

The Global Financial Crisis and Its Aftermath

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Abstract. This review of the 2008 financial crisis discusses the triggers of the crisis, the direct consequences, and the policy responses to the crisis. Pre-crisis condition is analyzed in linear time order: the Federal monetary policy, with the motivation to stimulate the economy, set loose lending criteria and facilitated the increase of subprime mortgages. Based on the subprime mortgage, credit default swaps (CDS) emerged as a new derivative of arbitrage and speculation without adequate regulation. Rather than its original use of risk diversification and transfer, such expansion of CDS eventually led to contagion, dragging the whole market into crisis. Direct consequences include mass unemployment, reduction in corporate investment, and bankruptcy of giant banks such as Lehman Brothers. A series of policies were released to suppress the contagion of the crisis and help the economy recover, among which the Dodd-Frank Act and Basel III serve as necessary regulations. The government had interfered with the housing market, which suffered from the burst bubble; bank regulators had re-examined the rules, adjusting the fraction of capital reserves required for banks.

Keywords: Financial crisis; securitization; subprime mortgage; response.

1. Introduction

In 2022, Ben S. Bernanke, Douglas W. Diamond, and Philip H. Dybvig were rewarded with The Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel "for research on banks and financial crises" [1]. In their foundational research of modern banking, Bernanke et al. examine the bank's role in the economy and explain why avoiding bank collapse is vital. Notably, they examine the close relationship between bank collapse and financial crisis in the case of the Great Depression in the 1930s, which is considered as one of the worst economic crises throughout history.

Financial crises are a cyclical phenomenon, the same as many other economic phenomena. Radke (2005, p. 1) refers to the financial crisis as a recurrent, cyclical phenomenon that is inseparably linked to business cycle fluctuation [2]. Though the frequency of those systemic crises has been somewhat irregular, such a cycle is frequently witnessed. The Great Depression in 1930 was followed by crises in the 1980-the 1990s, during which the second wave in developing countries and the third wave in developed countries occurred. Twenty years later, the 2008 financial crisis erupted in the U.S., dragging the international market into chaos.

Financial crises' cyclical pattern means that research on them would never have timeliness issues. In-depth research into those past cases can bring insight into identifying such patterns, enabling people to detect the approach of crises and respond to crises more effectively in the future. Still, financial crises' cyclical nature does not mean they are identical. Every crisis occurs in a unique environment, triggered by a unique factor. In other words, historical background, including political environment, military conflicts, and cultural conversations, should be considered preconditions of financial crises. In that case, a review of past crises has efficient significance for the age of 2020s. The current society struggles under the aftershock of the COVID-19 pandemic and the tension in the international situation ignited by the Russia-Ukraine conflict, both of which contribute to a more complex and pessimistic global economic condition. Baldwin and Mauro (2020) report a decrease of roughly 60% and 41% in global supply and demand after the outbreak of the COVID-19 pandemic [3]. Shahzad et al. (2023) discuss the impact of the Russia-Ukraine conflict on the precious metal market and describe an increase in the total connectedness index, reporting a close link between geopolitical conflicts and financial instability [4]. Thus, a better understanding of the financial crisis is necessary to prepare for the possible outcome of these issues. This report uses the 2008 financial

crisis as the subject to examine the causes and effects of financial crises, for this crisis is acknowledged as the most influential one and is the closest to the current environment.

The 2008 financial crisis began with the property-value bubble when the 4.2 billion existing home sales rate fell by 23.4% in January. In the following month, home sales fell even more, and the Fed decided to take action to prevent further recession. It lowered the fund rate twice in March and another in April, aiming to lower Libor and keep adjustable-rate mortgages affordable. Since March, the government has taken several actions to suppress the recession. The Fed and the Treasury played essential roles in it. However, the Fed remained the only bank that dared to loan in 2008, and many successful investment banks, such as Goldman Sachs and Morgan Stanley, turned to the government for protection. The real hit landed in September when Lehman Brothers declared bankruptcy. The government's inaction on this issue led to real panic in the global financial market, and controversies rose when Bank of America announced later that it would purchase Merrill Lynch. This report will discuss the preconditions of the 2008 financial crisis in the second section. It will then describe the direct effects of it and examine the policy response to the crisis.

2. Pre-crisis Conditions

From the macroscopic point of view, the 2008 financial crisis outbreak resulted from an overconfident economic environment. Under the Neoliberalism development pattern, the Fed had adopted policies of cheap credit and loose lending criteria since the 1980s. Such policies were initially set to stimulate economic increase, but instead, they intensified overconfidence. Consequently, the U.S. subprime crisis occurred. Subprime mortgages swelled due to the loose lending criteria, and investment banks bear many losses when many borrowers default. At that point, one reckless innovation of financial instrument, credit default swap (CDS), was invented from the subprime mortgages. This new financial instrument seemingly solved the problem of subprime mortgages for banks and lacked regulation. The efficiency is why the mass of CDS could reach enormous and eventually push the recession to a critical point.

2.1 The U.S. Mortgage Polices

It is commonly acknowledged that the real-estate bubble was the prelude to the crisis. Before that, a housing price boom was witnessed from 2000 to 2006. The annual increase of house prices in 2006 reached 10.6%, which means the house price in 2006 increased by 45£ every day on average. After peaking in 2006, however, housing prices started to decline sharply, and the housing price boom turned into a bubble. Two factors contributed to the property-value bubble: 1) the low-interest rate in 2002-2006; 2) loose lending criteria in the developing financial market [5]. Taylor (2010) attributes the house price boom and the subsequent financial crisis to the government policy, believing that the Fed should take primary responsibility [6].

The era from the mid-1980s to 2007 is known as the Great Moderation, during which the setting of policy is broadly consistent with the Taylor-type rule proposed by J.B. Taylor first in 1993. The Taylor-type rule requires the increase in federal funding rate to be more than that in inflation. Monetary policies that follow the Taylor rule should have reduced the market's instability. However, the long-term interest rates from 2003 to 2007 did not increase as much when the federal funding rate increased as would be expected based on experience during the Great Moderation. The low responsiveness could have led investors to falsely believe that there was a long-run change in the policy of long-term interest rates. The low-interest rate environment and derailed responsiveness created by such policies led to excessive investor optimism and eventually the housing price boom in 2006, which is closely related to the U.S. subprime crisis in 2007, a direct cause of the crisis and the subsequent recession.

2.2 Subprime Mortgage

A loan provided to potential borrowers with a bad credit history is referred to as a subprime mortgage. [7]. To compensate the lenders for the high risks they bear, subprime mortgage loans are usually adjustable rate mortgages (ARMs), whose interest rates could rise significantly over time. When lenders are insolvent, the bank must bear the loss of bad debt; when bad debt accumulates to a particular amount, it could lead to the investment bank's collapse. The uncertainty of asset valuation could also threaten the subprime mortgage-backed securities market, which was what happened in 2007.

Despite the risks, this fledgling market appeared attractive to investors who chase high-yield investment opportunities due to its high-interest rate. However, the increasingly lax lending standards at that time put the market on edge. Initial suppliers struggled to meet the booming demand and deal with the auditory workload, therefore lowering lending standards; the lax monetary policies, as mentioned, allowed such low-interest rates existed in the subprime mortgage market. The low lending standards fueled the growth of the market further. By 2006, the share of subprime mortgages had risen to more than 40% of the new mortgages from around 9% in 2000 [8].

Even though the subprime mortgage market remains a minor portion of the entire financial system, the interconnection of the financial system means that its crisis has a significant ripple effect. [9]. The subprime mortgage crisis triggered the liquidity crisis in 2007. On May 4th, the Guardian reports that UBS shut down its hedge fund, Dillon Read, after experiencing losses from speculating in the contentious American sub-prime mortgage market [10]. On July 10th, 431 securities received negative rating actions from Moody's, among which 399 were downgraded and an additional 32 on review. The original face value of affected securities reached \$5.2 billion. This review deteriorated the prices of mortgage-related products, causing a ripple effect on other markets and eventually triggering the financial crisis.

2.3 Credit Default Swaps (CDS)

One particular financial derivative has been blamed for generating the subprime mortgage crisis. In a contract between two parties known as a "credit default swap," one party acquires protection from the other against losses resulting from the default of insolvent borrowers. CDS was initially designed as a risk transfer tool that paid off when credit events occurred, including bankruptcy and failure to pay. The CDS seller would pay a certain amount to the buyer, based on the purchasing price, when the borrower is in default.

As previously indicated, the loose lending guidelines and low interest rates led to an excessive demand for real estate, which sparked the 2000s housing price boom. The initial supplier of these subprime mortgage loans struggled to meet the excess demand and bear such risks. By introducing CDS, market participants could secure their funds and increase the efficiency of the debt markets. However, trading CDS itself is risky. To ensure the 'insurance' works when credit events occur, the seller of CDS must be capitalized. Unfortunately, due to the uncertainty of asset valuation during that time, securities were often misrated, and little or no collateral was required for high-rate institutions to sell CDSs.

Additionally, an incorrect perception of CDS as arbitrary opportunities was created by an over-optimistic estimation of credit default risk. Consequently, an excess supply of CDS was created, leading to overselling of CDS. Also, since the market lacked regulation, investment banks used customers' deposits to invest in complex financial products with CDS. The adoption of a practical policy to regulate high-risk swaps and forbid banks from using deposits to purchase swaps and other financial derivatives was not implemented until 2009.

By 2008, the value of CDS had reached \$45 trillion compared to the \$22 trillion invested in the stock market. Lehman Brothers, one of the largest fatalities during that period, owed \$600 billion, \$400 billion of which was covered by CDS. Even after the collapse of Lehman Brothers, investors who bought CDS protection against a Lehman Brothers default pursued roughly \$8 billion in cash payments on Lehman CDS come due. The biggest concern at that time was whether the CDS could

be settled successfully. Indeed, only around \$5.2 billion of net payments were made to the \$400 billion in CDS on the debt of Lehman Brothers.

3. Consequences

The 2008 financial crisis cast a profound influence on the global economy. The housing market, the starting point, had witnessed a consistent decline in home prices from 2007 to 2011, followed by a struggling recovery. Homeownership rates dipped to 62.9% in 2016 and slowly increased by 1.3%, still distant from the peak of 69.2% in 2004 [11]. Many households had been unemployed, had been in arrear in the housing payments, or had negative equity in their houses. These three could happen in one household and put much pressure on them.

By the end of 2008, the contagion had spread across the financing factor, in which Lehman Brothers was considered the most critical node- both the marker of the crisis and the cause of further damage. Lehman had a history of heavy involvement with subprime market. It purchased West Coast subprime mortgage lender BNC Mortgage LLC in 2000. In the following four years, another five mortgage lenders specializing in Alt-A loans were purchased, orienting borrowers without complete documentation. The such strategy seemed rewarding at first. By 2007, Lehman's stock price had reached roughly \$60 billion.

However, Lehman failed to contain risks posed by increasing subprime mortgage defaults as cracks in the U.S. housing market expanded. Following the failure of Bear Stearns in August 2007, Lehman faced a sharp decline in stock price and shut down its BNC unit. The stock dropped by another 45% when Korea Development Bank put the talks of equity participation on hold; its debt also suffered a 66% increase in CDSs [12]. Lehman ultimately failed to make up the losses and filed for bankruptcy on September 15, 2008, causing the Dow Jones Industrial Average to fall by 4.5 points in a single day. Many money and institutional cash funds exposed to Lehman significantly suffered losses in their holding of Lehman assets, and the positions of hedge funds who utilized Lehman as their principal broker became frozen. Besides the enormous losses, many jobs were eliminated due to Lehman's bankruptcy. High unemployment ran through the whole crisis. Bureau of Labor Statistics (2012) reports that the national unemployment rate in the U.S. was 9.5% in 2009, while before December 2007, it had been 5.0% for 30 months [13]. Before the crisis, the U.S. unemployment rate was lower than most other countries. However, by the end of the recession, it was higher than in most industrial countries and remained that way in the following months.

4. Responses

In response to the global financial crisis's detrimental impacts, many forces have taken measures to support recovery, among which the wide-ranging set of policies counts as the most important one. These can be divided into two main categories: first, those directed at the immediate issues, from repairing the credit market to restoring demand; second, those aiming to prevent such disasters over a relatively long time period [14]. Two policies were passed for regulatory reforms and risk management in the financial sector.

4.1 Dodd-Frank Act

Federal legislation in the United States known as the Dodd-Frank Act was passed on July 21, 2010. The subprime crisis and overflow of CDSs reveal fundamental weaknesses in the U.S. financial regulatory system, calling for more established regulations. In response to these calls, President Barack Obama offered a plan in 2009 for a "sweeping redesign of the United States financial regulatory structure," and Congressman Barney Frank and Senator Chris Dodd independently introduced bills based on his idea in two institutions. The Financial Stability Oversight Council was founded, which provides complete oversight for financial institutions and existing regulatory agencies [15]. The authority grants them such power to identify risks affecting the stability of the U.S. financial

system and properly react to any dangers brought on by comparable risks. Following the creation of superior regulatory institutions was a series of reforms. The Dodd-Frank Act legislation set regulations on different parts of the financial sector. For bank capital, it makes capital and leverage requirements more stringent to strengthen financial institutions; for the derivatives sector and securitization market, it places significant regulatory restrictions. Areas of the Volcker Rule also receive regulatory reform, which involves proprietary trading and credit rating activities [16].

As the starting point of the financial crisis, the housing market received much attention. New lending rules under the Dodd-Frank reform law require borrowers to document their employment and debt levels. A borrower's ability to repay the mortgage must also be confirmed, something that many lenders neglected to do before to the crisis. Lenders are also required to disclose all fees associated with each loan. Though the tight credit reduced the risk of occurrence of the same housing bubble, it restrained demand for housing by limiting the availability of mortgage loans for many potential homebuyers, especially those with relatively low credit. More paperwork is required, and the procedure is more complicated than previous requirements. As mentioned, CDS played an essential role in the subprime crisis due to its lack of regulation. Credit default swaps, interest rate swaps, and total return swaps were all subject to rules under the Dodd-Frank Act (2010).. The Act states that the SEC is responsible for policing swaps that are based on a specific security or a limited set of securities. Government securities and broad-based securities indices are all under CFTC regulation.

4.2 Basel III

The Basel Committee on Banking Supervision created Basel III, a set of international banking standards, in reaction to the financial crisis. The bank regulators reevaluated existing regulations and created this framework with the goal of enhancing the stability of the global financial system. Although Basel III is undoubtedly a response to the 2008 financial crisis, King and Tarbert (2011) emphasize that it has its roots in Basel I and Basel II's flaws, which were virtually entirely made at a micro-prudential level [17]. Basel III, in contrast, provides a set of system-wide macro-prudential measures to address systemic risk in the global financial system.

The crisis demonstrates the weakness in the regulatory capital base's quality, consistency, and transparency. It is long-acknowledged that the definition of Tier 1 capital under Basel II has ambiguities, and banks naturally took advantage of it to lower the cost of capital. Basel III seeks to ensure that high-quality buffers support those internationally active banks by strengthening the fundamental definition of capital and adjusting the minimum capital requirement. According to Basel I, a bank's total capital should be at least 8% of RWAs and should be split evenly between Tier 1 and Tier 2. Such features remained nearly unchanged under Basel II. Basel III maintains the requirement of 8% minimum fractions, but it requires only 25% of Total Capital could consist of Tier 2 capital. Before the crisis, risk-weighted assets (RWAs) were the sole basis of capital requirements. Many banks and other financial institutions built excessive leverage while keeping strong ratios measured by RWAs. To safeguard against excessive and risky lending, Basel III introduces the leverage ratio as a backstop for risk-based requirements. It requires banks to hold a minimum leverage ratio of 3 percent, calculated by comparing Tier 1 capital with 'total exposure', a bank's average total consolidated assets.

5. Conclusion

This review examines the causes, effects, and policy response to the 2008 financial crisis. Before the crisis, the Fed's loose lending criteria and low-interest rate fueled the growth of the subprime mortgage market; under pressure from the uncertainty of asset valuation and frequent default by insolvent borrowers, the subprime crisis broke in 2007 and was fueled by the irrational overflow of CDS. Though the subprime market remains a small part of the financial sector, the crisis had spread across the financial sector by 2008. The housing market remained depressed after the crisis until 2011, and Lehman's bankruptcy became the marker of the Great Recession, for many other financial

institutions were involved. Unemployment went high as banks went bankrupt and many investments failed. In response to the weaknesses discovered in the crisis, a set of policies were made, among which Dodd-Frank and Basel III had particular influence. The Dodd-Frank Act seeks a comprehensive regulatory system in the U.S., and Basel III aims to promote the stability of the international financial system. These policies aim to reduce the risks of the same crisis.

The outbreak of the 2008 financial crisis is never considered without warning. The roots of it could trace back to the ambiguous definitions in Basel I. Many people had seen it coming yet failed to contain it. The 2008 crisis and the Great Recession painfully demonstrate the consequence of lacking an effective regulatory system on a domestic and global scale. Today's world is even more globalized than in 2008, and the COVID-19 pandemic has had an inevitable negative impact on the global economy. To understand prior crises is to seek to prevent the same recession, and this is where the value of the 2022 Nobel Prize in Economic Science is.

References

- [1] The Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel 2022. <https://www.nobelprize.org/prizes/economic-sciences/2022/summary/>. Last accessed 2022/12/15.
- [2] Radke, M. P., & Hagemann, H. (2005). *Explaining Financial Crises: A Cyclical Approach* (Hohenheimer Volkswirtschaftliche Schriften) (1st ed.). Peter Lang Publishing.
- [3] Baldwin, R. E., & Di Mauro, B. W. (2020). Economics in the time of COVID-19. CEPR.
- [4] Shahzad, U., Mohammed, K. S., Tiwari, S., Nakonieczny, J., & Nesterowicz, R. (2023). Connectedness between geopolitical risk, financial instability indices and precious metals markets: Novel findings from Russia Ukraine conflict perspective. *Resources Policy*, 80, 103190.
- [5] Hayford, M. D., & Malliaris, A. (2011). Causes of the Financial Crisis and Great Recession: The Role of U.S. Monetary Policy. *The Journal of Economic Asymmetries*, 8(2), 73–90.
- [6] Taylor, J. B. (2010). Getting Back on Track: Macroeconomic Policy Lessons from the Financial Crisis. *Review*, 92(3).
- [7] What is a subprime mortgage? <https://www.consumerfinance.gov/ask-cfpb/what-is-a-subprime-mortgage-en-110/>. Last accessed 2022/12/15.
- [8] Hellwig, M. F. (2009). Systemic Risk in the Financial Sector: An Analysis of the Subprime-Mortgage Financial Crisis. *De Economist*, 157(2), 129–207.
- [9] Edey, M. (2009). The global financial crisis and its effects. *Economic Papers: A journal of applied economics and policy*, 28(3), 186–195.
- [10] UBS shuts hedge fund after big sub-prime losses. <https://www.theguardian.com/business/2007/may/04/usnews.internationalnews>. Last accessed 2022/12/15.
- [11] The Great Recession and Its Aftermath. <https://www.federalreservehistory.org/essays/great-recession-and-its-aftermath>. Last accessed 2022/12/15.
- [12] Scardovi, C. (2016). *Restructuring and Innovation in Banking* (SpringerBriefs in Finance) (1st ed. 2016). Springer.
- [13] The Recession of 2007–2009. BLS Spotlight on Statistics, 2012.
- [14] Paskelian, O. G., & Bell, S. (2013). The Tale of Two Regulations—Dodd-Frank Act and Basel III: A Review and Comparison of the Two Regulatory Frameworks. *Review of Futures Markets*, 21(5), 7–29.
- [15] Summary of the Dodd-Frank Wall Street Reform and Consumer Protection Act. <https://www.davispolk.com/insights/client-update/summary-dodd-frank-wall-street-reform-and-consumer-protection-act-enacted>. Last accessed 2022/12/15.
- [16] King, P., & Tarbert, H. (2011). Basel III: an overview. *Banking & financial services policy report*, 30(5), 1–18.
- [17] Basel II: International Convergence of Capital Measurement and Capital Standards: A Revised Framework - Comprehensive Version. <https://www.bis.org/publ/bcbs128.html>. Last accessed 2022/12/15.