Too Big to Fail: An Analysis of Systemic Risk in the 2008 Financial Crisis

Songyin Xiao[1,a,*]

[1]Haide College, Ocean University of China, Qingdao 266100, China
a. xiaosongyin@stu.ouc.edu.cn
**corresponding author*

Abstract: The recent bankruptcy of Silicon Valley Bank and the awarding of the Nobel Prize in Economics have both brought attention back to the issue of how to lower systemic risk in the banking industry and stop or lessen the severity of a financial crisis. To study this issue, this paper reviews the 2008 U.S. subprime mortgage crisis, explaining the causes of the crisis and its tremendous adverse effects from the perspectives of, among others, the U.S. monetary policy, the emergence of the Credit Default Swap (CDS) frenzied property market, and the lack of regulation in the financial sector. It also describes the measures taken by the government and banks to resolve the crisis from their perspectives. Further among them, the paper reviews the process of Basel III in strengthening the regulation of large financial institutions, prompting them to improve their capital adequacy ratios and reduce systemic risk. The key role played by systemic risk in preventing the crisis and reducing its impact is emphasized. Thereafter, this paper compares and unfolds the subprime crisis of 2008, the Japanese financial crisis of the 1990s, and the recent Covid-19 crisis to illustrate the responsibility of the banking sector to society. The paper also suggests that banks should increase their capital adequacy ratio, reduce excessive risky investments, reduce systemic risk, ensure their credibility in society, and prevent bankruptcies in today's fluctuating national monetary policies and tense economic situation.

Keywords: subprime mortgage, systemic risk, capital adequacy ratio

1. Introduction

On October 10, the highly anticipated Nobel Prize in Economics was announced. According to the official news, the 2022 Prize in Economic Sciences was awarded to Ben S. Bernanke, Douglas W. Diamond, and Philip H. Dybvig for their research on banking and financial crises [1]. The Nobel Committee claims that the recipients of this year's economics prizes have greatly advanced our knowledge of banks' contributions to the economy, particularly in times of financial crisis. One of the main conclusions of their study is the significance of preventing bank failures. The chairman of the committee responsible for awarding the Economic Sciences Prize claimed that the discoveries of the winners had increased our capacity to avert major crises and pricey bailouts.

Banks have two main functions in society, namely, regulating the economy and creating credit. Commercial banks are responsible for regulating the economy by controlling the lack of capital in all facets of society through their activities in credit mediation, while also adjusting the structure of the economy, consumption patterns, investment patterns, industrial structure, etc. under the direction of the central bank's monetary policy and other national macroeconomic policies. This accelerates the liquidity of money and allows it to get more profit and get it to where it should go. Credit creation is the process by which commercial banks produce credit creation functions based on functions for facilitating credit and payments. For instance, as a guarantee for savings, loans, and other relevant functions.

Since the COVID-19 epidemic broke out in 2020, nations all over the world have spent a lot of money on creating health care infrastructure and implementing policies to keep people alive, but it must be acknowledged that this has partially led to economic stagnation and even regression. Because of the loss of jobs, people have no income and a large number of borrowing defaults. In the EU, for example, as of June 2020, more than 5 billion euros of debt has been approved for deferment, the risk for banks has increased significantly, its credit function is being weakened and people are beginning to question its authority [2].

On the evening of March 10, 2023, information about the collapse of Silicon Valley Bank (SVB) quickly dominated the headlines of the Internet. The 16th largest bank in the United States as of December 31, 2022, Silicon Valley Bank has total assets of about $20.9 billion and total deposits of about $175.4 billion. Its collapse has caused widespread panic and distrust of banks, with more and more depositors lining up to withdraw their money in front of the bank, causing major banks to store large amounts of cash to counter the phenomenon and guarantee their credit, which in turn will further reduce the ability of major banks to counter the risk and make the panic spread further. Many people call the current moment the Covid-19 financial crisis and are questioning the Silicon Valley banks is this disaster. The first domino of this disaster, and want to study the impact it will have. Therefore, it is extremely relevant to look back and study the 2008 financial crisis that is uncannily similar to it - ending with the collapse of Lehman Brothers. It gives us a clearer picture of the place of banks in economic life and can help us to prevent it or reduce its harm.

2. Cause

2.1. Loose Monetary Policy

After the Internet bubble in 2000, the economic level of many American people took a major hit. People had money and did not want to use it for consumption, but more wanted to store it in the bank. In order to promote the recovery of the country's economic status, the U.S. implemented a moderately loose monetary policy and lowered interest rates on deposits and loans. Deposit interest rates have fallen and people have less to gain from their deposits, so they will save less and use the extra money for consumption and investment. With lower interest rates on loans, people pay less interest on loans and will be stimulated to take out loans for consumption and investment. With more money circulating in the market, consumption will increase in relative terms. In this way, economic development will be more balanced than the previous economic winter.

In addition, in order to further accelerate economic recovery and growth, there was an urgent need to find a new pillar industry to lead the GOP economy out of the doldrums, and the U.S. government came up with the real estate industry, which has been the most bubble-prone industry since ancient times. At some point, probably in 2002 or 2003, the continued strong rise in housing prices evolved into a bubble. People began to think of housing as an investment rather than simply a place to live, and millions of homeowners began to trade up for larger homes or vacation homes. Driven by low interest rates, easy access to credit, and a herd mentality, speculation became almost frenzied. In some areas of the U.S., homes are being bought only to be re-sold within a few months, not to be used for living. In such a situation of soaring house prices, everyone is convinced that the rate of house price increases will run much faster than the bank loan interest, so they are reckless in not considering their own risk-bearing ability, loans, buying houses, selling houses, and get gains.

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Put all the groundless pressure on the belief that housing prices will definitely continue to skyrocket.

2.2. Subprime Mortgage

With such an almost crazy investment trend among people, there is no shortage of ordinary families or even poor families who do not consider their own risk taking ability and go for bank loans in order to participate in this wave of speculation. When these individuals purchase a home due to their subpar credit rating, they are classified as subprime credit borrowers because they do not have a reliable source of income or even none at all. These people would apply for subprime mortgages to buy homes because prime mortgages did not require strong credit histories or strong repayment abilities from the borrowers, and subprime mortgages had significantly higher interest rates than conventional mortgages. These people were turned down for prime mortgages by banks due to their poor credit histories or weak repayment abilities. The majority of subprime mortgages in the United States are repaid using a combination of fixed-rate and variable-rate options, with homebuyers paying the loan back at a fixed rate for the initial few years after purchase and at a variable rate for the remaining time [3]. This approach usually results in lower interest rates in the first few years of the loan, but gradually increases in the later years. For speculators, however, the lower interest rates in the first few years increased their confidence that home prices would outperform the interest rates on their loans, fueling the boom in subprime mortgage business.

The banks' extremely lenient lending policies and derelict inspection function greatly encouraged and facilitated this behavior and inflated the real estate bubble. The banks' lowered lending management standards were influenced by the bubble itself, in addition to their own negligence. Due to historically high housing prices, banks reasoned that if they gave loans to subprime borrowers who were unable to repay them, they could still be repaid by selling the mortgaged property, auctioning it off, or using it as collateral. However, when the borrower is unable to pay back the loan because of the unexpected collapse in housing values, the bank sells the house only to discover that the proceeds do not cover the loan plus interest at the time, or even just the loan amount itself, so the bank loses money on this loan. If there were only a few defaults, the banks would have been able to accept these losses, but at the time the housing bubble burst like a defeat, and the large defaults directly lowered the valuation of the banks' assets dramatically. The properties mortgaged in the hands of banks are no longer the so-called good assets that can continue to grow in value, but have become hot potatoes, significantly reducing prices and no one asked for, let alone recover the previous loan. In addition, banks often use leverage to invest, the final vacancy of money even to several times more than the total assets of the bank. Naturally, they can only declare bankruptcy.

2.3. Credit Default Swaps

The bank also felt anxious with the overwhelming number of subprime contracts, so it decided to insure its investments in what is known as a CDS. in layman's terms, the bank pays the insurance company an annual insurance policy, and in the event of a subprime loan going bad, the insurance company pays out the money for the bank instead. This is the mechanism of the CDS. Under the CDS mechanism, banks packaged and insured a large number of subprime mortgages, transferring much of the risk to the insurance company. But its earnings are also reduced because of the premiums, and to increase its earnings, it uses high leverage to participate in lending programs and obtain high interest rates on the loans. In other words, it lends money by pledging its own property to obtain loans that far exceed its own property value. At the same time, the insurance company was happy to charge higher and higher premiums, because at that time, with a default rate of less than

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one percent, the compensation was much lower than its premium income, and it was a sure-fire deal.

With such a mechanism in place, more and more people flocked to the CDS market. Insurance companies, looking at this sure-fire deal, also began to buy and sell CDS as a commodity. The insurance companies were not creditors of the subprime lenders, but they were able to resell the CDS to each other in the absence of market regulation in order to transfer the risk and the value of the CDS. These CDSs seemed to become a new form of stock in a sense, being speculated higher and higher [4]. At the same time, the rating agencies began to lower their rating standards and even rate them indiscriminately in order to compete for this huge CDS market, so that many risky subprime mortgages were packaged as prime loans, which in turn received higher ratings and valuations. With such a strong catalyst, the CDS market grew rapidly, and by 2007, before the outbreak of the subprime crisis, the subprime mortgage market was as high as $6.5 trillion, four times the annual GDP of the U.S. This huge bubble was so big that it cast a shadow over the entire U.S.

3. Consequence

A severe crisis that was caused by the bubble's implosion spread not only throughout the US but also to other countries. The second-largest subprime mortgage provider in the US, New Century Financial Corp, said on April 2, 2007, that it will seek bankruptcy protection and fire 54% of its workforce due to $17.4 billion in debt from Wall Street. After New Century Financial Corp. filed for bankruptcy, American Home Mortgage Investment Corporation, the tenth-largest mortgage lender in the US, followed suit shortly after. On August 6, 2007, it officially filed for bankruptcy protection.

There was still a stronger storm to come. Bear Stearns, the fifth-largest investment bank in the US, revealed on August 8th, 2007, that two of its funds, with a combined $400 billion in assets, had failed. The U.S. government dared not imagine how much panic would be caused by the collapse of such a large company. This will lead to people afraid to invest, companies are afraid to borrow, the economy into a standstill. Then-Treasury Secretary Paulson suggested a $700 billion bailout proposal for the US government to buy non-performing assets from banking firms. To address the company's liquidity crisis, the Federal Reserve decided to give Bear Stearns emergency money via JPMorgan Chase & Co. [5]. This is the first occasion that the Fed has given a non-commercial bank emergency money since the start of the Great Depression in 1929. But even with the intervention of the U.S. government, the aftershocks of this bubble's explosion were far from over.

Lehman Brothers, the fourth-largest U.S. investment bank, enhanced its earnings by substantially investing in the inflated real estate market, as well as by acknowledging losses more slowly than other companies and failing to make up for missed opportunities to secure funding when investments went wrong. The company was in such a dire situation that it became difficult to locate a buyer. A bankruptcy was announced after negotiations for a takeover failed. The immediate catalyst for the collapse of Lehman Brothers was Paulson's "see no evil" stance, the essence of which was a clear signal from the U.S. government that they were no longer willing to intervene directly in the market to provide assistance, as Bear Stearns or the "two houses" had done. Nevertheless, despite Bear Stearns being on the edge of bankruptcy, the U.S. Treasury and Federal Reserve assisted in saving it [6]. Lehman Brothers was not saved. Since then, the collapse of market confidence has been uncontrollable, and the stock market has fallen more than wildly.

The largest bank in France, BNP Paribas, announced the freezing of all three funds at the same time due to losses incurred from investments in U.S. subprime bonds. The second-largest bank in Japan, Mizuho Bank, and its parent firm, Mizuho Group, disclosed losses of 600 million yen in connection with U.S. subprime mortgages on August 13, 2007. The storm caused by U.S. subprime mortgages has already cost banks in Japan and Korea money. UBS Securities Japan has estimated that the nine biggest Japanese banks have accumulated more than a trillion yen in US subprime mortgage-backed securities. Moreover, a total of $565 million has been invested in CDOs by five Korean banks, including Woo-ri. The countries in the world could not stay away from this crisis and began to jointly respond to this riot created by the U.S. On October 8, 2008, major central banks acted simultaneously to make a clear response to the turmoil in financial markets by announcing interest rate cuts one after another. The European Central Bank, the Bank of England, the Bank of Canada, the Riksbank, and the Swiss Central Bank all dropped interest rates by 50 basis points to encourage investment through increasing consumption, joining the Federal Reserve in doing so.

4. Response

4.1. Governmental Intervention

After the severe financial crisis passed, the U.S. government passed a number of laws to strengthen financial company regulation in order to reduce the risk that future taxpayers will bear as a result of such large financial companies, as well as to increase the security and stability of the country's financial system and safeguard consumers. The most famous one is the Dodd-Frank Act, which is regarded as another piece of financial regulation comparable to the Glass-Steagall Act. Under the Act, a Supervisory Committee was established to determine which large financial institutions had systemic risk, excessive leverage, etc. The Act also restricts banks from establishing risky investment policies and limits investment transactions by large financial institutions [7].

The act also includes a provision for controlling derivatives, such as credit default swaps, which were widely regarded as having contributed to the financial crisis of 2007−2008. To increase the transparency of these markets, swap transactions must be disclosed in more detail. The SEC Office of Credit Ratings was created by Dodd-Frank so that rating agencies could give relevant and trustworthy credit assessments of the companies, municipalities, and other organizations they assessed [8]. To avoid "too-big-to-fail" agencies from taking on major risks that could seriously harm the general economy, the office is tasked with ensuring that agencies offer relevant and credible credit ratings of the firms, municipalities, and other organizations that they examine. The Act does not just emphasize reducing the operational risk of institutions, but also aims to reduce the impact and damage caused when large financial institutions fail. It creates a new insolvency resolution process under the control of the FDIC and requires large financial institutions to create their own risk provisions in advance to avoid financial institution failures necessitating taxpayer bailouts once more. It prompted banks to raise their reserve ratios in response to consumer access and prevented consumers from suffering huge losses from bank failures. The Act, while praised at the time for its reasonable control of risk, was also criticized for reducing the competitiveness of U.S. banks, increasing the operating costs of financial institutions, limiting the operations of small and medium-sized banks that were not significantly affected by the financial crisis, and reducing the liquidity of capital.

The Dodd-Frank Act was partially amended in 2018 to exempt some small financial institutions from regulation and to relax regulation of mid-sized institutions. For example, the Act allows banks with total assets of less than $10 billion and assets and liabilities used for trading of less than 5% of total assets to be exempt from the Volcker Rule for proprietary trading. Banks' requirements for capital adequacy as well as investment leverage are reduced. However, the amendment does not relax the constraints on the mega financial institutions, only the relaxation of constraints on these small and medium-sized financial institutions. A member of the Bundesbank Executive Committee said requiring small banks to use the same regulatory indicators as large international banks may put small banks at a disadvantage. I therefore support lowering the regulatory requirements for

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small, low-risk financial institutions that do not operate across borders". Thus, the changes in the bill, although slightly increasing the risk of the financial system, because it does not relax the regulation of the "too big to fail" large institutions, but rather allows small and medium-sized institutions to become more flexible in their investments.

4.2. Banking Regulation

In 2007, Basel II, which had been revised for nearly a decade, directly confronted this subprime crisis and fully demonstrated its flaws, such as the existence of pro-cyclicality, lack of effective monitoring of non-normal and complex risks, etc. Therefore, the Basel Committee on Banking Supervision, which was composed of senior officials from 27 national industry regulatory authorities and central banks, reached an agreement on Basel III's content on September 12, 2010, and the banking sector as a whole formally entered the Basel III era.

Basel III builds on the previous agreement by further increasing the capital adequacy requirements, thereby providing higher control over the liquidity of banks' assets as well as risks, thus ensuring that banks have sufficient repayment capacity. It also introduced a leverage ratio to better demonstrate the difference in risk between the on- and off-balance sheet of banking institutions [9]. Under this agreement, the systemic risk of the market is reduced, the speculative investments of large banking institutions are curbed, the risk factor is greatly reduced, the total proportion of their risky assets is gradually reduced in order to meet the capital adequacy requirements, the systemic risk is controlled, and the probability of a "large and collapsed" bank and the impact of the collapse are greatly reduced. The probability of a large and collapsing failure and the impact it will have are greatly reduced [10]. Therefore, controlling systemic risk is very important for today's financial system, especially in this time of great economic stress.

To date, however, with the onset of the new crisis, trade has declined significantly around the world and economic conditions are downward. The United States in order to cope with the crisis brought about by the infrastructure construction costs, people's panic, the country's massive unemployment, the monetary policy of a large number of interest rate cuts to promote domestic investment consumption, increase employment, it is true that the short-term relief of the United States domestic market tension, but in practice, this is not a simple and effective policy. With the interest rate cut, the U.S. domestic high inflation and the emergence of a large number of risky investment, which will greatly increase the systemic risk.

In response to the high inflation in the United States and the resulting interest rate hikes, a large number of assets were deposited in banks, and the small amount of liquidity in the market forced companies to take out assets that previously existed in banks. However, too many assets were taken out to make the bank's liquidity reserve greatly reduced, causing panic, the banking industry in order to respond to customer demand can only first sell the assets at a discount, but this will also be further similar to the bank's share price fell, turning into a vicious circle, panic more serious, depositors lined up to take away their own deposits, making the bank's liquidity funds completely broken This is the direct cause of the bankruptcy of Silicon Valley. Its bankruptcy, in addition to the unreasonable financial and monetary policies of the United States, was also due to its own investment policy of short term debt and long term investment, i.e., using the large amount of funds placed on the account to make many investments in treasury bonds, which also made its liquidity reduced and the systemic risk increased. So taking Silicon Valley Bank as a counter-example, it is a question to think about how banks can handle themselves in the volatile economic situation under the COVID-19 economic crisis, control their own systemic risks, and ensure capital adequacy while maintaining their earnings.

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5. Conclusion

Financial crises are often accompanied by high-risk investments and inappropriate government policies and lack of regulation in the banking sector. The government's failure to put in place appropriate restraint mechanisms to allow asset prices for stocks and real estate to soar, which resulted in an expanding economic bubble, was another contributing factor to the financial crisis in Japan in the 1990s, as was the failure of the financial regulatory authorities to set up an efficient regulatory and control system for the large amount of money from financial institutions entering the real estate sector to fuel the bubble economy. Whether it is the 2008 financial crisis reviewed in this paper, or the previous crisis in Japan in the 1990s, and then the Covid-19 crisis often comes from inappropriate government policies and speculative investments in the banking sector that bring high risks. The creation of a bubble industry is like beating a drum, if it does not have enough real value, it does not lead to so many people really need it and pay for its high price. Then the bubble that gets bigger and bigger will one day blow up in one person's hands.

As a specialized sector of finance like the banking industry, it should strengthen its supervision and regulate trading standards to stop the over-inflation of predictable high-risk industrial bubbles. At the same time the banking industry should set an example by ensuring capital adequacy and refraining from excessive highly leveraged, high-risk investments. Strict compliance with Basel 3 to ensure the banks' own high quality assets and credibility and to enhance the public's confidence in them will reduce the risk of bank failure. At the same time, the banking industry should conclude that it should be more accurate and have effective measures in assessing systemic risk, so as to reduce the systemic risk of each bank in general and avoid the chain damage of bad impressions and thus can avoid the generation of crisis.

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