



A HOLISTIC REVIEW OF IDIOSYNCRATIC VOLATILITY: A COMBINED BIBLIOMETRIC AND SYSTEMATIC REVIEW

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RESEARCH ARTICLE



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Abstract

Idiosyncratic volatility, a measure of stock-specific risk, has garnered significant attention from researchers and practitioners alike. This study tries to present thorough review of Idiosyncratic Volatility research and pinpoints the broad trends in the field. The study uses bibliometric analysis techniques and Systematic Literature Review to achieve the stated purpose. A bibliometric analysis was conducted to identify patterns and trends focusing on citation, co-authorship, bibliographic coupling, and co-occurrence. The top cited papers were reviewed, highlighting their contribution for conducting the systematic literature review. The bibliometric analysis was conducted on 361 articles from the top 50 finance and economics journals that were accessed through the Scopus database over 25 years (1998-2023). Analytical tools such as Biblioshiny with R packages and VOS Viewer were utilized. The current analysis reconciles several divergent findings from earlier studies on Idiosyncratic volatility, including the risk analysis and the low-risk anomaly, and also identifies potential research gaps for future studies.

Keywords: *Idiosyncratic volatility, Bibliometric Analysis, Literature Review, VOS viewer, Biblioshiny.*

1. Introduction

The fundamental investment concept is that the returns and risks associated with financial instruments should be appropriately aligned. In an unpredictable financial environment, the evaluation of returns and risks poses a significant challenge for investors (Panousi & Papanikolaou, 2012). The CAPM describes the relationship between asset returns and their associated risks, assessing an asset's risk by its covariance with the overall market's returns (Rossi, 2016). The Capital Asset Pricing Model (CAPM), developed by William F. Sharpe, is a widely recognized and authoritative framework used in finance to determine the expected return on an investment given its risk (Kumar et al., 2023). According to the CAPM, the expected return on an investment can be determined by the risk-free rate of return plus a risk premium based on the asset's beta, which measures its sensitivity to market movements (Lalwani & Chakraborty, 2020). The beta of an asset reflects the asset's systematic risk, which cannot be diversified away, and therefore, commands a premium. The higher the beta, the higher the expected return on the asset (Kumar et al., 2023). The CAPM model suggests that idiosyncratic risk does not affect asset pricing, but some models argue that there is a positive correlation between idiosyncratic risk and stock returns (Herskovic et al., 2015).

Idiosyncratic volatility (IDVOL) refers to the fluctuation in the price of an individual stock or security that cannot be attributed to overall market movements or systematic factors (Bekaert et al., 2012a). In other words, it represents the unique or specific risk associated with a particular company's stock, beyond the broader market influences (Goyal et al., 2002). According to evidence of idiosyncratic volatility predictability in a cross section of stock returns, actively managed equity fund managers may have taken into account and been able to take advantage of the significant idiosyncratic volatility premium (Phan et al., 2014). In any developed country, there is no growing trend in idiosyncratic volatility (Ni et al., 2021). Instead, we discover that idiosyncratic volatility is well represented by a stationary process that switches between regimes while mean-reverting and occasionally transitions to a higher-mean, higher-variance regime (Bekaert et al., 2012).

A strong positive link between mispricing and absolute idiosyncratic volatility, i.e.; the variance of the residual from an asset-pricing model, underscores the increasing significance of noise traders (Aabo et al., 2017). To imply that the degree to which financial institutions control individual stocks' shares is related to their idiosyncratic volatility. And demonstrate how idiosyncratic volatility contributes positively to projected earnings growth (Mehra et al., 2021). Investors and analysts use idiosyncratic volatility to assess the level of risk associated with a particular stock and to make informed decisions about their

investment portfolios (Chen et al., 2020). Higher levels of idiosyncratic volatility generally imply greater uncertainty and risk for investors, as the stock's price may experience larger and more unpredictable fluctuations (Chichernea et al., 2015). To discover that stock returns and one-period volatility estimates do not strongly correlate. But a strong predictor of returns is the mean-reverting unconditional volatility (Bozhkov et al., 2020). It's important to note that idiosyncratic volatility is just one of many factors that investors consider when evaluating stocks, and it should be used in conjunction with other financial metrics and qualitative information to make well-informed investment decisions (Vidal-García et al., 2019). It's important to thoroughly review existing literature, systematically synthesize it, and present its findings along with any limitations.

This study uses bibliometric methodologies to accomplish this, which combine a variety of quantitative tools capable of managing big data sets connected to the literature (Donthu et al., 2021). The bibliometric analysis of the existing literature then evaluates the current status of the field, highlights themes and intellectual underpinnings of sectors where the relevance of Idiosyncratic volatility is examined, and provides frameworks for future research. As per the knowledge of authors, this study will be the first bibliometric analysis on IDVOL.

The study has addressed the following research problems.

- RQ1 What are the projected trends for research growth in Idiosyncratic volatility through 2023?
- RQ2 Which articles have had the most citations, and which nations, publications, and authors have contributed the most to Idiosyncratic volatility related research?
- RQ3 What thematic structure is present in IDVOL-related articles?
- RQ4 What are the current trends, main focuses and themes of highly cited articles in the field of idiosyncratic volatility based on thorough review over the past decade?

2. Conceptual Background

2.1. Volatility: Understanding market volatility requires a comprehensive view of economic, political, and social factors affecting financial markets worldwide. Volatility is a term used in finance to describe the degree of variation or fluctuation in the price or value of a financial instrument over a specific period of time (Neugebauer, 2020). Financial instruments can include stocks, bonds, commodities, or currencies, and their prices can change rapidly and frequently. It is understood that volatility plays a key role in asset price (Kumar et al., 2023). Options can essentially be bet on volatility because a precise estimate of future volatility provides key information to market participants (S.; B. I.; D. R. Ali, 2023). Financial market volatility is crucial for investment and financial market regulation in addition to being critical for option pricing (Mateus & Konsilp, 2014). Additionally, trading activity and the number of trading days in a month positively correlate with stock volatility (Schwert, 1989).

Volatility is often used as a measure of risk and uncertainty in the financial markets because it indicates how much the price of an asset is likely to change in the future. The evidence showing a strong correlation between expected market risk premium and expected stock return volatility (Magdalena Sembiring et al., 2016). A negative relationship between unexpected changes in stock return volatility and unexpected stock market returns has also been demonstrated (Guo & Savickas, 2006). Indirect proof of a correlation between predicted risk premiums and volatility exists in the form of this negative relationship. Higher volatility means that the price of an asset is more likely to experience larger price swings, which can be both positive and negative (French et al., 1987).

On the other hand, lower volatility suggests that the price of an asset is more stable and predictable, with smaller price movements over time (Bhootra & Hur, 2015). Investors and traders use volatility as a tool to manage risk and make investment decisions. When the typical GARCH-M framework is used to simulate the stochastic volatility of stock returns, there is a positive but negligible relationship between the conditional mean and conditional volatility of the excess return on stocks (Magdalena Sembiring et al., 2016). The conditional mean and conditional volatility, on the other hand, are estimated to have a negative relationship using Campbell's Instrumental Variable Model (Glosten et al., 1993).

2.2 Idiosyncratic volatility: Idiosyncratic volatility is often used as a measure of the uncertainty or riskiness of an individual stock (Peterson & Smedema, 2013). It can arise from factors such as company-specific news, events, management decisions, competitive pressures, technological changes, and other internal or external factors that affect a specific company's operations or prospects (Delisle et al., 2016). According to evidence of idiosyncratic volatility predictability in a cross section of stock returns, actively managed equity fund managers may have taken into account and been able to take advantage of the significant idiosyncratic volatility premium (Phan et al., 2014). The last two severely underperformed in predicting the realised volatility for the next period, although they did confirm the favorable relationship between idiosyncratic risk and returns (Bozhkov et al., 2020).

One common way to quantify idiosyncratic volatility is by calculating the residual standard deviation of a stock's returns after accounting for overall market movements (Bhootra & Hur, 2015). It can also be measured using statistical tools like the Fama-French three-factor model, which attempts to separate a stock's returns into systematic (market-related) and idiosyncratic (company-specific) components (Brockman & Yan, 2009a). The controllable Idiosyncratic Volatility indicator proves to be a trustworthy warning indication for both declining investment prospects and high levels of transaction costs. Second, with more consistent risk signals, the investor will trade closer to the target portfolio (Shi, n.d.). The impact of idiosyncratic volatility on

stock returns predictability; the best predictor among the different volatility measures used is the implied idiosyncratic volatility and there is clear evidence of a return premium for carrying idiosyncratic volatility risk (Mateus & Konsilp, 2014). Mutual fund investors appear to draw toward IV (Idiosyncratic volatility) when making buy decisions but run away from IV when making redemption decisions, as both inflows and outflows are strongly correlated with IV (Clifford et al., 2021).

3. Research Methodology

We use the analytical framework established by (Phoong et al., 2022) to outline the research objectives and the methodology employed to achieve them. The referenced study succinctly presented the methodology for each research objective in a tabular format. Table 1 presents the main objectives of this study along with the methodology we used to address them.

Table 1. Overview of Research Objective and Methodology.

	Research Objective	Research Methodology
	To understand the evolution of and trend in Idiosyncratic volatility research.	Publication trend
	To figure out the leading countries, impactful journals, and influential authors concerning IDVOL research.	Citation analysis
Bibliometric Analysis	To assess the structure and pattern of country collaboration in this field of research	Co-authorship analysis of countries
	To figure out the conceptual structure of keywords.	Co-occurrence analysis
	To understand countries' coupling structures and how often countries share similar literature in this field of research	Bibliographic coupling of countries
	To analyze the existing state and sustainability prospects of the area	Thematic map
Systematic review	To understand the application of techniques used to forecast of IDVOL.	Citation analysis of highly cited documents

3.1. Bibliometric analysis

The analysis of bibliographic data using bibliometric techniques is one of the most important metrics for determining the caliber of scientific output (Keshari & Gautam, 2023a). The most significant discoveries of a group of bibliographic records are frequently highlighted using bibliometric analysis (Donthu et al., 2021). The report uses a range of bibliometric analysis methodologies to assess the research relevant to the application Idiosyncratic volatility research (Öztürk et al., 2024). In addition to being able to handle a large corpus, bibliometric analysis may identify publication trends, produce visualizations of the development of a subject, and identify emerging themes (A. Ali & Bashir, 2022). This makes it possible to evaluate the situation as well as imagine prospective future study areas. By examining the bibliometric structure, it is possible to analyze the degree of idiosyncratic volatility risk.

3.2. Choosing the techniques for analysis

Both VOS Viewer and the Bibliometrix R-package were used by the study to analyze the data. The Bibliometrix R-package software's metrics for citations and publications identify the most significant authors, works, sources, and nations based on total citations and total number of publications. Using the Bibliometrix R-package, co-authorship analysis emphasizes the international research collaborations based on the countries of origin of the papers. As a result of the keywords utilized in the studies, the Bibliometrix R-package is also employed for keyword analysis, producing a thematic map and the hot issues in the industry. Thematic mapping provides information on the dominant topics in the area right now and the prospective directions for future research. Co-occurrence analysis in VOS Viewer focuses on the textual keywords of the document and shows the link between terms in literature, giving insight into the knowledge structure of the field. Bibliographic coupling is used in VOS Viewer to clarify the topics in the body of knowledge. These are the bibliometric analysis methods employed in this paper with the aid of the two programs.

3.3 Data collection

This study has considered Scopus Database to extract the data required. The detailed systematic procedure adopted in collecting the data is given in the Figure 1. We excluded the year 2022 because the publications in this field of research were not yet finalized. keywords to retrieve relevant articles by examining the literature.

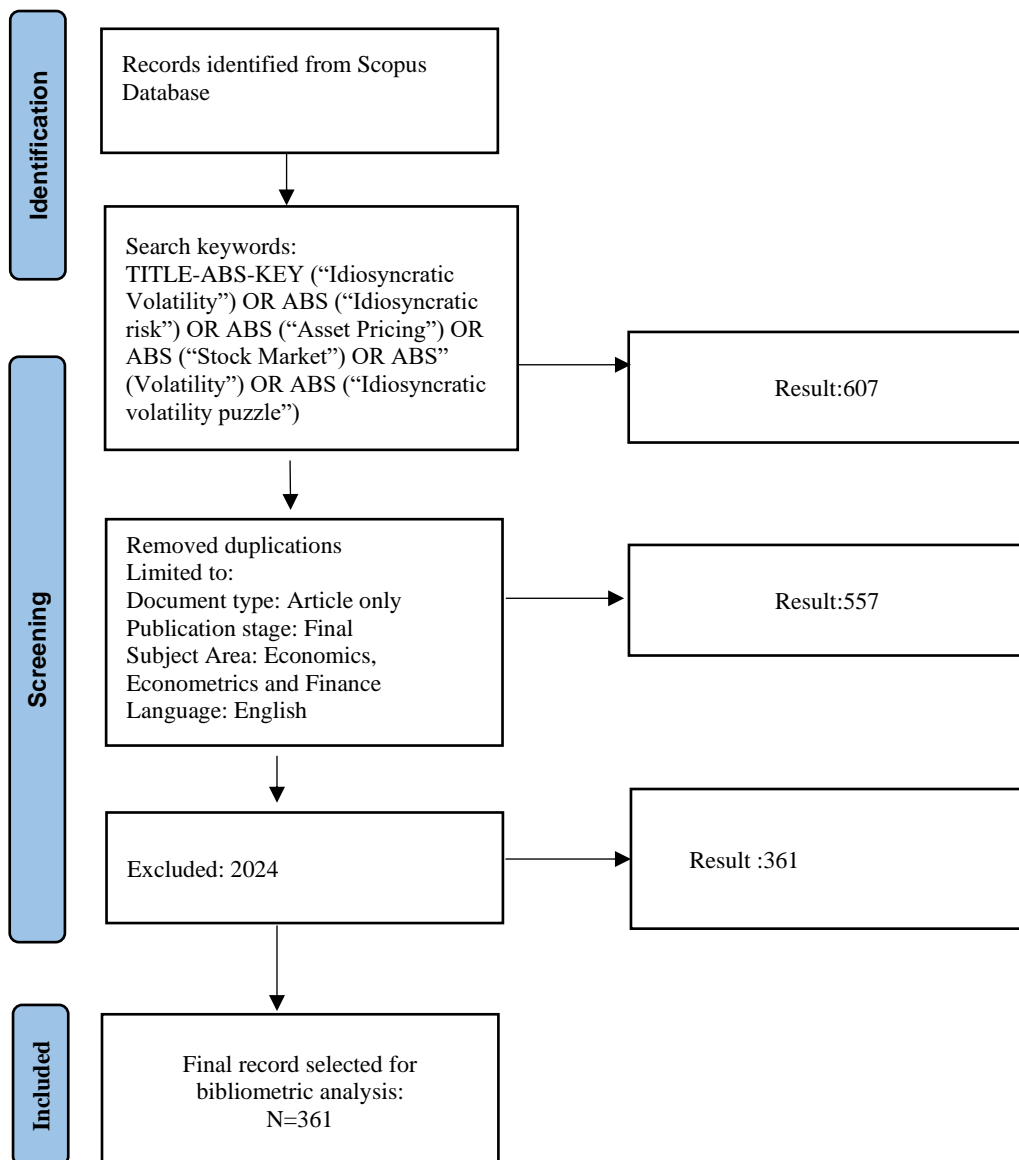


Figure 1. Dataset extraction and processing mechanism for bibliometric analysis.

4. Data analysis

4.1. Sample characteristics

The sample contains 361 articles, 2 conference papers and 4 reviews which have been produced by 124 journals and written by 729 authors from 46 different countries during 1998-2023. There are only 43 single-authored documents while 686 authors wrote in collaboration.

4.2. Performance analysis

4.2.1 Publication trend: The total number of papers is plotted against each year of publication in Figure 2, which shows the publishing trend of Idiosyncratic volatility research. The Figure shows that Idiosyncratic Volatility research started to evolve only after 1998, and there were few papers from 1998 to 2005.

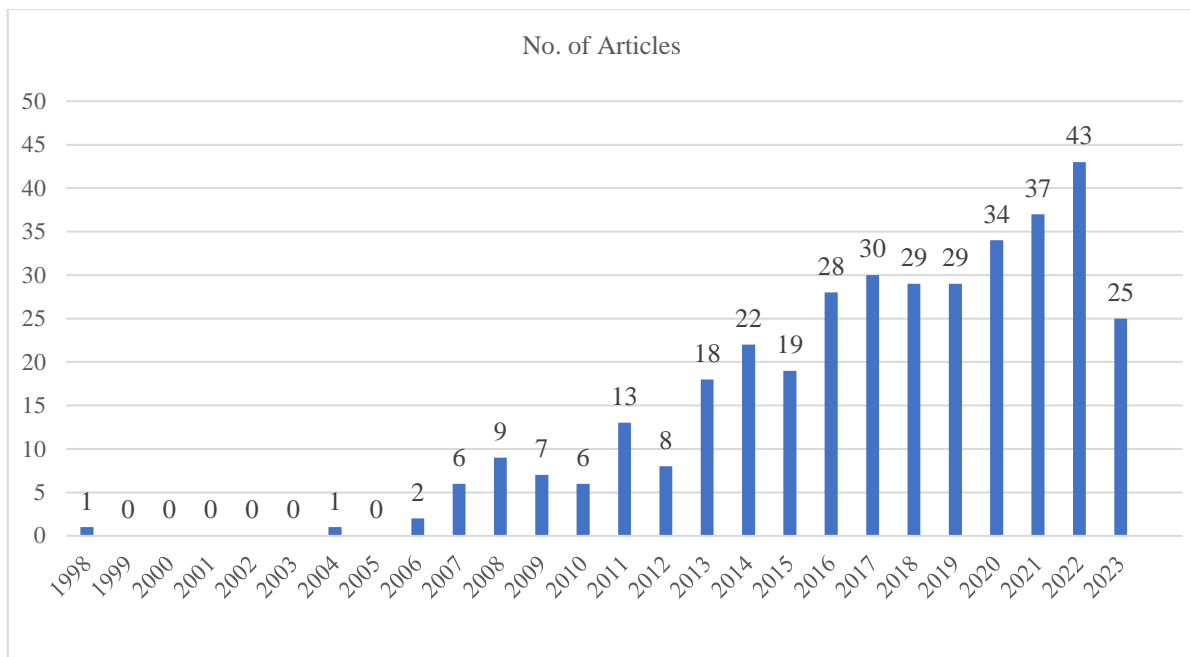


Figure 2. Publication trend of IDVOL research.

The average number of publications per year was finally reached after nine years, or in 2007. Over the past three years, the most papers have been produced, with 2022 being the most productive (43 articles), followed by 2020 (37 articles), and 2020 (34 articles). Even though 2022, the year of recovery from Covid-19, was the year that produced the most studies in this field, 2023 will not compare to 2022 in this regard. Only 25 articles have been published in 2023 as the year draws to a close, which is 58% of the total number of articles produced in 2021. This demonstrates that research on Idiosyncratic Volatility is not moving as quickly in 2023.

4.2.2 Leading Countries

The most cited countries of research related Idiosyncratic volatility are ranked in Table 2 based on the total number of citations. United States had 2701 citations with 127 publications and followed by China had 2204 citations with 66 scientific publications. India had third highest citations with 1174 along with 16 publications.

4.2.3 Most cited documents

Publishing in academic journals enables researchers and academics to disseminate innovative and valuable ideas and knowledge. By selecting the most suitable and high-quality journals, researchers can share their findings with the most influential journals that contribute significantly to a specific area of study. Figure 3 shows the most influential cited documents on IDVOL research. Global Journal of Applied Economics had highest number of citations 736. Then followed by the Review of Quantitative Finance and Accounting with 698 citations and Journal of Economic Behavior & Organization with 653 citations.

Table 2. Top countries of IDVOL research

Country	TP	TC
United States	127	2701
China	66	2204
India	16	1174
New Zealand	21	785
Canada	16	334
United Kingdom	28	283
Germany	14	227
France	8	223
Hong Kong	14	206
Australia	34	188

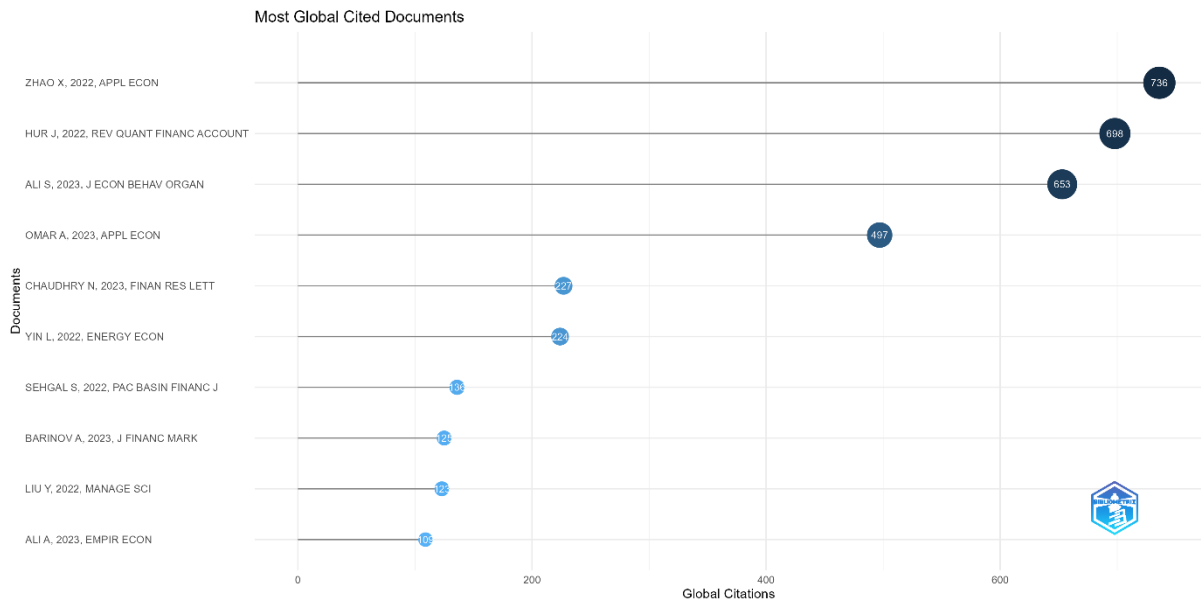


Figure 3. Most cited Documents.

This research performed ranking analysis by identifying the total number of publications (TP), total number of citations (TC), citation per publication (CPP), Citescore from scopus database, ABDC ranking, SCImago Journal Rank (SJR) and H-Index. The most cited 20 journals are presented in Table 3. It is observed that Applied Economics had the most citations along with the highest total citations per publication. In terms of H-Index, the Journal of Financial Economics was placed first with an H-Index of 311, as it had a high SJR ranking of 13.66 in Q1 journals. This was followed by Management Science, which had an H-Index of 290 and an SJR ranking of 5.44 in Q1 journals. The Journal of Banking and Finance had the highest number of publications (21) with an H-Index of 197.

Table 3. Ranking of Top 20 influential Journals

Rank	Source	TP	TC	CPP	Citescore	ABDC	SJR	H Index
1	Applied Economics	10	1310	131.00	3.8	A*	0.59, Q2	113
2	Finance Research Letters	17	534	31.41	11.1	A	1.9, Q1	101
3	Pacific Basin Finance Journal	15	239	15.93	6.8	A	1.14, Q1	75
4	International Review of Financial Analysis	17	228	13.41	10.3	A	1.83, Q1	91
5	Management Science	8	221	27.63	8.8	B	5.44, Q1	290
6	Journal Of Empirical Finance	15	214	14.27	3.4	A	0.93, Q1	93
7	International Journal of Finance and Economics	5	207	41.40	5.7	B	0.73, Q2	52
8	North American Journal of Economics and Finance	9	166	18.44	7.3	B	0.86, Q1	57
9	Journal of Financial Markets	5	163	32.60	3.4	A*	1.1, Q1	70
10	International Review of Economics and Finance	12	134	11.17	5.7	A	1.09, Q1	78
11	Journal Of Banking and Finance	21	128	6.10	6.4	A*	1.66, Q1	197
12	Cogent Economics and Finance	7	121	17.29	3	B	0.43, Q3	37
13	Research In International Business and Finance	6	114	19.00	11.2	B	1.29, Q1	73
14	Journal Of Risk and Financial Management	5	100	20.00	4.5	B	0.49, Q2	40
15	European Financial Management	7	86	12.29	4.3	A	0.87, Q1	73

16	Journal Of Financial Economics	14	81	5.79	15.8	A*	13.66, Q1	311
17	Emerging Markets Finance and Trade	6	59	9.83	7.8	B	0.78, Q1	58
18	Journal Of Corporate Finance	8	39	4.88	11.8	A*	3.18, Q1	131
19	Financial Review	5	10	2.00	3.3	A	1.13, Q1	53
20	Applied Financial Economics	8	6	0.75	2.5	B	0.383, Q3	45

Source: Elaborated by authors using data extracted from Scopus. Note: TP = Total Publications, TC = Total Citations, CPP = Citations per publication, Citescore = Citescore from Scopus, SJR= SCImago Journal Rank, ABDC = ABDC ranking, H = H Index, N/A = Not Applicable.

4.3 Science mapping

4.3.1 Co-authorship analysis of Idiosyncratic volatility related research based on countries. The co-authorship between authors from various nations is depicted in Figure 4. This observable and tried-and-true method efficiently reveals scientific collaboration. Researchers now work in teams that integrate diverse viewpoints and complementary abilities to accomplish shared goals rather than playing independently.

Author collaboration network can check the intensity of collaboration and the degree of intimacy between different authors. Hence, co-authorship analysis is an effective tool for evaluating collaboration trends and recognizing significant sources (Donthu et al., 2021), which is why this paper intends to look at the co-authorship analysis.

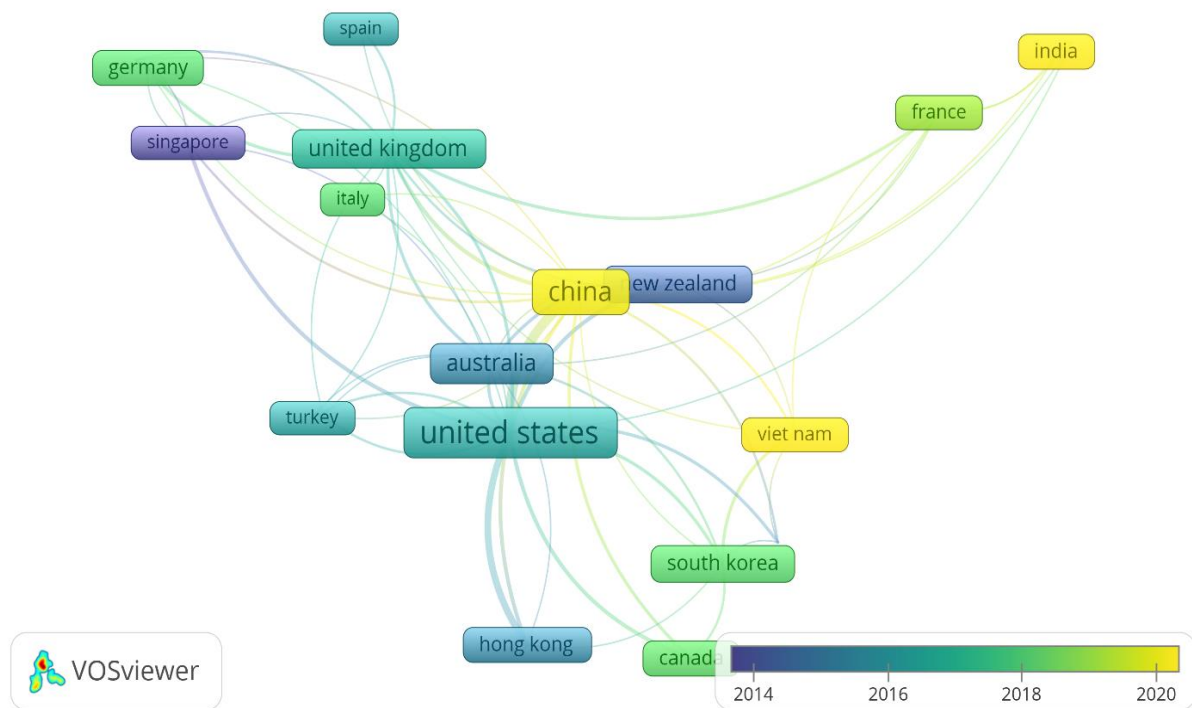


Figure 4. Co-authorship analysis based on countries.

Co-authorship analysis is taken based on the countries, of the 58 countries 22 have the international co-authorship relationship. Countries are denoted in Figure 2 by a label and a frame. Each frame's size represents the number of papers from that country that have been written. The thickness of the link also reveals the intensity of the ties between the two nations or the quantity of papers with writers from both nations. According to the data, China has the second-highest number of co-authorship links with other nations after the United States (10 countries). There are 36 countries that are isolated, which indicates that its authors have never collaborated on works with authors from other countries.

4.3.2 Keyword analysis

4.3.2.1 Trending topics and thematic mapping.

Analysing the keywords utilized in papers is a significant method for determining emerging subjects and the focus of the authors on the topic (Öztürk et al., 2024). The topics that are currently trending in this area are shown in Figure 5 based on the authors'

keyword usage. In order to conduct this study, the minimum word frequency was set at 4, and the yearly word count was set at 5. It demonstrates that recent studies in this field have focused on idiosyncratic volatility, stock market, asset pricing and idiosyncratic volatility. China is the trending topics in 2022, investments and United States are the trending topics in 2021. It is noted that the term idiosyncratic volatility used by the researchers since 2016, which is stopped in 2020. Apart from idiosyncratic volatility, the most prominent keywords used in the studies are investments, financial markets and risk assessments.

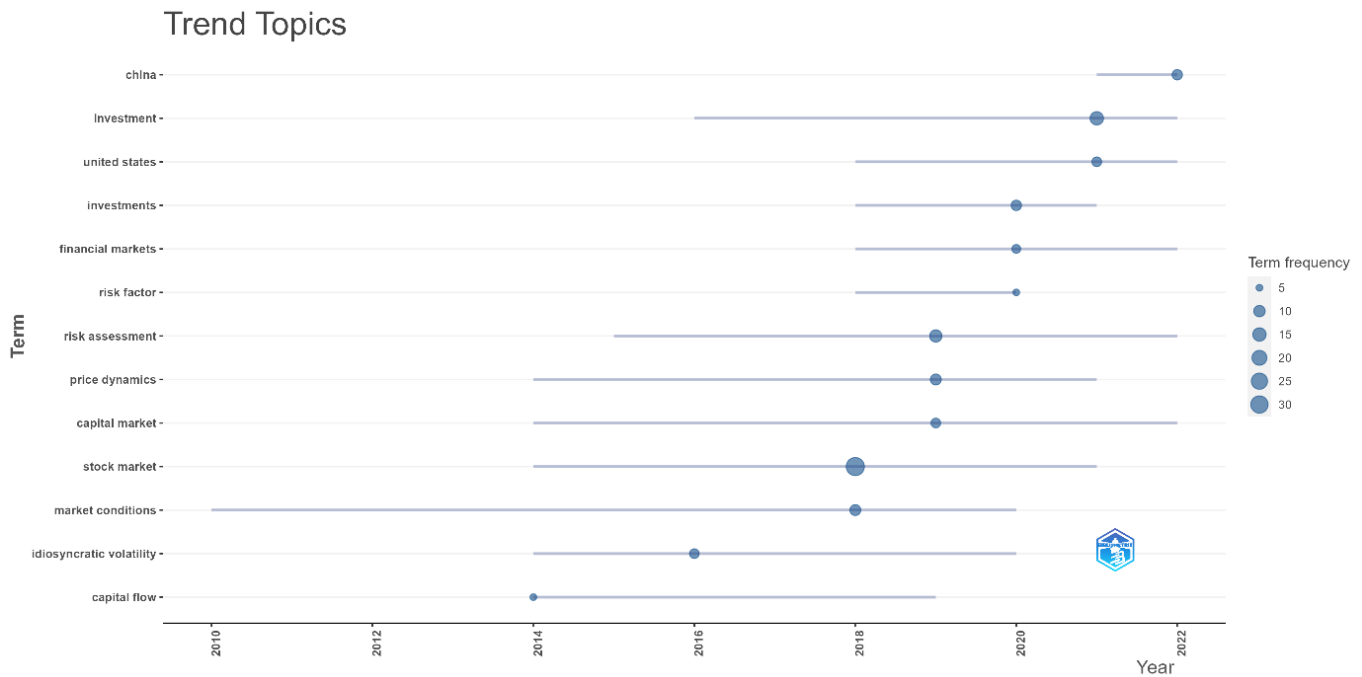


Figure 5. Trending Topics with the use of keywords

Table 4. Top Keywords

Sl. No.	Keyword	TO	Sl. No.	Keyword	TO
1	Idiosyncratic Volatility	205	11	Idiosyncratic volatility puzzle	12
2	Idiosyncratic Risk	58	12	Momentum	12
3	Asset pricing	38	13	Liquidity	11
4	Stock market	35	14	Risk Assessment	11
5	Volatility	22	15	Skewness	10
6	Stock returns	17	16	Cross section of stock returns	10
7	Investments	17	17	Market conditions	9
8	Anomalies	14	18	Return predictability	9
9	G12	13	19	Price dynamics	9
10	G11	12	20	Extreme Returns	9
	Note(s): TO=Total Occurrences				

Thematic map

The thematic map IDVOL research shown in Figure 6 is another analysis done with the keywords using the Bibliometrix R-package. A thematic map aims to analyze the existing state and sustainability prospects of the area (Singh, 2021). This analysis is helpful in educating researchers and stakeholders about the possibility of the establishment of new thematic research topics within a discipline (Phoong et al., 2022). The issues' significance and level of development are determined by the density and

centrality measurements, respectively. The size of each circle indicates how frequently that specific term has been used in publications.

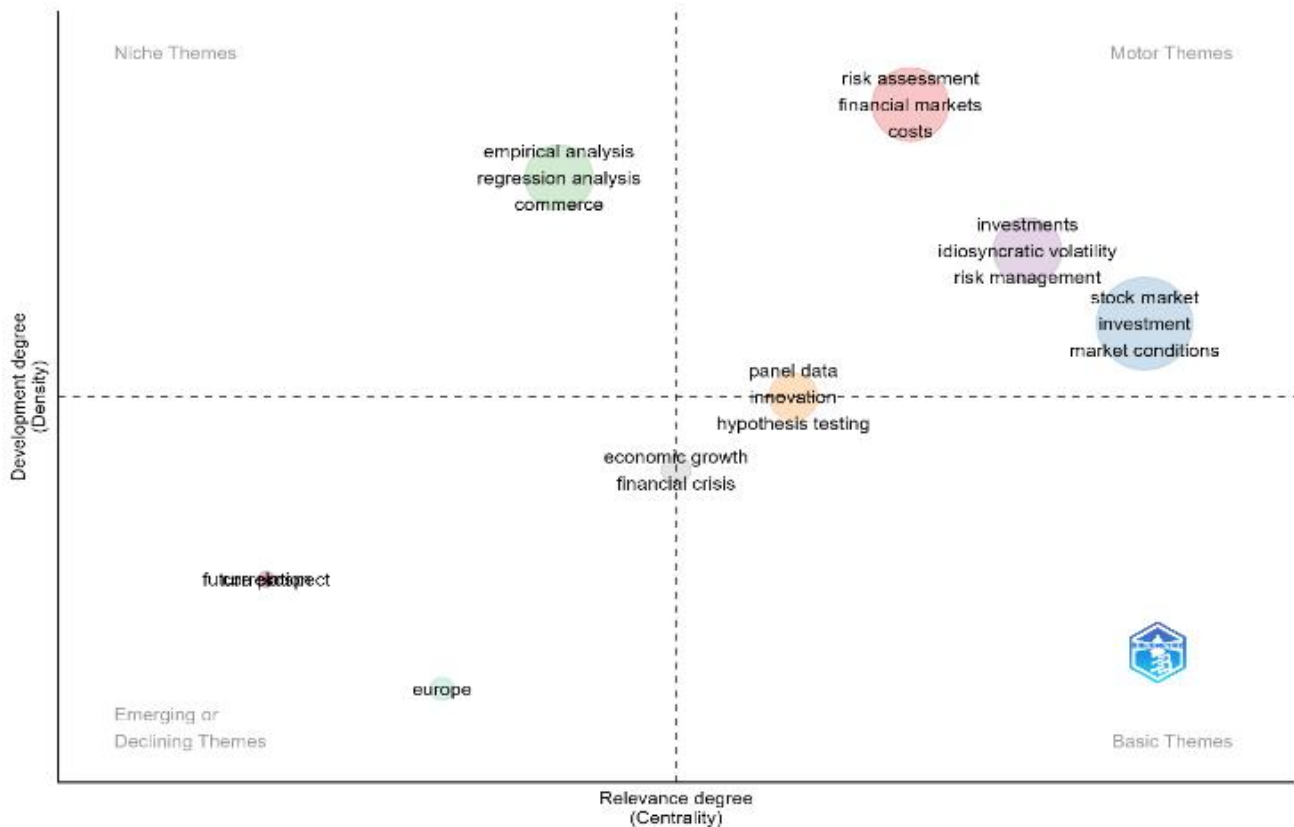


Figure 6. Thematic map.

There are four quadrants on a themed map. The upper-right quadrant represents the driving and motor themes in idiosyncratic volatility, featuring distinct clusters linked by numerous terms, emphasizing risk assessments, financial markets, investments, idiosyncratic volatility, risk management, stock market, market conditions, and panel data. The fourth quadrant displays basic themes with two cross-sectional clusters: one comprising panel data, innovation, and hypothesis testing intersecting with the motor themes quadrant, and the other consisting of economic growth and financial crisis intersecting with the emerging themes quadrant. The third quadrant contains emerging and declining themes with three clusters, one intersecting the basic themes quadrant and the others being distinct, focusing on the future prospects of idiosyncratic volatility and European studies. The niche themes quadrant, with the least number of studies, includes empirical analysis, regression analysis, and commerce.

4.3.2.2 Co-occurrences analysis

Co-occurrence analysis is another analysis that is carried out using keywords. An indication of the topics that are being focused on in these studies of the idiosyncratic volatility is provided by the analysis of keywords in the publications used by the authors. Out of the 1050 keywords in the 361 documents, 61 meet the threshold of being occurred for a minimum of 5 times, which is shown in Figure 7.

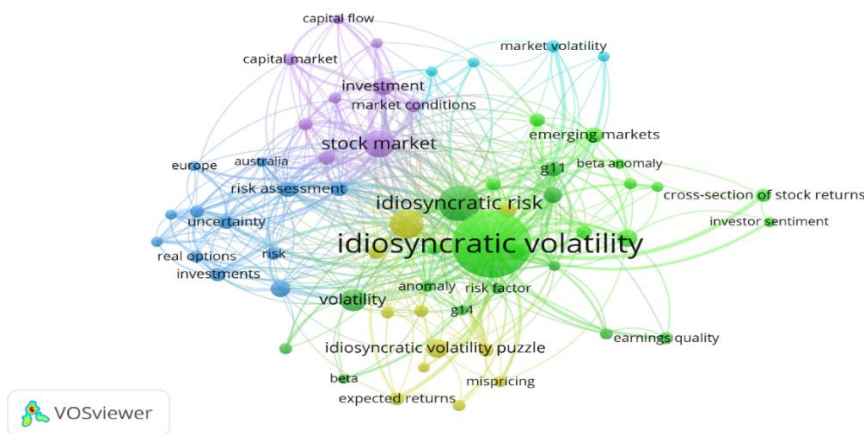


Figure 7. Co-occurrence analysis of keywords

4.3.2.3 Bibliographic coupling

Citations from publications are used in bibliographic coupling to show the level of knowledge currently held in a field. Bibliographic coupling encompasses fundamental, specialized and contemporary knowledge (Keshari & Gautam, 2023b). Coupling occurs when two works cite a common third work, suggesting that their topics might be related. Analyzing documents with at least 10 citations resulted in 132 documents, of which 128 were connected, revealing seven thematic groupings as shown in Figure 8. Each item within these clusters was examined using content analysis to consolidate them under a single theme.

Cluster 1 consists of 45 articles focusing on the relationships between aggregate volatility risk, idiosyncratic volatility risk, and corporate social responsibility. It also covers high-frequency factor models, absolute idiosyncratic volatility and mispricing, turnover and liquidity, momentum, product market competition, and volatility.

Cluster 2 consists of 30 articles examining the nature of turnover and its relationship with rational and behavioral hypotheses, the negative cross-sectional relationship between extreme positive returns and average returns, and the impact of block ownership on a firm's information environment.

Cluster 3 consists of 23 articles examining the relationship between the quality of accounting information and idiosyncratic volatility, demonstrating a positive relationship between idiosyncratic volatility and expected return, and noting that higher leveraged firms have higher idiosyncratic volatility.

Cluster 4 comprises 19 articles discussing the association between earnings quality and firm-specific return volatility, the relationship between unexpected earnings signals and information uncertainty, the impact of different idiosyncratic volatility measures on future stock returns in both bear and bull markets, the non-linear relationship between idiosyncratic volatility and life cycle stages, and the significance of the idiosyncratic volatility effect in explaining risk-adjusted returns on long-short portfolios.

Cluster 5 includes 6 articles exploring the sources of betting-against-beta (BAB) profits, the relationship between idiosyncratic volatility and information asymmetry in FDI firms, the influence of CEO tenure, board committee membership, and board composition on idiosyncratic volatility, the relationship between aggregate idiosyncratic volatility and global market return, the risk-return profile of the global market portfolio, and the idiosyncratic risks in Shariah-compliant REITs.

Cluster 6 consists of 3 articles investigating the role of hedging in mitigating investment risk, the impact of idiosyncratic volatility on portfolio alphas and returns, and the interaction between volatility risks and growth options in corporate finance.

Cluster 7 comprises 2 articles highlighting the significant quantile regression-based coefficients of idiosyncratic volatility at extreme quantiles, discussing the impact of the pandemic on various sectors, and analyzing idiosyncratic price and volatility reactions across different stocks.

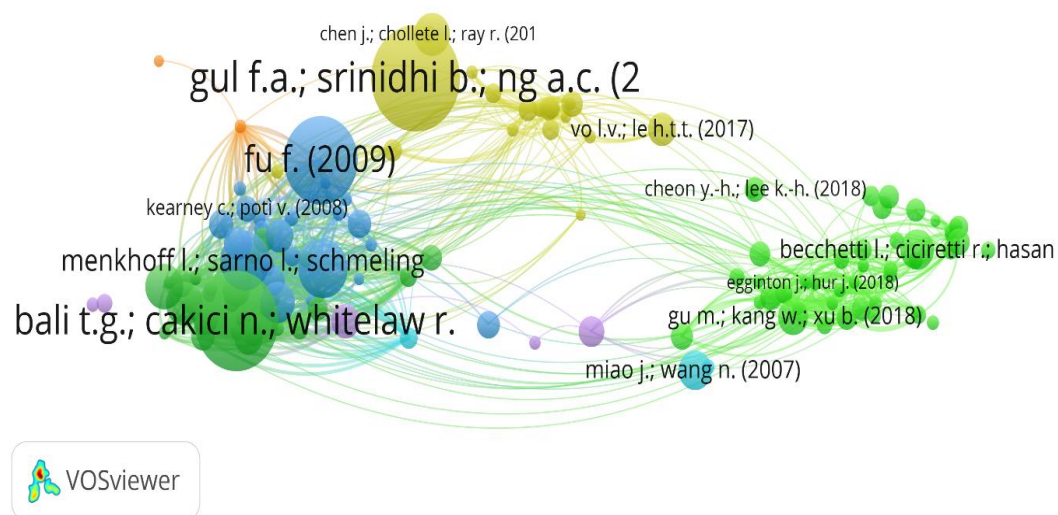


Figure 8. Bibliographic Coupling

4.4 Systematic review of Highly Cited Articles

In this section, we systematically reviewed highly cited articles in this domain. This can provide researchers with an overview of current trends in this field and support their investigations, enabling them to make significant contributions to the literature by addressing existing gaps (Rossi, 2016).

The top cited research articles are presented in Table 5, highlighting their main research focus, the specific techniques utilized for finding the Idiosyncratic volatility, and their research contributions. An article's influence is greatly affected by its total number of citations, as a highly cited work is usually regarded as high-quality. Among those articles, the most cited article is “Does board gender diversity improve the informativeness of stock prices?” by Gul et al., (2011), published in the Journal of Accounting and Economics, with a total of 736 citations. They examined whether gender-diverse boards in U.S. listed companies make them more transparent and encourage the incorporation of more firm-specific information into stock prices. And estimated idiosyncratic volatility using stock returns from 2002–2007, using panel data analysis and Fama-French Three factor model. According to their findings, there exists a positive link between gender diversity in the corporate board and stock price informativeness. Their exploratory analysis suggests that gender diversity improves stock price informativeness by increasing voluntary public disclosures in large firms and increasing the incentives for private information collection in small firms. Accordingly, “High idiosyncratic volatility and low returns: International and further U.S. evidence” published in the Journal of Financial Economics by Ang et al. (2009), had 698 citations. To analyze the anomalous relation between lagged idiosyncratic volatility and future average returns in U.S, utilized the data over the period July 1963 to December 2003. According to their conclusion, the low returns earned by stocks with high idiosyncratic volatility around the world comove significantly with the idiosyncratic volatility effect in the United States

Table 5. Systematic Review of Highly cited papers

Authors	Citations	Title	Source title	Author Keywords	Major Research Focus	Tools used	Major research Findings/ contributions
(Gul et al., 2011b)	736	Does board gender diversity improve the informativeness of stock prices?	Journal of Accounting and Economics	Diversity; Earnings quality; Female director; Governance; Idiosyncratic volatility; Transparency	Examined whether gender-diverse boards in U.S. listed companies make them more transparent and encourage the incorporation of more firm-specific information into stock prices.	Fama-French 3-factor model, One-factor model, Fama and MacBeth, Panel data analysis	Results found a positive link between gender diversity in the corporate board and stock price informativeness.
(Ang et al., 2008)	698	High idiosyncratic volatility and low returns: International and further U.S. evidence	Journal of Financial Economics	Cross-section of stock returns; Factor model; Predictability	Analysed the anomalous relation between lagged idiosyncratic volatility and future average returns in U.S. data exists in other markets.	Fama and MacBeth (1973), Fama-French (1993) three-factor model.	Found that the low returns earned by stocks with high idiosyncratic volatility around the world comove significantly with the idiosyncratic volatility effect in the United States.
(Bali et al., 2011)	653	Maxing out: Stocks as lotteries and the cross-section of expected returns	Journal of Financial Economics	Cross-sectional return predictability; Extreme returns; Idiosyncratic volatility; Lottery-like payoffs; Skewness preference	Investigated the significance of extreme positive returns in the cross-sectional pricing of stocks.	Panel data analysis, fama-french four factor analysis, fama-french three factor model.	Both portfolio-level analysis and firm-level cross-sectional regressions reveal a negative and significant relationship between the maximum daily return over the past month (MAX) and expected stock returns.
(Fu, 2009)	497	Idiosyncratic risk and the cross-section of expected stock returns	Journal of Financial Economics	Cross-sectional returns; GARCH; Idiosyncratic risk; Time-varying	Analysed the relation between idiosyncratic risk and expected return.	EGARCH, Fama-MacBeth regressions, Panel data analysis, Fama-French Three factor	Stated a significantly positive relation between the estimated conditional idiosyncratic volatilities and expected returns.
(Menkhoff et al., 2011)	227	Currency momentum strategies	Journal of Financial Economics	Carry trades; Idiosyncratic volatility; Limits to arbitrage;	Broad empirical investigation of momentum strategies in the foreign exchange market.	Panel data analysis, fama-french four factor analysis, Sharpe ratio, Descriptive statistics	The study found a significant cross-sectional spread in excess returns of up to 10% p.a.

				Momentum returns			between past winner and loser currencies.
(Rajgopal & Venkatachalam, 2011)	224	Financial reporting quality and idiosyncratic return volatility	Journal of Accounting and Economics	Abnormal accruals; Earnings quality; Idiosyncratic volatility; Temporal analysis	Investigated whether changes in financial reporting quality are associated with this trend in return volatility	Descriptive statistics, Panel data analysis, Dechow–Dichev measure for reporting quality	Found that worsening earnings quality captured by these proxies is positively associated with rising return volatility over the 40 year period 1962–2001.
(Brockman & Yan, 2009a)	136	Block ownership and firm-specific information	Journal of Banking and Finance	Block ownership; Idiosyncratic volatility; Probability of informed trading	examines the impact of block ownership on the firm’s information environment	Descriptive statistics, Panel regression analysis	Findings confirm that block holders increase the probability of informed trading and idiosyncratic volatility, and decrease the firm’s stock return synchronicity
(Hou & Loh, 2016)	125	Have we solved the idiosyncratic volatility puzzle?	Journal of Financial Economics	Cross-section of stock returns; Idiosyncratic volatility; Lottery preferences; Market frictions	Examined the negative relation between idiosyncratic volatility and subsequent stock returns (the idiosyncratic volatility puzzle).	Fama-MacBeth cross-sectional regressions, Panel data analysis	Many existing explanations explain less than 10% of the idiosyncratic volatility puzzle and explanations based on investors’ lottery preferences and market frictions show some promise in explaining the puzzle.
(Francis et al., 2007)	123	Information uncertainty and post-earnings-announcement-drift	Journal of Business Finance and Accounting	Abnormal returns; Anomalies; Earnings quality; Information uncertainty	Analysed whether rational investor responses to information uncertainty (IU) explain properties of and returns to the post-earnings-announcement-drift (PEAD) trading anomaly	Descriptive statistics, fama-french three factor model, fama-french four factor model, Panel data analysis	The results show that abnormal returns from accounting-based trading strategies, especially PEAD strategies, are systematically linked to measures of the firm’s information environment quality, specifically information uncertainty.
(Herskovic et al., 2015)	109	The common factor in idiosyncratic volatility: Quantitative asset pricing implications	Journal of Financial Economics	Cross section of stock returns; Firm volatility; Idiosyncratic risk	Presented new empirical evidence regarding the behavior of idiosyncratic risk and consider the implications of this behavior for asset prices	Fama and French three-factor model, five-factor principal components model, panel data analysis, Fama and MacBeth analysis	In the model, CIV is a priced state variable as an increase in idiosyncratic firm volatility raises the average household’s marginal utility. The calibrated model aligns with the high co-movement in idiosyncratic volatilities, the CIV-beta return spread, and various other asset price moments..

(Becchetti et al., 2015)	108	Corporate social responsibility, stakeholder risk, and idiosyncratic volatility	Journal of Corporate Finance	Corporate social responsibility; Idiosyncratic volatility; Stakeholder risk	Explored the nexus between IV and corporate social responsibility (CSR) and document that IV is positively correlated with aggregate CSR and is negatively correlated with a CSR specific risk factor	panel data analysis, sensitivity analysis.	Findings are consistent with the view that CSR reduces flexibility in responding to productive shocks via the reduction of stakeholder well-being, thereby producing the combined effect of making earnings less predictable and reducing exposure to risk of conflicts with stakeholders
(Miao et al., 2006)	103	Investment, consumption, and hedging under incomplete markets	Journal of Financial Economics	Hedging; Idiosyncratic risk; Incomplete markets; Precautionary savings; Real options; Risk aversion	Analysed the joint decisions of business investments, consumption/savings , and portfolio selection	Brownian motions, coefficient of absolute risk aversion (CARA), Hamilton-Jacobi-Bellman (HJB) equation,	The study showed that project volatility has both positive and negative effects on the implied option value, with the negative effect driven by the precautionary savings motive. The model was further extended to include hedging opportunities, highlighting that entrepreneurs investing in non-tradable projects often need to make joint financing decisions.
(Nartea & Wu, n.d.)	89	Do extreme returns matter in emerging markets? Evidence from the Chinese stock market	Journal of Banking and Finance	China; Cross-section of stock returns; Extreme returns; Predictability	Investigated the presence of extreme return effect in the Chinese stock markets with portfolio-level analysis and firm level Fama-MacBeth cross-sectional regressions	Fama-French (1993) three-factor model alpha (FF-3 alpha), Fama-MacBeth regressions, Panel data analysis	The results found the evidence of a negative relationship between extreme positive returns (MAX) and stock returns in the Chinese stock market if extend the holding period to three and six months
(Gu et al., 2018)	87	Limits of arbitrage and idiosyncratic volatility: Evidence from China stock market	Journal of Banking and Finance	China stock market; Idiosyncratic volatility; Limits of arbitrage	Examined how limits of arbitrage can affect the pricing of idiosyncratic volatility.	Fama and French (1993) three factors, Panel data analysis, Descriptive statistics, Fama-MacBeth regression	The study find a highly significant negative return premium for stocks with high idiosyncratic volatility in the Chinese stock market. This IVOL negative premium is much stronger in stocks with high limits of arbitrage.
(Kelly, n.d.)	76	Information efficiency and firm-specific return variation	Quarterly Journal of Finance	Idiosyncratic volatility; market efficiency; private information; R ² , Synchronicity	This paper examines this contention that R ² is an inverse measure of information efficiency.	Regression, Panel data analysis, Bayes probability, Carhart Four factor model	Low-R ² stocks are smaller, making them less valuable to trade, and are less frequently traded, making them more difficult to trade.

							and have higher trading costs and price impact, making them less profitable to trade. The study suggests that R2 is a poor measure of information efficiency or stock price informativeness
(Cao & Han, 2013)	73	Cross section of option returns and idiosyncratic stock volatility	Journal of Financial Economics	Idiosyncratic volatility; Limits to arbitrage; Market imperfections ; Option return	This paper provides a comprehensive study of individual stock option returns after delta-hedging the exposure to the underlying stocks	Fama-MacBeth regression, Panel data analysis,	The key new finding is that the average delta-hedged option return is negative and decreases monotonically with an increase in the idiosyncratic volatility of the underlying stock. This holds for both call options and put options
(Annaert et al., 2013)	72	Are extreme returns priced in the stock market? European evidence	Journal of Banking and Finance	Cross-section of expected returns; Extreme returns; Idiosyncratic volatility puzzle; Lottery-like payoffs; Skewness	what determines cross-sectional variation in expected stock returns	Fama-MacBeth regressions, Panel data analysis, descriptive statistics	Although stocks with extreme positive returns also display low momentum and have high lagged monthly returns, these characteristics do not explain their underperformance . This finding is consistent with individual investors preferring stocks with lottery characteristics that imply a low probability of earning a very high return
(Vo & Le, 2017)	71	Strategic growth option, uncertainty, and R&D investment	International Review of Financial Analysis	Growth option; Idiosyncratic volatility; R&D investment; Uncertainty	This paper investigates the effect of uncertainty on R&D investment	Tobin's Q regression, Herfindahl-Hirschman index (HHI), 2SLS regression, Fama and French (1993) three-factor regression model	Firms invest more in R&D when they face higher uncertainty, as measured by idiosyncratic return volatility.
(Arena et al., 2008)	70	Price momentum and idiosyncratic volatility	Financial Review	Idiosyncratic volatility; Limits of arbitrage; Price momentum	Examined the relation between price momentum and idiosyncratic volatility (IVol)	Panel data analysis, Descriptive statistics, Fama-French three-factor regression	Stocks with higher IVol display greater momentum than do stocks with lower IVol. This relation is statistically significant, large and robust to consideration of firm size, transactions costs, turnover, price delay, distress risk, different sample periods, different formation and

							holding periods and alternative specifications of IVOL.
(Liu et al., 2018)	62	Absolving beta of volatility's effects	Journal of Financial Economics	Anomaly; Beta; Volatility	Investigated beta anomaly in to stock pricing and returns	Fama-French 3-factor model, Panel analysis	The beta anomaly, which is negative (positive) alpha on stocks with high (low) beta. The anomaly arises from beta's positive cross-sectional correlation with IVOL.

“Maxing out: Stocks as lotteries and the cross-section of expected returns” by Bali et al., (2011), published in the journal of Financial Economics, had 653 citations. According to their conclusion, portfolio-level analysis and firm-level cross-sectional regressions indicate a negative and significant relation between the maximum daily return over the past one month (MAX) and expected stock returns. “Idiosyncratic risk and the cross-section of expected stock returns” by (Fu, 2009) ranked fourth most cited articles (497), published in the journal of Financial Economics. They stated a significantly positive relation between the estimated conditional idiosyncratic volatilities and expected returns. In another angle, “Currency momentum strategies” by Menkhoff et al., (2011), published in the Journal of Financial Economics, had 227 citations. They concluded that a significant cross-sectional spread in excess returns of up to 10% p.a. between past winner and loser currencies.

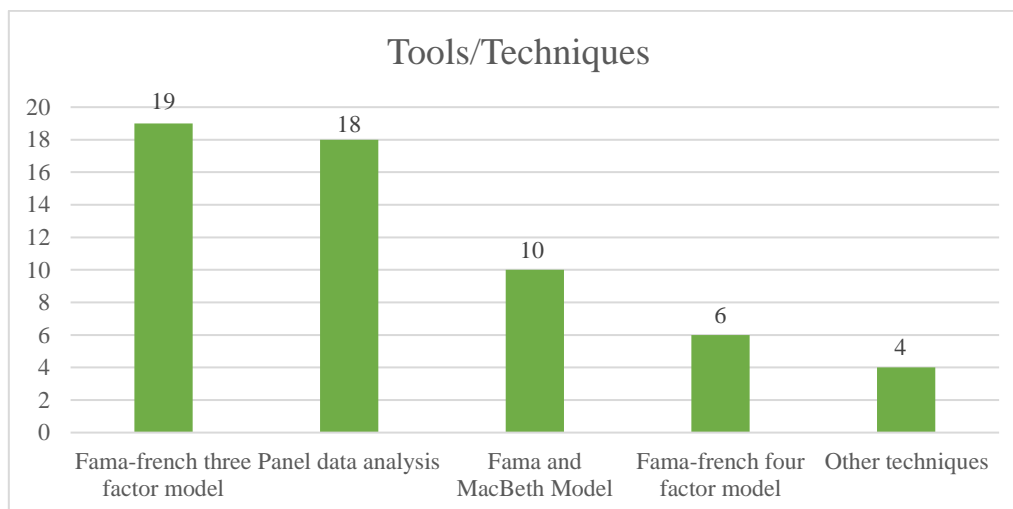


Figure 9. Frequency of Techniques used. Sources: Author compilation.

By assessing how often IDVOL research are utilized to estimate and predict the characteristics of the volatility on panel data, we found that most of the highly cited articles are used Fama- French Three factor models and panel data Regression analysis. In the highly cited studies, 95% studies were used Fama- French three factor model and 90 % studies were Panel data regression analysis. Accordingly, many of the studies applied Fama-French Four factor model, Fama-MacBeth Regression, descriptive statistics along with Fama- French Three factor models and panel data Regression analysis. Some authors (Ang et al., 2009b; Bali et al., 2011; Brockman & Yan, 2009b; Fu, 2009; Gul et al., 2011b; Rajgopal & Venkatachalam, 2011) proposed that the Fama-French Three factor model was the best tool for analysing the Idiosyncratic volatility.

5. Findings and conclusions

5.1. Conclusions

The current study advances understanding of the existing state of Idiosyncratic volatility related research. This study has compiled a comprehensive summary of all papers made in the field of idiosyncratic volatility up to 2023. A bibliometric analysis of 361 articles from the Scopus database revealed the evolution and trends in this research field. The study of idiosyncratic volatility gained more attention and attraction in academic research and financial literature during the late 20th century and early 21st century. The main contribution of the article is that there haven't been any bibliometric studies on idiosyncratic volatility related research in before. The study demonstrates a rising trend in this topic's scholarly publications. The research indicates a recent increase in promising scientific articles on the subject, with a notable improvement in relevant publications since 2011 when researchers began to show more interest. From 2016, there's been a clear, though slow, upward trend. Despite contributions from various countries, the global community has not given sufficient attention to research on idiosyncratic volatility. The citation analysis revealed that United States had 2701 citations with 127 publication and followed by China had 2204 citations

with 66 scientific publications. India had third highest citations with 1174 along with 16 publications. At that time, it was discovered that the Global Journal of Applied Economics had the highest number of citations at 736. It was followed by the Review of Quantitative Finance and Accounting with 698 citations and the Journal of Economic Behavior & Organization with 653 citations. The ranking analysis of impactful journals were grouped based on the total number of publications (TP), total number of citations (TC), citation per publication (CPP), Citescor from scopus database, ABDC ranking, SCImago Journal Rank (SJR) and H-Index. Most of the articles are classified within the A*, A, and B rankings of the ABDC list. Co-authorship analysis shows that out of 58 countries, 22 have international co-authorship relationships, with China having the second-highest number of links after the United States. Trending topics demonstrates that recent studies in this field have focused on idiosyncratic volatility, stock market, asset pricing and idiosyncratic volatility.

The thematic map in keyword analysis have discovered certain areas that could beneficial to researchers. The main themes of the upper-right quadrant in idiosyncratic volatility research are risk assessments, financial markets, investments, and stock market conditions, emphasizing their connections through numerous terms. The top-cited research articles reviewed highlight their main research focus, the specific techniques utilized for finding idiosyncratic volatility, and their research contributions. The most cited article were “Does board gender diversity improve the informativeness of stock prices?” by Gul et al., (2011), published in the Journal of Accounting and Economics, with a total of 736 citations. The frequency of techniques on IDVOL research were utilized to estimate and predict the characteristics of the volatility on panel data, discovered most of the highly cited articles were used Fama- French Three factor models and panel data Regression analysis. In the highly cited studies, 95% studies were used Fama- French three factor model and 90 % studies were Panel data regression analysis.

Our study has some significant academic and managerial implications. In terms of academic implications, this study provides some important insights regarding gradual progression, prolific authors, impactful journals, and important studies in IDVOL literature. Apart from this, the study thoroughly reviewed highly cited papers to identify the frequently used techniques and the best articles proposed by prominent authors in this field. This study significantly advances this field of research by highlighting the development and current structure of IDVOL research in the analysis of volatility and forecasting of stock return in the panel data. From a managerial viewpoint, our research aims to provide a comprehensive understanding of the concept of idiosyncratic volatility. This knowledge can help fund managers, investors, and other market participants to better understand the idea, make informed investment decisions, and diversify their portfolios.

5.2 Limitations and Future Research Direction

There are several limitations that must be addressed despite the paper’s contributions. The first is the usage of a single database as opposed to a number of sources for data retrieval. Using other databases will provide more coverage of the subject, even though the authors of this study believe that Scopus includes a sizable number of papers that are typical of the subject overall. Unpublished working papers, doctoral theses, books, or conference proceedings did not meet the criteria for inclusion. Additionally, the importance of research conducted in other languages was disregarded because the study only looked at English-language publications.

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