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Bibliometric Analysis of Leverage, Liquidity and Profitability: Revealing Literature Gaps, Author Collaborations, and Key Insights

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Abstract

The primary goal of this paper was to perform a thorough bibliometric analysis that specifically examines the leverages, liquidity, and profitability. It aims to summarize current research while dealing with core issues regarding publication patterns, notable journals, and countries involved, citations, collaborative networks, prevalent terms, and statistical methodologies employed in this field so far. The Biblioshiny package in R-studio and VosViewer were used to do bibliometric analysis on a Scopus dataset consisting of 416 articles. The study provides various aspects related to publishing pattern, productive nations and articles, top journals, co-occurrence networks, coupling networks and keywords used in the study which would be helpful for the future researchers. Further, investigations were mainly undertaken by examining all the sectors combined, however the focus on a single industrial sector especially in India was limited. The majority of the studies were based on secondary data, allowing for the possibility of primary research.

Keywords: Capital Structure, Debt-equity ratio, Firm's profitability, Leverage, Liquidity, ROE.

Introduction

Investment decision in financial management refers to capital allocation with the aim of earning a higher return. Companies either use internal funds or external funds to finance their capital. When a company borrows externally, it is referred to as Financial Leverage. In addition, investors use leverage in order to have more Return on Investment (ROI). However, with great reward, there is a great risk attached to it. Leverage carries severe risk as it can lead to bankruptcy also. Nonetheless, debt may be considered useful for expanding business only if ROI is greater than the interest rate on external funds. Misuse of leverages could have disastrous results as it played a contributing role in the Global Financial crisis of 2008.

Specialists in the financial sector agree that financial leverage is a common strategy used by businesses to increase their profitability and market value. When a corporation uses financial leverage to its advantage, it opens itself up to certain risks. For example, if a heavily levered company fails to generate enough Earnings before Interest & Tax (EBIT), it may be forced to liquidate because it cannot afford to pay its interest payments and continue operating. According to James C. van Horne (1974), a company's primary goal should be to increase profits for stockholders. A company's value will be impacted by its cost of capital, which inevitably affected by its financial leverage (1).

Furthermore, liquidity also plays a crucial role in the successful operation of a corporation. If a company wants to operate its operations smoothly, it must avoid situations in which it either lacks cash or has too much cash on hand. Keeping the firm liquid in order to ensure its functions and responsibilities may be fulfilled is the primary responsibility of the management. So, it is of utmost importance to keep a close eye on the firm's liquidity condition, since failing to do so makes the business fall (2). Lack of or overabundance of either liquidity or leverage could take an adverse turn on firm's performance. Therefore, it is mandatory for businesses to strike a balance between liquidity and leverage so that they can match the organization's needs (3). Furthermore, the company's operations may also be mismanaged by the use of excessive leverage and liquidity that could adversely affect the company's

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profitability. Hence, the effective use of both of them drives the company's profitability (4).

The main aim of this paper is to analyse the contribution of existing literatures using bibliometric analysis. Review paper highlights major findings and methodologies used by researchers and summarizes the main conclusion for further researchers. The purpose of this analysis is to acquaint researchers with broad insights into the academic achievements of countries, journals, articles, and keywords, as well as their annual productions, citations, and overall performance (5). According to Trinidad *et al.*, (6) this stage is of utmost importance because it enables the researcher to assess the credibility of a particular journal and safeguards against the publication of their work in unscrupulous journals. Additionally, this paper brought attention to the following research concerns: The literature concerning leverage, liquidity and profitability published; Journals having the greatest occurrence of papers pertaining to the current study; Countries that are most engaged in publishing research on this topic; The highly cited paper in this field; The countries collaborating within this field; The phrase "Leverage, Liquidity and Profitability" appear in academic circles; Countries sharing similar literature within the same field; The famous statistical techniques used by all the studies in conducting research within this field.

El-Sayed Ebaid studied the effect of capital structure decisions on a firm's performance in Egypt because of the country's status as an emerging or transition economy. The study's methodology includes multiple regression analysis to estimate the connection between leverage and company performance. Based on these findings, the researchers concluded that capital structure decisions had little to non-existent influence on the financial performance of Egyptian publicly traded companies (7). Gill, in his research suggested that, prosperous enterprises place more emphasis on debt as their principal means of financing. An increased level of debt magnifies the likelihood of default, thereby raising the chance for insolvency of a company. Consequently, it is essential for management to consider the implementation of a prudent capital structure (8). Furthermore, researcher stated that high-debt companies have greater ROEs but lower ROAs. Also, there exists a substantial link between capital structure and performance of firm. However, there was a statistically significant negative effect of capital structure determinants on ROA and ROE (9). The detrimental effect of capital structure on company performance was also shown (10). Sandhar and Janglani, conducted an investigation on working capital management with regard to profitability and liquidity. The research showed that liquidity ratios were negatively related to profitability which supported the theory of the trade-off between liquidity and profitability (11). As per the research conducted by Ben-Celeb, both Liquidity ratios were shown to have a weak correlation with ROCE-based profitability (12). A study was conducted to investigate the impact of liquidity and leverage on the profitability of the 10 Indian pharmaceutical companies. The findings of the study revealed that liquidity ratios were positively correlated with the firm's profitability. Research showed that liquidity has a substantial effect on the profitability of selected pharmaceutical companies and he found no major impact of leverage on profitability (13).

The managers need to behave responsibly while dealing with liquidity problems, therefore they must keep the firm's current assets and current obligations in balance at a perfect level since it affects how quickly debts are paid off. In addition, they need to stay away from keeping a larger proportion of their assets in liquid form for the inevitable requests of suppliers and other regular expenditures (14). Researcher highlighted the need for organizations to enhance their liquidity performance and prioritize profitability performance in order to augment company value, therefore sending a favorable indication to investors (15). Besides the relation between liquidity and profitability, study depicts the contradictory relationship between leverages and profitability. However, in some studies researcher found a positive link between financial leverage and performance (16). Furthermore, these researchers revealed that company's prospects may be greatly affected by its use of leverage and liquidity. The researchers showed that financial leverage variables had a major effect on the company's performance. Researchers found that there is a substantial negative link between two variable i.e. financial leverage and a firm's profitability in Pakistan's cement manufacturing industry. Firms with high levels of

debt tend to have poorer profitability, whereas those that keep their debt levels modest tend to have better profitability (17). Some studies show that financial performance is affected positively by financial leverage. Hence, firms should enhance their financial performance and demonstrate their commitment to economic growth while civilizing their optimal capital structures (18).

Summing up, researchers believed that, "Excessive debt may pose significant risks to both a corporation and its investors. An uncontrolled amount of debt has the potential to result in the insolvency of a business. Leverage has the potential to enhance value" (19). ROA was negatively correlated with financial leverage, suggesting that an increase in debt levels might result in a reduction in asset value. However, in some studies it is mentioned that firm performance negatively impacted by increasing financial leverage (20). The correlation between leverage and profitability illustrates that augmenting the level of outstanding debt may effectively boost profitability, hence justifying the use of debt (21).

Variables Used in Different Study

Return on Assets (ROA) and Return on Equity (ROE) have been utilised extensively in research as dependent variables by various researchers. Common Variables used in various studies along with its formula are summarized in Table 1.

Table 1: Variables Used in Relevant Literature Reviews

Variable name		Formula
Dependent (Profitability & Financial Performance)	ROA	Net income / Total Assets
	ROE	Net income / Shareholder's Equity
	Return on Capital Employed (ROCE)	Earnings before Interest & Tax / Capital Employed
	Earnings Per Share	Net Income / Outstanding equity shares
	Net Profit Margin	Net Profit before taxes / Sales
	Return on Investment	(Net Income / Cost of Investment) * 100
	Gross Profit Margin	Gross Profit / Revenue
Independent (Liquidity & Leverage)	Current Ratio	Current Assets / Current Liabilities
	Quick Ratio	Quick Assets / Current Liabilities
	Debt-Equity ratio	Debt / Equity Ratio
	Working Capital Ratio	Working Capital / Current Liabilities
	CCC	DIO + DSO – DP
	Gearing ratio	(Long term debt + Short term debt + Bank overdraft) / Shareholder Equity
	Inventory Turnover Ratio	COGS / Average Inventory
	Average Collection Period	365 / Receivable Turnover ratio
	Average Payable Period	365 / Creditors Turnover ratio
	Interest Coverage Ratio	EBIT / Interest expense

Methodology

A systematic literature review (SLR) refers to one that details how the research was conducted and covers all relevant material (22). A literature review contributes to the development of theory, identifies the areas where significant research studies have been done, and reveals the areas in need of future study (23). This section presents the research methodology that is used to find suitable research papers. Studies published within 2012-2023 were utilized in this research.

Bibliometric analysis is the scholarly study of citation trends in academic publications. In this method, one searches for and analyses patterns that appear across published works in an effort to discover new fields of academic investigation. The

primary focus of bibliometric analysis is on publications or their bibliographic data, the title, authors, publication year, abstract, keywords, subject area, and an extensive list of citations (24). It typically involves a series of methodological procedures. Establishing fundamental criteria, keywords, and spatial parameters for the purpose of conducting the search is the first step. Following this, a pertinent database is selected, which plays an essential role in generating input data and modifying the search parameters. Subsequently, it is necessary to export the acquired search results, which are necessary for the subsequent and concluding phase, which includes the creation and analysis of the bibliometric map (25).

Biblioshiny with the R package and VosViewer were implemented in this study to analyze the important aspects mentioned in the research problems. Biblioshiny with R package, introduced by Aria and Cuccurullo is a standard quantitative analytical tool used for scientometric and bibliometric analysis, as it is an ideal application for non-coders to generate general statistics information from bibliographic data. It is used for basic counting (26). This tool has been used to identify the yearly scientific output of publications pertaining to research, highly cited articles, highly cited authors, and other information relevant to literature reviews. On the other hand, VosViewer was developed by Van Eck and Waltman and is a software widely used to construct network mapping of keywords, countries, and journals to visualize the selected item's relations. Both the software's used scientific databases to conduct the literature reviews.

Suitable scientific databases are necessary to guarantee the validity and quality of the articles included in the dataset. Web of Science (WoS), Scopus, and Google Scholar are all scientific databases. The researcher has chosen the Scopus Database because of its extensive coverage. Scopus is self-proclaimed as the most extensive database of peer-reviewed literature, including citations and abstracts. The terms "Leverage", "Liquidity", and "Profitability" were queried using the Boolean operator "AND" in the Scopus research database. Research papers using these keywords were identified and search resulted in 504 documents. However, results were filtered by limiting the time period, final result contained only 482 documents. Out of which only 416 documents were exported in "CSV" format for bibliometric analysis. Figure 1 depicts the research process involved in the article collection. Researcher used PRISMA (Preferred Reporting Items for Systematic reviews and Meta-Analyses) Statement to show the process adopted for systematic literature review. It includes 27-item checklist and a four-phase flow diagram which assists in creating systematic reviews (27).

Detailed procedure of exclusion and inclusion of articles is given in below.

Inclusion Criteria:

- Studies between the period 2012 and 2023.
- Studies that were mainly focused on the interplay between Leverage, Liquidity and Profitability were chosen instead of only one variable.

Exclusion Criteria:

- Documents of conference proceedings, book chapters, review and early access articles.
- Articles that were not written in English language.
- Studies that were not able to be presented in full text.
- Some studies were related to the three variables but not related to the context of the study.

Results and Discussion

Descriptive Analysis

The descriptive analysis offers comprehensive data on the yearly output, annual citations, and performance of nations, journals, papers, and keywords. Table 2 depicts the descriptive analysis of Scopus data sets used in the study.

Table 2: Descriptive Analysis

Description	Results
MAIN INFORMATION ABOUT DATA	
Timespan	2012:2023
Sources (Journals, Books, etc)	247
Documents	416
Annual Growth Rate %	8.01
Document Average Age	4.32
Average citations per doc	7.925
References	18993
DOCUMENT CONTENTS	
Keywords Plus (ID)	313
Author's Keywords (DE)	1189
AUTHORS	

Authors	981
Authors of single-authored docs	80
AUTHORS COLLABORATION	
Single-authored docs	86
Co-Authors per Doc	2.55
International co-authorships %	18.99
DOCUMENT TYPES	
Article	416

Literature Concerning Leverage, Liquidity and Profitability Published in a Year: Publication analysis employs the full counting technique, which assigns complete recognition to contributions that are relevant to the field (28). Figure 2 depicts the annual publication count and annual citation of articles. Based on the data, it can be deduced that the number of papers published in the year 2012 amounted to a mere 21. Subsequently, the research related to this topic saw consistent growth throughout the year 2017, as shown by the publication of a total of 30 publications pertaining to the topic. In the year 2020, the annual output saw exponential growth, resulting in the creation of 57 articles. This scenario suggests that the subject matter garnered significant attention among the academic community in the year 2020, as shown by the publication of 57 scholarly publications. Regrettably, there is a decline in the yearly output subsequent to the year 2020. However, in 2023, 52 articles published. Therefore, this graph illustrates both the increasing and negative trends in yearly output.

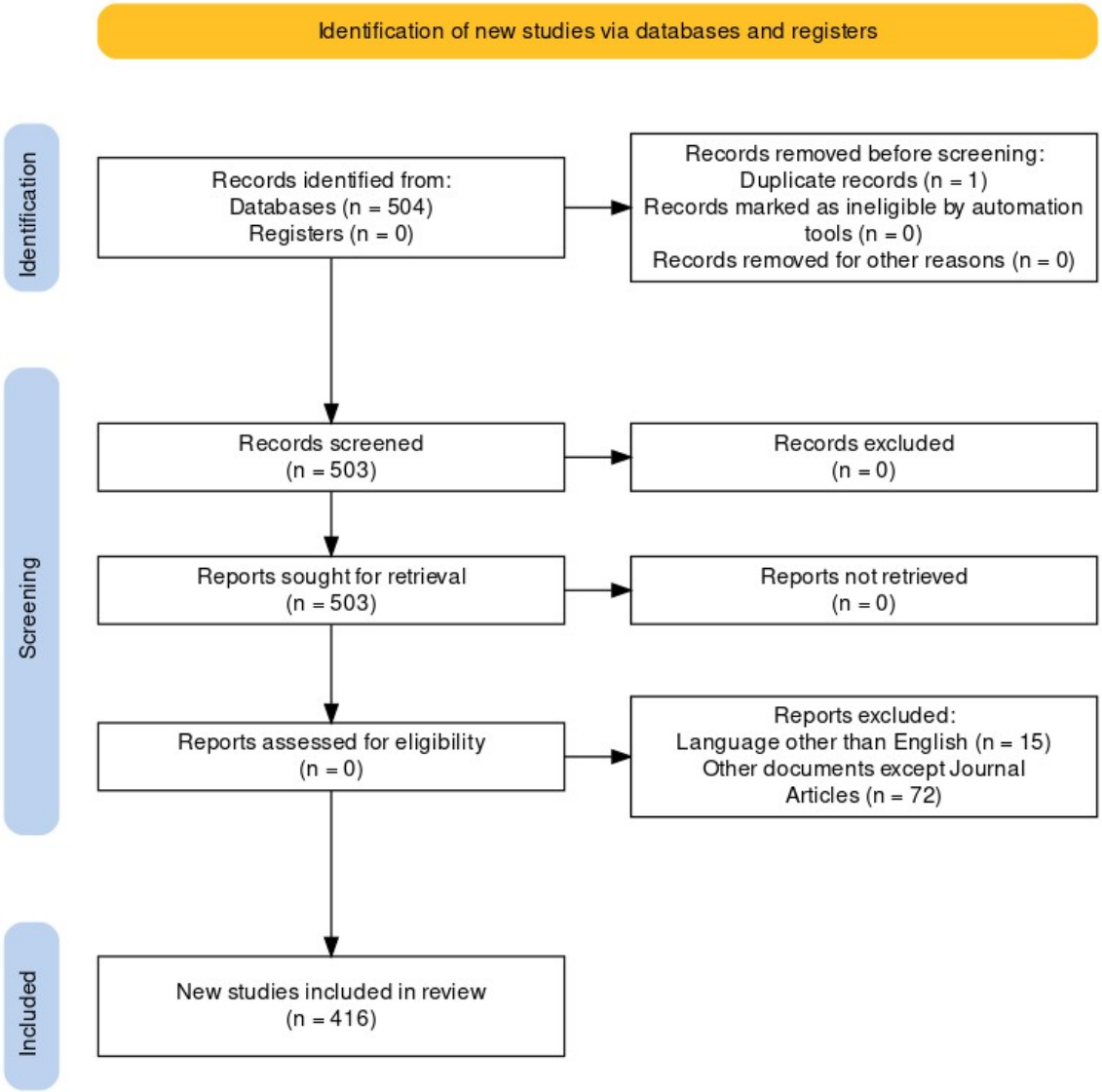


Figure 1: Selection Procedure for Literature Review

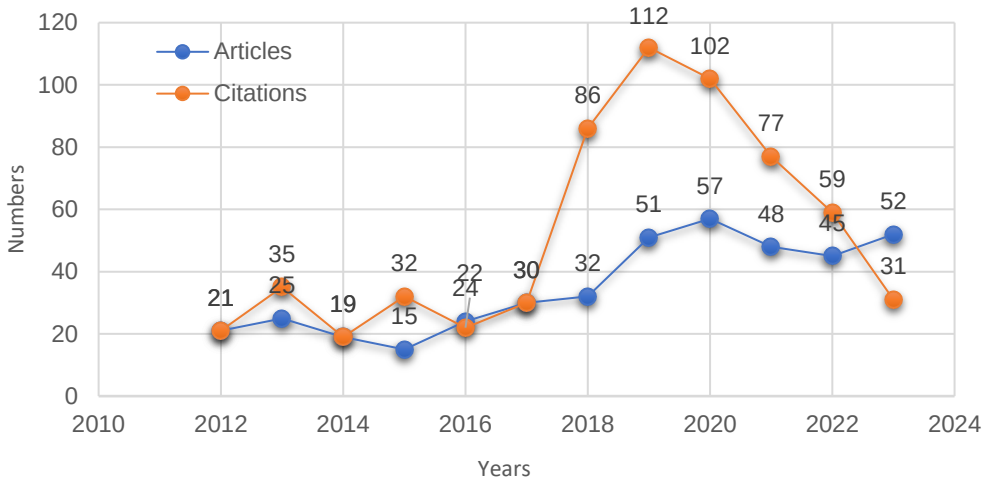


Figure 2: Annual Publication and Citations

Also, citation analysis is a research method that assesses the level of popularity of an article by quantifying the frequency at which it is referenced in other scholarly works (29). The citation analysis work as a tool for collecting pertinent research because it identifies the most significant works in a particular field. Since there is a positive association between the article quality and its high citation ratings, the citation score is a reliable metric (30). In the Figure 2, the citation of the specific literature shown variability throughout the course of time. In the year 2014, the number of citations reached its lowest point. In the year 2019, a notable citation record of 112 was observed, indicating a significant number of academics who relied on prior studies as references in their published works. Moreover, the citations reached their lowest point in 2023, since this year marked the last data gathering period of the project. It is anticipated that there would be a gradual rise in the use of citations over a period of time.

Countries that are Most Engaged in Publishing Research on this Literature: Table 3 is a compilation of the ten nations that have shown the highest level of productivity. The majority of research efforts are focused on India, resulting in a total of 45 publications. Indonesia has emerged as a nation with the second-highest quantity of publications, totalling 22, while Malaysia has produced 21 publications. The publications originating from India had the largest number of citations, with a total of 305. This was followed by publications from the United Kingdom, which received 254 citations, and the United States, which received 196 citations.

Table 3: Top 10 Most Productive Countries

Country	TC[1]	TP[1]	Average AC[1]
India	305	45	6.78
Indonesia	100	22	4.50
Malaysia	185	21	8.80
United Kingdom	254	15	16.90
USA	196	15	13.10
China	104	12	8.70
Turkey	95	10	9.5
United Arab Emirates	172	9	9.05
Qatar	131	5	26.20
Bulgaria	98	5	19.6

[1]TC: Total Citations, TP: Total Publications, AC: Average Annual Citations

Journals that have the Greatest Occurrence of Papers Pertaining to the Current Study: The most productive academic journals have the capacity to publish papers of high quality that have undergone a rigorous peer review process, hence transmitting the most recent advancements in

relevant subjects (31). This research included the publication of 416 journal papers among a total of 230 publications. Table 4 presents a comprehensive overview of the ten most significant journals in their respective fields, with rankings based on the quantity of published articles. A total of 94 papers have been published across 10 journals, representing 22.59 per cent of the overall publications. According to the publishing records, Cogent Economics and Finance has shown the greatest number of articles, with a total of 23 publications. Following closely is the Journal of Asian Finance, Economics and Business, with 11 publications. Furthermore, publications from the Research in International Business and Finance have the highest citations of 223, followed by Cogent Economics and Finance with 170 citations.

Table 4: Top 10 Most Productive Journals

Journal	Pub Year	TP	TC	AC	h-index[1]
Cogent economics and finance	2015	23	170	7.39	6
Journal of asian finance, economics and business	2020	11	151	13.72	7
Academy of accounting and financial studies journal	2012	10	26	2.57	3
International journal of finance and economics	2019	9	143	15.89	4
Global business review	2014	9	38	4.22	3
Research in international business and finance	2012	8	223	27.86	4
Journal of banking and finance	2012	7	107	15.29	4
International journal of economics and financial issues	2012	7	76	10.85	3
Asian journal of accounting research	2018	5	58	11.6	3
Borsa istanbul review	2017	5	48	9.6	3

[1]h-index is calculated based only on the publication of relevant literature only

In addition, Table 4 displays the h-index for the relevant literature concerning Leverage, liquidity and profitability in the highly renowned journal. The h-index is a metric that is determined by identifying the highest value of h, when a journal has published a minimum of h articles, each of which has received at least h citations. The Journal of Asian Finance, Economics and Business obtained the highest ranking in terms of its h-index, which was recorded as 7. It was closely followed by Cogent Economics and Finance, which achieved an h-index of 6.

Due to the lack of consistency in the total citations of publications in the leading journals, Figure 3 presents the dynamic trend of these journals based on the study of the annual number of relevant articles published. This figure aims to provide an understanding of the increasing trend of journals in the current study. The increasing tendency has been shown in the trend analysis of reputable academic publications such as the Global Business Review, WSEAS Transactions in Business and Economics, and the Journal of Emerging Technologies. In addition to this, it has been seen that the Indian Journal of Finance and the International Journal of Finance and Economics have shown an upward slope until the year 2021, after which they have maintained a consistent level. Nevertheless, cogent economics and finance have shown both declining and increasing trends between the year 2019 and 2023.

The Most Influential Papers in this Field: Examining the most impactful academic journals may provide researchers valuable insights about the prevailing trends of a certain discipline, hence aiding their inquiries into the associated domain. Table 5 displays a compilation of the ten most frequently cited publications pertaining to the concepts of Leverage, Liquidity, and Profitability over the specified time frame. The cumulative number of citations is a key factor that impacts the role of article. Also, higher citation count signifies higher quality of work. Out of a total of 416 papers, the academic article titled "The determinants of profitability of Indian commercial banks: A panel data approach" has garnered the maximum number of citations, amounting to a total of 102.

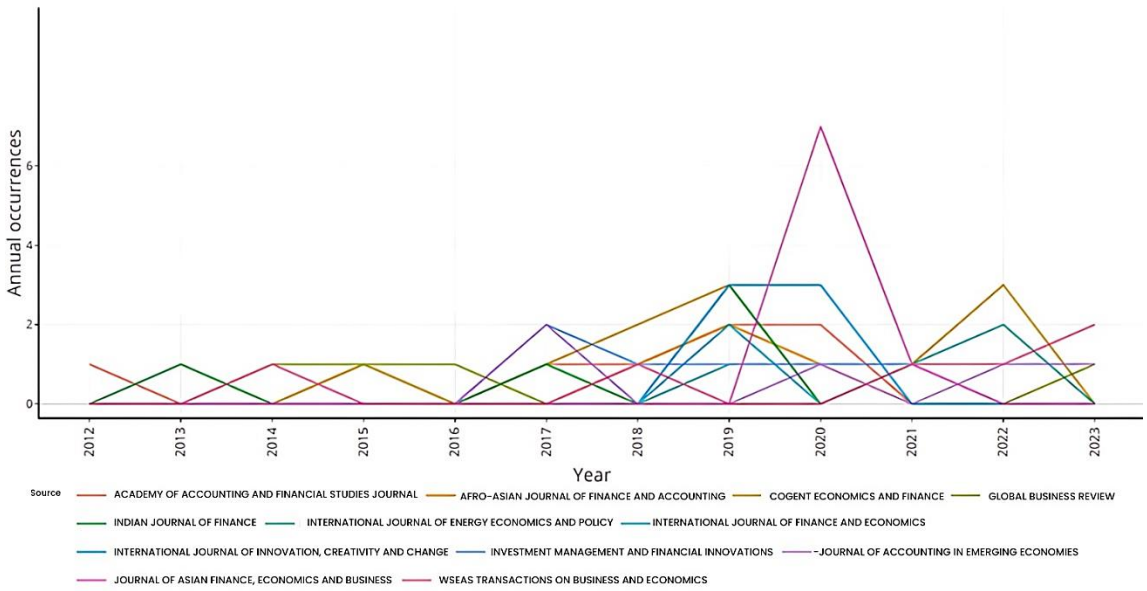


Figure 3: Dynamic Trend of Journals

Table 5: Top 10 Highly Cited Authors and Documents

Title	Pub Year	Author	TC	AC	Journals
The determinants of profitability of Indian commercial banks: A panel data approach	2019	Almaqtari *et al.*, (32)	102	20.4	International Journal of Finance and Economics
Islamic versus conventional banks in the GCC countries: A comparative study using classification techniques	2015	Khediri *et al.*, (33)	102	11.33	Research In International Business and Finance
On the determinants of SME capital structure in Central and Eastern Europe: A dynamic panel analysis	2013	Mateev *et al.*, (34)	98	8.91	Research In International Business and Finance
Factors affecting profitability in Malaysia	2018	Alarussi *et al.*, (35)	77	12.83	Journals Of Economic Studies
The Determinants of Profitability in Listed Enterprises: A Study from Vietnamese Stock Exchange	2020	Nguyen *et al.*, (36)	56	14	Journal Of Asian Finance, Economics and Business
Bayesian regularized artificial neural networks for the estimation of the probability of default	2020	Sariev *et al.*, (37)	55	13.75	Quantitative Finance
Bank-specific and macro-economic determinants of profitability of Indian commercial banks: A panel data approach	2018	Al-Homaidi *et al.*, (38)	53	8.83	Cogent Economics and Finance

The determinants of corporate profitability: an investigation of Indian manufacturing firms	2018	Nanda *et al.*, (39)	52	8.67	International Journal of Emerging Market
Affects of Working Capital Management on Firm's Performance: Evidence from Turkey	2012	Vural *et al.*, (40)	52	4.33	International Journal of Economics and Financial Issues
Profitability in Norwegian salmon farming: The impact of firm size and price variability	2018	Asche *et al.*, (41)	50	8.33	Aquaculture Economics & Management

Network Visualization

Network visualization represents the collaborative authorship across countries, the occurrence of certain terms together, and the connection between bibliographic references. Network analysis is thought to provide researchers a more effective graphical representation of cooperation, co-occurrences, and bibliographic coupling. This is achieved by illustrating the relationships between chosen items by the size and color of nodes, as well as the thickness of connecting (42).

The Countries Collaborating with Each Other: Co-authorship analysis examines the extent of national collaboration efforts by quantifying the number of publications that are jointly authored by researchers from different institutions or countries (43). The study of countries' co-authorship investigated the level of cooperation between various nations and offered researchers a comprehensive picture of how countries contribute to a certain field (44, 45). In the current study, author sets the minimum document of country to 3 in order to facilitate the collaborative network of countries publishing articles related to current topic. Out of 89 countries, only 43 countries were connected to each other. Figure 4 represents the visualization of the map of countries publishing in co-authorship with different nodes and sizes. Node size means number of documents published in a particular country. Bigger node depicts higher documents published in a particular country.

Countries are ranked according to total link strength (TLS) which defines the total link strength is defined as the total number of articles published by authors through collaboration among different countries. The most collaborative country depicts high values in TLS. Malaysia is the leading country with the highest TLS of 23 among all countries followed by Pakistan and United Kingdom with TLS of 17 and 15 respectively.

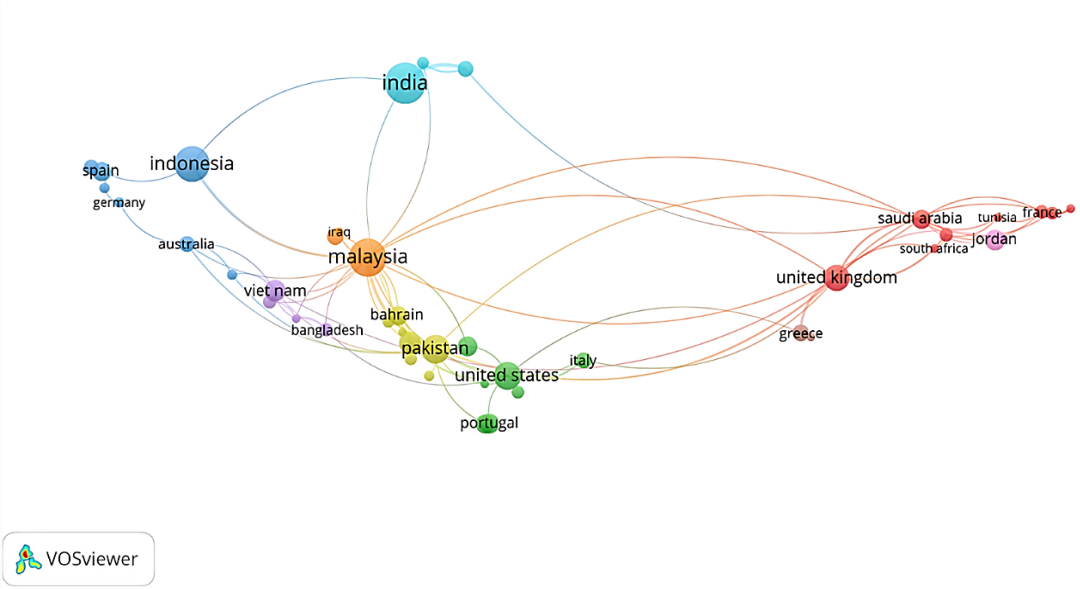


Figure 4: Countries Co-authorship Based on Document Weights

The nations were classified into nine primary clusters, each represented by a distinct color: red, green, blue, dark yellow, violet, light blue, orange, brown, and pink. The following information provides a breakdown of the primary nine clusters, each of which has the highest number of sub items. Based on the node sizes depicted in Figure 4, the countries that were found to be the most influential in terms of publication in the relevant field for each cluster are as follows: United Kingdom (Cluster 1), United States (Cluster 2), Indonesia (Cluster 3), Pakistan (Cluster 4), Vietnam (Cluster 5), India (Cluster 6), Malaysia (Cluster 7), Greece (Cluster 8), and Jordan (Cluster 9).

The Phrase "Leverage, Liquidity and Profitability" Appear in Academic Circles: Co-occurrence analysis is a method that identifies study areas that are currently popular by examining the frequency of terms appearing together (46). The co-occurrence analysis of keywords is a well-recognized tool in bibliometric analysis. It is used to uncover the central study theme. This method has been referenced in many studies by (47, 48).

Typically, elements within a bibliometric map are shown by both an inscription and a circular shape. The dimensions of the circle are contingent upon the weight of the object. There is a positive correlation between the weight of an object and the size of both the inscription and the circle. The lines connecting the two specified keywords serve as a visual representation of the degree of association or correlation between them (49). Among the total of 1123 keywords, 122 were found to be interconnected. The author established a minimum threshold of 3 occurrences. Table 6 shows the descriptive analysis of top 10 keywords with number of occurrences of keywords along with its TLS and Link with other keywords.

Table 6: Descriptive Analysis of Co-occurrence of Keywords

Keywords	Number of Occurrences	TLS	Link
Profitability	107	275	87
Liquidity	76	231	70
Leverage	75	203	58
Capital Structure	78	155	53
Financial Performance	34	60	31
Financial Distress	19	41	20
India	16	38	22
Financial Leverage	17	37	19
Pecking order theory	14	37	16
Panel data	17	36	24

Figure 5 depicts a map visualization that represents the most frequent terms among all the keywords with a TLS score of 275, specifically focusing on the concept of "Profitability". Liquidity had the second highest value in terms of TLS, with a score of 231. It was followed by leverage, which had a TLS score of 203. The keyword "profitability" had the largest node size among all the keywords, indicating the highest frequency. The connection link across the two separate nodes displays keywords that are highly likely to appear together in the same article. Profitability is identified as the most significant correlation among 87 keywords.

Word Cloud is a data visualization method that represents text data by varying the size of each word based on its frequency or significance. Figure 6, represents a map generated using the Word Cloud function from the Biblioshiny package in the R Studio program. The map represents 50 keywords that were incorporated and occurred more than 10 times. Font size refers to the frequency at which a particular font occurs. The most frequently used keywords were 'profitability', 'liquidity', 'leverage', and 'capital structure'.

Bibliographic Coupling

Bibliographic coupling was initially proposed by Kessler in 1963 as a means to identify similarities between two articles (50). Bibliographic coupling is a significant factor in ascertaining the degree of relatedness between particular items, including countries and publications. In this investigation, bibliographic coupling between counties and articles was performed.

Countries that Share Similar Literature within the Same Field: Bibliographic coupling between nations refers to the situation when an article from two different countries includes a reference to a document from their respective reference lists (51). The colours in this research indicate the number of clusters, whereas the size of the nodes signify the impacts of each nation. Larger nodes indicate more substantial contributions. In Figure

7, the author established a minimum threshold of 3 documents per nation. Among the total of 89 nations, only 53 were able to fulfil the necessary criteria.

The analysis indicates that Malaysia, India, and the United Kingdom were the three nations with the most comparable bibliographies. The map had a total of 5 clusters. Malaysia is in the forefront of the red cluster. Pakistan is in the forefront of the Dark yellow cluster. The United Kingdom, together with Saudi Arabia and France, takes the lead in the violet cluster. Malaysia, situated centrally within the network, has a strong pivotal effect on the relevant study domain, given its many connections with other nations.

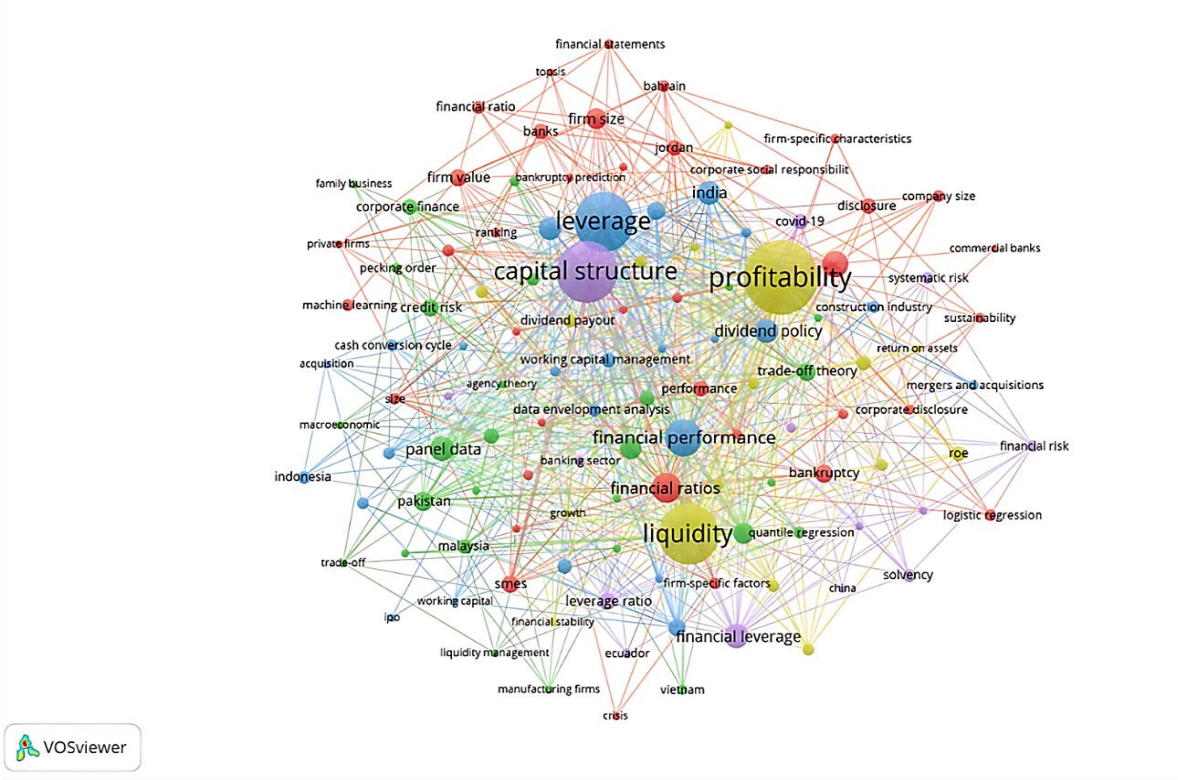


Figure 5: Bibliometric Map of Co-occurrence of Keywords

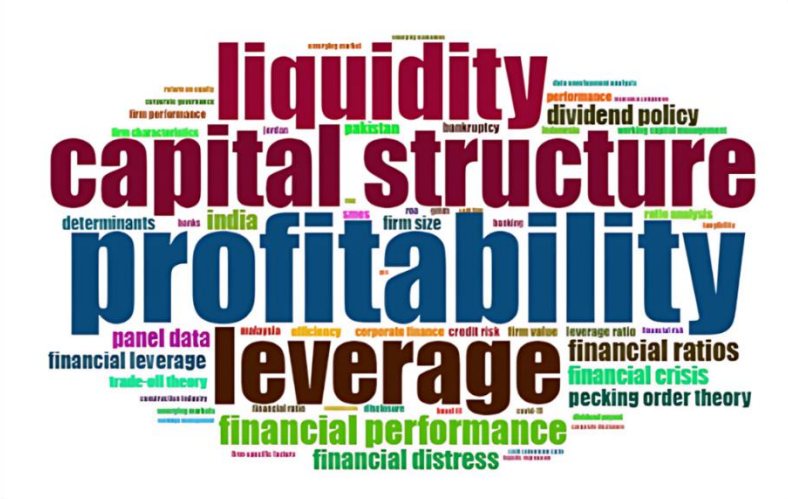


Figure 6: Word Cloud as per the Frequency of Occurrence in Documents

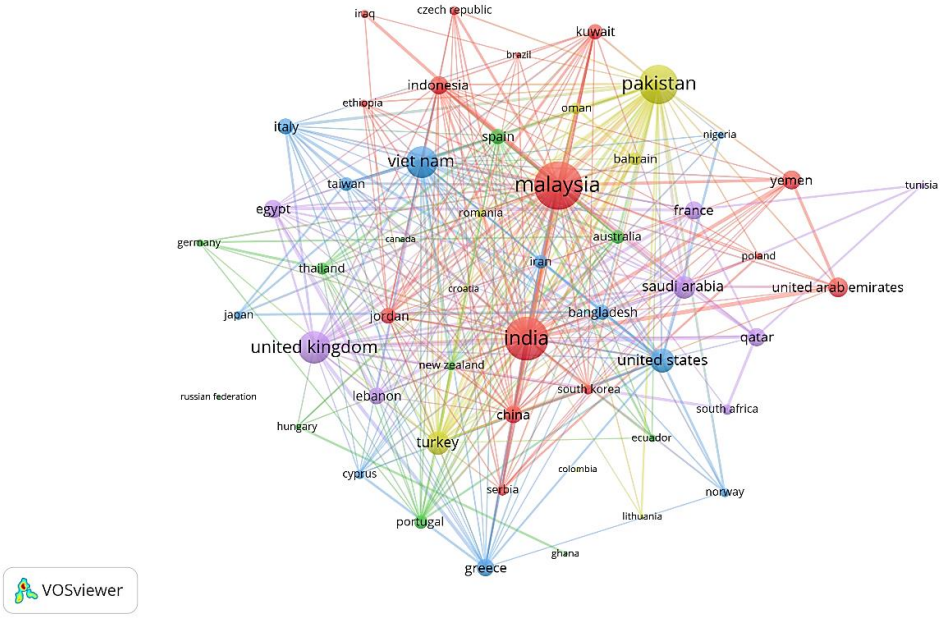


Figure 7: Bibliographic Coupling of Countries

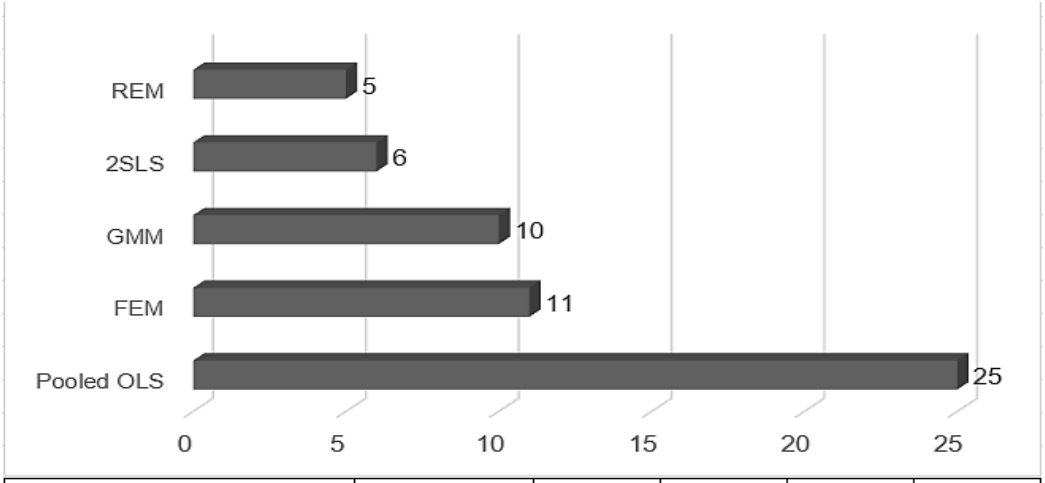
Statistical Techniques

The Famous Statistical Techniques Used by All the Studies in Conducting Research within this Field: The selection of an appropriate statistical or economic methodology for data analysis is a crucial decision that researchers must make (52). Table 7 presents a comprehensive compilation of statistical and economic methodologies used by researchers in relevant academic literature between the years 2012-2023. The analysis revealed that majority of researchers has used regression analysis in their study. It was instructive to remember that regression was the standard and most often used method.

In order to determine which regression method is the most often used, many regression models were investigated in detail. Researchers in this field often use the five types of regression shown in Figure 8. The results showed that pooled ordinary least squares (OLS) were the preferred method.

Table 7: Statistical Techniques Used by Most of Researchers

Year	Correlation	Regression	Structural Equation Modelling	Bayesian Estimation method
2012	3	2		
2013	1	2	1	
2014	3	5		
2015	1	4		
2016	1	7		
2017	1	2		1
2018	5	7	1	
2019		8		
2020		6		
2021		7	1	
2022		7	2	
2023		8		



	Pooled OLS	FEM	GMM	2SLS	REM
No of time techniques used	25	11	10	6	5

Figure 8: Common Regression Techniques Used by Researchers

Practical Implications

The study posits that further investigation into co-authorship networks should be undertaken due to the limited number of existing networks. It is imperative to broaden the scope of research endeavours to encompass a more extensive countries as majority of studies were associated with limited countries. Furthermore, Profitability and leverage are two intriguing topics, and it would be interesting to study them using other variables to broaden their application and generality.

Additionally, financial managers may also improve strategic choices by analyzing author cooperation and significant findings. It informs financial strategies to maximize important key performance indicators for company's profitability. This may also assist managers manage risk by balancing funding and investments to preserve liquidity and profitability.

The study's results may help policymakers adopt transparent reporting and financial management policies. Policymakers may mitigate risks and improve corporate financial stability by understanding the research's primary topics and trends.

Furthermore, identifying notable scholars and works may also foster academic cooperation and information exchange. Interdisciplinary study may enhance the field. Through the resolution of research gaps, academics can enhance their comprehension of the interplay between liquidity, leverage, and profitability. This will improve financial theory and applications.

Limitations and Future Scope

Researchers interested in this area should collect primary data as there are not enough primary studies in this area. In the future, advanced research approaches should be researched for improved outcomes. There has been no research on the effects of leverage in the heavy metals or telecommunications sectors. This allows for further research into these sectors. ROE and ROA were used to quantify profitability; additional variables may be used by future researchers. This study focused on the literature only after 2012 but studies done before 2012 could have a possible impact on the current study.

Conclusion

When it comes to preserving the company's financial success, both liquidity and leverage play increasingly important roles. The financial performance of the firm is measured by profitability. It is considered a crucial factor of the company because it measures the firm efficiency and effectiveness in using resources. Both Leverage and Liquidity play a crucial role in increasing profitability. Many debates, investigations, and research have demonstrated an unfavourable link among financial leverage and company's profitability because of rising interest costs affecting firm profitability. In contrast, prior research showed that financial leverage had a positive influence on business performance by improving the company's financial situation and boosting the stock's market value (53). Hence, industrial firms may maximize their profits by

maintaining a balance of their leverage and liquidity (54).

This study does an investigation of leverages, liquidity and profitability in a stylised manner, using bibliometric analysis. It also discusses the conceptual challenges, outcomes, and implications for financial management. The paper's contribution, encompasses not only the examination of the most relevant topics and nations in investigating the effects of leverage and liquidity on profitability, but also the discovery of a notable research gap via the implementation of bibliometric analysis. Numerous studies found that there was no correlation between liquidity, leverage, and profitability. In addition, researcher provided in-depth descriptions of the difficulties, unanswered questions, and planned future efforts in the aforementioned arena. The study consolidates a plethora of studies conducted across many businesses and geographies, uncovering deep patterns within financial measures. Insights from Egypt, the US, Vietnam, ASEAN nations, Malaysia, and Bangladesh reveal varied results in terms of leverage and financial performance, emphasizing the absence of consistent patterns in the predicted relationships.

By doing a bibliometric analysis, we have addressed the research issues by determining the originality of the study and the significant number of citations, indicating that these practices are not new. The bibliometric study revealed a notable increase in research activity in the relevant subject from 2018 to 2020, followed by a large decline from 2021 to 2023. Meanwhile, India, the UK, and the United States (USA) are the primary contributors, with the largest number of citations being reported as 305, 254, and 196, respectively. Following that, Cogent Economic and Finance was recognized as the highest-rated journal, while the Journal of Asian Finance, Economics and Business is the most likely publication to surpass it in the near future.

The collaboration network divided nations' co-authorship into nine clusters. Out of which, Malaysia, India and Indonesia were ranked top three regarding the number of countries that have published in co-authorship. Simultaneously, the keywords "Profitability", "Liquidity", and "Leverage" are the most often used and have the largest frequency and number of links. Among the nations that are interconnected, Malaysia, India, and the UK exert the most impact in the relevant region, since many countries are interconnected with Malaysia. Based on the review, the author discovered that the most often used statistical approaches in this discipline are Regression and Pooled OLS, with Pooled OLS being the recommended method. This contribution is achieved via a comprehensive examination of the extant literature and a meticulous analysis of the current trends and methods within these fields.

Furthermore, this study is a significant contribution towards establishing a robust foundation for policy formulation and the effective implementation of specific measures aimed at fostering firm growth. The use of bibliometric analysis has facilitated the identification of unique prospects and obstacles within the context of Leverage, liquidity and profitability, hence establishing a foundation for forthcoming research endeavours and advancements in this domain. Our research will aid senior management and other decision-makers in making sound financial judgements that will increase the value of their companies.

Abbreviations

FEM: Fixed effect method
GMM: Generalization method of moment
2SLS: Two stage least square regression
REM: Random effect method

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Author Contributions

Authors contributed equally to conceptualization, data analysis, and manuscript writing for this study.

Conflict of Interest

The authors have no competing interests (financial or otherwise) to declare.

Ethics Approval

Not Applicable.

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