised the acceptable leverage ratio to forty times an institution's capital and made compliance voluntary. This obviously meant that the large investment banks could do whatever they wanted to where the SEC had no power over them. This led to investment banks having asset to equity ratios in the upper thirties. Also there was only supported by overnight repos, short term loans, money that could disappear at a smallest dent in the financial markets.[16]. Rising leverage was also promoted in a way by easy monetary policies by the Fed.

Leverage rates were so high that any small decrease in the asset prices would lead to something very similar to the Great Recession. The financial institutions other than the commercial banks looked adequately capitalized but this was because the analysts were looking at only items on their balance

[15] Wall Street Watch 2009, pg 17

[16] Half of the spectacular rise in investment bank's return on equity in the four years leading up to the crisis was generated by higher leverage rather than smart investing, efficient innovation or even boom-induced capital gains on trading assets.

sheet while a major chunk of the risky assets were hidden through off-balance sheet vehicles. High leverage pushed the financial markets into a bubble way above the real economy.

Once the crisis was revealed, it was noted that both commercial and investment banks were in fact excessively leveraged. CitiBank and Bank of America had leverage ratios in the forties while a lot of European banks had similar leverage ratios before the crisis. “Many major banks, by the end of that year (2008) saw their equity evaporate and became insolvent. Only massive government bailouts kept these ‘zombie banks’ alive.”

3) Deregulating banks to measure their own risk: Due to lack of regulation, these financial intermediaries became so giantly compound that no one either from inside that is their employees, directors, etc could understand the level of risk they are undertaking nor participants outside the organization could comprehend the perils of it. The banks were later asked to calculate its capital requirements by calculating how much of their assets are risky. This method of calculating risk was based on past data which is also known as Value at Risk. Value at risk (VaR) is a tool that quantifies possible financial losses within a say portfolio or company over a specific time frame using confidence intervals. VaR modeling calculates the possibility as well as the probability for losses in a defined time period. This was basically conveyed by BIS (Bank for International settlement) who communicated this to the banks through their respective country’s central bank. This meant all the power lied with these banks themselves with regulators having no say in the most important aspect of banking regulations.

Banks were easily manipulating this measure for their own good. Banks would first take a time frame where they did not make losses or the losses of that period could not calculate or say estimate

the risk of current times appropriately. They would take periods of boom and that would significantly reduce their VaR measure of risk as during this time there were less write offs or defaults on unrecovered loans. Second they also had pushed the risky assets to off-balance sheet vehicle so the base for this calculation was also now a small number. This way, banks would get a number they want and justify the requirement of the little capital they had in their balance sheets and increase the leverage to a great extent.

4) Originate to Hold versus Originate to Distribute

In earlier periods in the banking evolution, financial intermediaries were simply portfolio lenders, the same bank that gave you a loan would hold that asset in its books until it's repaid. There was no transfer of these assets. However, in current times, due to collateralisation, multiple assets were put together and packed into different and complex securities. Many banks thus did not even care to check the credit worthiness of the borrowers as they would ultimately pass on the risk by packing all these subprime loans and selling these to the investors. These banks were converting these illiquid assets and profitable securities by just repacking them.

"The first securitized assets, mortgage loans, were packaged into mortgage-backed securities in 1970 at the Government National Mortgage Association (Ginnie Mae). The Federal Home Loan Mortgage Corporation (Freddie Mac) and the Federal National Mortgage Association (Fannie Mae) soon followed suit in the nationwide push to foster homeownership; these government-sponsored agencies (GSEs) bought up mortgage loans to facilitate a secondary market. These securities carried

an implicit guarantee from the government, and they were required to conform to underwriting standards that ensured loan quality and limited risk" [17].

The Evolution of the mortgage market began in the early 1980s. The Alternative Mortgage Transactions Parity Act of 1982 put an end on restrictions against classes of mortgage loans with exotic features, such as adjustable-rate and interest-only mortgages. These loans carried low "teaser" rates in initial years and after that interest rates automatically reset at much higher levels[18].

A lot of times borrowers did not really comprehend the complex financial arrangements they entered into. These lenders picked out specifically lower income groups with low credit scores which made them high risk borrowers. They took a pool of home loans and segregated the payments made by homeowners into different pieces called "tranches." The buyer of the bottom most layer/ tranche is the riskiest one and is the first one to get affected in case of default. Obviously they are paid higher interest rates. The owner of the second layer takes the second hit once the bottom most layer is fully affected and gets the next highest interest rate, and so on. The investor in the upper most tranche had a low interest rate but also a very high assurance that his investment wouldn't end before he was ready. This business of securitising and repacking the mortgaged based securities became very profitable. These bankers were now making money out of thin air. They gave mortgage loans to immigrants, housekeeping staff, with no credit default history. The Wall Street Journal reported the surprising fact

[17]Ashcraft, Adam B. and Til Schuermann, "Understanding the Securitization of Subprime Mortgage Credit," Federal Reserve Bank of New York, staff report no. 318, March 2008

[18] Birger, Jon, "How Congress Helped Create the Subprime Mess," Fortune, January 31, 2008. http://money.cnn.com/2008/01/30/real_estate/congress_subprime.fortune/.

that in 2006, sixty-one percent of subprime borrowers had credit scores high enough to qualify them for conventional mortgages[19].

All these changes in the mortgage industry triggered huge investment in unconventional securities. In 2001, there were twice as many agency-conforming loans as there were non-conforming ones. In the later part of 2006, the size of the subprime borrowers crossed the volume of the conforming borrowers in the mortgage market. This was further accelerated by interest rate reductions by the Federal Reserve.[20]

It is important to know the timing of these events. Through the 2004's, the Fed continued to hold lower interest rates as a precautionary measure after the tech bubble burst. It maintained the lowest possible rates in America's history. The loose monetary policy, along with unconventional ways of mortgage lending and securitised trading inflated the housing bubble that had begun in late 1990's. In earlier years, house price increases, it increased way above the inflation, almost more by 70% . In some regions, the housing prices increased more than 150% of their historic prices.[21].

"The issuance of private-label, subprime, and Alt-A residential mortgage backed securities (RMBSs) increased from $98 billion in 2001 to almost $814 billion by 2006 (Ashcraft and Schuermann, 2008)". Excessive financial engineering through the use of MBS, collateralized debt

[19] Brooks, Rick and Ruth Simon, "Subprime Debacle Traps Even Very Credit-Worthy," Wall Street Journal, December 3, 2007. http://online.wsj.com/article/SB119662974358911035.html.

[20] Ashcraft, Adam B. and Til Schuermann, "Understanding the Securitization of Subprime Mortgage Credit," Federal Reserve Bank of New York, staff report no. 318, March 2008. http://www.newyorkfed.org/research/staff_reports/sr318.pdf

[21] Baker, Dean, "The Housing Bubble Fact Sheet," CEPR Issue Brief, July 2005. http://www.cepr.net/documents/publications/housing_fact_2005_07.pdf.

obligations (CDOs) and credit default swaps (CDS), significantly increased the risk tolerance of investors as these instruments were so complex no one really understood the composition of it. Financial innovation in securitization markets, especially the use of increased risk tolerance of investors in mortgage-related securities. CDO was a collection of riskiest tranches of MBS and they managed to get these bonds re-rated as AAA. All the trashy layers whose ratings were below AAA were again sliced and put with other MBS and these were allotted AAA ratings. I liked the comparison done by another author for this - he says "CDOs, RMBS bonds—particularly those with less than AAA ratings—were pooled with other RMBS bonds. In this way, the "sow's ears" of lower-grade RMBS bonds were transformed into what were thought to be "silk purses," in the form of higher-rated CDO bonds." Credit default Swaps were in essence insurance contracts available over the counter and hence not regulated. These were used to hedge the investments in MBS and CDOs that way investors would freely invest in such securities without much ado as these were insured. Another fact to be noted was that the credit agencies could also not measure the risk of these securities accurately. From an insider point of view also mentioned in the Big Short: none of these credit analysts knew what went inside these securities, why they were rating some of them AAA and others BBB. Most of them thought that MBS, CDOs had only 10-20% of subprime elements in it, nobody knew it topped 90%.

The mortgage lenders knew there was enormous opportunity for profit making considering the house prices were at their peak, so they found innovative ways to make money out of it. All these MBS, CDP's were labeled as safe because of the ratings they were getting but were composed of loans given to non-confirming borrowers. At the same time, in terms of regulation, government regulators took a hands-off approach to the activities of private actors. Hence, this decentralized, non-regulated

system was highly vulnerable to even the slightest of shocks, and the inevitable collapse had ramifications for the broader economy.

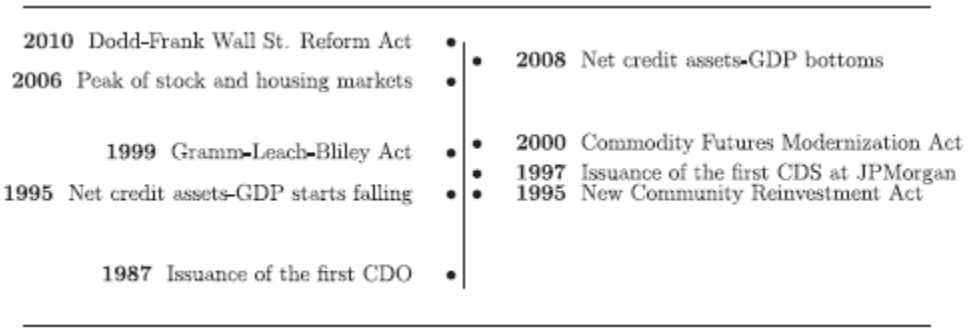

Fig. 2. Timeline of events during the run-up to the U.S. credit crisis.

As depicted by the figure above[22] , the boom in the US credit market can be matched to the timings of innovation in the financial market. Financial intermediaries created new financial instruments that securitized the payment streams generated by a wide variety of assets, particularly home mortgages, and by far-reaching reforms that radically changed financial regulations. You might think collateralized debt obligations (CDO's) were introduced in the early 2000's while its slow evolution dates back to the early 1980s. The collateralization of debts , securitisation of housing loans started around the mid 1990's with the introduction of residential mortgage backed securities (RMBSs) and collateralized mortgage obligations (CMOs). The use of these instruments became hugely popular when Credit default Swaps were created on the payments of mortgage backed securities . By the end of 2007, the market of CDSs alone was worth about $45 trillion (or 3 times

[22] Journal of Monetary Economics, Financial Innovation,the discovery of risk, and theU.S.credit crisis- Emine Boz a,n, EnriqueG.Mendoza b,c

U.S. GDP). The financial reforms introduced in the 1990s were the most significant since the Great Depression, and in fact aimed at removing the barriers separating bank and non-bank financial intermediaries set in the 1933 Glass–Steagall Banking Act.

These three Acts were particularly important for the housing boom: The 1995 New Community Reinvestment Act, which strengthened the role of Fannie Mae and Freddie Mac in mortgage markets and facilitated mortgage securitization; the 1999 Gramm–Leach–Bliley Act, which removed prohibition bank holding companies from owning other financial companies; and the 2000 Commodity Futures Modernization Act, which left over-the-counter financial derivatives beyond the reach of regulators.

Counter-argument

There is a counter-intuitive argument that over-regulation, rather than under-regulation, caused the crisis. This is typically made by those who wish to revert to a Gold Standard, such as Congressman Ron Paul, who blames the Fed for the financial crisis[23].

Many blame the 2001 banking regulation which promoted loading of toxic securities like Mortgage Backed Securities and Collateral Debt Obligations on bank's balance sheets. If the banks wanted profitable instruments then they could have invested in double A or lower rated bonds, if they wanted riskless profits - they could have bought Treasury bonds which are considered safe around the world. However, they ended up creating, promoting and investing in these complex mortgage bonds. The critics who have this view that regulators caused the financial crisis place blame on a strange rule

[23] https://www.wsj.com/articles/SB10001424052970204346104576637290931614006

introduced by the Fed along with FDIC called "Recourse Rule"[24]. These banks lent money irrespective of the credit score of the borrowers as these were anyway to be securitised and repacked and passed on to the bigger investors who would purchase all the MBS, CDOs created by these banks. Banks also purchased back these securities to free up sixty percent of the capital they would have had to hold against individual mortgages. Capital held by a bank is capital not lent out at interest; by reducing their capital holdings, banks could increase their profitability.

Another point to support this argument is that the Fed developed a program "housing for all" which led to excessive lending, basically lending to those who could not afford to buy houses. This incentive along with low interest rates maintained by Fed was enough to push the lenders to lend money to non conforming borrowers. It is also argued that the Community Reinvestment Act pushed the financial intermediaries to lend housing loans even when the creditworthiness could not be proved to grant loans to low-income borrowers who should not have been given a loan under "normal" conditions. In this view, the community reinvestment movement pushed the regulators to push the lenders to relax lending standards[25].

The best example to support my argument (deregulation caused the crisis) and to counter the opposing view can be found in the work of University of Texas economics professor Stan Liebowitz. In an article in the New York Post, he explains how "the greatest scandal of the mortgage crisis is that it is a direct result of an intentional loosening of underwriting standards—done in the name of ending discrimination, despite warnings that it could lead to wide-scale defaults" (Liebowitz, 2008). He

[24] https://www.theatlantic.com/business/archive/2009/09/did-regulation-cause-the-financial-crisis/26880/
[25] Galloway, and J. Olson (eds.), Revisiting the CRA: Perspectives on the Future of the Community Reinvestment Act, pp. 8–11. Boston and San Francisco: Federal Reserve Banks of Boston and San Francisco.

argues that “lenders did not come up with the idea of looser underwriting standards on their own. Also, the CRA did not call for risky loans to subprime borrowers, but for fair loans to minority borrowers". The act did not intend for the banks to lend to anyone without seeing or evaluating their creditworthiness rather it wanted the credit opportunity should be made available justly to everyone.

A report from the Financial Crisis Inquiry Commission (“FCIC”) brought home how important it is for us to reexamine the role of business regulation. “The Financial Crisis was the tragic result of thirty years of deregulatory pressures in the financial sector. The FCIC quite rightly concluded that failures in financial regulation and supervision along with failures of corporate governance and risk management at major financial firms were prime causes of the financial crisis that engulfed this country in 2007 and 2008[26].”

As per the report issued by the FCIC documents, “Decades of deregulation and failure to regulate newly emerging financial markets, firms, and products led to a financial system that was extremely fragile and vulnerable to a full-blown crisis when the U.S. housing bubble collapsed.” As per their investigation they also found that the large banks, depository institutions spent a lot of effort, time and money to persuade the policy makers to relax these reluguations. Consequently, due to so much pressure from the financial sector, these breaches gaps came into the picture, a new era where these authorities ceded power and it sat in the hands of the banks working in their self interest. This

[26] FIN. CRISIS INQUIRY COMM’N, FINANCIAL CRISIS INQUIRY REPORT at xviii-xix (2011), available at http://fcic-static.law.stanford.edu/cdn_media/fcic-reports/fcic_final_report_full. pdf [hereinafter FCIC REPORT]. The FCIC was created by section 5 of the Fraud Enforcement and Recovery Act of 2009 and was directed “to examine the causes, domestic and global, of the current financial and economic crisis in the United States.” Pub. L. No. 111-21, § 5(a), 123 Stat. 1617, 1625 (2009). It issued the FCIC Report on January 27, 2011.

also resulted in the development of a shadow banking system, enormous trading of over-the-counter non-regulated derivatives.

Banking soon moved away from the traditional saving and lending market in the 1980s and 1990s to trading in complex highly illiquid Mortgage backed securities and collateralized debt obligations and regulators could not adapt to this newly advanced financial sector, constituting a form of “passive” deregulation (Immergluck, 2009). Securitization and vertical disintegration did not appear out of thin air. They were enabled by significant deregulation in mortgage markets dating back to the 1980s as well as laws that directly facilitated securitization (McCoy and Renuart, 2008).

Supervision and oversight activities were not sufficient, and intervention was avoided in the name of regulatory forbearance. No oversight over the high level of leverage of U.S. banks and financial institutions through the use of a remarkable increase of the innovative, complex and highly volatile financial engineering products such as securitizations and derivatives placed on external vehicles - SPVs together led to the biggest financial crisis of all times.

Chapter Three: Policy Responses

The financial sector has produced large economic efficiencies because financial institutions, which play a unique role in the economy, act as intermediaries between parties that need to borrow and parties willing to lend or invest. Without such intermediation, it is difficult for companies to conduct business. Thus, systemic risk can be thought of as widespread failures of financial institutions or freezing up of capital markets that can substantially reduce the supply of capital to the real economy. The U.S. experienced this type of systemic failure during 2007-2008. The Policy responses have been divided in three different phases.

Phase I: August 2007 to March 2008: Challenging but Manageable

Conditions in Phase I were generally viewed in real time as being characterized by economic weakness led by an adjustment in housing, exacerbated and spread by increasing incidence and severity of strains in financial markets, as many mortgage lenders failed and a few larger financial institutions heavily exposed to mortgages faced difficulties. Policy actions in this phase were consistent with the view that the drag from the financial sector would lead to a weak economy but not pose a significant risk of sparking a systemic crisis.

Policy responses could be divided into two parts, one traditional fiscal measures and two, monetary measures to support growth and credit in the face of an economic slowdown. These policy responses were the extended version of the discount window which provided term funding rather than only overnight, and provided credit through auctions which helped in avoiding the scar linked with use of the discount window. The objective was to a) restore the financial system, b) support financial intermediaries c) and ease the credit flow impacted due to the crisis.

The Fed started with making interest rate cuts from 5.25 percent before September 18, 2007, to 3 percent by January 30, 2008. This reduction was significant both in terms of the cut made by Fed ever and also because of being done outside of a regularly scheduled FOMC meeting. [27]

After that, fiscal stimulus was brought into the picture through the Economic Stimulus Act (ESA) enacted in January 2008. This provided $100 billion in the form of tax rebate to households, this was done to bring back the consumption expenditure to the normal level. The Stimulus Act also incentivised households to do investment activities. This stimulus package was supposed to be "temporary, targeted, timely"—focussing and supporting near-term activity. This call was ine line with the expectations of the regulators which believed the crisis to be temporary. This stimulus specifically targeted lower income families who had a very high MPC. Research suggests that this had a positive impact on consumption expenditure and GDP (Parker, Souleles, Johnson and McClelland (2013), and Broda and Parker (2014)), though Ramey (2018) sees the estimated impact as overstated.[28]

In December 2007, the Fed launched the Term Auction Facility (TAF). It was meant to provide long term funding for investment banks through quantitative easing with an arrangement to receive funds in installments.[29] TAF attained its objective in easing up credit in the interbank market. It also helped in reducing the Libor-OIS spread associated with TAF[30].

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[27] Reinhart, Carmen M. and Kenneth S. Rogoff. "Recovery from financial crises: Evidence from 100 episodes," American Economic Review 104.5 (2014): pp. 50-55.
[28] Claessens, Stijn, M. Ayhan Kose and Marco Terrones, (2013), "The Global Financial Crisis: How Similar? How Different? How Costly?" in Financial Crises: Causes, Consequences, and Policy Responses, editors Claessens, Stijn, M. Ayhan Kose, Luc Laeven, Fabian Valencia, International Monetary Fund
[29] Ashcraft, Adam B., Allan M. Malz and Zoltan Pozsar. "The Federal Reserve's Term Asset-Backed Securities Loan Facility," Economic Policy Review Nov (2012): pp. 29-66.
[30] As per research as by McAndrews, Sarkar and Wang (2017).

In order to help the banks outside the US in need of USD, the Fed introduced currency swap lines with central banks of other countries including the European Central Bank (ECB) and the National Bank of Switzerland. The Fed would lend to these banks on security and these central banks in turn would provide liquidity in terms of dollars to the foreign banks[31]. Research such as Baba and Packer (2009) found that"

> *"the swap lines ameliorated foreign exchange dislocations that manifested as wider interest rate spreads between loans to European banks and U.S. Treasury securities. These strains reflected doubts about the safety of European banks that made U.S. institutions less willing to lend to those in Europe"*

Both these measures were targeted to bring in liquidity ease for depository institutions. This reduced the interest rate and was expected to transmit the benefit of lower rates to the economy as a whole.

Additionally, Treasury, banking agencies and other agencies including Housing and Urban Development (HUD) together formed a coalition called "Hope Now" coalition to promote mortgage agreements alterations. They wanted the lenders to freeze interest rate resets for 1.8 million subprime borrowers whose loans would automatically adjust to a higher interest rate after a low teaser interest rate in initial periods.

The policy responses in Phase 1 were significant but could provide only limited support as the financial and economical conditions of the country were deteriorating to a greater extent when compared to the support provided.

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[31] Aizenman, Joshua and Gurnain Pasricha (2010). "Selective Swap Arrangements and the Global Financial Crisis: Analysis and Interpretation," International Review of Economics and Finance, Vol. 19, 3, pp. 353-365.

Phase II: March 2008 to September 2008: Collapse of GSE's, deeper concerns over uncertainty

What separates this phase from the first one is that in this phase, there was the collapse of various financial intermediaries and the Fed and the market participants now understood the far reaching impact of the crisis. The US was now in recession, however the quarter one of 2008 was not very deeply affected, in fact it sent mixed signals of economic recovery when quarter two growth was positive. Monetary policy during this time reduced the interest rate further by 75 basis points immediately after the fall of Bear Stearns. Later in April, it was further reduced by 25 basis points. The Economic Stimulus Act was also put on hold in regards to payment of tax rebates as only a slight reduction was noted in terms of GDP.[32].

In contrast to above, systemic policies were in full swing. After the collapse of Bear Stearns, the Fed used its emergency power to bring new liquidity facilities and funding to stabilize Bear Stearns. In September, Fannie Mae and Freddie Mac were placed into conservatorship. The Treasury increased its initial pledge of taxpayer capital by another $200 billion totalling now to $400 billion. The Fed actions for saving these two were mainly to ensure that mortgage credit would be made available to genuine/ creditworthy borrowers even during the crisis[33]. The Fed also introduced the Term Securities Lending Facility (TSLF) which allowed dealers to trade their worthless illiquid assets

[32] Ashcraft, Adam, Nicolae Garleanu and Lasse Heje Pedersen. "Two monetary tools: Interest rates and haircuts," NBER Macroeconomics Annual 25.1 (2011): pp. 143-180

[33] Allen, William and Richhild Mossner (2010). "Central Bank Cooperation and International Liquidity in the Financial Crisis of 2008-09," BIS Working Papers, No. 310, May.

for Treasury securities. Further, Fed also came up with Primary Dealer Credit Facility (PDCF), in which the Fed lent to primary dealers against collateral[34].

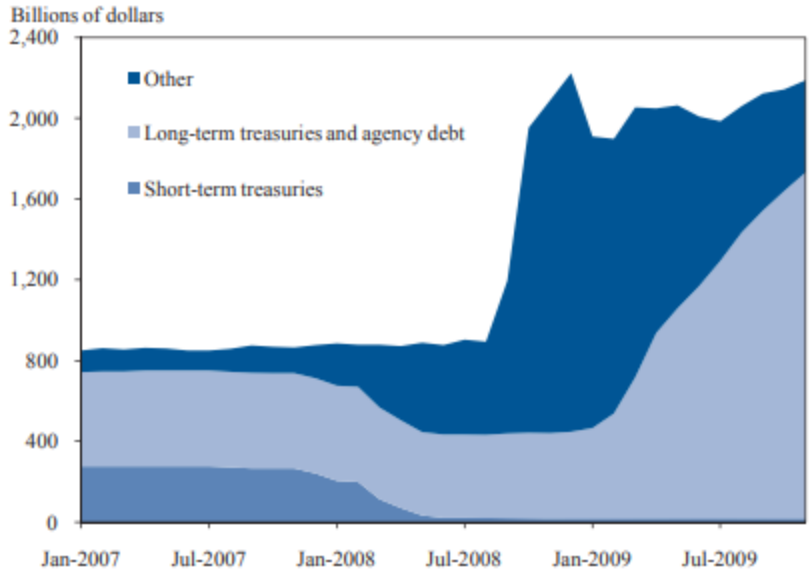
While the policy actions taken during Phase II were effective at alleviating certain areas of acute strain, the broader environment continued to deteriorate. The continued decline of the economy meant expected losses at financial firms were also continuing to increase.

Phase III: October 2008 to December 2009: Panic and then rebound

The bankruptcy of Lehman Brothers and fall of American Insurance Group led to collapse of financial markets and consumer confidence plummeted. There was panic everywhere and market participants now believed that the world was going into depression. The federal funds rate was effectively reduced to zero and now there the Fed moved to using other unconventional methods to respond to the crisis. In March 2009, federal reserve announced plans for purchase of $300 billion debt, in addition to this, Fed also announced purchase of GSE's mortgage-backed securities upto 1.25 trillion. This led to enormous expansion of assets on the Fed's balance sheet. The below graph shows the change in the value and composition of Fed's Balance Sheet.

[34] Adrian, Tobias, Christopher R. Burke and James J. McAndrews. "The Federal Reserve's Primary Dealer Credit Facility," Current Issues in Economics and Finance 15. Aug (2009).

Figure 2-4
Assets on the Federal Reserve's Balance Sheet



Notes: Agency debt refers to obligations of Fannie Mae, Freddie Mac, and the Federal Home Loan Banks. Agency mortgage-backed securities are also included in this category.
Source: Federal Reserve Board, H.4.1 Table 1.

Then came the news of Lehman Brothers. Lehman was unanimously considered the weakest of all and investors have been significantly reducing their stake in it. Even still, its bankruptcy announcement triggered events that were quite disruptive. To address this, many responses were initiated by the Fed.

The policy responses taken by Fed during this period included a) Announcement of TARP b) Enactment of the American Recovery and Reinvestment Act (ARRA).

On October 3, Congress passed the Emergency Economic Stabilization Act of 2008. This Act provided up to $700 billion for the Troubled Asset Relief Program (TARP) for the purchase of distressed assets and for capital injections into financial institutions.[35] TARP added the ability to purchase assets from financial institutions. This provided a means to address questions around the

[35] Economic Advisory Council Annual Report 2010

capital adequacy of these intermediaries. “The use of these tools aimed at restoring creditor confidence along with investor’s about the capital adequacy of these institutions.[36]

The Fed expanded its lending activities by providing liquidity to new types of firms including insurance companies, to new central bank counterparties through the currency swap lines, and to new markets. Another element of their response was the Consumer and Business Lending Initiative, which was aimed at maintaining the flow of credit. In addition to this, it came up with various other ways to induce liquidity including the commercial paper market, with the Asset-Backed Commercial Paper Money Market Fund Liquidity Facility (AMLF) and the Commercial Paper Funding Facility (CPFF), and later the asset-backed securities markets, with the Term Asset-Backed Securities Loan Facility (TALF). The Federal Reserve had created the Term Asset-Backed Securities Loan Facility to fight the significant reduction in securitized lending. The Treasury also increased its commitment to $100 billion to leverage up to $1 trillion of lending for businesses and households. It promoted securitisation to free up the credit lines and lower the interest rates on non commercial loans including student loans, auto loans, credit card loans. The Bush administration also set up an auto financing program with TARP to help GM and Chrysle. This program extended $25 billion in funding to the two companies[37].

Due to the panic by market participants, the economy was crashing sharply with GDP declining by 8.4 percent in the quarter four quarter. This indicated that there might be further decline in both the financial and housing market. Level of stress remained at peak heights even after the initial panic triggered by Lehman’s failure.

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[36] Calomiris, Charles W. and Urooj Khan. “An assessment of TARP assistance to financial institutions,” Journal of Economic Perspectives 29.2 (2015): pp. 53-80.

[37] Economic Advisory Council Annual Report 2010

There were a few investment banks that helped themselves by raising capital on their own either from domestic or foreign market and some others were acquired by bigger institutions (the acquisition of Merrill Lynch by Bank of America), the Treasury also injected $205 billion into 707 financial institutions across 48 states, starting with capital injections in the nine largest financial institutions on October 13, 2008, Columbus Day[38].

The Fed took more responses. The government implemented a program to prevent Citi from destabilizing. It joined hands with the Treasury (using TARP), the FDIC (invoking its systemic risk exemption authority) and the Fed who came together spinning off the troubled MBS and CDS into a separate subsidiary. Returns on MBS fell substantially when compared as the spread of Treasury yields decreased providing support to the house-mortgage market[39].

All these measures strengthened the financial system even when the economy remained weak. The GDP was declining by 4.5% in Q1 in 2009 with no significant improvements in the next one. These concerns raised further in February and March as market participants did not have clarity about a new Financial Stability Plan announced by the new administration on February 10, 2009[40].

These concerns in this period came from general instability and speculations that hinted at nationalization of the large banks. Even after the release of stress test results, May 2009 quantified the expected loss of the biggest banks in the US. It suggested they increase their capital requirements

[38] Del Negro, Marco, Gauti Eggertsson, Andrea Ferrero and Nobuhiro Kiyotaki. 2017. "The Great Escape? A Quantitative Evaluation of the Fed's Liquidity Facilities," American Economic Review, Vol. 107(3), pp. 824-857, March.
[39] Blinder, Alan and Mark Zandi (2010). "How the Great Recession was brought to an End," Moody's Corporation.
[40] World Bank Data

instead of being cautious about lending. TALF and the Public-Private Investment Program (PPIP) helped to restart the securitization markets with a combination of private and government capital, working to boost asset prices. The recession ended in June 2009; GDP growth became positive in the next quarter.

The final stride by the government as a policy response to the crisis was the announcement of the American Recovery and Reinvestment Act of 2009 (ARRA). This plan came with a package of $787 billion, the largest countercyclical fiscal action in American history. ARRA provided tax cuts, government spending for about 2% of GDP of 2010. This final package was very well diversified. One-third took the form of tax cuts. Taxes for a family were reduced by $800 for both 2009 and 2010. It also provided a one time payment of 250$ to senior citizens and people with disabilities. Companies received significant tax cuts as well. The fiscal stimulus was cut down and then completely removed after the GDP stabilized in early 2011[41]. Research surveyed by Ramey (2018) finds that:

> *"The fiscal stimulus was effective in supporting output, even while concluding that many of the research papers to date overstate the fiscal multiplier. Fiscal policy was effective with monetary policy at the zero lower bound. Without the extraordinary liquidity facilities, the decline in GDP would have been around 30 percent larger than it was during the crisis and the decline in inflation even larger."*

[41] Annual reports of Economic council of advisors 2011

Conclusion

In this paper, we consider how financial regulation and supervision have failed to understand/manage the financial engineering products during/before the global financial crisis initially and later how improved response / intervention from the regulators helped stabilize the economy. We can see from all the activities that led upto the crisis that the financial system, the market participants were completely unaware of the forthcoming crisis. They were not prepared for the shock that caused failures of the entire economy. An undue reliance on market discipline had left the largest financial firms undercapitalized, and this was exacerbated by a failure of the regulators who gave in to pressure of the large banks and did not arrange for financial stability.

Since the crisis, major steps toward financial stability have been achieved by the government. The largest US dealer banks are all now under the supervision of the Federal Reserve. Their capital requirement, risk assets computation and liquidity has been now tied up very stringent banking and SEC regulations. SEC has also come up with mandatory disclosures requirements with regards to composition of a bank's balance sheet, disclosure about the compliance of the banking regulations followed by these institutions. Lot of weaknesses in financial infrastructure and varios unsafe practices in the markets for securities financing and derivatives have been strengthened. "New failure resolution methods now prevent derivatives and other critical financial contracts from suddenly terminating at insolvency. As a result, general creditors to these firms no longer presume that they will be bailed out. This has led to much higher costs of debt financing for these firms, which has discouraged their leverage and has knocked down the rapid pre-crisis growth of their balance sheets.[42]". Regulations have forced the majority of derivatives risk into these clearinghouses, which are the new "too big to

[42] Economic council of Advisors annual report 2010

fail" financial firms. Some may think with passage of time will lower the vigilance mechanism and regulators will monitor the excessive risk taking as closing as they are monitoring now, however its been 15 years now since the crisis and government has not lowered its radar, its still keeping an eye over the operations and activities of these large institutions and have not relaxed any of those regulation which they think might create a turmoil. There might be need for reinforcing surveillance when the financial engineering outruns the regulations in place to prevent a crisis. I still continue to wonder if the crisis could have been avoided had the government acted early and enacted all these policies by 2006-2007?

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