Bibliometric analysis of trends and patterns in capital structure research: A decade-long review (2012-2022)

Mfaume Ismail Mahmoud* | Arni Surwanti* | Firman Pribadi*

Abstract This study aims to comprehensively analyze capital structure research trends and patterns from 2012 to 2022, employing the esteemed Scopus database as its primary data source. Methodologically, a systematic screening process within Scopus identifies pertinent literature, while the analytical capabilities of VOS viewer are harnessed to dissect keyword occurrences and co-authorship networks. Key findings underscore a notable upsurge in publications dedicated to capital structure research, culminating in a pinnacle of scholarly activity in 2022. Notably, Rossi, M., emerges as the preeminent contributor in this academic discourse, boasting the highest volume of publications within this domain. This analysis assumes paramount importance, serving as a guiding compass for researchers navigating the intricate landscape of capital structure. It provides a comprehensive panorama of seminal articles, influential authors, prevalent research themes, and dominant countries of origin, encapsulating the core facets of capital structure research. However, it is imperative to acknowledge a limitation rooted in the exclusive reliance on the Scopus database, which, although prestigious, may inadvertently exclude valuable contributions not indexed within its confines. This study contributes significantly to the burgeoning field of capital structure research across diverse academic disciplines, shedding light on principal researchers and their global origins and thus underscoring the domain’s universal relevance. By offering valuable insights, it is poised to inspire future corporate finance and capital structure advancements.

Keywords: capital structure, VOS viewer, corporate finance, leverage

1. Introduction

Capital structure denotes financing tools to back a company’s activities and assets, such as retained earnings, long-term debt, and equity (Kumar et al., 2020). It is pivotal in determining the worth of small and large enterprises. Equity capital encompasses ownership interests in a company’s future cash flows, including common stock, preferred stock, and retained earnings. Conversely, debt or leverage is exemplified through bonds and loans (D’Amato, 2020). This amalgamation of debt and equity is reflected in a firm’s balance sheet and assets. A company’s capital structure may include long-term debt, short-term debt, common stock, and preferred stock, with the ratio of short-term to long-term debt bearing substantial analytical importance.

The primary objective of every business is to increase the owners’ well-being, often known as firm value (Gunardi et al., 2020). To enhance the firm’s value, the company must carefully analyze various aspects while making decisions. The debt-to-equity ratio should be maintained to maintain a minimum cost of capital. Thus, it will optimize the investment value, increasing the firm’s value. To maximize shareholder value, companies must determine the best debt-to-equity ratio as their primary financing means (Tripathy & Uzma, 2022). The decisions in a company’s actions that aim to increase shareholder value include funding and investment decisions. The significance of capital structure rests in its ability to assist investors in evaluating the financial health of a company’s balance sheet (Sinnadurai, 2022).

Capital structure decisions remain of paramount importance for companies. How a firm finances its operations and investments through a mix of equity and debt has enduring implications (Seppa, 2008). Recent trends and patterns in capital structure research have been shaped by dynamic factors in the financial landscape. Notably, the COVID-19 pandemic has sparked interest in understanding its impact on capital structure decisions, risk management, and debt financing strategies (Priyan et al., 2023). For instance, in a capital structure decision, the D/E ratio holds particular significance in identifying the risk associated with a firm’s borrowing practices, as a company heavily reliant on debt financing exhibits an aggressive capital structure and consequently poses greater risks to investors (Jõeveer, 2018; Saif-Alyousfi et al. 2020 and Bajaj et al. 2021). It is essential to emphasize that the amalgamation of debt and equity employed to fund a company’s operations constitutes its capital structure. On the other hand, equity represents the value attributable to shareholders and retained earnings (Olusola et al., 2022).
Evaluating a company’s capitalization structure using relevant financial ratios plays a vital role in comprehending the firm’s risk profile. The prudent management of debt and equity within the capital structure is instrumental in maintaining financial stability, and it warrants careful attention from both company stakeholders and potential investors. Pursuing an appropriate capital structure tailored to the company’s needs and risk tolerance is crucial to fostering sustainable growth and financial success (Campbell & Kelly, 2013).

Previous research has investigated capital structure research in various dynamic areas, such as A Bibliometric Analysis of the Knowledge Base on Capital Structure Decisions by Priyan et al. (2023), which provides capital structure-based knowledge, particularly in decision-making. This study examines capital structure research trends and patterns from 2012 to 2022 using the prestigious Scopus database as its primary data source. The significance of understanding how firms adapt their financing strategies is highlighted by the changing market dynamics characterized by increased volatility and innovation, which makes the topic of this research particularly intriguing. Sustainability and environmental, social, and governance (ESG) factors have gained prominence, necessitating investigating their influence on capital structure decisions. In addition, technological advances, regulatory changes, globalization, behavioral finance insights, sustainable finance instruments, financial crises, venture capital, private equity, corporate governance, and the unique financing challenges of emerging markets all contribute to the allure of capital structure research. Using the Scopus online database, this study examines the evolution of publications on capital structure research, a decade-long review.

2. Literature review

2.1. Trade-off theory

The trade-off theory of capital structure remains a foundational concept in the contemporary corporate finance literature, shedding light on how firms navigate the intricate decision-making process of determining their optimal debt and equity financing mix. At its core, this theory posits that companies are engaged in a perpetual balancing act, carefully weighing the benefits and drawbacks of debt financing. A pivotal advantage lies in the interest tax shield, which allows firms to deduct interest payments from their taxable income, thus reducing their overall tax liability (Myers, 1984). Debt also often emerges as a cost-effective source of capital, as it typically bears a lower cost than equity, potentially leading to a reduction in the firm’s weighted average cost of capital (WACC) and, subsequently, an augmentation of its overall value (Modigliani & Miller, 1963).

Nonetheless, the trade-off theory acknowledges the potential perils accompanying excessive debt usage. Elevated leverage elevates the specter of financial distress, a scenario wherein a firm encounters difficulties meeting its debt obligations, culminating in costly bankruptcy proceedings and potential erosions in firm value (Jensen & Meckling, 2019). Furthermore, the infusion of debt introduces agency costs arising from conflicts of interest between shareholders and bondholders. Shareholders may be incentivized to pursue riskier ventures to maximize their returns, potentially at the expense of bondholders’ interests. Consequently, firms may incur agency costs associated with the vigilance and alignment of managerial and shareholder behavior (Jensen & Meckling, 2019). In this dynamic landscape, the trade-off theory underscores that firms continuously evaluate these trade-offs, diligently striving to ascertain the optimal capital structure that maximizes shareholder wealth and harmonizes with their unique financial circumstances and strategic imperatives.

2.2. Pecking order theory

The pecking order theory, a prominent concept in contemporary corporate finance literature, offers valuable insights into firms’ financing decisions, particularly regarding their preferences for internal versus external sources of capital. Rooted in the seminal work of Myers & Majluf (1984), this theory contends that firms tend to follow a hierarchy or “pecking order” when seeking external financing. Internal financing is at the top of this hierarchy, primarily comprised of retained earnings. Firms prefer internal funding due to its lower information asymmetry and reduced transaction costs (Myers & Majluf, 1984). It aligns with the notion that managers have superior knowledge about their firm’s financial health, making internal funds a preferred choice. When internal funds are insufficient to meet financing needs, firms reluctantly turn to debt issuance, perceiving it as a less adverse signal to external stakeholders than issuing equity (Myers & Majluf, 1984).

The pecking order theory underscores the significance of information asymmetry in financing decisions. Firms avoid equity issuance, especially when their stock is undervalued, to prevent conveying negative signals to the market (Myers & Majluf, 1984). This behavior can lead to a pecking order where internal funds are used first, followed by debt and equity issuance as a last resort. This theory resonates in contemporary finance, as firms aim to minimize information-related costs and maintain favorable signaling to investors, influencing their financing sources in a dynamic financial landscape (Leland, 1998).

3. Methods

The study utilized a bibliometric technique, employing the VOS viewer software application to aggregate and visually represent the bibliometric network. The study was initiated by researching scholarly articles on capital structure inside the
Scopus database. The search encompassed a period of ten years, from 2012 to 2022. The significance of capital structure research has been notable, especially in the context of the COVID-19 pandemic within the last three years. It has motivated researchers to undertake the present study, which involves a thorough database filtering process spanning a decade. The aim is to comprehensively understand the progression of written works or publications about capital structure. The publications were subjected to a screening process involving criteria such as year of publication, subject area, document type, keywords, and language, as Zakaria et al. (2020) stated. After completing the screening procedure, the total number of articles identified was 303, obtained from the original pool of 9,245 publications. The results of the filtering process were saved in the Comma-Separated Values (CSV) file format and later subjected to analysis using the VOS viewer program. The study utilized a systematic methodology to gather and analyze bibliometric data, as shown in Figure 1.

4. Results and Discussion

4.1. Publication Per Year

The evolution of capital structure research articles throughout the last decade, as illustrated in Figure 2 below, has garnered significant scholarly attention. Figure 2 shows a consistent and uninterrupted increasing trajectory starting in 2012.
and reaching its pinnacle in 2020. Notably, the surge in scholarly investigations on capital structure over the past decade can be ascribed to various factors. The dynamic nature of the financial landscape, coupled with significant financial crises and economic occurrences, such as the Global Financial Crisis of 2008 and the COVID-19 pandemic, has generated a keen interest in comprehending how firms adjust their capital structures to endure and mitigate the impact of economic disruptions. These occurrences have led to a significant number of studies being conducted to evaluate the effects of crises on decisions about capital structure. In contrast, there was a notable peak in the quantity of publications observed throughout ten years, with the highest point being in 2020. However, after this peak, publication numbers declined in 2021 and 2022.

![Figure 2 Annual Publications. Source: Scopus Database.](image)

4.2. Documents by Affiliation

According to the statistics presented in Table 1 below, it can be observed that the National Economics University Hanoi has recorded the maximum number of publications, amounting to 9, over a span of 10 years. Universitas Jember ranks second in terms of publication count, with a total of five journals. Università degli Studi del Sannio secures the third position, having published a total of four articles.

<table>
<thead>
<tr>
<th>Affiliation</th>
<th>Number of Publications</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Economics University Hanoi</td>
<td>09</td>
</tr>
<tr>
<td>Universitas Jember</td>
<td>05</td>
</tr>
<tr>
<td>Università degli Studi del Sannio</td>
<td>04</td>
</tr>
<tr>
<td>International Islamic University Malaysia</td>
<td>04</td>
</tr>
<tr>
<td>Prince Sattam Bin Abdulaziz University</td>
<td>04</td>
</tr>
<tr>
<td>Pekalongan University</td>
<td>03</td>
</tr>
<tr>
<td>Universidade da Beira Interior</td>
<td>03</td>
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<tr>
<td>Universidade de São Paulo</td>
<td>03</td>
</tr>
<tr>
<td>Mansoura University</td>
<td>03</td>
</tr>
<tr>
<td>Krakow University of Economics</td>
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</tbody>
</table>

Source: Scopus Database.

4.3. Documents by Author

Table 2 displays data derived from scholarly authors who have researched the topic of capital structure. Based on the available data, it can be deduced that Rossi, M. emerges as the most prolific author in capital structure research, having authored four scholarly works. Chandra, T., Guizani, M., and Roziq, A. have published three literary works on capital structure.
Table 2 Documents by authors.

<table>
<thead>
<tr>
<th>Writer</th>
<th>Number of Publications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rossi, M.</td>
<td>04</td>
</tr>
<tr>
<td>Chandra, T.</td>
<td>03</td>
</tr>
<tr>
<td>Guizani, M.</td>
<td>03</td>
</tr>
<tr>
<td>Roziq, A.</td>
<td>03</td>
</tr>
<tr>
<td>Ajmi, A.N.</td>
<td>02</td>
</tr>
<tr>
<td>Bany-Ariffin, A.N.</td>
<td>02</td>
</tr>
<tr>
<td>Chow, Y.P.</td>
<td>02</td>
</tr>
<tr>
<td>El-Masry, A.A.</td>
<td>02</td>
</tr>
<tr>
<td>Haron, R.</td>
<td>02</td>
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<tr>
<td>Kedzior, M.</td>
<td>02</td>
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</tbody>
</table>

4.4. Documents by Country

Figure 3 categorizes publications about research themes, depending on the countries that have made noteworthy contributions. Indonesia holds the foremost place among nations, having produced a total of 43 documents. The United States follows closely behind with 37 papers, while India secures the third position with 28 publications. The findings in Figure 3 are significant, particularly concerning research in the Asian region, with Indonesia emerging as the primary contributor. Hence, the study examination conducted in various Asian countries, specifically in developing nations such as Thailand, has significant potential for prospective inquiries.

![Figure 3 Country Publications. Source: Scopus Database.](image)

4.5. Keyword co-occurrence network analysis

The researchers examined the co-occurrence network to ascertain the frequency with which keywords are employed in studies about capital structure. This approach facilitates the identification of research subjects and issues typically identified by researchers. Furthermore, the researchers performed a network analysis utilizing VOS viewer software to examine the co-occurrence of keywords. This software generates a text mining-derived map that quantifies the association between keywords by considering the proximity of distinct terms (Laudano et al., 2018). According to Dolhey (2019), there is a positive correlation between the proximity of words, namely, the shorter distance between them, and the strength of their associations. The event network map with keywords is depicted in Figure 4 below. A total of 36 keywords were employed, with a minimum frequency of 5 instances and a cumulative count of 870 occurrences. The presented map visually represents the interconnections among various keywords by using lines. The rows shown provide information on the co-occurrence of a specific keyword with another keyword across multiple publications within the utilized dataset. The capital structure is strongly associated with corporate governance and leverage, indicating a close interaction between both variables.
4.6. Co-authorship Network Analysis

Researchers must collaborate with fellow experts to uncover novel insights and areas of expertise. According to Sampaio et al. (2016), this partnership expands the range of research topics and fosters innovation. Network analysis enables the visualization of collaborations and trends across scientific and research domains, facilitating the identification of authors who have coauthored with many other authors within a given dataset (Dolhey, 2019). The analysis of co-authorship reveals an author’s inclination to collaborate closely with fellow authors. In this study, the authors picked a full counting method by the VOS viewer countries unit of analysis with the 3 minimum number of documents of a country and 5 minimum number of citations of a country. Based on the findings, the produced results consist of 34 countries out of 67. Nevertheless, only countries with the most prominent connections represent a comprehensive assemblage of writers collaborating in their literary endeavors. The graphic depicted in Figure 5 illustrates the visualization of co-authorship.

Figure 4 Network visualization of Keyword Co-Occurrences.

Figure 5 Coauthorship network visualization map. Analytical unit: Countries. Counting technique: Total tallying. The minimum set of documents a country might need = 3. The minimum number of citations for a county = 5.

5. Final considerations and recommendations

This study conducted a comprehensive bibliometric analysis of capital structure research spanning 2012 to 2022, comprising 303 articles from the Scopus database. The findings underscore the enduring significance of capital structure in corporate finance. The study’s recognition of year-to-year trends reveals a discernible increase in the publication of research
pertaining to capital structure, indicating a growing interest in this domain. The concentration of capital structure studies within business, management, and accounting underscores its pivotal role in these disciplines. Furthermore, the study’s identification of prolific authors, such as Rossi, M., and countries with extensive contributions, such as Indonesia, illuminates the global reach of capital structure research. This global interest underscores the universality of capital structure as a subject of study, transcending geographical boundaries. Moreover, the co-occurrence analysis of keywords presents a valuable resource for prospective researchers, as it delineates the evolving focus areas within capital structure research. This analytical approach allows for identifying research themes and provides insights into the progression of the capital structure discourse over time. The study’s findings offer a substantive foundation for future research endeavors in capital structure, affirming its enduring relevance and potential for further scholarly exploration.

This study is subject to certain limitations that necessitate careful consideration and present opportunities for future research endeavors. First, it exclusively relies on the Scopus database as the primary source for identifying and filtration papers pertaining to capital structure research. Consequently, it is essential to acknowledge that documents not indexed by Scopus remain outside the purview of this analysis. To enhance the comprehensiveness of future research in this domain, subsequent scholars should incorporate a broader spectrum of academic databases, including but not limited to Google Scholar and Web of Science. This multi-database approach would enable a more comprehensive literature review, thereby minimizing the risk of overlooking valuable contributions to the field. Second, it is recommended that future researchers adopt an expansive outlook to foster a holistic understanding of capital structure. By transcending disciplinary boundaries, exploring diverse research methodologies, and encompassing a wide array of empirical contexts, scholars can contribute to a more nuanced and comprehensive comprehension of the intricate nuances surrounding capital structure decisions. This interdisciplinary approach can lead to fresh insights and a richer discourse within corporate finance. When thoughtfully implemented, these recommendations can bolster the rigor and breadth of research related to capital structure, thereby advancing our collective knowledge in this pivotal facet of finance.

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Ethical considerations

Not applicable

Conflict of Interest

The authors declare no conflicts of interest.

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