Understanding Financial Contagion: Insights Into Transmission Mechanisms and Their Contribution in Shock Intensification

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Abstract: The main goal of this paper is to identify and analyze the key mechanisms that can lead to financial contagion and their function in the dissemination of shocks within the financial system.

The key mechanisms discussed in the paper include interbank lending, bank runs, asset price contagion, the role of asymmetric information, moral hazard and heard behavior among the investors. By exploring these mechanisms, the paper seeks to enhance the understanding of how shocks are transmitted and intensified within the financial system. To achieve the aim of this paper, secondary research was conducted, utilizing relevant research papers, conference papers, open-access materials, and study reports relating to the research topic.

The findings draw attention to the possibility of banking system contagion effects, especially due to interbank credit exposures, which might affect a small number of banks and potentially spread to a large amount of the system. The incidence of bank runs, which are brought on by economic instability and a lack of faith in the banking system, worsens the spread of shocks. Additionally, the spread of contagion, which results in market crashes and price spillovers, can be aided by investor herding behavior and confusion brought on by asymmetric information.

Key Words: financial contagion, financial crises, asymmetric information, bunk run, moral hazard, heard behavior.

1. INTRODUCTION

Policymakers and economists have engaged in substantial research on the concept of financial contagion, in order to examine its transmission mechanisms and the effects it has on the global financial system.

The theoretical background of this research is framed around understanding the concept of financial contagion and the basic mechanisms through which financial shocks are transmitted.

Nguyen et al. (2022, p.2) explored the concept of contagion in their paper, which refers to a notable rise in the interconnectedness of asset returns across different markets. The author highlights that this co-movement between financial markets can occur due to contagion or interdependence among them. The Global financial crisis of 2007-2009 serves as an example where the crisis spread rapidly across various economies, leading to significant drops in global stock markets and impacting both advanced and emerging markets.

Study conducted by Paas, T. and Kuusk, A. (2010, p.28) have led to a more profound understanding of the basic links that explain the transmission channels. In their research through in-dept literature analysis the authors have examined how the transmission of the crisis between countries is influenced by financial, real, and political connections. When two countries are linked through the global financial system, there are financial links between them. The Mexican crisis of 1994 appears to have been mostly transmitted through financial connections. They cited numerous studies that claimed that throughout the 1990s, financial connections between countries served as the main channel of shock transmission.

Hale, G., Kapen, T. and Minoiu, C. (2016) examined how the worldwide network of bank links enables the transmission of financial shocks in foreign markets. By creating cross-border interbank connections for more than 6000 banks, in the period from 1997 to 2012, their analysis helps them to understand global interbank connection. They concluded that interconnected financial systems allow shocks to be transmitted across borders via banks, having detrimental effects on the real economy.

During the global financial crisis, banks played a critical role in the distribution of financial shocks between countries. In their research, Park, C-Y, and Shin, K. (2017, p.13-14) examined and tested

financial contagion from advanced to emerging market economies through the global banking network. According to their findings, during the global financial crisis, emerging countries that were more exposed, both directly and/or indirectly, to banks in the crisis-affected countries experienced increased capital outflow. Additionally, their findings indicate that the aggregate cross-border lending system of the global banking system could serve as a way for the global liquidity crisis to spread a financial shock throughout the entire world. For developing country economies that significantly rely on foreign borrowing, this creditor bank liquidity issue can be particularly problematic.

In their study Herrmann, S. and Mihaljek, D. (2010, p.22) analyzed the spillover effects of bank lending from advanced economies to emerging markets using a gravity model. The study found that cross-border lending between advanced and emerging economies was affected by various factors. Specifically, cross-border lending was reduced when there was a greater distance between lender and borrower countries and when lender countries had larger home markets. Conversely, cross-border lending increased when borrower countries had larger markets. Additionally, cross-border lending was positively influenced by interest rate and growth differentials, but was negatively affected by a weakening of the borrower country's currency. The study concluded that the latest financial crisis was mainly caused by a reassessment of global risk and expected volatility in global financial markets. Healthier banking sectors, rigid exchange rate regimes, and stronger financial integration helped stabilize cross-border bank flows to central and eastern Europe compared to other emerging markets.

Dungey, M. and Gajurel, D. (2015) in their paper presented a modeling framework, which is based on the Capital Asset Pricing Model (CAPM). The framework aims to analyze the contagion effects of the global financial crisis that occurred during 2007-2009 on the banking sectors of 54 countries. It distinguishes between different channels of contagion, including idiosyncratic contagion (unanticipated shocks from the crisis-originating country), systematic contagion (common shocks affecting global markets), shift contagion (changes in market conditions), and volatility contagion (transmission via changes in market volatility). The study finds that banking crises are strongly correlated with idiosyncratic contagion, particularly from the crisis-originating US banking sector. The results suggest that policy efforts to contain the systematic effects of the crisis may have dampened the systematic channel. About 60% of the sample banking markets experienced a break in global systematic risk exposure, while approximately the same percentage experienced idiosyncratic contagion from the US banking market. Only about 40% of the sample markets showed volatility contagion during the crisis. The paper identifies two clusters of economies: one experiencing both systematic and idiosyncratic contagion and another experiencing only idiosyncratic contagion. The countries affected by idiosyncratic contagion alone had a narrower range of output loss compared to those with significant systematic contagion. The study highlights the importance of regulatory variables, such as concentrated banking sectors and strong capital requirements, in reducing the likelihood of systemic crises.

Domantas, S. (2010, p.3) explained the 2008 financial turmoil and global downturn by the failure of financial intermediation and the increase in asymmetric information. When the economy slowed down and mortgage borrowers became insolvent, the housing market crashed, causing the value of collaterals to drop sharply. As a result, financial institutions suffered large losses that caused Lehman Brothers to go bankrupt and an increase in investor risk aversion. As more financial and non-financial institutions became exposed to these CDOs, banks stopped issuing loans because they were unable to distinguish between borrowers who may default and those who wouldn't. This caused interest rates to increase and a shortage of available money in debt markets. Due to the inability of even big businesses to get capital, production output and general economic activity declined.

The rest of the paper is organized as follows. The materials and method used for preparation of this study are briefly described in Section 2 of the paper. In section 3, in-depth analysis of the financial contagion mechanisms is conducted, following by measures for overcoming the contagion risks and the last section of the paper presents the study's conclusions.

2. MATERIAL AND METHODS

The paper analyzes some of the key mechanisms that cause financial contagion including interbank lending, bank runs, asset price contagion, and the influence of asymmetric information. This paper's major objective is to identify and analyze the fundamental mechanisms that can lead to financial contagion and their function in the dissemination of shocks within the financial system.

To achieve the aim of this paper, secondary research was conducted, utilizing relevant research

papers, conference papers, open-access materials, and study reports relating to the research topic.

3. EXPLORING FINANCIAL CONTAGION MECHANISMS

Although financial contagion is well documented in previous literature there is still no agreement among researchers on the concept or mechanisms of financial contagion. In their extensive research *Paas, T. and Kuusk, A. (2010, p.27) emphasizes how various researchers have defined financial contagion in different ways.* For instance, some researchers define contagion as the certainty of experiencing a crisis domestically if it occurs in another market, while others see the coincidence of extreme return shocks across countries as evidence of contagion.

Table 1 provides compilation of variety of definitions relating to the phenomenon of financial contagion, offering a comprehensive and in-depth exploration of this complex concept.

Table 1: Financial Contagion Definitions

Authors	Financial Contagion Definitions
Basu, R. (2020, p.3)	The term "contagion" refers to the broad concept of a spill-over effect, where an isolated event such as a significant currency devaluation or debt default extends its impact from one financial market or country to multiple others.
Rudiger, D., Park and Y.C., Stijn, C. (2000)	Financial contagion is characterized by a notable rise in interconnections between different markets following a shock affecting a specific country or group of countries. This definition emphasizes the significance of additional channels, such as trade and finance, through which shocks are typically transmitted.
Hernandez, F.L. and Valdes, R. (2001, p.3)	In simple terms, contagion can be defined as a situation where one country (Country A) experiences difficulties or negative consequences due to the troubles faced by another country (Country B). These troubles can range from severe events like currency devaluation, debt moratoriums, or significant regime changes, to milder issues like a decrease in capital inflows and pressure on the exchange market, leading to a decline in domestic asset prices.
Paas, T. and Kuusk, A. (2010, p.27)	Financial contagion only occurs when shocks are transmitted to other countries without any direct connection or common shocks. Some authors argue that there is contagion if the probability of a crisis in one country increases when a crisis occurs in another country, even after considering the usual macroeconomic factors This is called excess co-movement, and it's often attributed to herding behavior.
Yarovaya, L. et al. (2020, p.12)	The term "contagion" refers to the spread of crises that cannot be explained by observable changes in the overall economic conditions of a country. Financial contagion, as described by Masson (1999, 2004), occurs when crises are transmitted due to shifts in investors' expectations and behaviors, rather than being linked to changes in the country's macroeconomic fundamentals. In essence, it implies that the crisis spreads based on psychological and behavioral factors rather than solely economic indicators.

Source: Author' own research

Paas, T. and Kuusk, A. (2010, p.27) highlighted that understanding financial contagion is closely tied to identifying its transmission channels, but there is no consensus among researchers regarding the specific channels through which contagion spreads. Financial contagion can occur through various mechanisms, each playing a role in the transmission and intensification of shocks within the financial system. Following are some of the key mechanisms of financial contagion that policymakers and economists have extensively researched to better understand its impact on the global financial system:

- Banks often rely on borrowing from and lending to each other in the interbank market to manage their liquidity needs and meet regulatory requirements. Upper, C., & Worms, A. (2004) discussed the credit risk associated with *interbank lending* and the potential for contagion effects in the banking system. They highlighted that the risk of contagion depends on the specific interbank linkages. Their findings indicated that contagion effects through interbank credit exposures are possible, with the risk typically limited to a small number of relatively small banks. However, even with safety mechanisms like institutional guarantees for savings banks and cooperative banks, there remains a possibility of bank failures affecting a significant portion of the banking system, suggesting the importance of existing safety nets in reducing the danger of contagion.

  When a shock affects a bank's financial health, it may become unable or reluctant to extend loans to other banks, leading to a tightening of liquidity conditions in the interbank market. This can result in a credit crunch and funding difficulties for other banks, potentially exacerbating the initial shock and spreading it to other institutions.

- *A bank run* happens when depositors withdraw all their funds from a bank or financial institution out of concern that the institution may become insolvent. Investors may initiate a bank run if they become aware of the institution's financial difficulties and the heightened risk of bankruptcy (Wall Street Mojo, n.d.). In their research authors Brown, M., Trautmann, S. and Vlahu, R. (2014) investigated the contagion of panic-based bank runs from one bank to another. Their results showed that panic-based deposit withdrawals can strongly spread among economically related banks, but not between banks without economic linkages. The contagion

is initiated by expectations of other depositors' behavior and is transmitted through subjective beliefs. Their study highlighted the importance of economic events and information in triggering bank runs, suggesting that economic linkages between banks can have negative effects on financial stability. It also raises questions about the role of transparency in information disclosure and its impact on contagion. While participants in their experiment lacked perfect information about the quality of their bank's assets, they were fully aware of the economic linkages between their bank and the leading bank. The results indicated that greater transparency regarding these economic linkages could facilitate the spread of deposit withdrawals among banks. However, it remains uncertain whether reducing transparency about the existence or absence of linkages between banks would result in less or more contagion Overall, the study suggests that careful consideration should be given to information disclosure practices to mitigate the potential negative effects of contagion in the financial system.

- The issue of *asymmetric information* affects the borrowing and lending process in the financial markets. In these markets, the borrower has significantly more knowledge about his financial situation than the lender, meaning that neither party is dealing with the same information (Madan, P. and Kaur, J., 2013, p.22). According Alqaralleh, H. and Canepa, A. (2021, p.4) contagion can occur in financial markets due to existence of asymmetric information. Traders in international financial markets face difficulties in obtaining complete information about the situations in other countries. As a result, they rely on observable stock price movements to gather additional information, which reflects the behavior of other traders. This imperfect information can lead to confusion between price movements caused by specific shocks in a foreign country and those that reveal changes in their own home country. This confusion, in turn, can cause excessive price spillovers across borders, potentially leading to stock market crashes.
- *Moral hazard* represents a willingness to take higher risks that would typically be avoided because the individual knows that someone else will bear the negative outcomes (Gorgieva-Trajkovska, G. and Adzipetrov, R., 2016). Despite moral hazard being one of the causes of financial crises, it can also lead to the transmission of financial shocks from one country to another. More specifically, investors may suspend their investments in countries that have financial systems comparable to the crisis-ridden one if foreign creditors experience losses in a country where they previously believed they would be bailed out by government authorities in case of difficulties.
- *Herding behavior among investors*, which can lead to financial contagion, is another well-known phenomenon that has gained a lot of interest among researches. Bikhchandani, S. and Sharma, S. (2000, p.3), Chen, Z. (2021, p.191), Meril, M. and Roger, T. (2013) have explained the concept of herding as the tendency of individuals to imitate others' actions, influenced by their decisions. An individual is considered to be herding if they would have made an investment without knowledge of others' decisions but refrain from doing so when they discover others opting out. Similarly, they are also herding when the knowledge of others investing influences their decision to make the investment.

  Herding behavior can be caused by a variety of factors, including the need to follow others' lead, worry about missing out on opportunities for benefits, and the belief that the knowledge of the crowd is more reliable than individual judgment.

All the previous mentioned mechanisms contribute to the transmission and intensifying of shocks, increasing instability, destabilizing markets, and potentially creating threats to the entire financial system. Understanding and addressing these mechanisms are crucial for maintaining financial stability and reducing the negative effects of financial contagion.

4. RECOMMENDATION FOR REDUCING CONTAGION RISKS AND ENSURING STABILITY

Studying the transmission of previous financial crises serves as a valuable tool for economists and policymakers, enabling them to gain deeper understanding of the contagion mechanisms and contributing factors of such crises. Through a detailed analysis of past events and recognizing patterns, they can develop more effective strategies to minimize the consequences of future crises and establish stability within financial systems.

Our findings suggest that the following actions should be taken into account by financial institutions and policymakers in order to effectively address and decrease the risks connected with financial contagion:

- Prudential oversight is essential in lowering the threat of banking system contagion. Prudential supervision works by reducing the likelihood of bank failures through enforcing prudent behavior among banks. This helps to lower the probability of initial shocks or failures occurring. Additionally, if banks do fail, prompt regulatory intervention can ensure that they are liquidated before losses become significant, which is reflected in a low loss ratio. Moreover, banking regulation can limit the exposure of banks to individual debtors or groups of debtors, thereby reducing the potential for contagion. Additionally, maintaining adequate safety nets, such as institutional guarantees, can provide a crucial buffer against contagion effects (Upper & Worms, 2004).
- Given the significant role of bank runs in the transmission of financial contagion, it is crucial to strengthen the stability of the financial institutions. Governments can employ various measures to prevent banks from defaulting and minimize the risk of bank runs. These measures include setting higher reserve requirements, providing bailouts, implementing oversight and regulation, promoting transparency etc. These kinds of measures can enhance market confidence and reduce the likelihood of bank runs during times of financial stress (Wall Street Mojo, n.d.).
- To limit and prevent the negative effects of the moral hazard in the banking sector, a range of measures can be taken including supervision, minimum capital requirements, subordinated debt mandatory issuance, limited insurance coverage, risk-weighted premiums, mutual liability, clear insolvency procedures, private involvement and management of the insurance program (WB, n.d, p.141). In addition to deposit-rate controls, Hellmann, T., Murdock, K., and Stiglitz, J. (2000, p.162-163) argued that alternative policy instruments can be utilized to tackle moral hazard. Asset-class restrictions, exposure rules, and risk-based deposit-insurance premiums can all play a role in reducing risky behavior in the banking sector. Asset-class restrictions and exposure rules can limit banks' ability to invest in assets that encourage excessive risk-taking, thus mitigating the moral-hazard problem. By restricting investments in gambling-like assets, banks' incentives to engage in risky behavior can be reduced.
- While previous research emphasizes the importance of improving transparency to address the asymmetric information issues, Stiglitz (2000, p.10) argued that true effectiveness requires comprehensive transparency, covering areas such as off-shore banking, hedge funds, and potentially even the actions of central bankers. In essence, Stiglitz advocates for a broader and more all-encompassing approach to transparency to achieve meaningful results in reducing information asymmetry in the financial system.
- Chen, Z. (2021, p.193) has offered several measures that can help in avoiding the negative effects of herd behavior in the dynamic financial market, including flexible investment strategies, improving analytical judgment, and developing long-term investment plans. Regulatory bodies should take into account the different situations of market participants and promptly develop thorough and precise legal regulations. Strengthening the financial knowledge and education of individual investors can help improve their cognitive level and reduce negative herd effects. Tamplin, T. (2023) emphasized that both investor education and the study of behavioral finance play essential roles in helping investors recognize and overcome cognitive biases that lead to herding behavior.

By implementing the above measures, policymakers and financial institutions can enhance the resilience of the financial system, reduce the risk of contagion, and reduce the potential negative impacts on economies.

5. CONCLUSION

This paper investigates the concept of financial contagion, explores its transmission mechanisms and offers recommendation for policymakers and financial institutions to reduce contagion risks and ensure stability. Through an in-depth study of existing literature, the paper establishes a theoretical framework for understanding financial contagion mechanisms across countries.

The study highlights various mechanisms of financial contagion, including interbank lending, bank runs, asymmetric information, moral hazard, and herding behavior among investors. These factors may help shocks spread and become more intense, heightening instability, tumbling markets, as well as posing risks to the entire financial system.

The findings draw attention to the possibility of banking system contagion effects, especially due to interbank credit exposures, which might affect a small number of banks and potentially spread to a

large amount of the system. The incidence of bank runs, which are brought on by economic instability and a lack of faith in the banking system, worsens the spread of shocks. Additionally, the spread of contagion, which results in market crashes and price spillovers, can be aided by investor herding behavior and confusion brought on by asymmetric information.

To manage and reduce the risks related to financial contagion, the paper offers several recommendations for policymakers and financial institutions.

Our future research will be built on this study, with an emphasis on performing empirical research to support the conclusions of the theoretical analysis. More specifically, our future research will mainly focus on gathering data from previous financial crises in order to comprehend how the mechanisms interacted and contributed to the transmission of shocks.

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