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Financial Contagion: A Systematic Literature Review

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ABSTRACT

Purpose – This study aims to provide a comprehensive overview of the available information on the financial contagion/contagion effect during the COVID-19 pandemic through a systematic literature review.

Design/methodology/approach – Financial contagion, the phenomenon of events spreading and affecting financial markets, has gathered significant attention from scholars and practitioners. Numerous studies have been conducted on this topic, necessitating a thorough examination to understand the diverse approaches and findings related to financial contagion. Therefore, we conducted a review of financial contagion/contagion effect studies in the Web of Science (WoS) and the Scopus databases, analyzing 37 articles.

Results – His review, based on selected keywords and defined criteria, had a total of 1,160 citations referencing these articles as of December 2024. Notably, the multivariate GARCH models, the VAR model, and the Copula model emerged as prominent methodologies for investigating the financial contagion effect.

Discussion – By synthesizing current research findings, we offer insights into potential directions for future studies on this vital subject, thus contributing to a deeper understanding of financial contagion/contagion effect.

1. Introduction

Financial contagion among financial markets has a significant influence on today's interconnected financial system. A crisis or financial distress that initiates in one institution or market can spread to others. Contagion stemming from the interconnected and interactive nature of the financial system implies a tendency for an event or issue in financial markets to negatively affect other participants. When the literature on financial contagion is analyzed, many studies on this subject are identified. Therefore, instead of analyzing all these studies one by one, it would be a more effective approach to use methodologies that will enable us to see the whole picture. Using a systematic literature review, which is one of these methodologies, saves time and labour and provides much more information about the event or subject in question (Yıldız, 2022). One such methodology is a literature review, which involves not only reviewing previous works but also constitutes a dedicated research effort in its own right (Thome et al., 2016). It's a specialized form of secondary research that aims to offer an objective and impartial method for finding, extracting, gathering, and synthesizing relevant primary studies (Kitchenham et al., 2015). According to Karaçam (2013), systematic reviews are more scientific and more likely to gain acceptance. Reviews are more objective, contain fewer biases and errors, are more comprehensive due to the systematic approach used in literature searches, and are repeatable. The methods used for the literature search are clearly stated, and the criteria for selecting studies are explicitly defined. The qualities of the included studies are assessed, and even the smallest evidence and effects are included in the review when combining research data. Researchers can replicate systematic reviews and verify their results (Moule ve Goodman, 2009; Hemingway ve Brereton, 2009, as cited in Karaçam, 2013).

In today's world, the interaction between financial markets and globalization has rapidly intensified. Understanding and managing the increasing interplay between markets can contribute to the creation of more stable financial systems. Therefore, the notion of financial contagion, which denotes the impact and diffusion of events in financial markets on one another, has gained international significance. Therefore, the goal of this

ETHICAL APPROVAL: This study uses secondary data and does not require ethics committee approval.

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study is to conduct a systematic literature review of financial contagion studies in the Scopus and Web of Science (WoS) databases and to make recommendations for future research in this field. In this study, studies examining the financial contagion/contagion effect of the COVID-19 pandemic in the financial markets of different countries were evaluated through a systematic literature review. Data obtained through searches conducted with selected keywords and exclusion and inclusion criteria were examined with the assistance of EndNote 20, R Program (Biblioshiny), and MS Excel Programs. A total of 37 articles were considered to address the research queries. The contribution of this study lies in the application of a literature review to an important topic like financial contagion, facilitating the examination of the subject. Additionally, it offers insights and implications for future endeavors.

The remaining sections are prepared as follows. Section 2 describes the methodology, and Section 3 presents findings and discusses the results. Section 4 offers future research topics on financial contagion/contagion effect. Concluding remarks are covered in Section 5.

2. Methodology

The systematic literature review was conducted following the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) protocol. The objective was to comprehensively address the concept of financial contagion, observe the aggregated findings of research related to the subject, and perform a literature review. The PRISMA protocol was adhered to ensure a structured and transparent approach to the systematic literature review process (Page and Moher, 2017).

2.1. Research Objectives and Research Questions

The goal of this study is to comprehensively address existing studies on financial contagion/ contagion effect in the financial markets of different countries during the COVID-19 pandemic. These studies have been scanned in the Web of Science (WoS) and the Scopus databases, which are considered among the most comprehensive scientific databases. The research questions to be addressed in the study are as follows:

- Which articles address financial contagion/ contagion effect in the financial markets of different countries
- during the COVID-19 pandemic?
- What are the research objectives of these articles that examine financial contagion/ contagion effect?
- What are the prominent findings of these articles that examine financial contagion/ contagion effect?
- What are the citation counts of the examined studies? Which studies have received the highest number
- of citations?
- What is the multi-authorship status of the examined studies?
- How are the examined studies distributed across the years?
- How are the examined articles distributed across different journals?

2.2. Search Strategy and Study Selection Process

The data gathering procedure was carried out through Scopus and Web of Science (WoS) due to their ability to simultaneously import multiple datasets into the EndNote program and their status as two of the most comprehensive scientific databases. After reviewing various publications related to the general topic, the following keywords were selected for the search Web of Science (WoS) and in Scopus databases, as they were considered to represent all dimensions of the topic: “Financial Contagion” OR “Contagion Effect” AND “COVID-19” OR “COVID-19 Pandemic” OR “COVID-19 Crisis” The chosen keywords were used for searches in both databases. In Scopus, the search was conducted in the fields of "article title," "abstract," "keywords", while in the WoS Core Collection, it was conducted in the "Topic" field, which includes author keywords, Keywords Plus®, title, and abstract.

Inclusion and exclusion criteria were established for searching and selecting articles. Publications up to December 27, 2024, that were indexed in the specified databases were included, while book chapters, etc., were excluded. Systematic literature review articles were excluded from the study as they cannot be included in systematic literature searches. Following the application of the selected keywords and inclusion and exclusion

criteria, searches yielded a total of 281 sources: 200 from Scopus and 81 from Web of Science (WoS). Among the remaining 281 articles, 39 duplicates were removed, resulting in 242 articles moving on to the next stage. Title screening was performed on these articles, abstracts, and keywords, yielding 108 articles. Abstracts of these 108 articles were screened, leading to the selection of 104 articles for full-text examination. Among these, 5 articles without accessible full texts, and 62 articles that were deemed not to answer the research questions were removed, leaving 37 articles for evaluation. The flow of the screening process conducted following the PRISMA protocol is detailed in Figure 1 (Moher et al., 2009).

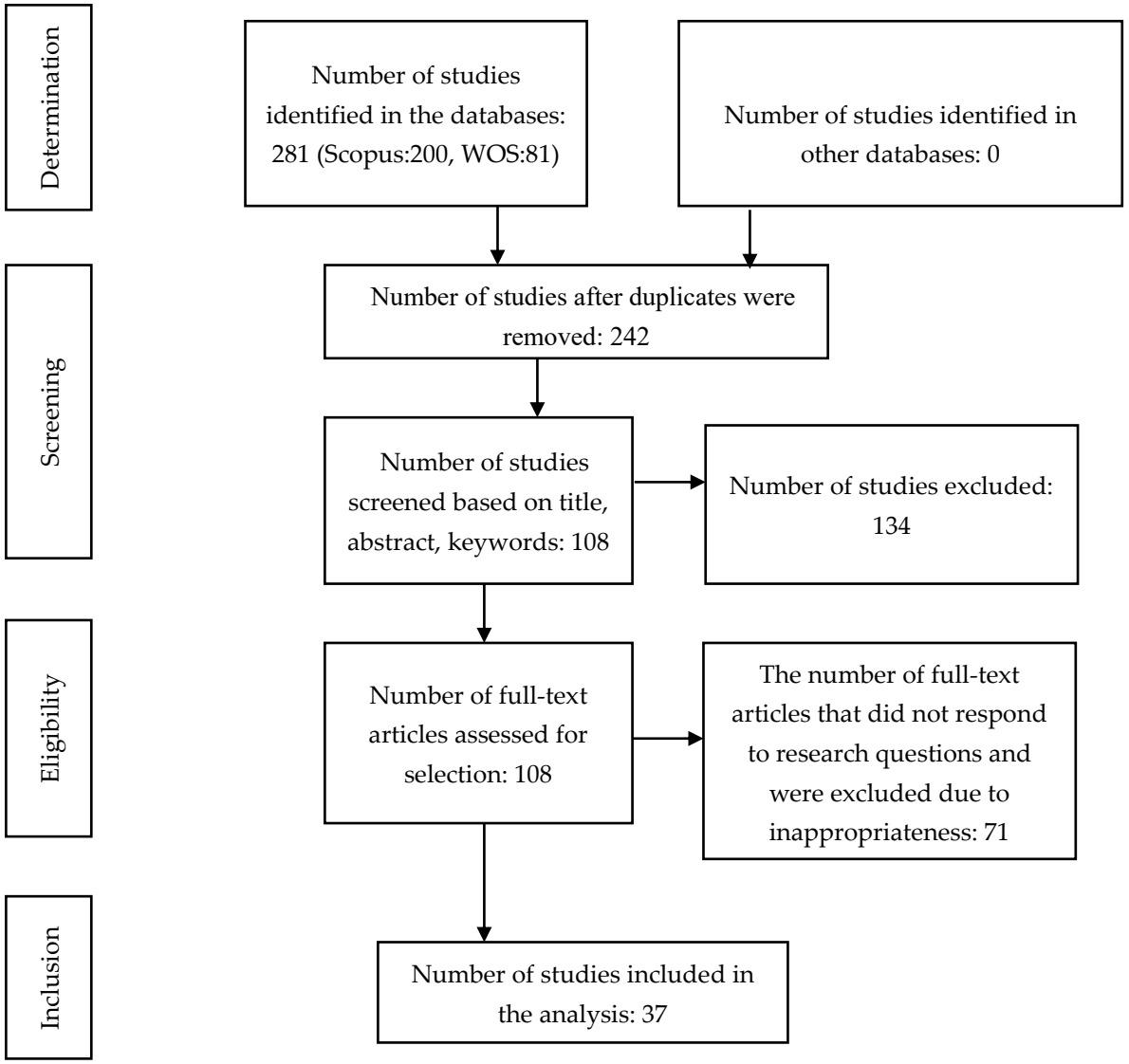

Figure 1. PRISMA Flow Diagram (2009) - Systematic Literature Review Screening Process

2.3. Evaluation and Data Extraction of Articles

During the data extraction process, all included articles were classified based on year, journal, utilized methods, and topics. At this stage, the entire texts of the publications obtained from the screening, as well as their details, were reviewed by the researchers. Given the importance of publication quality at this stage, a quest was directed to two significant databases, Scopus and Web of Science, to ensure the quality of the publications.

3. Results

A total of 37 articles investigating financial crises, the COVID-19 pandemic period, and financial contagion/contagion effect were examined according to the predefined criteria. The findings obtained from the evaluations are presented below in subheadings.

3.1. Distribution of Articles by Number of Authors

The total number of authors contributing to the 37 examined articles is 100. Among the included articles, six were authored by a single author, nine by two, fourteen by three, six by four, and two by five. It is evident that the majority of articles on financial contagion are multi-authored.

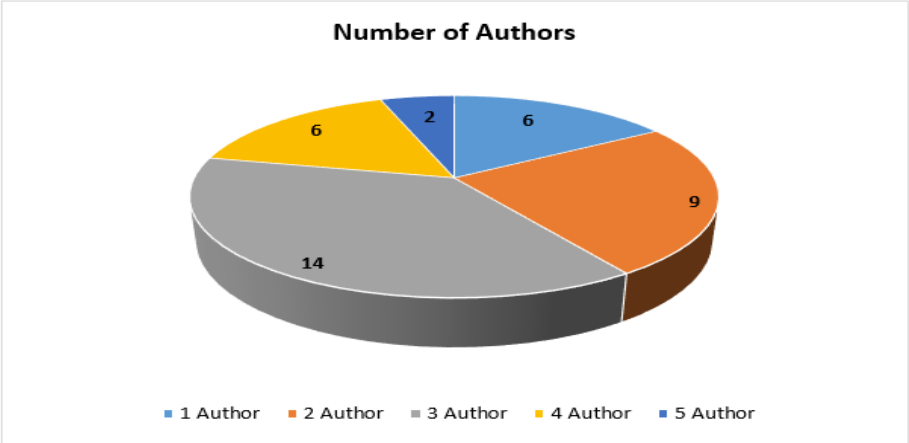

Figure 2. Number of Authors

3.2. Distribution of Articles by Year

Figure 2 displays the distribution of articles related to the COVID-19 pandemic period and financial contagion/contagion effect by year. The included studies span the years from 2020 to 2024. The analysis shows that the lowest number of publications occurred in 2020 (1 article), while the highest number was in 2022 (14 articles). 11 articles were published in 2021, 6 in 2023, and 5 in 2024. Moreover, there has been a growing trend in 2021 and 2022, indicating an increasing focus on studies related to financial contagion. This suggests that an escalating significance is attributed to the topic. The articles considered in this study were collected from the databases until December 2024. Therefore, only articles up to December 2024 are included in the evaluation.

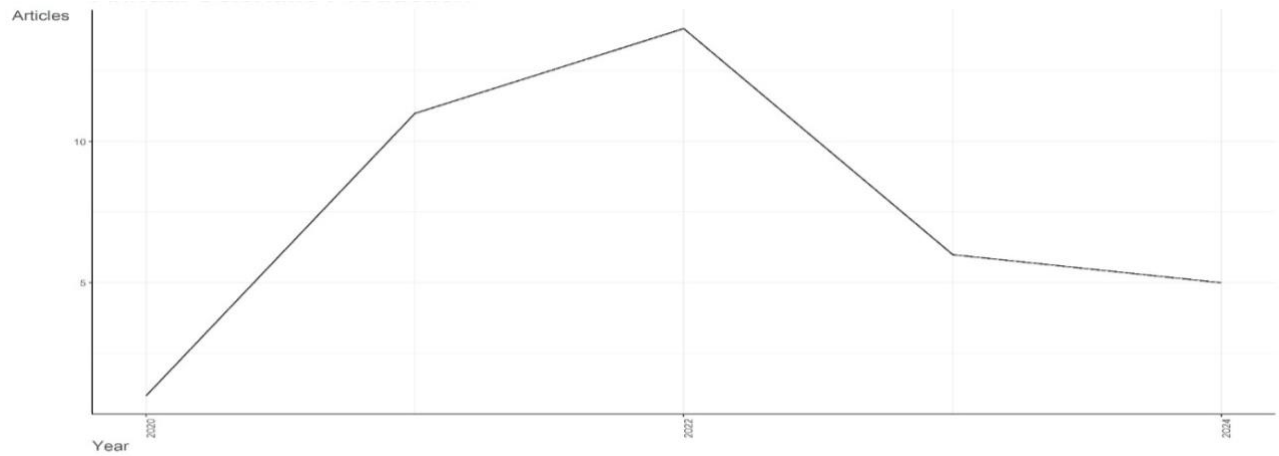

Figure 3. Distribution of Articles by Year

3.3. Distribution of Articles by Journal

Figure 3 illustrates the distribution of articles based on the journals in which they were published. According to this distribution, "Finance Research Letters" (3) and "International Review of Financial Analysis" (3) emerge as the journals with the highest number of published articles.

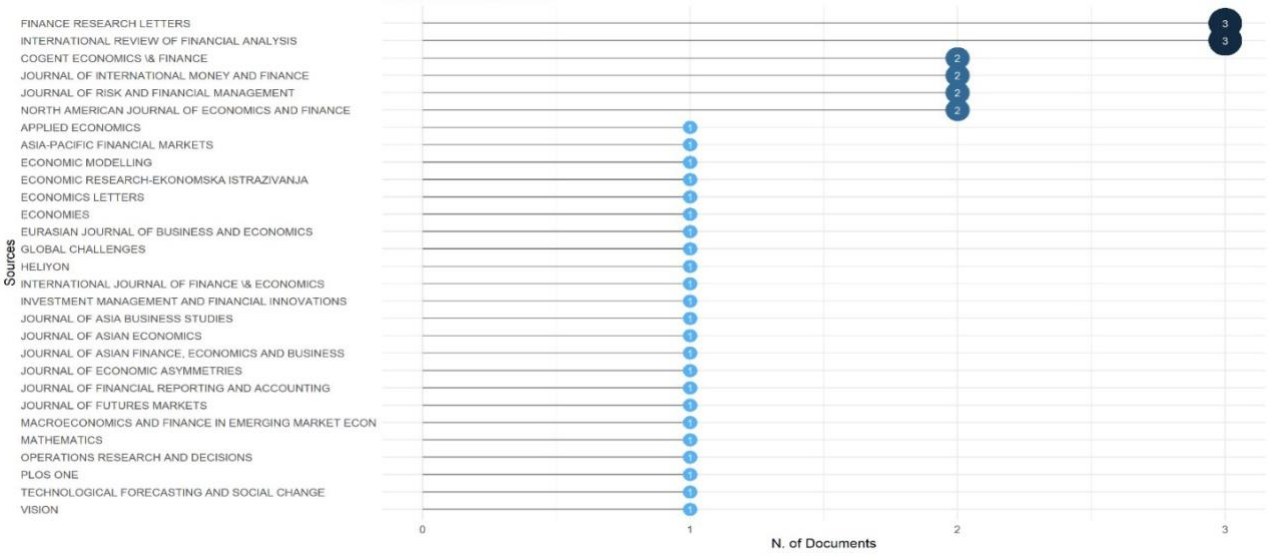

Figure 4. Distribution of Articles by Journal

3.4. Distribution of Articles by Citation Counts

A total of 1160 citations have been made to the 37 examined articles up until December 27, 2024. Table 1 lists the most highly cited articles. The study with the highest number of citations is authored by Akhtaruzzaman et al. (2021) with 552 citations. Descriptive information regarding the 5 most highly cited articles is provided in Table 1.

Table 1. Descriptive Information of the Most Highly Cited Articles

Year	Author	Title	Citations	Journal
2021	Akhtaruzzaman, et al.	Financial Contagion During the COVID-19 Crisis	552	Finance Research Letters
2021	Yousfi, et al.	Effects of the COVID-19 pandemic on the US stock market and uncertainty: A comparative assessment between the first and second waves	100	Technological Forecasting and Social Change
2022	Samitas, et al.	COVID-19 pandemic and spillover effects in stock markets: A financial network approach	78	International Review of Financial Analysis
2021	Banerjee	Futures market and the contagion effect of COVID-19 syndrome	62	Finance Research Letters
2022	Gunay & Can	The source of financial contagion and spillovers: An evaluation of the COVID-19 pandemic and the global financial crisis	41	PloS one

3.5. Distribution of the Articles Analyzed in the Systematic Analysis According to Countries

Figure 4 shows the distribution of articles by country. According to this distribution, “China”, “United Kingdom”, “India”, “France”, and “Romania” emerge as the countries where the most articles are published.

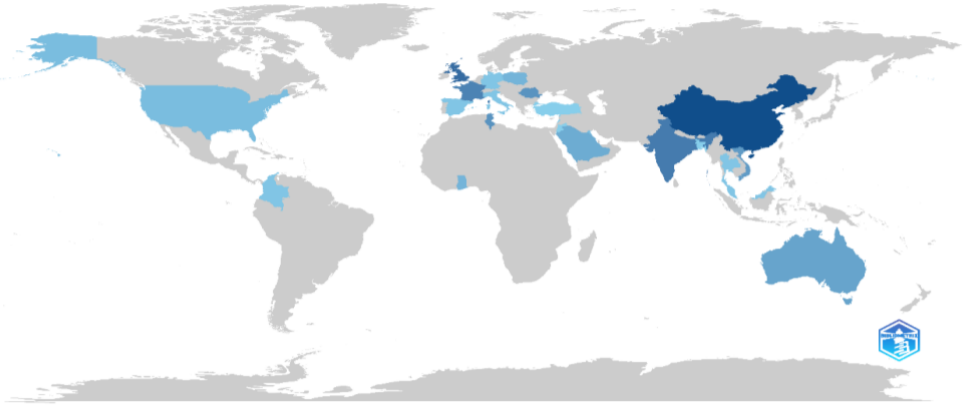

Figure 5. Country Scientific Production

3.6. Analysis of Studies Included in the Systematic Literature Review

When examining the literature included in the systematic analysis, the provided text contains summaries of various studies related to financial contagion and its effects on different economies during various crises. The studies analyze factors like the spread of financial crises and the interdependence of stock markets. The main findings of each study are briefly highlighted below:

Table 2. Final Sample of the Study

Authors/ Year	The Sample Period and Market Details	Methodology	Findings
Chevallier (2020)	From 22 January 2020 to 5 May 2020. 31 stock markets	Susceptible-Infective-Removed (SIR), GARCH, DCC-GARCH, Value-at-Risk (VaR)	The findings of the study have revealed the devastating impact of the COVID-19 pandemic on financial markets.
Akhtaruzzaman, et al. (2021)	From 1 January 2013 to 20 March 2020 China and the G7 countries' stock returns	VARMA (1,1) DCC-GARCH Model, Optimal Portfolio Design and Hedging Ratios, Directional Spillover Model	The study highlights increased conditional correlations in stock returns among public firms, particularly financial ones, during the pandemic. Nonetheless, the significant rise in these correlations during the COVID-19 outbreak highlights their critical role in the transmission of financial contagion.
Alqaralleh & Canepa (2021)	From 1 January 2014 to 8 August 2020 Equity market price indices for six markets	Wavelet-Copula-GARCH procedure	The results suggest that there was contagion in equity markets after the outbreak of the COVID-19 pandemic.
Banerjee (2021)	1st August 2015- 31st July 2020 China, 17 countries' derivative market	Multivariate Asymmetric DCC-EGARCH	The analysis shows that during COVID-19, there was significant financial contagion in most developed and emerging markets, with close trade ties with China.
Brania & Gurgul (2021)	From 2008 to 2020. Germany, the Netherlands, the Eurozone, France, the United Kingdom, Australia, the United States, and both foreign exchange and capital markets.	Descriptive Statistics, Matrices Of Correlation	This study concludes that during both crises, contagion effects were significantly stronger in stock markets compared to forex markets. Furthermore, the contagion impact on financial markets was more pronounced during the 2008 crisis than during the COVID-19 crisis.
Chakrabarti, et al. (2021)	From January 2015 until 25 May 2020. G20 countries	Detrended Cross-Correlation Analysis (DCCA)	The COVID-19 pandemic has increased contagion in the global equity market, reducing the benefits of international portfolio diversification and increasing the associated risks.

Fu, et al. (2021)	Between 2018 and 2020. Stock markets of 15 countries selected from Asia, Europe, Latin America, and North America	Lower Order Moment Model EGARCH	According to the findings, countries that experienced a more severe COVID-19 pandemic faced more financial contagion.
Le &Tran (2021)	From 03/01/2005 to 31/12/2009, from 03/09/2019 to 30/06/2020. US, Vietnam, and the Philippines	DCC – GARCH Model	According to the findings, contagion from the US stock market to the Vietnamese stock market was detected during the global financial crisis, but to the Philippine stock market, it was not detected. During the COVID-19 pandemic, there was evidence of contagion in the Philippine and Vietnamese stock markets.
So, et al. (2021).	From 12 December 2019 to 29 May 2020 47 stock markets	Granger-Causality Test	The findings of the study also indicate that there was contagion from the COVID-19 pandemic to financial markets, leading to a significant increase in systemic risk within these markets
Wang, et al. (2021).	From April 8, 2005, to April 30, 2020, United States, China stock markets	Dynamic MRS-copula-EVT Model	The results indicate that financial contagion is briefer, more impactful, and more responsive to risky downside shocks in the US compared to China. Overall, the COVID-19 pandemic demonstrates the most significant financial contagion since earlier financial crises.
Yousfi, et al. (2021)	From January 5, 2011, to September 21, 2020 US and Chinese stock markets	DCC and ADCC Model	According to the research, during the rapid spread of the COVID-19 pandemic in the US, financial contagion effects in two stock markets were identified using the dynamic correlation method.
Zorgati & Garfatta (2021)	From January 1, 2014, to January 30, 2021. Stock index series of Asian, American, and European countries	Local Quadratic Regression, Local Linear Regression, Local Correlation	By employing local correlation metrics and polynomial regressions, it is demonstrated that spatial contagion effects exist between China and geographically distant countries. However, this effect is not observed in countries that are geographically closer, such as Taiwan, Vietnam, and Hong Kong.
Shahrier (2022)	From June 2019 to December 2020 ASEAN-5 countries' exchange rates	Wavelet Analysis, Vector Error Correction Model	It was found in the study that the Indonesian rupiah was the first to react to the COVID-19 shock, leading to fundamentals-based contagion to Malaysia and Thailand, while the Philippines and Singapore experienced temporary pure contagion driven by market sentiment.
Chopra & Mehta (2022)	January 1, 1995-May 18, 1998, January 4, 2005-December 7, 2009, January 4, 2005-April 27, 2012, January 1, 2018- April 30, 2021 13 Asian countries' stock markets	DCC- GARCH Model	The study finds that, among the Asian financial crisis, the US subprime crisis, the Eurozone debt crisis, and the COVID-19 crisis, the US subprime crisis is the most contagious for Asian stock markets
Fry-McKibbin, et al. (2022)	December 31, 2019- August 20, 2020 G20 equity markets	Higher-Order Comoment Contagion Tests	In this study, evidence of contagion through equity market tail risk in early 2020 was identified, along with widespread contagion from the U.S. to G20 equity markets through multiple channels following the pandemic announcement.
Grillini, et al. (2022)	From 01/01/2000 to 15/03/2021 Eurozone countries stock markets	Vector Autoregressive (VAR) model	This study provides evidence supporting the existence of contagion within the Eurozone through stock market illiquidity.
Gunay & Can (2022)	From June 6, 2005, to October 6, 2020. 4 developed and 2 emerging countries' equity markets	DCC-GARCH, Modified ICSS Test, and Diebold-Yilmaz Connectedness Analysis	According to the findings of the analysis, the US stock market served as the main source of financial contagion and volatility spillovers during the pandemic, much like its role in the Global Financial Crisis, even though the outbreak started in China.

Heil, et al. (2022)	From January 1995 to July 2020 American, European, and Asian-Pacific countries' equity markets	Dynamic Spatial Autoregressive Model (SAR)	The study identified global contagion during the COVID-19 pandemic only in the first quarter of 2020.
Kakinuma (2022)	From October 2013 to May 2021 stock markets in Southeast Asia	The vector autoregressive-Baba, Engle, Kraft, and Kroner-generalized autoregressive conditional heteroskedasticity model	The links between Southeast Asian equities, bitcoin, and gold strengthened during the pandemic. However, Bitcoin did not serve as a hedging tool for investors in Southeast Asia. Although bitcoin's pricing mechanism and technology are different from traditional equities, the results reveal a parallel movement between bitcoin and Singapore and Thai equities during the crisis.
Nguyen, et al. (2022)	From January 2005 to July 2021 U.S, Japanese, Chinese, and Asian stock markets	DCC-EGARCH Methodology	In this study, significant contagion effects from the U.S. equity market to the markets of both advanced and emerging economies were identified during the Global Financial Crisis. However, during the COVID-19 pandemic period, U.S. driven contagion was detected in only 3 out of 10 Asian emerging markets.
Pineda, et al. (2022)	From January 07, 2005, to December 04, 2020, The United States, China, and five European countries' stock markets	DCC-GARCH Methodology	The findings reveal signs of contagion primarily stemming from investor hopes and their influence on volatility in the course of the three crises. Additionally, information dissemination, measured through text-based indexes during the COVID-19 crisis, significantly contributed to market contagion and herding behavior.
Rai, et al. (2022)	1 January 2019 and 15 July 2021 Eight stock indices	EGARCH and DCC-GARCH Approach	The findings reveal that contagion exists in the equity markets for certain pairs of stock indices, with the impact of contagion varying between medium and short-term periods across different indices.
Ramakrishna & Kalpakam (2022)	From January 4, 2017, to October 30, 2020. India, US, UK, Hong Kong, China, Japan, and the EURONEXT Index. Stock Market	Johansen Cointegration Technique, VECM, Impulse Response Function	The findings of the study reveal that, in the pre-COVID-19 period, there were linkages between the stock markets of India and those of the United Kingdom, Japan, and Hong Kong. However, the post-pandemic results show that shocks were transmitted from India to two major European indices the U.K. and Euronext stock exchanges as well as to the Japanese stock market.
Samitas, et al. (2022).	From 1/12018 till 18/6/2020. 51 emerging and developed stock markets	A-DCC Model and Financial Network Approach	The evidence indicates immediate financial contagion as a consequence of the lockdown and the spread of the novel coronavirus.
Siddiqui, et al. (2022).	From 1 April 2019 to 30 June 2020 3 developed and 8 emerging stock markets	DCC-GARCH Model	The results indicate that certain emerging markets are influenced by contagion from developed markets, while others show no impact
Yuan, et al. (2022)	From January 1, 2019, to March 27 26 major stock markets	Dynamic Mixture Copula-EVT Model	By examining investor behavior, fear, and sentiment, the research reveals that investor attention plays a crucial role in explaining the financial contagion triggered by the pandemic
Zhang, et al. (2022)	From January 3, 2016, to December 31, 2020 Mainland China, Hong Kong, Japan, South Korea, Singapore, Thailand, and Taiwan	The Threshold Autoregressive Model (TAR)	The findings of the study support the existence of jump interdependence among Asian equity markets
Ayadi & Ben Said (2023)	From January 1, 2020, to December 31, 2022 10 developed markets' stock markets	VAR Model, Granger Causality Test, Impulse Response Functions, Variance Decomposition Test	The empirical findings demonstrate volatility instability across various indices and highlight causal relationships between the standardized volatility of markets. Additionally, market responses to shocks originating from the American and Chinese markets vary across markets.

Houda Benzarti & Mighri (2023)	From 31 December 2018 to 20 August 2020. 24 emerging Islamic equity markets.	Frequency-Domain Granger Causality Test	The findings of the study indicate significant evidence of contagion during the COVID-19 period, particularly through the coskewness, cokurtosis, and covolatility channels. Moreover, it is determined that emerging Islamic equity markets are not immune to the contagious effects of the COVID-19 pandemic.
Davidescu, et al. (2023)	From 1 April 2005 to 1 April 2021, the US, Germany, Romania, the Czech Republic, Hungary, and Poland stock markets	DCC-GARCH Diebold–Yilmaz (2012) Methodology, The Markov Switching Regime Approach	The study's empirical findings indicate that the contagion effects from developed stock markets to emerging Central and Eastern European stock markets increased significantly during the initial phase of the health crisis.
Nguyen (2023)	From January 2017 to January 2021 Six ASEAN equity markets	DCC-GARCH Model, the Bayesian Test	The findings suggest that there is a positive volatility pass-through from crude oil prices to emerging equity markets. These co-movements became more pronounced during the health crisis, providing evidence for the presence of contagion effects.
Sghaier, et al. (2023)	From 1st January 2013 to 7 April 2022. Chinese and the G20 stock markets	Time-Varying Copula Approach	The findings strongly suggest that there is a contagion effect between China and all countries except the United States, Argentina, and Turkey during the COVID-19 period.
Yuan, et al. (2023)	From April 8, 2005, to January 24, 2022. 22 major emerging and developed markets across North America, Europe, Latin America, South America, Asia, Africa, and Oceania	The Dynamic Mixture Copula-EVT Model	The findings confirm that the wealth effect is the main channel for lower-tail contagion, whereas portfolio rebalancing behavior acts as the predominant channel for upper-tail contagion during various crises.
Harb & Umutlu (2024)	May 01, 2005, and May 31, 2023. 59 countries and 20 global industries	Residual-Based and Volatility-Adjusted Correlation	The findings of this study show that some industries and countries were resilient to shocks during the Global Financial Crisis and the COVID-19 pandemic crisis, whereas others played the role of shock transmitters.
Huong (2024).	From 31 July 2000 to 8 January 2021 Vietnam and the Asia stock market	The Bivariate VAR and BEKK-GARCH Models	The key findings show that stocks from the Philippines, Singapore, and Thailand influenced the Vietnam index during the COVID-19 period. In contrast, the Vietnam index exhibited an opposite directional impact on Malaysia and the Philippines
Junior, et al. (2024)	January 2012 to March 2023 12 Sub-Saharan stock markets	WMC and WMCC, CEEMDAN, Effective Transfer Entropy, Non-Linear Causality Test	The results of this study have shown that the majority of stock markets in Africa were insulated from the contagion effects of the pandemic.
Zhang, et al. (2024).	From 1 January 2016 to 30 June 2021 9 countries' stock market	The BEKK-GARCH Model, Quantile Regression	The findings of the study indicate that news originating from the United States strengthened market co-movements during the pandemic, that bad news led to more intense contagion, and that investor sentiment and volatility were key determinants in this process.

Upon examining the results of the aforementioned literature on financial contagion, it is evident that interest in the concept has increased over the years, with growing importance attributed to the topic. The Multivariate GARCH models, VAR models, and Copula models stand out as prominent tools for examining contagion effects. International financial contagion has been intensively researched in stock markets, both during and before the COVID-19 pandemic, as well as during past financial crises. Overall, these research summaries cover various aspects of financial contagion, together with its determinants, spread channels, and impacts on different markets during crisis periods. Each study contributes to the understanding of financial contagion, highlighting the complexities of its patterns, the effects of various factors, and the challenges in predicting and managing the spread of financial crises. These summaries provide an overview of the studies' main objectives and findings related to financial contagion and market interdependencies during crisis periods.

4. Suggestions For Future Research

The scholarly investigation into financial contagion has witnessed a notable expansion following the occurrence of the COVID-19 pandemic and the 2007-2009 financial crisis. Consequently, a more profound analytical approach holds the potential to yield novel perspectives and insights, thereby contributing to the advancement of the understanding of financial contagion. Notwithstanding the progress made, numerous aspects within this field remain unexplored or underdeveloped. The following outlines key recommendations for prospective research endeavors to enhance understanding of the significance and implications of financial contagion on an international scale:

1. The transmission of information among markets occurs no later than the following business day, which is realistic in the era of fully computerized emerging markets. How can future research contribute to the field by exploring the creation of tests to assess causality at extended time lags, particularly considering the observed lag of two days or more between markets, which may offer insights into independence and contagion dynamics?
2. Recent years have seen authors focusing on econometric techniques that prioritize the identification of the relative significance of potential transmission channels and contagion in financial crises. How can the application of Spatial Econometrics, an unexplored technique in contagion analysis, contribute to a new research field by expressing global relations based on open dynamic-spatial norms, potentially shedding light on financial interdependence during crises?
3. How do regulatory measures and government stimulus packages impact the financial sector's role in spreading crises to other nations and industries, and what is their influence on the probability of the severity of a crisis and real economy infection, warranting further investigation?
4. Comparing volatility index returns and stock index returns reveals time-sensitive changes in them. How does the time-sensitive nature of changes in volatility indices, especially in comparison to stock index returns, affect the effectiveness of volatility hedging, and what challenges and implications does this pose for future research in analyzing these effects?
5. Recommendations for global investors in financial markets exhibiting financial contagion are crucial, especially considering the potential portfolio benefits when risk appetite shifts. How does the presence of pure contagion in markets impact international investors, particularly concerning potential portfolio benefits amid shifts in risk appetite? Further, what insights can be gained by exploring contagion between FX markets and stock markets among nations when pooling data from sample countries, and how might this area be explored in future research?
6. The narrative method might be extended to differentiate among various kinds of country-specific shocks, such as political news, economic news, or rating changes. How can the narrative approach be extended to discern between different types of country-specific shocks, including economic news, political events, or rating changes? Additionally, what insights can be gained by testing financial contagion not only among different nations but also among various sectors within a unified context? How might this direction be explored in future research?
7. Quantile reversion is not the sole approach for modeling causal factors, quantile risk. Other methods, like the copula and the extreme value theory, could be useful. How might other methodologies, such as copula and extreme value theory, contribute to modeling the quantile risk of random variables, in addition to quantile regression? Furthermore, considering the potential of a quantile vector autoregression with regime-switching, how can this model effectively capture regime-dependent cross-effects between quantiles of random variables, and what insights might it offer for future research?
8. Policymakers should reflect on the effects of financial contagion in financial markets, particularly bordering nations, when establishing policies to cope with a financial crisis. In what ways can policymakers effectively consider and address the impact of financial contagion from neighboring countries when formulating strategies to manage a financial crisis? How might global communication and cooperation contribute to mitigating the transmission of financial turmoil across global markets?

9. How can future research enhance our understanding of financial contagion by exploring comovements across multiple countries, extending fuzzy dynamical system scenario simulation to an international framework, and comprehensively investigating uncertainty using a fuzzy-rough model in view of the time-delay impact on countries affected by volatility during financial shocks? Furthermore, it is necessary to analyze financial institutions and the chaotic behavior of governments in the financial system model as a dynamical system.
10. Further research may concentrate on time-varying relations among the US financial markets and other countries by allowing for regional financial risk variables. What valuable insights could be obtained by investigating the co-movements of sector returns across countries in global markets, thus expanding upon existing literature?
11. How can the construction of a focused network facilitate the interpretation of findings in the context of connectedness within the financial contagion mechanism? Additionally, what considerations should be explored in defining a dynamic tree-network arrangement, and how might the dynamic delay be achieved through the incorporation of serially correlated behavior in asset returns or the utilization of a time-varying constraint approach to explore dynamic reliance between local and global mechanisms?
12. Given the proposed methods and the empirical results presented, what is the potential impact and validity of employing financial linkage predictors, compared to industrial sector datasets, in constructing alternative real economy and financial contagion models, including commonly used methods such as VEC, copula, and CCA? How can the robustness of the suggested approach be enhanced through additional substantiation by examining the empirical findings derived from these diverse methods?
13. Furthermore, considering the current study's limitation of using network indicators solely as explanatory variables, one might explore how these indicators could be employed to depict the topological configurations of financial structures in future research. This approach elucidates the dynamic evolution of financial networks and contributes to a comprehensive understanding of contagion mechanisms from a network perspective
14. From a policymaker's perspective, how can our proposal be utilized to proactively assess the anticipated effect of a financial crisis in a specific nation on the international financial system, leveraging the identified relationships? Considering the varied nature of crises—whether financial, real, or emotion-driven—their effect is channeled into the structure through impacts that can be estimated in advance, either through the market or lending channel. What further study is needed to expand the approach to include other nations, especially those within the G-20?

5. Conclusion

Research has revealed the interconnectedness of financial markets, where economic and financial instabilities occurring in one country affect others. Therefore, countries need to safeguard their economic structures, ensure the functioning of their economies, and manage investment decisions while managing risks effectively. Investigating the impact of financial crises and pandemics on the financial system's exposure to contagion is crucial for policymakers and risk managers in formulating effective strategies. From an investor's perspective, understanding a country's vulnerability to crises occurring in other nations is essential when making investment decisions. This study provides a systematic overview of the international financial contagion studies, focusing on financial contagion during the COVID-19 pandemic period, and highlighting the growing interest in this area in recent years.

With the application of selected keywords and inclusion and exclusion criteria, the results obtained from articles retrieved from the Web of Science and Scopus databases are as follows: The analyzed studies are within the time period range of 2020-2024. The publication count was minimal in 2020 (1 article), while the number increased to 14 articles in 2022, indicating a rising trend in research on financial contagion in recent years, thereby reflecting a focus on the topic. The majority of articles related to financial contagion have multiple authors. Notably, the journals "Finance Research Letters" (with 3 publications) and "International Review of Financial Analysis" (with 3 publications) stand out as the most frequently published sources. Among the 37 examined articles, a total of 1160 citations have been made up to December 27, 2024. The most cited article,

authored by Akhtaruzzaman et al. (2021), has received 552 citations. The DCC-GARCH model, the VAR model, and the Copula model emerged as prominent methods for studying contagion effects.

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