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Assessing the Impact of Derivatives on the 2008 Financial Crisis and the Effectiveness of Subsequent Regulatory Reforms

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Abstract: The 2008 financial crisis was a global financial catastrophe that reflected the misuse of financial derivatives in financial markets, such as credit default swaps, asset-backed securities and collateralized debt obligations, exposing significant weaknesses in the global financial system. These financial instruments were designed to hedge against debt risk, but their lack of transparency and massive misuse ultimately led to the accumulation of systemic risk that accelerated the financial crisis. Since then, regulatory authorities around the world have realized the necessity for stronger regulatory frameworks, and a series of significant reforms have been implemented, such as the Dodd-Frank Wall Street Reform and Consumer Protection Act in the United States, the European Market Infrastructure Regulation in the European Union, and the Basel III international regulatory framework, with the objectives of increasing transparency in financial markets and improving the risk management measures of financial institutions. This paper will explore the role of derivatives in the 2008 financial crisis and examine the effectiveness of these regulatory measures introduced after the crisis in enhancing stability of financial system.

Keywords: 2008 Financial Crisis, Derivatives, Regulatory Framework

1. Introduction

The 2008 financial crisis is deemed to begin with the collapse of the real estate market in the US. Because of spread of shocks, it escalated into a global financial disaster quickly. One of the significant causes of this crisis is due to the abuse of financial derivatives. These financial derivatives were originally used as helpers for hedging risks, speculation and arbitrage. However, due to the abuse of them, they became tools to amplify and accumulate risks and accelerators of financial crises.

Credit default swaps (CDS) are essentially contracts between buyers and sellers to swap risks on a specific credit event. In this way, CDSs are widely used to hedge against the risks of debt defaults by investors. However, due to the lack of transparency and supervision in the financial derivatives market at that time, the abuse of CDS led to a large amount of risk accumulation, which triggered the subprime crisis. Because of this, American International Group (AIG) became one of the classic cases of being seriously hit due to CDS trading. In addition to CDS, asset-backed securities (ABS) and collateralized debt obligations (CDO) were also widely used to securitize risky subprime mortgages

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in the early 2000s. Due to the complex structure of such financial derivatives, their potential risks are often overlooked by the public. Eventually, the cooling of the housing market and a large number of subprime mortgage defaults triggered panic and turmoil in the financial markets, followed by a liquidity crisis and credit freeze, which had a devastating impact on the real economy, leading to a large number of business failures and a prolonged economic recession.

After the crisis, it was found that the existing regulatory framework was obviously not sufficient enough to deal with the risks in the financial derivatives market, so the government departments and regulators around the world carried out a comprehensive reform of the regulatory framework of financial derivatives to enhance the ability of financial markets to resist risks and prevent such crises from happening again. Among these regulations, the Dodd-Frank Act in the US, the EMIR in the EU, and Basel III developed by the Bank for International Settlements are most famous.

This article will analyze and explore the role of financial derivatives in the 2008 financial crisis and will evaluate the effect of current regulatory reforms in enhancing financial stability. This article will focus on the contribution of CDS, ABS, and CDO to the financial crisis, and examine the specific regulatory measures in Dodd-Frank Act, EMIR, and Basel III, and their overall impact on the global financial system.

2. Role of Derivatives in 2008 Financial Crisis

2.1. Credit Default Swaps

In the bond market, Credit default swaps (CDS) are the most common credit derivatives. In a CDS contract, the buyer and the seller perform a risk transition on a specified credit event, and the buyer needs to pay a certain premium to the seller, and the seller promises to pay the buyer when a specific credit event occurs. Investors often use CDS to hedge against the risk of default on their debt holdings. However, during the 2008 financial crisis, CDS went from being an effective risk management tool to a risk amplifier.

Since CDS contracts have no requirements on buyers and sellers to hold the underlying asset, investors take advantage of this to use CDS for risk transfer extensively. According to Calistru's study, with the rapid expansion of the CDS market, which is in the tens of trillions of dollars, this makes the risk in the financial system highly concentrated [1]. At the same time, the risk of CDS is significantly underestimated due to the lack of transparency that most CDS transactions take place off-exchange, making it hard for regulators and market participants to comprehensively understand the risk profile of these contracts.

American International Group (AIG) is one of the classic cases of the subprime mortgage crisis that was hit hard by CDS transactions. As a result of AIG's massive sale of CDS contracts and its commitment to pay out in the event of a default on subprime mortgage-backed securities (MBS), the outbreak of the subprime mortgage crisis triggered a large number of subprime MBS defaults, resulting in a huge payout demand for AIG, which eventually led to the drying up of its liquidity. In September 2008, AIG had to accept up to $182 billion in aid from the U.S. government to avoid bankruptcy. To make matters worse, AIG's woes finally led to a collapse in market confidence and threatened the stability of the global financial system [2].

2.2. Asset-Backed Securities & Collateralized Debt Obligations

Apart from the misuse of CDS, asset-backed securities (ABS) and collateralized debt obligations (CDO) also served as accelerators for the 2008 financial crisis. ABS are financial securities which are backed by income-generating assets such as home equity loans, credit card receivables, and student loans, while CDO is a more complex structured finance product that is supported by a pile of loans and other assets.

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In the early 2000s, when the real estate market was booming, many financial institutions began issuing subprime loans to borrowers with poor credit and transferring the credit risk of the loans to investors by issuing ABS and CDOs and selling high-risk subprime mortgages in the form of securities to investors. The complex hierarchical structure of CDOs, the lack of transparency of their underlying assets, the inability of regulators to properly assess their risks, and the widespread confidence in the continued rise in house prices at the time led rating agencies to ABS and CDOs higher, thus attracting more investors, including pension funds and insurance companies, and thus driving the rapid expansion of the subprime mortgage market. Unfortunately, a few years later, as the housing market cooled, house prices began to fall, and defaults on subprime loans rose sharply, leading to a rapid depreciation of ABS and CDOs. As financial institutions at the time generally held large amounts of such securities, market confidence quickly collapsed, triggering violent financial turmoil [3].

As the fourth-largest investment bank in the world at the time, Lehman had a significant presence in the subprime mortgage securitization market by issuing and trading large amounts of ABS and CDOs. As the value of ABS and CDOs fell sharply, the value of assets on its corporate balance sheet was written down sharply, resulting in huge losses. Ultimately, Lehman became insolvent and filed for bankruptcy on September 15, 2008, shocking global financial markets and setting off a chain reaction. The gradual breakdown of trust among financial institutions led to a global credit crunch and severe economic distress in many countries [4].

2.3. Systemic Risk

The concept of systemic risk gained widespread recognition after the 2008 financial crisis and became a central issue in financial regulation and policymaking. Systemic risk, also known as financial system instability, refers to the risk that the entire system will fail due to events within the financial system. Unlike specific risks for individual companies or industries, systemic risk spreads through the interconnectedness of financial markets, affecting the economy as a whole.

Looking back at the 2008 financial crisis, the misuse of financial derivatives led to a concentration of risk, significantly increasing systemic risk, thereby accelerating the collapse of financial markets. On the one hand, while CDS enables financial institutions to transfer the default risk of their own debt, it also enhances the interconnection of the market. The proliferation of CDS contracts has made banks, insurance companies, and other financial institutions highly dependent on each other's credit profile. When market confidence declines, a default by either party can quickly trigger a ripple effect that leads to turmoil in financial markets [5]. On the other hand, investors and regulators are unable to accurately assess the risks of high-risk subprime mortgages because financial institutions use derivatives with complex hierarchies, such as ABS and CDOs, to securitize high-risk subprime mortgages. Eventually, when subprime mortgage defaults rose, the value of ABS and CDOs fell sharply, and these rapidly depreciating securities were held in large quantities by some systemically important financial institutions (SIFIs), causing financial market participants to lose confidence in each other's credit profiles, triggering a liquidity crisis and a freeze in credit markets [6].

3. Adjustments on Regulatory Framework after 2008 Financial Crisis

3.1. Dodd-Frank Wall Street Reform & Consumer Protection Act

In the aftermath of the 2008 financial crisis, the U.S. Congress passed the Dodd-Frank Wall Street Reform and Consumer Protection Act to prevent a similar financial crisis from happening again. The Act has successfully reformed the regulatory framework for derivatives markets by emphasizing the importance of enhancing transparency in the derivatives market, imposing capital and margin requirements, and giving regulators more powers.

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Prior to Dodd-Frank, most derivatives transactions were conducted in the over-the-counter market, thus they lack of transparency. In this way, it was difficult for market participants and regulators to identify their potential risks in a timely manner. In addition, because the original derivatives deal did not require capital and margin on both sides, there was uncertainty in the financial markets, which contributed to the collapse of Lehman Brothers [7].

The introduction of the Dodd-Frank Act provides solutions to these problems. First of all, it requires most standardized derivatives contracts to be traded through clearinghouses, which makes trading information more public and also increases regulators' control over the market, allowing market participants to assess risks more accurately. In addition, the Act also requires financial institutions to hold sufficient capital at the time of trading and be able to provide corresponding margin, so as to ensure that financial institutions have sufficient financial buffers to cope with potential market fluctuations [8].

In recent years, the Dodd-Frank Act has been furtherly revised by Trump administration, trying to release the regulatory burden suffered by financial institutions and thus to promote the growth of economy. For instance, some restrictions of the Volcker Rule were released, allowing banks to engage in proprietary trading and invest in hedge funds or private equity funds under certain circumstances. Moreover, the Trump administration has increased the criteria for identifying systemically important financial institutions (SIFIs) from $50 billion to $250 billion in total assets, reducing the regulatory burden on small and medium-sized banks. These changes have reduced banks' compliance costs and increased their flexibility, but they have also raised public concerns about risk management and increased systemic risk.

3.2. European Market Infrastructure Regulation

Similarly, the EU has introduced the EMIR in the wake of the financial crisis to improve market transparency and risk management by introducing transaction reporting, central clearing and strict risk management requirements to enhance the resilience of the EU's financial markets.

First, EMIR clearly stipulates transaction reporting obligations. Before the introduction of EMIR, trading information of OTC derivatives was shared only between the two parties of the transaction, thus regulators find it difficult to obtain comprehensive market data. EMIR requires that all OTC derivatives transactions must be reported to Trade Repositories. Both parties have to submit the details of the transaction, including information such as the counterparty, the amount and duration of the transaction, as soon as possible after the transaction takes place. This significantly increases market transparency, enabling regulators to better monitor market activity and risk accumulation, helping to identify potential systemic risks and intervene in a timely manner [9].

Second, many OTC derivatives transactions were previously cleared bilaterally, that is, the parties to the transaction directly bear the credit risk, and there is a lack of unified risk management standards. EMIR requires that compliant OTC derivatives transactions must be cleared through central counterparties (CCPs) and imposes strict risk management requirements, including bilateral margin requirements for uncleared trades, regular risk assessments, and stress testing. As an intermediary, CCP will assume the credit risk of both parties to the transaction, ensuring that they have sufficient financial resources to cope with market volatility. In this way, centralized risk management reduces the uncertainty caused by market volatility and enhances the soundness of the financial system [10].

Finally, EMIR has also helped to establish a better regulatory system. Due to the fragmentation and inconsistency of regulation of the OTC derivatives market prior to the financial crisis, the EMIR gave the European Securities and Markets Authority (ESMA) greater powers to regulate and coordinate the activities of the derivatives market. ESMA is responsible for developing and enforcing the relevant rules and ensuring compliance for market participants. Although the enhanced regulatory

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and compliance requirements have increased the cost of compliance for market participants, they have also increased the reliability of the market.

3.3. Basel III

Basel III is another reform agreement introduced by the Basel Committee on Banking Supervision (BCBS) after the 2008 financial crisis. It has put forward a series of new concepts into financial regulatory system, such as capital adequacy ratio, liquidity coverage ratio and net stable funding ratio, which have significantly strengthened the soundness and elasticity of the banking industry by making the requirements for capital and its liquidity, and laid a solid foundation for the stability and sustainable development of the global financial system.

Prior to the introduction of Basel III, banks did not have adequate capital requirements for off-balance sheet items, including derivatives. Basel III raised minimum capital adequacy requirements for banks and claimed stricter capital buffers and countercyclical capital buffers. At the same time, Basel III required banks to set aside more capital for off-balance sheet items, such as derivatives, to reflect the potential risks of these items. The requirements for capital adequacy ratios have strengthened the capital base for the banks, making them more elastic when they are in the face of market volatility and financial crises. Furthermore, capital requirements for derivatives have also increased the cost of holding these products, thus banks would manage their derivatives exposures more carefully. On the whole, banks' capital base has been significantly strengthened, their ability to resist risks has improved, and the market's confidence in the stability of the banking system has also increased [11].

Apart from requirements for capital, Basel III has also introduced two key ratios about liquidity: the Liquidity Coverage Ratio (LCR) and the Net Stable Funding Ratio (NSFR). Before the financial crisis, there was nearly no requirements for the liquidity management of banks, thus there was a lack of systematic liquidity risk management standards. To solve this problem, the LCR requires banks to hold sufficient liquid assets with high-quality to cover thirty-day outflows, while the NSFR claims that banks should maintain a steady source of funding to cover activities over one-year periods. These new liquidity regulations have pushed the banks to focus more on the liquidity management to ensure that sufficient liquidity can be maintained in the face of market stress. In this way, the robustness of the banking system to deal with short-term and long-term market stresses has been enhanced significantly [12].

4. Conclusion

The 2008 financial crisis emphasized the urgent need to establish a stronger regulatory framework to control the risks associated with financial derivatives. The crisis has shown that instruments such as CDS, ABS and CDO may contribute to systemic risk and financial instability in the absence of proper regulation and information transparency. Looking back to the result of the crisis, it finally led to significant regulatory reforms with the objectives of addressing vulnerabilities of the financial system and preventing similar future crises ever since.

The Dodd-Frank Act in the US ensures that financial institutions are equipped with adequate financial buffers in the face of market volatility by designating trading venues and platforms, increasing the transparency of trading information, and it also imposes requirements for capital and margin. Similarly, the EU's EMIR aims to address similar issues by claiming mandatory reporting and central clearing obligations for OTC derivatives transactions, thus to improve market transparency and the overall elasticity of its financial markets. Lastly, the Basel III framework puts forward stricter capital and liquidity requirements for banks and strengthens the banking sector's

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resilience under financial shocks by introducing the minimum capital adequacy ratio, liquidity coverage ratios, and net stable financing ratios.

Despite these significant advances in the existing regulatory framework for financial derivatives in the wake of the 2008 financial crisis, there are still challenges in addressing the systemic risks posed by financial derivatives in a comprehensive manner. The nature of interconnected global financial markets signifies that risks can be spread across borders rapidly, which requires continued international cooperation and coordination among regulators. In addition, the rapid pace of financial innovation continues to introduce new tools and risk dynamics, which requires an adaptive and forward-looking regulatory framework. Vigilance and continued efforts to increase transparency, improve risk management practices and promote international regulatory cooperation in the face of changing financial markets and emerging risks are essential to maintaining the stability of the global financial system and preventing future crises.

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