Proceedings of the 4th International Conference on Business and Policy Studies
DOI: 10.54254/2754-1169/2025.19783

The Impact of Financial Innovations on the Amplification of Financial Crises

Ziyan Chen[1,a,*]

[1]University of Glasgow, Glasgow, United Kingdom, G12 8QQ
a. sarahc226@163.com
**corresponding author*

Abstract: A financial crisis arises when the value of financial assets or markets rapidly declines, often leading to panic, liquidity shortages, and the collapse of the banking systems. In modern financial systems, financial innovations such as mortgage-backed securities (MBS), credit default swaps (CDS), and high-frequency trading have emerged as key drivers of both market efficiency and systemic instability. These innovations can amplify financial crises by increasing leverage, introducing complexity, and precipitating abrupt market shocks. This paper examines how specific financial innovations, particularly derivatives like MBS and CDS, contributed to the amplification of the 2007-2008 financial crisis. The study uses a case study approach to analyze the crisis and evaluate both the advantages and disadvantages associated with these financial innovations. The conclusion underscores the necessity for stronger regulation and oversight of financial innovations since unchecked complexity, excessive leverage, and inadequate risk management can precipitate to systemic collapse. Transparent markets, robust risk management practices, and prudent regulation are indispensable in averting and preventing future crises. This research highlights the critical role that financial innovations play in both driving and mitigating financial crises. By analyzing the 2007-2008 American Financial Crisis, the paper provides insights into how these innovations, while offering potential benefits, can also introduce significant risks when improperly regulated. The findings emphasize the necessity of balanced oversight to ensure innovation does not compromise systemic stability.

Keywords: Financial crises, financial innovation, international group, regulations

1. Introduction

The global economic downturn, which commenced with the housing market bubble and credit expansion in 2007 and reached its peak with the collapse of Lehman Brothers and housing market decline in September 2008, led to a worldwide recession and undermined trust in the financial system. It has been described as a crisis of the overall system, lack of liquidity, loss of confidence (in financial markets), and a "credit crunch" [1]. The utilization of financial innovations such as mortgage-backed securities (MBS), collateralized debt obligations (CDOs), and credit default swaps (CDS) played a crucial role during the global financial crisis from 2007 to 2008 [2]. While these financial innovations were intended to improve market efficiency and risk distribution, they also contributed to an accumulation of excessive risk and instability [3]. Therefore, examining how hyperactive financial innovation exacerbated the crisis will provide guidance for future formulation and regulation of financial policies across different countries [4-5]. In this paper, the impact of several financial innovations on the global financial crisis of 2007-2008 will be analyzed empirically. Specifically, the researcher focuses on mortgage-backed securities, collateralized debt obligations, and credit default swaps. Each of these innovation instruments will be individually introduced in Section 2, and the contribution of the innovations to the crisis is in Section 3. After that, the author offers proposed regulatory responses to financial innovation and the lessons learned from the crisis. Finally, a conclusion of this study is in Section 6.

2. Overview of Financial Innovation

2.1. Definition

Financial innovation refers to the process of devising and executing novel financial tools, technologies, institutions, and markets [6]. They can be broadly categorized into institutional, product, and process innovations [7]. Institutional innovations involve changes in the structure or organization of financial institutions, such as the creation of new entities like hedge funds or venture capital firms. Product innovations refer to the development of new financial instruments or services. [8] Process innovations focus on advancements in the methods or technologies to deliver financial services, including automation, blockchain technology, and online banking platforms [9]. Key examples of financial innovations include derivatives, securitization, and fintech [4-6].

2.2. Drivers

The growth of financial innovation has been driven by several key factors, each reshaping the landscape of modern finance. Technological advancements are a central force, enabling the creation of new financial products and services, such as online banking, digital payments, and blockchain applications [10]. These technologies enhance transaction speed, security, and accessibility, creating fertile ground for efficient and scalable financial solutions. With improving digital infrastructure, institutions can increasingly develop sophisticated financial products to meet the needs of a digitally integrated world.

Globalization is another major driver, expanding the demand for cross-border financial products that facilitate international trade, investment, and currency exchange [11]. This increased interconnectedness creates opportunities for innovations that bridge diverse regulatory and economic landscapes as financial institutions compete to cater to a global clientele with diverse requirements.

The evolving regulatory environment also plays a significant role [12]. New regulations and policy adjustments can open doors for financial products that adapt to or operate within updated frameworks, encouraging institutions to diversify their offerings. Meanwhile, intensified competition within financial markets pushes institutions to continually innovate to attract and retain clients. Unique and advanced financial products like derivatives allow firms to manage risk, maximize returns, and distinguish themselves from competitors. Collectively, these drivers—technological advances, globalization, regulatory evolution, and competition—serve as powerful catalysts for financial innovation, fostering an environment ripe for the development of new, market-responsive financial solutions.

2.3. Evolution

Financial innovation has evolved through several key phases, each marked by distinctive developments that have reshaped global markets. In the 1970s, the expansion of financial derivatives like futures and options provided new ways for investors to manage risk and speculate on market

DOI: 10.54254/2754-1169/2025.19783

movements. These instruments quickly gained popularity, facilitating more complicated financial strategies and contributing to the growth of global markets [13].

In the 2000s, the focus shifted to securitization, particularly in the housing market with products like mortgage-backed securities (MBS) and collateralized debt obligations (CDOs). These innovations allowed banks to package and sell mortgage loans, providing greater liquidity and making homeownership more accessible. However, the lack of transparency and excessive risk associated with these products played a significant role in the 2007–2008 financial crisis, highlighting the potential dangers of poorly managed financial innovation [13].

Today, a new wave of digital financial innovation is underway, driven by FinTech and cryptocurrencies. FinTech has revolutionized personal finance and banking through advancements like mobile payments, peer-to-peer lending, and robo-advisors, making financial services more accessible and efficient [14]. Meanwhile, cryptocurrencies and blockchain technology offer decentralized and potentially lower-cost alternatives to traditional financial systems, though they face regulatory and security challenges [15]. This evolving landscape underscores the need to balance the benefits of financial innovation with adequate oversight to ensure market stability and protect consumers.

3. The Dual Impacts of Financial Innovation

3.1. Positive Impacts

Financial innovation brings numerous positive effects for individuals, businesses, and the economy as a whole. For individuals, advancements like online banking, mobile payments, and robo-advisors enhance access to financial services, making banking more convenient, accessible, and often more affordable. These tools empower users to manage savings, investments, and credit with ease. For businesses, innovations improve operational efficiency and risk management. For example, derivatives allow companies to hedge against currency or interest rate fluctuations, stabilizing finances. FinTech solutions, such as automated accounting and digital lending platforms, streamline processes, making it easier for businesses, particularly small and medium enterprises, to manage funds and access capital. On an economic level, financial innovation supports growth by increasing liquidity and improving capital allocation. Securitization enables banks to lend more freely, while innovations like blockchain enhance transparency and reduce transaction costs, potentially fostering greater inclusion in the financial system and driving broader economic participation.

3.2. The Role of Financial Innovation in Financial Crisis

Mortgage-backed Securities (MBS) involve the pooling of different mortgage loans into securities that are subsequently sold to investors. The purpose behind this process was to enhance liquidity in the housing market and provide banks with fresh capital for further lending activities. However, during the housing boom, there was a decline in the quality of underlying mortgages as banks increasingly issued high-risk subprime loans to borrowers with unfavorable credit histories. MBS facilitated the packaging and sale of these risky loans, thereby concealing their true level of risk. As the housing market started declining and defaults on these subprime loans surged, it resulted in a significant decrease in the value of MBS. Consequently, investors and financial institutions incurred substantial losses due to this decline. This led to widespread instability during the 2007-2008 crisis as major financial institutions like Bear Stearns and Lehman Brothers faced significant exposure to MBS losses, ultimately contributing to their collapse [16].

CDOs, known as Collateralized Debt Obligations, played a significant role in exacerbating the crisis. These intricate financial instruments combine various types of debt, such as MBS, and divide them into different layers or "tranches" with varying levels of risk and return. The complexity of

CDOs made it challenging to comprehend and evaluate their associated risks accurately. Ratings agencies often assigned favorable credit ratings to CDO tranches that included high-risk subprime mortgages, thereby misleading investors about the true level of risk involved. As a result, when the underlying mortgages started defaulting, the losses incurred from CDOs surpassed initial expectations significantly. This contributed to the downfall of major financial institutions like Lehman Brothers and AIG [17].

Derivatives such as credit default swaps (CDS) also played a critical role. CDS are contracts that provide insurance against the default of a borrower [18]. While CDS were designed to mitigate credit risk, they were often used speculatively, and their rapid growth led to excessive leverage. Financial institutions wrote CDS contracts without holding adequate reserves to cover potential losses, creating a hidden web of risk. When defaults increased, the vast number of CDS contracts triggered massive payouts, straining the financial system and contributing to the collapse of major banks, such as the failure of Lehman Brothers and the bailout of AIG, as institutions were unable to cover the massive liabilities.

4. Regulatory Responses to Financial Innovation

In response to the 2007 global financial crisis, regulatory authorities implemented a range of measures to address the issues exposed by financial innovations. Key regulatory responses included the introduction of stricter oversight and transparency requirements for derivatives and securitization products. For instance, the Dodd-Frank Wall Street Reform and Consumer Protection Act, enacted in the United States, aimed to increase transparency in the derivatives market by mandating that many derivative contracts be traded on exchanges and cleared through central counterparties [19].

Mortgage-backed securities (MBS) and collateralized debt obligations (CDOs) faced increased scrutiny, with new regulations requiring more detailed disclosure about the quality and risks of the underlying assets. Rating agencies were also subject to stricter regulations to ensure more accurate and reliable credit assessments [16].

Additionally, regulatory reforms included enhanced capital requirements for financial institutions to ensure they could better absorb losses and reduce systemic risk. The Basel III framework, for example, established more rigorous capital and liquidity standards for banks. Furthermore, there was a push for greater consumer protection, including measures to prevent predatory lending practices and improve transparency in financial products. These regulatory responses were aimed at mitigating the risks associated with financial innovations and preventing a recurrence of such a severe financial crisis [19].

5. Lessons Learned and Future Outlook

The 2007 global financial crisis imparted several crucial lessons about financial innovations [1,7]. One major lesson is the importance of transparency in complex financial products such as mortgage-backed securities (MBS) and collateralized debt obligations (CDOs). The crisis revealed that insufficient transparency can obscure the true level of risk, leading to severe consequences when assets underperform. Additionally, the need for stronger regulatory frameworks became evident. Finally, robust risk management practices within financial institutions are essential to effectively identify and mitigate risks associated with financial innovations.

Looking to the future, advancements in technology, including blockchain and fintech, present new opportunities for efficiency and inclusion. However, these innovations must be accompanied by effective regulatory measures to prevent new forms of risk. Ensuring that future financial innovations emphasize responsible development and proactive oversight will be crucial in leveraging their benefits while avoiding the pitfalls experienced during the 2007 crisis. Balancing innovation with

DOI: 10.54254/2754-1169/2025.19783

strong regulation and risk management will help safeguard the stability and resilience of the financial system.

6. Conclusion

Financial innovations have played a pivotal role in shaping both economic growth and financial crises. Financial instruments such as derivatives, mortgage-backed securities (MBS), and cryptocurrencies have revolutionized markets by increasing efficiency, improving liquidity, and providing greater access to capital. These innovations have allowed financial institutions and investors to manage risk more effectively while promoting financial inclusion by making capital more accessible to a wider range of participants. However, despite these benefits, the very same innovations also contributed to the amplification of the 2007 global financial crisis. Derivatives, MBS, and other complex financial products were adequately comprehended by many investors and notably lacked transparency. The bundling of risky assets into these financial instruments created systemic risks that rapidly propagated across global financial markets once triggered by the collapse of the housing market. This lack of transparency, combined with excessive leverage and insufficient regulation, led to a breakdown in confidence and widespread financial instability, demonstrating how poorly managed financial innovations can lead to devastating economic consequences.

Looking ahead, the lessons from the 2007 crisis underscore the need for stronger regulatory oversight and ongoing research into financial innovations. Future efforts should prioritize enhancing the transparency of financial products to ensure investors and regulators fully understand the risks involved. In addition, there must be an emphasis on improving risk assessment techniques, which can better capture the hidden risks associated with complex financial instruments. Regulatory frameworks must also evolve to address the rapid development of new technologies and practices, such as fintech and decentralized finance, which present both opportunities and new risks. By taking a proactive approach to regulation, research, and risk management, policymakers and financial institutions can strike a balance between encouraging innovation and ensuring financial stability, preventing future crises, and fostering sustainable economic growth.

References

[1] L. B. Andersen, D. Häger, S. Maberg, M. B. Næss, and M. Tungland, 'The financial crisis in an operational risk management context—A review of causes and influencing factors', Reliability Engineering & System Safety, vol. 105, pp. 3–12.

[2] B. J. Keys, T. Mukherjee, A. Seru, and V. Vig, 'Did Securitization Lead to Lax Screening? Evidence from Subprime Loans', The Quarterly Journal of Economics, vol. 125, no. 1, pp. 307–362.*

[3] 'Initiative for Policy Dialogue'. Accessed: Sep. 14, 2024. [Online]. Available: https://ipdcolumbia.org/

[4] S. Morris and H. S. Shin, 'Unique Equilibrium in a Model of Self-Fulfilling Currency Attacks', The American Economic Review, vol. 88, no. 3, pp. 587–597, 1998.

[5] C. M. Reinhart and K. S. Rogoff, 'Is the 2007 US Sub-Prime Financial Crisis so Different? An International Historical Comparison', The American Economic Review, vol. 98, no. 2, pp. 339–344, 2008.

[6] P. Tufano, 'Financial innovation', Handbook of the Economics of Finance, vol. 1, Part 1, pp. 307–335, 2003.

[7] V. Hernández, M. J. Nieto, and A. Rodríguez, 'Product and Process Innovations and the Institutional Context of Transition Economies: The Effects of External Knowledge', in The Multiple Dimensions of Institutional Complexity in International Business Research, vol. 15, A. Verbeke, R. van Tulder, E. L. Rose, and Y. Wei, Eds., in Progress in International Business Research, vol. 15. , Emerald Publishing Limited, 2021, pp. 155–170.

[8] C. O'Brien, 'Product Innovation in Financial Services: A Survey', Journal of Actuarial Practice (1993-2006), Jan. 2004.

[9] W. L. Silber, 'The Process of Financial Innovation', The American Economic Review, vol. 73, no. 2, pp. 89–95, 1983.

[10] R. D. Barman, F. B. A. Hanfy, R. Rajendran, G. Masood, B. Dias, and J. P. Maroor, 'A critical review of determinants of financial innovation in global perspective', Materials Today: Proceedings, vol. 51, pp. 88–94, Jan. 2022, doi: 10.1016/j.matpr.2021.04.565.

[11] M. Zheng, G.-F. Feng, Q.-J. Wang, and C.-P. Chang, 'Financial globalization and technological innovation: International evidence', Economic Systems, vol. 47, no. 1, p. 101048, Mar. 2023, doi: 10.1016/j.ecosys.2022.101048.
[12] T. Beck, T. Chen, C. Lin, and F. M. Song, 'Financial innovation: The bright and the dark sides', Journal of Banking & Finance, vol. 72, pp. 28–51, Nov. 2016, doi: 10.1016/j.jbankfin.2016.06.012.
[13] J. Lerner, A. Seru, N. Short, and Y. Sun, 'Financial Innovation in the Twenty-First Century: Evidence from US Patents', Journal of Political Economy, vol. 132, no. 5, pp. 1391–1449.
[14] D. A. L. M. Sant'Anna and P. N. Figueiredo, 'Fintech innovation: Is it beneficial or detrimental to financial inclusion and financial stability? A systematic literature review and research directions', Emerging Markets Review, vol. 60, p. 101140, Jun. 2024, doi: 10.1016/j.ememar.2024.101140.
[15] W. Xu, D. Hu, K. R. Lang, and J. L. Zhao, 'Blockchain and digital finance', Financial Innovation, vol. 8, no. 1, p. 97, Nov. 2022, doi: 10.1186/s40854-022-00420-y.
[16] M. Choudhry, D. Joannas, R. Pereira, and R. Pienaar, 'Mortgage-Backed Securities', in Capital Market Instruments: Analysis and valuation, M. Choudhry, D. Joannas, R. Pereira, and R. Pienaar, Eds., London: Palgrave Macmillan UK, 2005, pp. 232–263.
[17] R. Eckrote, C. Milliken, E. Nikbakht, and A. C. Spieler, 'Collateralized Debt Obligations, Collateralized Bond Obligations, and Collateralized Loan Obligations', in Debt Markets and Investments, H. K. Baker, G. Filbeck, and A. C. Spieler, Eds., Oxford University Press, 2019, p. 0.
[18] X. Fu, M. C. Li, and P. Molyneux, 'Credit default swap spreads: market conditions, firm performance, and the impact of the 2007–2009 financial crisis', Empir Econ, vol. 60, no. 5, pp. 2203–2225.
[19] M. L. Rattaggi, 'Regulatory reform in banking 10 years after the financial crisis', Journal of Risk Management in Financial Institutions, vol. 10, no. 3, pp. 296–302, 2017.