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OPTION MARKET EFFICIENCY: A COMPREHENSIVE BIBLIOMETRIC STUDY ON RESEARCH EVOLUTION AND EMERGING THEMES

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ABSTRACT

Purpose: This study focuses on option market efficiency, a critical area in financial derivatives impacting pricing, volatility forecasting, and risk management strategies. Utilizing bibliometric analysis with tools such as Biblioshiny and VOS viewer, this research performs a quantitative assessment of the literature on option market efficiency. By analysing 403 research papers from the Scopus database, this study aims to provide a structured overview of key themes, influential authors, and research trends, enhancing the quality of literature review within this domain.

Design/Methodology/Approach: The dataset was systematically compiled from the Scopus database, following the PRISMA protocol for literature screening and selection. The chosen papers, spanning from 1978 to 2021, were analysed using Biblioshiny and VOS viewer to identify significant themes, key contributors, and core publications in option market efficiency research. A conceptual model was applied to extract prominent themes, while a thematic map visually displayed interconnections within the field.

Results: The analysis revealed substantial growth in academic publications on option market efficiency, with the United States, China, and India as the most prolific contributors. High-frequency keywords, such as 'Option Market,' 'Volatility Forecasting,' and 'Put-Call Parity,' were identified as core themes. Thematic mapping categorized these into motor themes, including “Option Market Dynamics” and “Volatility Management,” highlighting well-developed and central aspects of the literature. Foundational themes like "Market Microstructure" and "Transaction Costs" provide the base for future work, while emerging themes such as "Machine Learning" indicate areas of growing interest. Influential journals in this field include the Journal of Futures Markets, Journal of Financial Economics, and Journal of Banking and Finance.

Originality/Value: This study employs advanced bibliometric techniques, offering valuable insights into the research landscape of option market efficiency. The integration of a conceptual model and thematic map provides a structured and innovative understanding of trends, aiding researchers and practitioners in navigating this complex field.

Practical Implications: The findings present actionable insights for policymakers and practitioners by highlighting trends and gaps in the literature, supporting informed decision-making in option markets. This study also provides a foundation for future research by detailing the evolution and current focus areas within option market efficiency.

Keywords: Bibliometric Analysis, Option Market Efficiency, Implied Volatility, Scientific Mapping, VOS Viewer

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1. INTRODUCTION

The efficiency of financial markets has long been a central topic in finance research, with significant implications for investment strategies, risk management, and regulatory policies. Within this broader context, the efficiency of option markets has emerged as a particularly intriguing area of study. Options, as derivative instruments, play a crucial role in price discovery, risk transfer, and portfolio management. Understanding the efficiency of option markets is therefore essential for both academic researchers and practitioners in the financial industry.

Option market efficiency refers to the degree to which option prices reflect all available information and the speed at which new information is incorporated into these prices. The concept is closely tied to the Efficient Market Hypothesis (EMH), which posits that financial markets quickly absorb new information, making it difficult for investors to consistently outperform the market. The study of option market efficiency has evolved significantly since the introduction of the Black-Scholes-Merton option pricing model in the early 1970s. Researchers have explored various aspects of efficiency, including the accuracy of option pricing models, the presence of arbitrage opportunities, the information content of implied volatilities, and the impact of market microstructure on option prices.

Despite the wealth of research in this area, there remains a need for a comprehensive overview of the field's evolution, key contributors, and emerging trends. This is where bibliometric analysis can provide valuable insights. Bibliometrics is a quantitative approach to analysing academic literature, allowing researchers to identify patterns, trends, and relationships within a specific field of study.

The **objectives** of this bibliometric analysis are:

1. To map the intellectual structure of research on option market efficiency
2. To identify key authors, institutions, and publications that have significantly contributed to the field
3. To trace the evolution of research themes and methodologies over time
4. To uncover potential gaps and emerging areas in option market efficiency research

The aim of conducting this bibliometric analysis is to provide a comprehensive overview of the option market efficiency literature to researchers, practitioners, and policymakers. This study will not only synthesize existing knowledge but also highlight potential areas for future research, contributing to the ongoing development of this important field in finance.

2. LITERATURE REVIEW

The study of option market efficiency centers around how well option prices reflect available information and adjust to new data, aligning closely with the Efficient Market Hypothesis (EMH). Foundational work on this topic began with the Black-Scholes-Merton model (1973), which remains integral in options pricing research. Despite its success, subsequent studies have highlighted discrepancies between observed prices and theoretical values, particularly under conditions of high volatility or market stress, leading to the development of alternative models (Black & Scholes, 1973; Merton, 1973; Hull & White, 1987).

The accuracy and robustness of these models have been a significant focus, particularly concerning “model mispricing” anomalies where actual prices deviate from theoretical predictions. Empirical findings indicate that these mispricing are often due to factors such as stochastic volatility and the occurrence of market jumps, which the classical models cannot fully capture. Advanced models, like GARCH (Bollerslev, 1986) and stochastic volatility models (Heston, 1993), have been proposed to better accommodate these dynamics, underscoring the importance of model evolution in understanding option market efficiency (Bates, 1996; Bakshi, Cao & Chen, 1997).

Put-call parity (PCP) has been a cornerstone in testing market efficiency, as any violations signal arbitrage opportunities. Research shows that deviations from PCP are relatively uncommon in mature markets, where robust arbitrage mechanisms maintain parity (De Jong, 2001; Ackert & Tian, 2001). However, in emerging markets, such as those in Brazil and India, studies have documented frequent PCP violations due to factors like illiquidity, transaction costs, and regulatory constraints, which prevent rapid correction of mispricing (Capelle-Blancard & Chaudhury, 2002; Goyal & Tripathi, 2012).

The role of implied volatility in reflecting and predicting future market conditions is another central theme in option market efficiency research. Implied volatility is widely regarded as an indicator of market expectations about future price fluctuations. Studies like those by Christensen and Prabhala (1998) show mixed results, with some markets demonstrating a reliable predictive relationship between implied and realized volatility, while others do not. These

inconsistencies highlight that implied volatility's effectiveness as a predictive tool is market-dependent and influenced by factors like liquidity and market microstructure (Canina & Figlewski, 1993; Day & Lewis, 1992).

Market microstructure, including elements such as trading volume, bid-ask spreads, and order flow, significantly impacts option pricing and efficiency. Higher liquidity and trading volume facilitate faster information absorption, reducing price discrepancies and increasing efficiency. Conversely, markets with lower liquidity and wider spreads often exhibit slower price adjustments and increased mispricing, particularly in options with lower trading frequencies (Chordia, Roll & Subrahmanyam, 2005; Naik & Yadav, 2003). This has been corroborated in studies on emerging markets, where limited trading volumes and larger transaction costs contribute to efficiency challenges (Deville, 2004; Anand & Singh, 2020).

Efficiency dynamics differ markedly in emerging markets due to structural and regulatory limitations. Research on the Polish WIG20 options market, for instance, shows that regulatory restrictions and low liquidity lead to persistent arbitrage opportunities and deviations from PCP (Deville, 2004). Similarly, studies on the Indian options market highlight that inefficiencies are more frequent and endure longer, influenced by factors like regulatory policies on short-selling and high transaction costs (Goyal & Tripathi, 2012; Anand & Singh, 2020). These findings underscore the structural challenges faced by emerging markets in achieving efficiency and the importance of market maturity in reducing mispricing.

In summary, option market efficiency is shaped by a complex interplay of pricing model robustness, market microstructure, and regulatory conditions. Developed markets with mature infrastructures generally exhibit higher efficiency, while emerging markets face structural barriers that lead to frequent inefficiencies. This bibliometric study will map these research trends and methodologies, highlighting the evolution of thought in option market efficiency and areas ripe for future exploration.

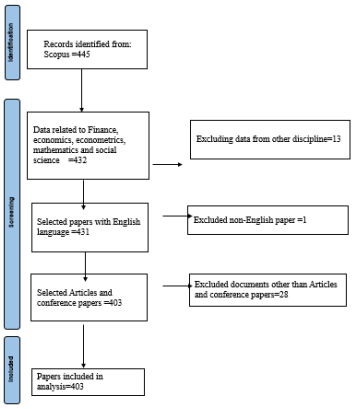
RESEARCH METHODOLOGY

A specific dataset is selected for analysis by searching and filtering documents from the Scopus database following the PRISMA protocol (figure 1). The search was conducted using the keywords "option market*" OR "options market*" OR "option trading" OR "options trading") AND (efficienc* OR inefficienc* OR mispric* OR "mis-pric*" OR arbitrage OR "put-call parity" OR "information content" OR "price discovery" OR "market anomal*" in the titles, abstract and keywords of articles published between 1978 and 2021, ensuring a comprehensive review of relevant literature. Biblioshiny and VOS viewer are used to conduct performance analysis and scientific mapping of the data set. The criteria employed are shown in the table below.

Table 1: Selection criteria

Keywords	"Option market*" OR "options market*" OR "option trading" OR "options trading") AND (efficienc* OR inefficienc* OR mispric* OR "mis-pric*" OR arbitrage OR "put-call parity" OR "information content" OR "price discovery" OR "market anomal*"
Search In	Title, Abstract and keywords
Publication Year	1978-2021
Fields of Research	Finance, economics, econometrics, mathematics and social science
Publication Type	Articles, Conference paper
Language of Documents	English

Figure 1. Identification of documents via SCOPUS



From: **Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ 2020;372: n71. doi: 10.1136/bmj. n7**

3. DATA ANALYSIS AND RESULTS

When employing bibliometric analysis, two primary forms of analysis are typically carried out: Science mapping and performance analysis. Performance analysis uses volume analysis and citation analysis to find important papers, authors, sources, countries, etc., on a given topic; whereas, science mapping finds the connections between the themes and structures (Behl et al., 2020). This research used both types of analysis to identify the trends and development in Option market efficiency.

1. DESCRIPTIVE ANALYSIS

Table 2: Description of main information

DESCRIPTION	RESULTS
Main information about data	
Timespan	1978:2021
Sources (Journals, Books, etc)	161
Documents	403
Annual Growth Rate %	7.67
Document Average Age	14.6
Average citations per doc	21.05
References	10939
Document contents	
Keywords Plus (ID)	507
Author's Keywords (DE)	866
Authors	
Authors	722
Authors of single-authored docs	82
Authors collaboration	
Single-authored docs	96
Co-Authors per Doc	2.22
International co-authorships %	19.11
Document types	
article	377
conference paper	26

This bibliometric analysis of option market efficiency spans research from 1978 to 2021, covering 403 documents from 161 different sources. Table 2 shows that there is a steady growth rate of 7.67% per year, indicating sustained interest in this field. The average citation per document is 21.05, suggesting high academic impact, while the average age of documents (14.6 years) highlights the importance of foundational studies in this area. Collaborative research is common, with an average of 2.22 authors per paper and 19.11% of studies involving international co-authorship. Most publications are peer-reviewed journal articles (377), complemented by conference papers (26), reflecting both ongoing discussion and established findings in option market efficiency.

2. PERFORMANCE ANALYSIS

The evaluation results of top 10 authors, top 10 journals, top 10 documents and top 10 countries are given below.

➢ MOST RELEVANT AUTHORS ACCORDING TO PUBLICATION

Table 3: Top 10 Authors based on Publication

Authors	h_index	g_index	m_index	Total citation	No. of Publications	Publication year
Ryu D	14	19	0.933	577	19	2010
Yang H	7	7	0.778	166	7	2016
Whaley RE	5	5	0.116	824	5	1982
Kang J	4	5	0.211	176	5	2006
Tian YS	4	4	0.148	72	4	1998
Ackert LF	3	3	0.111	61	3	1998
Dixit A	3	3	0.188	16	3	2009
Du B	3	3	0.429	23	3	2018

Fung JKW	3	3	0.12	58	3	2000
Jain PK	3	3	0.176	20	3	2008

From the table 3, **Ryu D** emerges as the most prolific author with 19 publications, a high h-index of 14, and 577 citations, indicating substantial contributions since 2010. **Whaley RE**, with fewer publications (5), has the highest citation count at 824, reflecting significant influence and foundational work dating back to 1982. **Yang H** shows promising impact with an h-index of 7 and 166 citations from 7 publications, despite a shorter career span. **Kang J** and **Tian YS** have contributed steadily with moderate citation counts of 176 and 72, respectively. Overall, these authors represent a mix of high productivity and foundational influence, shaping key aspects of research in option market efficiency.

➢ MOST RELEVANT SOURCES

Table 4: Top 10 relevant Sources

Sources	Articles
Journal of Futures Markets	38
Journal of Banking and Finance	34
Journal of Financial Economics	11
Quantitative Finance	10
European Journal of Finance	9
International Review of Financial Analysis	9
Financial Review	8
International Review of Economics And Finance	8
Applied Financial Economics	7
Journal of Financial Markets	7

The most relevant sources for research on option market efficiency are led by the **Journal of Futures Markets** with 38 articles, indicating its prominent role in this field. **Journal of Banking and Finance** follows closely with 34 articles, emphasizing its focus on financial markets and derivatives. Other influential journals include the **Journal of Financial Economics** (11 articles) and **Quantitative Finance** (10 articles), both known for their strong emphasis on financial theory and quantitative methods. The **European Journal of Finance** and **International Review of Financial Analysis**, each with 9 articles, also contribute significantly, along with **Financial Review** and **International Review of Economics and Finance** (8 articles each). This distribution highlights that research on option market efficiency is concentrated in journals dedicated to financial markets, quantitative finance, and economic analysis.

➢ MOST RELEVANT DOCUMENTS

Table 5: Top 10 relevant Documents

Paper	Total Citations	TC per Year	Normalized TC
Pan J, 2006, Review of Financial Studies	436	22.95	6.82
Jackwerth JC, 2000, Review of Financial Studies	411	16.44	8.70
Chakravarty S, 2004, The Journal of Finance	403	19.19	4.89
Fleming J, 1996, Journal of Futures Markets	279	9.62	3.78
Ofek E, 2004, Journal of Financial Economics	232	11.05	2.82
Whaley RE, 1982, Journal of Financial Economics	219	5.09	1.81
Harvey CR, 1992, Journal of Financial Economics	186	5.64	1.75
Figlewski S, 1989, The Journal of Finance	148	4.11	1.90
Bai J, 2016, Journal of Financial Economics	143	15.89	9.05
Amin KI, 1997, Contemporary Accounting Research	138	4.93	4.47

The most relevant documents in the field of option market efficiency show significant influence based on total citations and yearly citation rates. **Pan (2006)** in the *Review of Financial Studies* leads with 436 citations and a high citation rate of 22.95 per year, highlighting its continued impact. **Jackwerth (2000)**, also in *Review of Financial Studies*, follows with 411 citations and an impressive normalized citation count of 8.70, indicating strong relevance over time. **Chakravarty (2004)** in *The Journal of Finance* has 403 citations, showing its influence in linking finance and option market efficiency. Notable older foundational works include **Fleming (1996)** in the *Journal of Futures Markets* and **Whaley (1982)** in the *Journal of Financial Economics*, which, despite lower yearly citation rates, remain integral to the field's historical development. Newer studies, like **Bai (2016)** in *Journal of Financial Economics*, with a high normalized citation of 9.05, point to ongoing research advancements. This mix of classic and recent studies illustrates the evolving landscape of option market efficiency research

➢ COUNTRY WISE PRODUCTION

Table 6: Top 10 countries based on publication

Region	Frequency
USA	238
CHINA	125
UK	87
SOUTH KOREA	68
AUSTRALIA	59
INDIA	55
CANADA	22
ITALY	19
GERMANY	18
SPAIN	17

The country-wise publication frequency table indicates that the **USA** leads in research output on option market efficiency, with 238 publications, significantly ahead of other countries. **China** follows as the second-highest contributor with 125 publications, demonstrating strong engagement in this research area. **The UK**, **South Korea**, and **Australia** also contribute notably, with 87, 68, and 59 publications respectively, reflecting a robust interest in option market studies across these regions.

India ranks sixth with 55 publications, indicating its growing presence in the field. Other countries such as **Canada**, **Italy**, **Germany**, and **Spain** have lower but still meaningful contributions, each with a range between 17 and 22 publications. This distribution shows that option market efficiency research is globally dispersed, with strong contributions from both developed and emerging economies, highlighting the worldwide relevance and appeal of this field. The production strength of the countries is shown in Figure 2.

Figure 2: Country-Wise Production

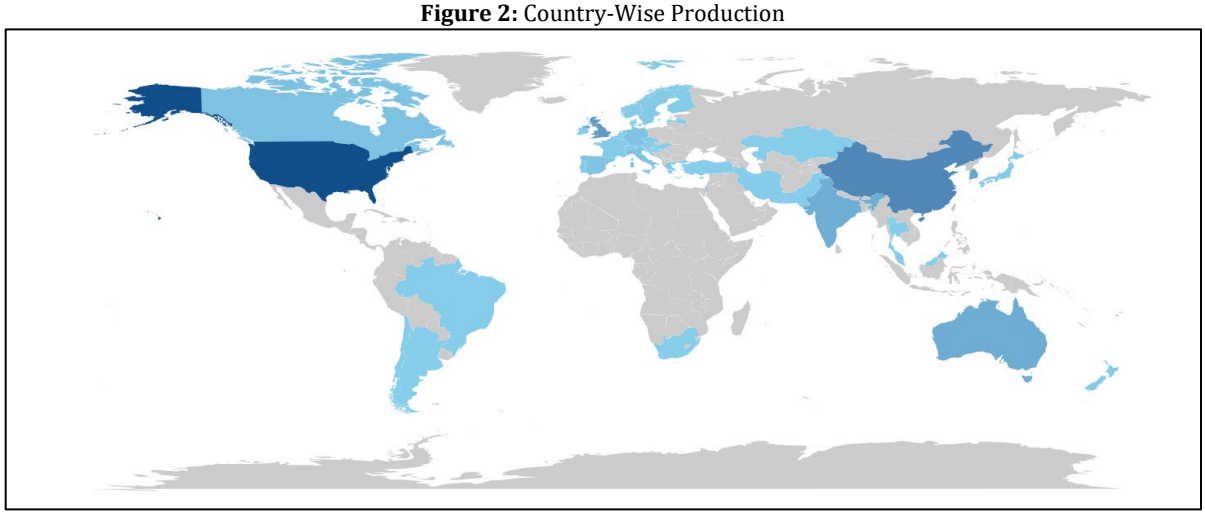
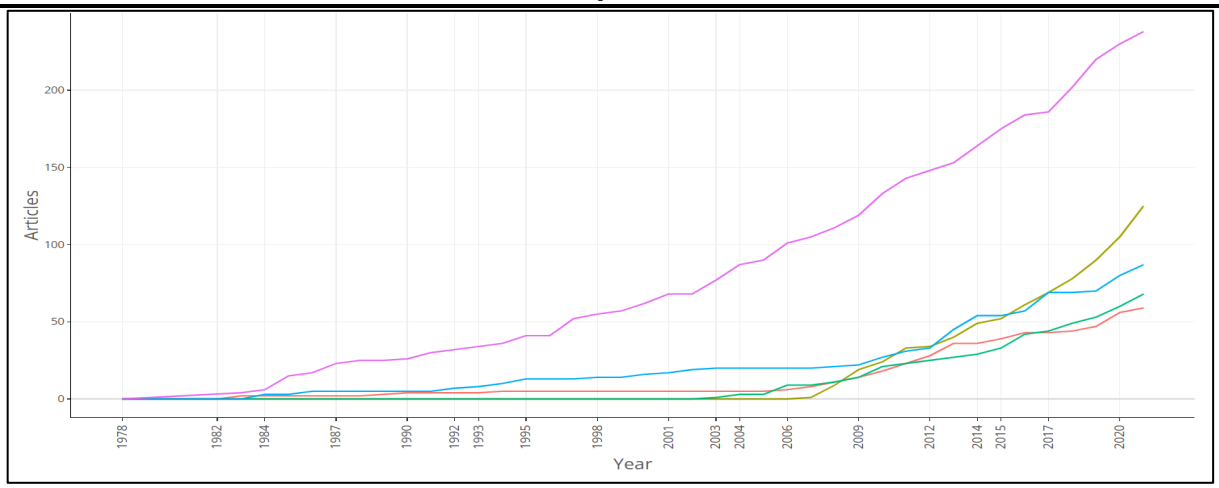


Figure 3: Country-Wise Production growth

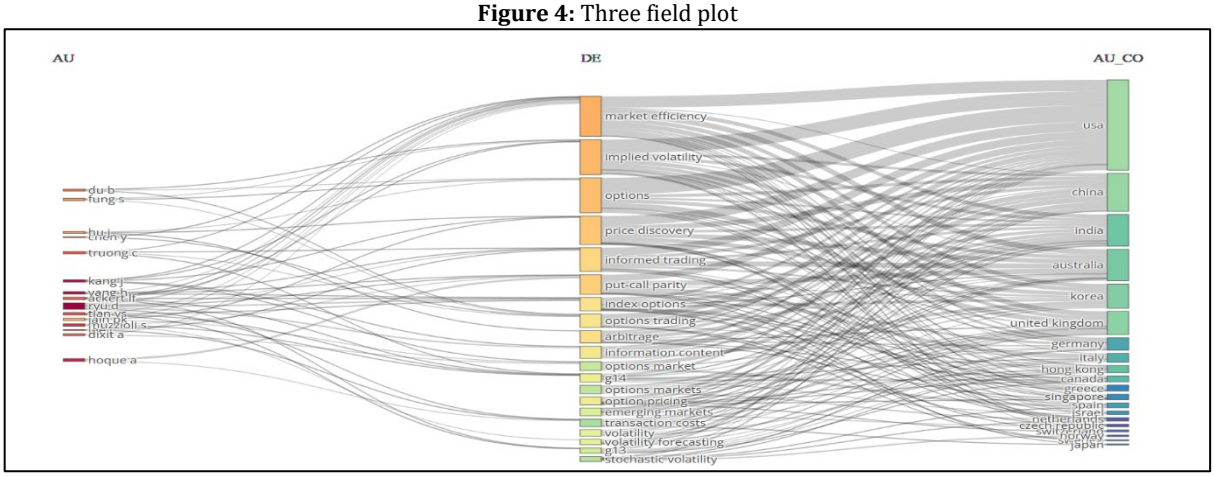


The country-wise production growth graph reveals a clear trend of increasing research output in option market efficiency over time, with the **USA** consistently leading in publication volume since the early 1980s. The USA's steep growth trajectory highlights its long-standing dominance and extensive contribution to the field. Around the early 2000s, **China** began showing a notable increase in publications, reflecting its growing focus on financial research, particularly in options markets. China's research output has continued to rise, positioning it as the second-largest contributor globally.

Other countries, including the **UK**, **South Korea**, and **Australia**, exhibit steady but moderate growth, especially from the mid-2000s onwards, indicating a broadening global interest in option market efficiency. Notably, India's contribution, while smaller than that of leading countries, also shows a gradual upward trend, signalling a developing focus in emerging markets. Overall, the chart indicates a significant increase in international research on option markets, with growing contributions from diverse economies, reinforcing the global relevance of this research area.

➢ THREE FIELD PLOT

Figure 4: Three field plot



The three-field plot provides an insightful overview of key relationships among authors, research topics, and countries in option market efficiency studies. Leading authors like **Ryu D**, **Yang H**, and **Kang J** are primarily associated with central themes such as market efficiency, implied volatility, and options trading. This reflects a strong focus on core topics in option market research. Themes like price discovery, put-call parity, and volatility forecasting attract interest from multiple authors, emphasizing their significance in the field.

The international distribution in the plot reveals that option market research is a global effort, with major contributions from **USA**, **China**, and **India**. These countries' researchers frequently collaborate and explore overlapping themes, indicating the global relevance and collaborative nature of option market efficiency studies. Overall, this visualization highlights both the diverse yet interconnected nature of research topics and the cross-border collaboration that characterizes this field.

3. SCIENCE MAPPING

The co-word analysis, trending topics, thematic map and collaboration among countries are all displayed in this part.

COLLABORATION AMONG COUNTRIES

Figure 5: Collaboration Network among Countries

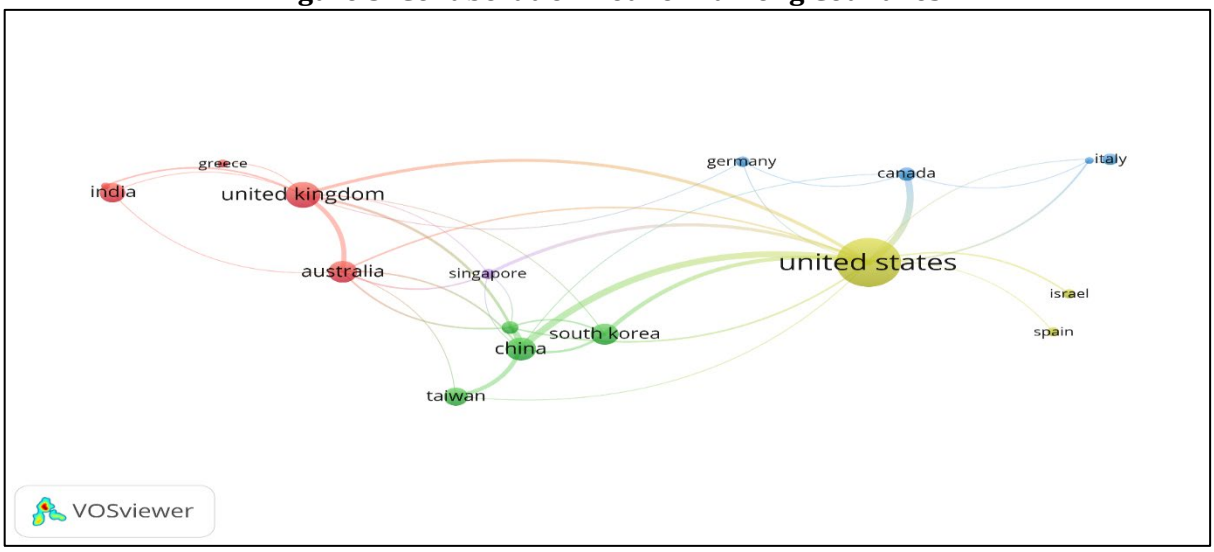


Figure 5 shows the collaborative relationships between various countries with at least 5 documents with at least 10 citations. The size of each node (country) represents the relative number of publications or connections, while the thickness of the lines indicates the strength of the collaborative ties between countries.

The central node in the network is the United States, which appears to be the most prolific and collaborative country in this research area. The thick connections radiating from the US node suggest that it has strong collaborative ties with many other countries, including Canada, Israel, Spain, Italy, and Germany.

Looking at the other prominent nodes, we can see that the United Kingdom, India, Australia, Singapore, China, and South Korea also appear to be actively involved in collaborative research. The connections between these countries indicate the formation of regional research clusters and potentially shared research interests or projects.

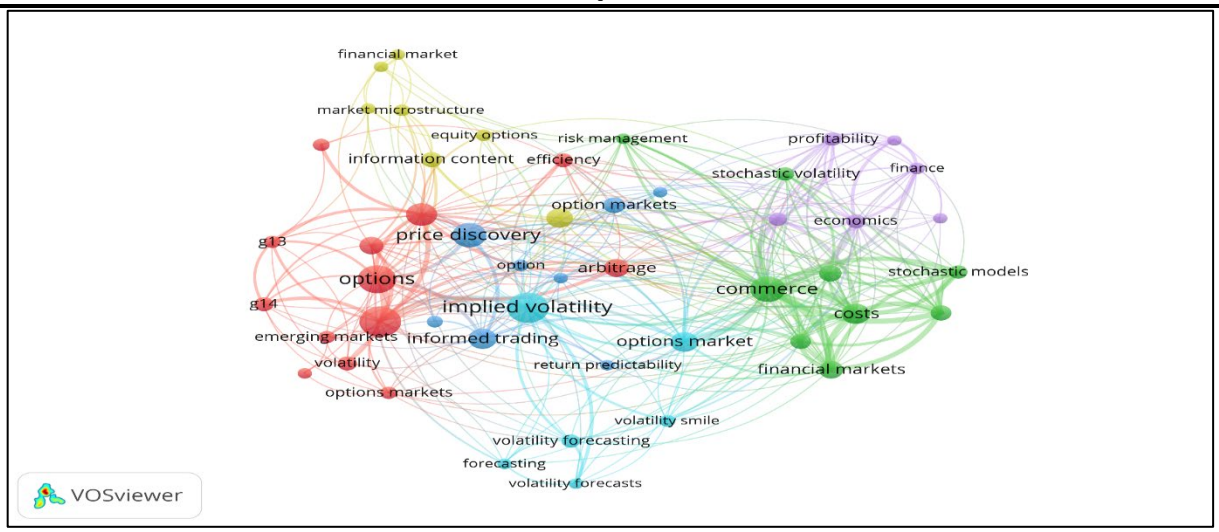
The relative positioning of the nodes provides further insights. For example, the proximity between Canada and the United States, as well as between the European countries (e.g., Italy, Spain, Germany), suggests closer collaborative relationships within these regional groups.

Additionally, the presence of more peripheral nodes, such as Taiwan, indicates that while these countries may be involved in the research, their collaborative ties with the core group of countries are relatively weaker.

Overall, this network visualization provides a compelling snapshot of the global research collaborations in your field of study. It highlights the central role of the United States, as well as the emergence of regional research hubs and collaborations between countries. This information can be valuable for understanding the current state of international research cooperation and identifying potential opportunities for further collaboration and knowledge exchange.

CO-OCCURRENCE OF KEYWORDS

Figure 6: Co-occurrence of keywords



The keyword co-occurrence network analysis provides valuable insights into the intellectual structure and key research themes within the literature on option market efficiency. The co-occurrence of keywords indicates the pairs of terms that frequently appear together, revealing the conceptual relationships and thematic clusters in this field of study.

The analysis, based on a threshold of a minimum of 5 keyword occurrences, identified 49 keywords out of the total 1,243 that met this criterion. These keywords can be organized into five distinct clusters, each representing a important area of research focus.

The first cluster, labelled as the "Core Options Market Dynamics" cluster, is centred around concepts such as "price discovery," "options," "equity options," and "option markets." The strong interconnections within this cluster suggest a focus on the fundamental mechanisms and dynamics of options trading and pricing, with links to market microstructure and information content highlighting the importance of understanding market structure and informational efficiency in this research area.

The second cluster, the "Volatility and Risk Management" cluster, is dominated by volatility-related terms, including "implied volatility," "stochastic volatility," "volatility forecasting," and "risk management." The connections to "return predictability" and "informed trading" indicate a significant emphasis on understanding and modelling volatility as a key factor in options market efficiency.

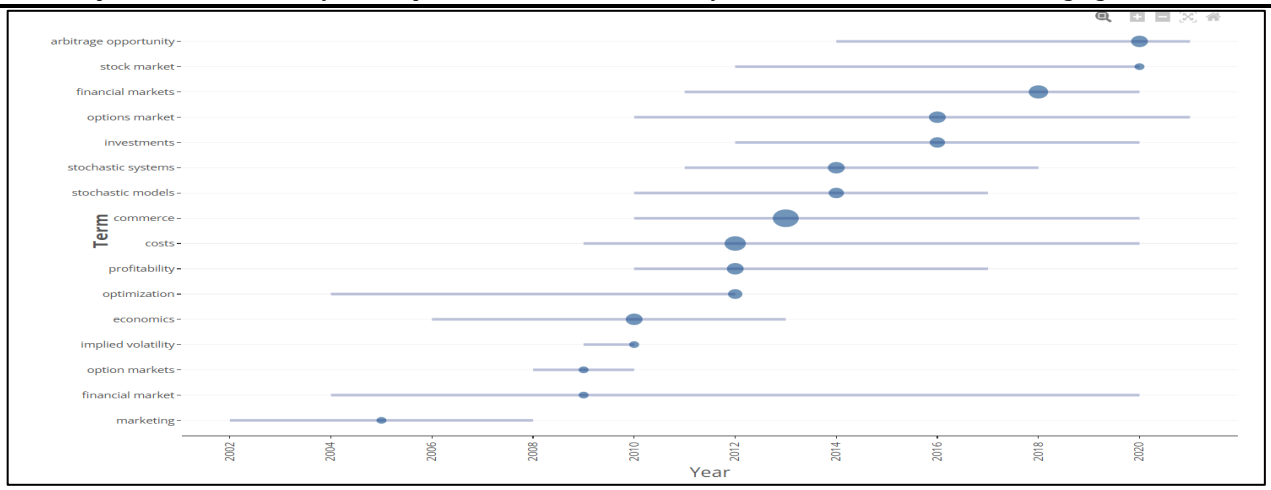
The third cluster, the "Options Valuation and Arbitrage" cluster, revolves around "option valuation" and "arbitrage," underscoring the importance of options pricing models and the exploitation of market inefficiencies. The links to "finance" and "economics" suggest a theoretical and quantitative approach to options market analysis.

The fourth cluster, the "Emerging Markets and Efficiency" cluster, includes keywords such as "emerging markets," "efficiency," and "financial markets," indicating a research focus on options market performance in developing economies. The interconnections with "information content" and "market microstructure" suggest an emphasis on understanding the drivers of efficiency in these markets.

The fifth and final cluster, the "Applications and Performance" cluster, encompasses terms related to the practical applications and performance outcomes, such as "profitability," "commerce," "costs," and "stochastic models." The links to "finance" and "financial markets" suggest a broader focus on the role of options markets in overall financial system performance.

TRENDING TOPIC

Figure 7: Trending Topic



The trend analysis of keywords in this research domain reveals several areas of evolving focus and sustained interest over the years.

In the early 2000s, topics such as the stock market, options market, and investments maintained a relatively consistent level of prominence, indicating their fundamental and enduring importance within the field. The stable trends for these keywords suggest a solid foundation of research exploring the dynamics and mechanisms of financial markets and investment strategies.

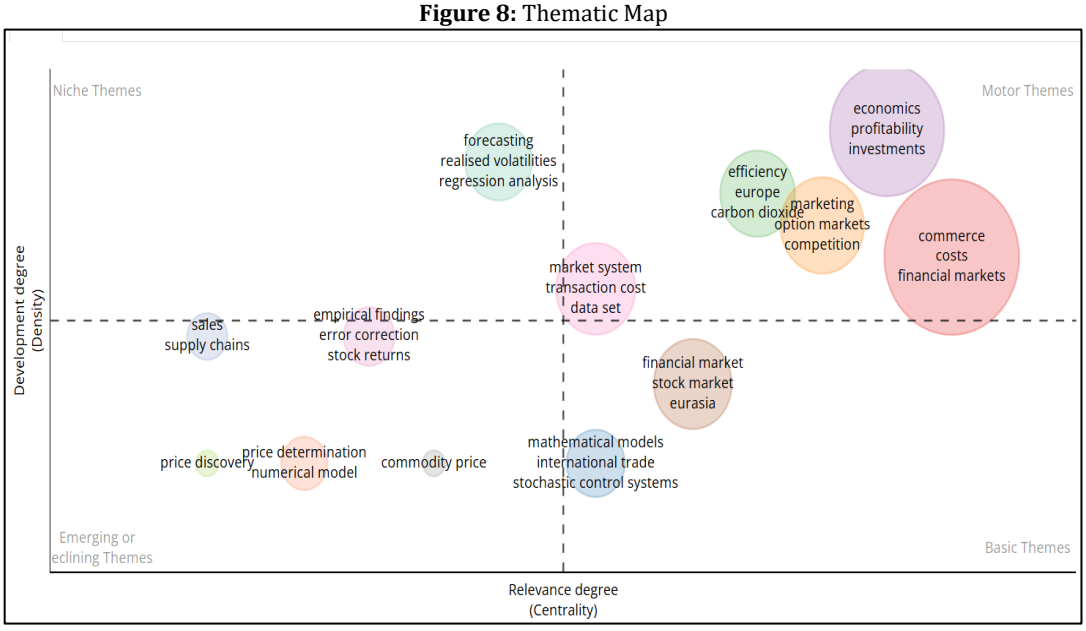
As the decade progressed, an increased focus on more specialized areas became apparent. The rising trend for "arbitrage opportunity" points to a growing interest in understanding and exploiting potential market inefficiencies, a crucial consideration for traders and investors. Similarly, the gradual upward trajectories of "stochastic systems" and "stochastic models" underscore the evolving sophistication of quantitative approaches employed in this domain, as researchers seek to model the inherent complexities and uncertainties present in financial markets.

Alongside these theoretical developments, practical considerations such as "commerce" and "costs" have remained steady areas of research focus, highlighting the need to bridge the gap between academic insights and real-world financial applications. The moderate but consistent interest in "profitability" and "optimization" further emphasizes the discipline's commitment to enhancing the financial performance and efficiencies of various strategies and systems.

The relatively flat trend observed for the keyword "economics" suggests an ongoing recognition of the broader macroeconomic factors that influence and shape financial market dynamics, underscoring the interdisciplinary nature of this research field.

THEMATIC MAP

Figure 8: Thematic Map



The thematic map provides a comprehensive visual representation of the key research themes and their relationships within the given domain. The insights revealed by this thematic map:

Niche Themes: The left side of the map highlights the "Niche Themes" - these represent specialized or emerging areas of research. Within this category, we see topics such as "price discovery," "price determination," and "numerical model," which suggest a focus on pricing dynamics and modeling approaches. Additionally, the presence of "supply chains" and "sales" indicates research on the operational and commercial aspects of the domain.

Basic Themes: On the right side of the map, the "Basic Themes" zone encompasses more foundational and widely studied areas. This includes topics like "financial market," "stock market," "Eurasia," and "commodity price," showcasing the core areas of research within the broader field.

Motor Themes: In the upper-right quadrant, the "Motor Themes" represent the most prominent and influential topics that drive the research agenda. This cluster includes keywords like "economics," "profitability," "investments," "option markets," "competition," "commerce," "costs," and "financial markets." These themes suggest a strong focus on the economic, financial, and strategic dimensions of the domain, highlighting the importance of factors such as profitability, investment decisions, and market dynamics.

Emerging or Declining Themes: The lower part of the map features the "Emerging or Declining Themes," which represent areas that are either gaining or losing prominence over time. Topics such as "forecasting," "realised volatilities," "regression analysis," "market system," "transaction cost," and "data set" suggest a growing emphasis on methodological approaches, market microstructure, and empirical analysis.

Centrality: The horizontal axis of the map indicates the "Relevance Degree (Centrality)," which reflects the importance and interconnectedness of the themes within the overall research landscape. The themes positioned towards the centre of the map, such as "financial market," "stock market," and "international trade," demonstrate a higher level of centrality and integration within the broader research framework.

By analysing the thematic map, researchers can gain valuable insights into the current state of the field, identify the most influential research themes, recognize emerging areas of interest, and understand the relationships and interdependencies between different aspects of the domain under investigation.

4. CONCLUSION AND IMPLICATIONS

This study provides a comprehensive analysis of the evolution and current state of research on option market efficiency from 1978 to 2021. The findings reveal a steady increase in scholarly interest, with a diverse set of contributing authors, institutions, and countries, reflecting the global relevance of this field. Notably, the United States and China emerge as primary research hubs, while India shows growing engagement, particularly in areas of emerging market dynamics.

The analysis highlights several central themes, including core options market dynamics, volatility and risk management, valuation and arbitrage, and the unique challenges in emerging markets. Thematic mapping further underscores the significance of foundational topics like price discovery, volatility forecasting, and put-call parity, while also identifying niche areas such as transaction costs and market microstructure.

This study identifies potential research gaps, particularly in understanding market efficiency within emerging economies and developing models that account for the specific microstructural characteristics of these markets. Future research can benefit from focusing on the implications of regulatory changes and technological advancements in financial markets, with an emphasis on real-time data and machine learning approaches for volatility and risk prediction.

By synthesizing past contributions and pinpointing areas for further exploration, this bibliometric study provides a valuable resource for researchers, practitioners, and policymakers, fostering a deeper understanding of the mechanisms and intricacies of option market efficiency in both developed and emerging markets.

CONFLICT OF INTERESTS

None.

ACKNOWLEDGMENTS

None.

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