

# BIBLIOMETRIC ANALYSIS OF IPO LITERATURE TO IDENTIFY CORE AND EMERGING KNOWLEDGE

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## Abstract

**How to cite this paper:** Karnatak, U. (2025). Bibliometric analysis of IPO literature to identify core and emerging knowledge. *Corporate Ownership & Control*, 22(4), 8–20.  
<https://doi.org/10.22495/cocv22i4art1>

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**ISSN Online:** 1810-3057

**ISSN Print:** 1727-9232

**Received:** 28.07.2025

**Revised:** 07.10.2025; 03.11.2025

**Accepted:** 19.11.2025

**JEL Classification:** G11, G12, G14, G15

**DOI:** 10.22495/cocv22i4art1

This study aims to identify conceptual links, trends, and emerging insights into Initial Public Offering (IPO) literature that will be relevant for scholars to further research on IPOs and their implications on firms' sustainability. We identified 579 relevant articles on IPO research by collecting data from Scopus and applying predefined criteria (IPO topics). These articles cover the period from 1986 to 2024. Citation and co-citation analysis revealed three clusters with key themes, including research on underpricing and long-term corporate value. Additionally, through theme analysis, we found that commerce and long-term sustainability of firm value are emerging research areas in the IPO literature. Using factor analysis, we identify the key conceptual framework underlying IPO research that will guide future research.

**Keywords:** Bibliometric Analysis, Co-Citation Analysis, Factor Analysis, Initial Public Offering

**Authors' individual contribution:** The Author is responsible for all the contributions to the paper according to CRediT (Contributor Roles Taxonomy) standards.

**Declaration of conflicting interests:** The Author declares that there is no conflict of interest.

## 1. INTRODUCTION

Initial public offerings (IPOs) attract considerable attention from financial market analysts and academic researchers. An IPO is the process by which a company raises capital by selling equity shares and becomes publicly listed. An IPO involves raising funds from outside investors to repay debt, invest in capital projects, fund research and development, or provide liquidity for early investors. The complexity of IPOs stems from regulatory requirements for transparent disclosure, as well as the company's managers or underwriters. However, underwriters are hired to assess the business accurately, yet they often undervalue the shares (La Rocca, 2021; Liu & Wang, 2015). The lower cost of processing information can influence both short-term and long-term business value. Although a reputable underwriter for the issuer's IPO and the analyst's role in disseminating information about the younger company, both before and after the IPO, are vital in reducing investor information costs, these factors may still impact the process.

The analyst's role is closely linked to IPOs in two ways. First, analysts provide recommendations

before the IPOs and after the company's shares are listed on the stock exchange (Jia et al., 2019; Sahoo, 2014). They continue to monitor the firms even once the shares are traded. As a result, the pre-IPO information content supplied by analysts influences the coverage they provide, which in turn impacts the number of subscribers and the amount of underpricing that occurs. Second, after the shares are listed on the stock exchange, analysts make their recommendations for the shares. These suggestions can affect the flow of information about the IPO firm and its long-term prospects, determining whether the firm will merge after the IPO, reorganize its operations, or even go private (Mehran & Peristiani, 2010).

The information asymmetry and signalling theory further explain how analyst coverage impacts IPO prices and their long-term value (Rajan & Servaes, 1997; Arnold, 2010; Sahoo, 2014; Dambra et al., 2018; Jia et al., 2019). These two important theories relate to both short-term and long-term values. The short-term value of IPOs is often viewed as a myopic strategy employed by the issuer and its underwriter; thus, IPO underpricing is attributed to signalling (Li & Zhang, 2021; Deb, 2014). When investors receive distorted or vague signals, they

tend to underprice IPOs (Francis et al., 2010). Signalling theory suggests that underpricing an IPO conveys a positive message to investors, which in turn lowers the required rate of return for shareholders.

Ritter and Welch (2002) conducted a literature review on IPO underpricing and long-term value, neglecting more relevant and broader issues such as how internal team dynamics and agency structure influence IPO pricing and firm value. Ritter's (2011) literature review focused on underpricing research from the perspectives of information asymmetry and signalling theory. According to the author, modern research recognizes the underlying theories that explain IPO underpricing and long-term abnormal returns. They believe that agency theory offers the best explanation for IPO pricing anomalies. Therefore, our contribution is to expand their study on agency theory by focusing on the literature of IPOs and identifying the gaps where signalling and information asymmetry theories most effectively explain IPO anomalies.

Certo et al. (2009) analyzed 103 management and business journal articles on IPOs. In their study, they identified four key issues related to IPO pricing: 1) corporate governance, 2) upper echelon, 3) social effects, and 4) innovation. The existing literature further explains that information asymmetry and signalling affect the IPO price, market dynamics, corporate governance, valuation uncertainty, marketing and promotion, the commercial sector, and sustainability. Nonetheless, it is essential to examine behavioural explanations for these outcomes within the IPO literature.

Previous studies have focused on the U.S. and Chinese IPO markets, as reviewed by Azevedo et al. (2018), who primarily examined the IPO literature based on studies conducted in the U.S., limiting the generalizability of potential findings. Katti and Phani (2016) and Ogura (2016) provided additional assessments of the IPO literature, focusing primarily on IPO underpricing, thereby narrowing the scope of this review. Our study is the first to broaden the literature, deepen our understanding of signalling and the theory of information asymmetry, and explore the importance of analysing IPO anomalies through the lens of agency theory.

It is evident from the previous discussion that a comprehensive review of the IPO literature is necessary to identify key segments that will shape future research. We used scientific methods, including bibliometric and factor analysis, to examine the evolution of ideas in existing studies. Our focus has been on business, economics, finance, decision sciences, and social science research. This will enable us to suggest directions for future investigation.

Our study aims to review extensive IPO literature and identify various themes related to IPO research, thereby highlighting gaps in the central area of study. We seek to address the following research questions:

*RQ1: What is the conceptual framework and main themes within IPO literature?*

*RQ2: How do current research trends compare to those of the past?*

*RQ3: What are possible directions for future research?*

Our main contribution to existing knowledge is that we scientifically examine various aspects of IPO studies and introduce new clusters. These clusters include sustainability, IPO pricing dynamics,

corporate governance practices, corporate restructuring, marketing, valuation uncertainty, and decision-making. To understand the changing patterns in IPO research, this study offers a comprehensive review of the literature, achieved through combining qualitative analysis with bibliometric and quantitative methods.

The rest of the article is structured as follows. Section 2 discusses the study design and methods used. Section 3 examines and analyzes the bibliometric analysis methods in detail. Section 4 presents the systematic results of the reviews that used multidimensional scaling (MDS) to analyse the literature. Section 5 discusses the results for the key thematic (topic) clusters. Section 6 considers our future research aims and limitations. Section 7 concludes the paper.

## 2. RESEARCH DESIGN AND METHODS

We follow the five-step strategy proposed by Halebian et al. (2009) to strengthen the robustness of our study. In the first step, we reviewed publications in business, economics, finance, decision science, and social science, with a particular focus on IPO-related research.

**Table 1.** The process of selecting a sample from the Scopus database

<b>Twenty-one keywords for "Initial Public Offering"</b>	
Initial public offering, venture capital, investment, earnings management, IPO underpricing, information asymmetry, audit committee, sustainability, investor attention, underwriters, valuation, agency problems, capital markets, corporate governance, corporate social responsibility, corporate strategy, long-term performance, media coverage, mergers, corporate restructuring	
<b>Article inclusion criteria</b>	
Search filter	Categories: Initial Public Offering and analysts
Subject area	Economics, Econometrics and Finance, Business, Management and Accounting, Social Sciences, Decision Sciences
Source type	Journals and book chapters
Document type	Articles and Reviews
Language	English
Period of search	1986 to 2024

Source: Authors' compilation.

Second, to minimise selection bias when evaluating high-ranking or international business journals, we followed the method of Terjesen et al. (2013) and searched all journals in Scopus, regardless of time constraints, to limit the inclusion of IPO literature to 2021. By conducting our analysis, we can include the most relevant articles (recent studies) from the Scopus e-database journals. Scopus was chosen because it is one of the best sources of bibliometric and systematic literature reviews, which are more reliable (Adriaanse & Rensleigh, 2013) and more popular than WoS due to its broader coverage (AlRyalat et al., 2019).

In the third stage, we considered only studies published in journals or book chapters to ensure rigor and proven expertise (Fink, 2016), as well as high-quality publications. We did this to guarantee study rigour and expertise, supported by extensive peer reviews. This confirms the quality of peer-reviewed journal articles and book chapters, which is not always the case with other types of writing.

In the fourth stage, we analysed the articles and assessed the research's reliability. This reflects the breadth of the study, achieved by excluding

earlier studies, ideas, and conference proceedings. We then searched Scopus and identified 2,134 papers that cited the first 89 core articles and research papers.

Finally, we use keywords to determine the sample duration and search approach. Table 1 presents the search terms, organized by purpose. Our data retrieval method encompasses phrases beyond the term “Initial Public Offering”, allowing for a broader analysis and the identification of common themes to enhance research efficiency. Boolean search in Scopus for “Initial Public Offering” yielded 21 keywords related to the conceptual framework of the review, which aims to conduct a systematic literature review (see Table 1). A Boolean search of “Initial Public Offering” in Scopus excluded irrelevant articles from our analysis. Bartolini et al. (2019) noted that keywords should be selected from the most relevant articles related to the literature review. Following their standards, we used keywords as filters to eliminate articles, journals, edited volumes, and research projects that lack citation information. We also excluded studies unrelated to the term “Initial Public Offering”. This search yielded 579 articles from the Scopus database, spanning the years 1986 to 2024.

### 3. ANALYSIS

This research conducted a bibliometric analysis using bibliographic coupling, co-word analysis, co-citation analysis, theme analysis, and factor analysis. A search of IPO literature using keywords is followed by a search of Scopus, which retrieves the review articles.

### 3.1. Descriptive analysis

We identified 579 articles from 195 journals, yielding 26,095 references. This is later used for a co-citation analysis in this study (see Table 2).

**Table 2.** Data description

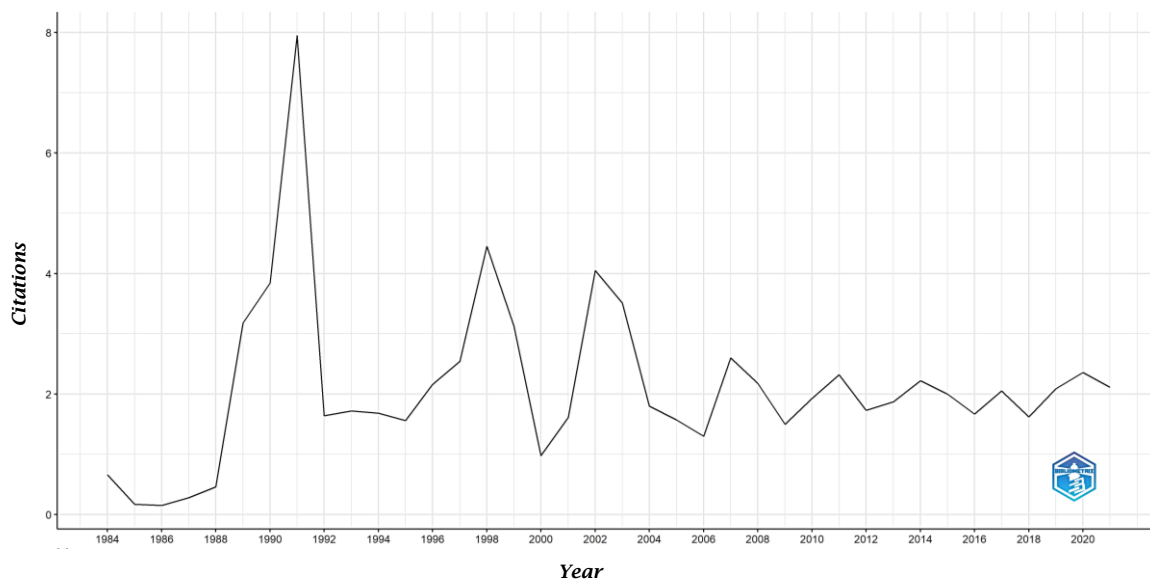
Description	Results
<b>Information about data</b>	
Period	1986 to 2024
Sources (journals, books)	195
Documents	579
Average citations per document	33.29
Average citations per year per doc	2.672
References	26,095
<b>Document types</b>	
Journal article	548
Review article	31
<b>Authors</b>	
Authors	1,049
Author appearances	1,484
Authors of single-authored documents	70
Authors of multi-authored documents	979

Source: Authors' compilation.

### 3.2. Citation analysis

Figure 1 illustrates the citation trend in IPO literature by displaying the average number of citations (the ratio of citations to publications) over time. The most highly cited papers were published between 1996 and 2004, establishing them as seminal studies in the field of IPOs. These studies enhance understanding of IPO pricing and company valuation. Signaling theory and information asymmetry theory have garnered significant attention in addressing the issue of underpricing in IPOs.

**Figure 1.** The citation (per paper) trend in IPO literature during 1986–2024



Source: Authors' illustration based on Scopus database.

Since 2004, the average number of citations received each year has remained relatively stable, with a downward trend that began in 2017 and continued through 2024. IPOs have attracted a lot of attention in the past.

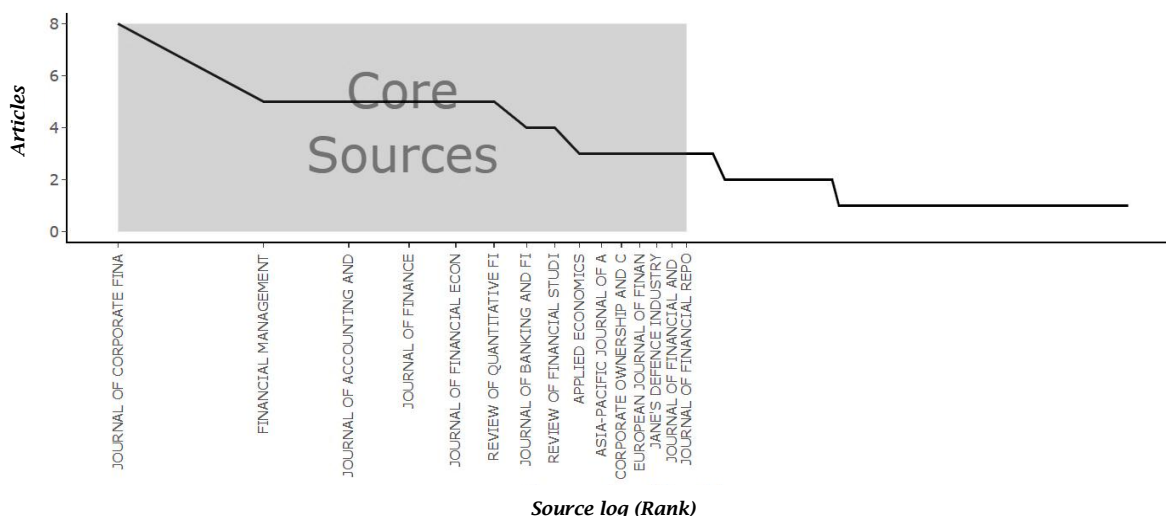
### 3.3. Source analysis

We identify leading journals publishing IPOs using Bradford's (1934) criteria. Bradford's rule categorizes research sources by the number of publications. It divides a subject's literature into zones: a small “core” of journals with the most

articles, a larger middle group, and the largest group of journals with the fewest articles, which helps identify key sources. Figure 2 shows the ranking of journals by the number of publications on the IPO

topic. We identified 12 reputable journals that have published IPOs and related materials. The remaining 183 journals have relatively fewer articles related to IPOs.

**Figure 2.** Identification of journals: Bradford's rule



Source: Authors' illustration based on Scopus database.

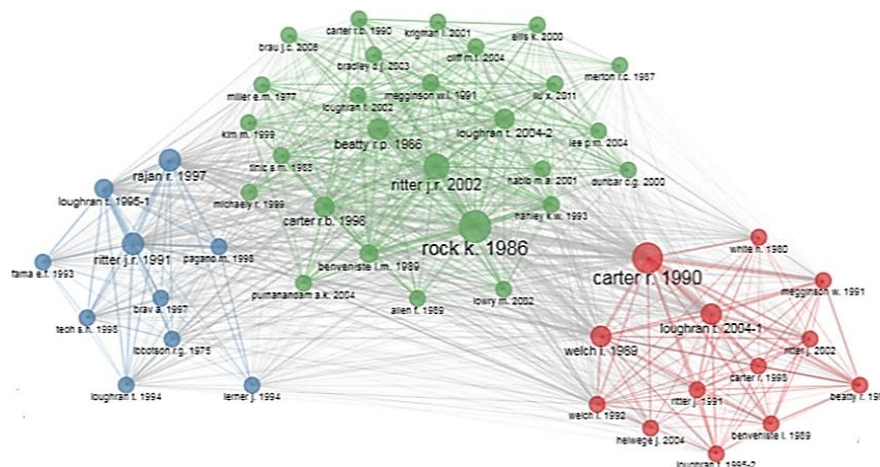
## 4. RESULTS

### 4.1. Citation and co-citation analysis

Citation analysis simplifies the analysis of research papers by objectively categorising them. Co-citation analysis is another approach for finding information or expertise within a research field. This method presumes that cited authors are relevant to the studied problem (Bu et al., 2016).

Citation and co-citation analysis reveal the intellectual framework or knowledge base (White & Griffith, 1981). Researchers organise information networks based on their questions (Culnan, 1987). Citation analysis has been used to identify information clusters that can serve as the basis for expanding the research field (Calabretta et al., 2011). Using co-citation analysis, we identified highly cited research articles that made significant contributions to the existing literature on IPOs (Figure 3).

**Figure 3.** Co-citation clusters of 579 articles



Source: Authors' illustration based on Scopus database.

Figure 3 presents 579 co-cited articles from 195 journals. This network is divided into three clusters: red (Cluster 1), green (Cluster 2), and blue (Cluster 3). These clusters represent the shared research area and are formed based on similarities between different studies. They contribute to IPO pricing, underpricing, and aftermarket value creation, with information asymmetry and signaling theory explaining this phenomenon.

#### 4.1.1. Signalling theory

Cluster 1 encompasses the most important studies on underpricing and company value. In this cluster, signalling theory explains IPO pricing. It also suggests that a reputable underwriter reduces underpricing (Carter & Manaster, 1990), and a reputable underwriter sends a positive signal to the market about the upcoming IPO. Loughran and

Ritter (2004) link underpricing to risk and propose that underpricing acts as a signal, helping to distinguish between risky and safe firms. Ritter (1991) argues that signalling an intention to underprice allows the company to balance long-term overpricing and reduce its cost of capital. Consequently, underpricing is a result of signalling, and as a signal, it influences the long-term value of a firm's IPOs.

#### 4.1.2. Information asymmetry

Cluster 2 includes studies that use information asymmetry to explain IPO underpricing. These studies indicate that underpricing acts as a reward to investors for acquiring information. According to Hanley (1993), underpricing reduces stock dilution by rewarding investors for exchanging knowledge, thereby decreasing information asymmetry. Consequently, underpricing is linked to investors' motivations, which send positive market signals. Baron (1982) views underpricing to lower the cost of gathering information by attracting investment bankers to bridge the information gap. The major study in this cluster demonstrates that underpricing can motivate investors, thus helping to eliminate information asymmetry.

#### 4.1.3. Long-term value

Through Clusters 1 and 2, the primary focus of the seminal work is to understand stock underpricing through theories of information asymmetry and signaling. However, Cluster 3 highlights the long-term effects of earnings management, IPO underpricing, and institutional representation. According to Rajan and Servaes (1997), research suggests that "underpricing the offer" leads to more analysts examining the issue after it is listed, which enhances the company's long-term value. Analysts overseeing the IPO process will reduce information asymmetry, thereby contributing to the company's long-term value creation.

According to Teoh et al. (1998), earnings management diminishes a company's long-term value and increases the number of analysts monitoring an IPO. According to Lerner (1994), the market values venture capital-backed IPO businesses more than non-venture-capital (VC)-backed IPO firms, when VCs are involved, and the long-term value of VC-backed IPOs reaches its peak.

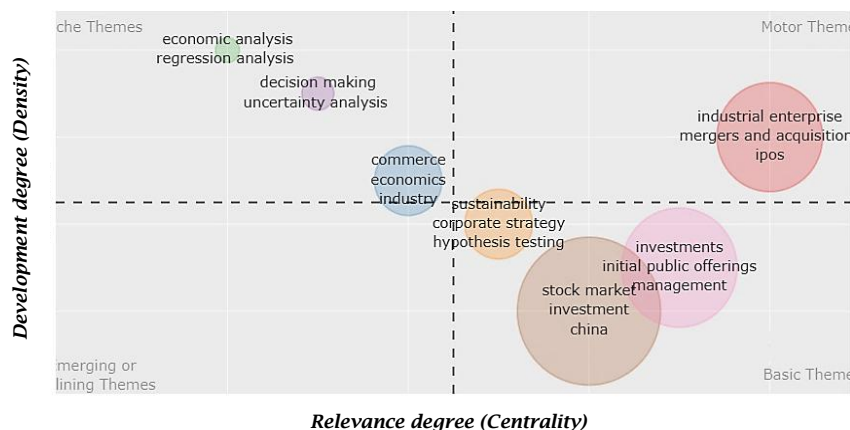
The co-citation analysis, along with the study of the three clusters, indicated that, aside from information asymmetry and signalling theory, agency theory remains in the early stages of development within the literature to explain IPO disparities. The presumed rationality of IPO participants and stakeholders is inadequate to account for the anomalies associated with IPOs. This finding makes a significant contribution to the field of study. It encourages scholars to consider using behavioural and agency theory models to explore the IPO literature more deeply and understand why analysts' coverage and recommendations impact IPO anomalies.

#### 4.2. Thematic map

While citation and co-citation analysis help identify the underlying theoretical models, thematic maps provide an overview of each model's position within one of four quadrants. Since thematic maps utilise the keywords and fields described in the research articles, themes are generated from these elements. They develop themes from keywords and research fields based on their evolution, significance, and connections to other themes. The conceptual framework is presented in Figure 4 by plotting their thematic density and centrality, which indicate their relevance in the field of literature. The upper left quadrant concentrates on niche topics that are subject to rapid change. The theme quadrant includes investor decision-making in uncertain environments. Variations in analyst recommendations and media coverage reflect uncertainty about the company's IPO.

Retail investor decision-making under uncertain circumstances, as signalled by a sceptical media tone or an analyst's recommendation in the context of IPOs (Zhang et al., 2020), is well-established but not thoroughly researched. The decision-making of retail investors needs further exploration in IPO literature. Limited research in this area allows for identifying and applying behavioural models and theories that can effectively explain investors' decision-making processes under relaxed assumptions of rationality, considering analysts' information visibility and their diverse expectations before an IPO. In contrast, signalling and information asymmetry theories have been used previously to explain IPO-related anomalies (Ritter, 2011).

Figure 4. Co-citation clusters of 579 articles



Source: Authors' illustration based on Scopus database.



The bottom right quadrant indicates incomplete key areas of research. The high centrality of these phrases suggests that academics have frequently used the keywords in at least one case. This may be due to the widespread use of these terms, which can be explained through information asymmetry and signalling theory. Most of the work in this area focuses on IPO pricing and determining optimal prices.

This quadrant focuses on the theory of information asymmetry, which Su (2004) and Kim et al. (2008) examined in relation to IPO underpricing and capital structure. Butler et al. (2014) identified dispersed information as a cause of IPO underpricing and proposed control elements to value a firm's IPO accurately. Specifically related to the theory of information asymmetry and its application, Strauß and Van der Meer (2017) investigated the impact of media coverage on IPO underpricing. Paleari and Vismara (2007) and Komenkul et al. (2017) found that emotions and uncertainty have a significant influence on underpricing in financial markets.

The concept of business sustainability is situated at the centre of the diagram, intersecting the four quadrants (Figure 4). This suggests that the topic is still evolving and has a limited connection to other major academic issues. A sustainable firm is characterised by the value it creates for its stakeholders. Research by Lizińska and Czapiewski (2018) shows how earnings management undermines a firm's long-term value. Kim (2019) contends that the reputation of the underwriter influences the company's value and can help predict potential delisting. Reputable underwriters tend to invest in firms with strong development prospects. Ryoo et al. (2020) elaborate on how different lead underwriters in IPO syndicates impact a company's viability over time.

Similarly, the "Commerce and Economy" is closely aligned with the intersection of the Development and Central Axes, highlighting the subject's uniqueness and originality. In this regard, the economy of accounting accruals, along with the management structure and the composition of the external environment, may contribute to creating firm value. Moore et al. (2012) emphasize the importance of a company's choice of model for its IPO. This model is based on the company's management philosophy, which is consistent with external market factors, including analyst coverage, underwriter reputation, venture capitalist reputation, and analyst recommendations — all of which are information related to the IPO firm and relate to the application of the theory of information asymmetry in understanding IPO-related issues.

The first quadrant is an important topic for industrial business resource planning. Due to its position on the thematic map, it is reasonable to

conclude that this subject has garnered significant attention in published work and is closely related to other issues. Ragozzino et al. (2018) hypothesize that firms managing resources before IPOs would do so afterwards. This suggests that pre-IPO firms plan their IPOs with a specific goal, and their activities are directed at potential investors.

Wu and Reuer (2021) emphasize the importance of disseminating information and signals about analyst coverage, underwriter reputation, and the presence of venture capitalists. They state that this information is crucial if the business merges after its IPO. Their theory focuses on the information the corporation conveys or signals through its resource allocation, whether those resources are financial, such as capital, or non-financial, including analyst coverage, media attention, or the appointment of notable analysts. Therefore, the theme aligns well with signalling theory, which is frequently used in the IPO literature (Park & Patel, 2015).

### 4.3. Factor analysis

Citation, co-citation, and topic analysis help identify the intellectual core of cited and keyworded works. Factor analysis examines dependencies and interactions using keywords, abstracts, or article titles. This is one of the advantages of this approach. It is typically used in conjunction with co-citation analysis to reveal the connections between variables within knowledge clusters (Leydesdorff & Vaughan, 2006).

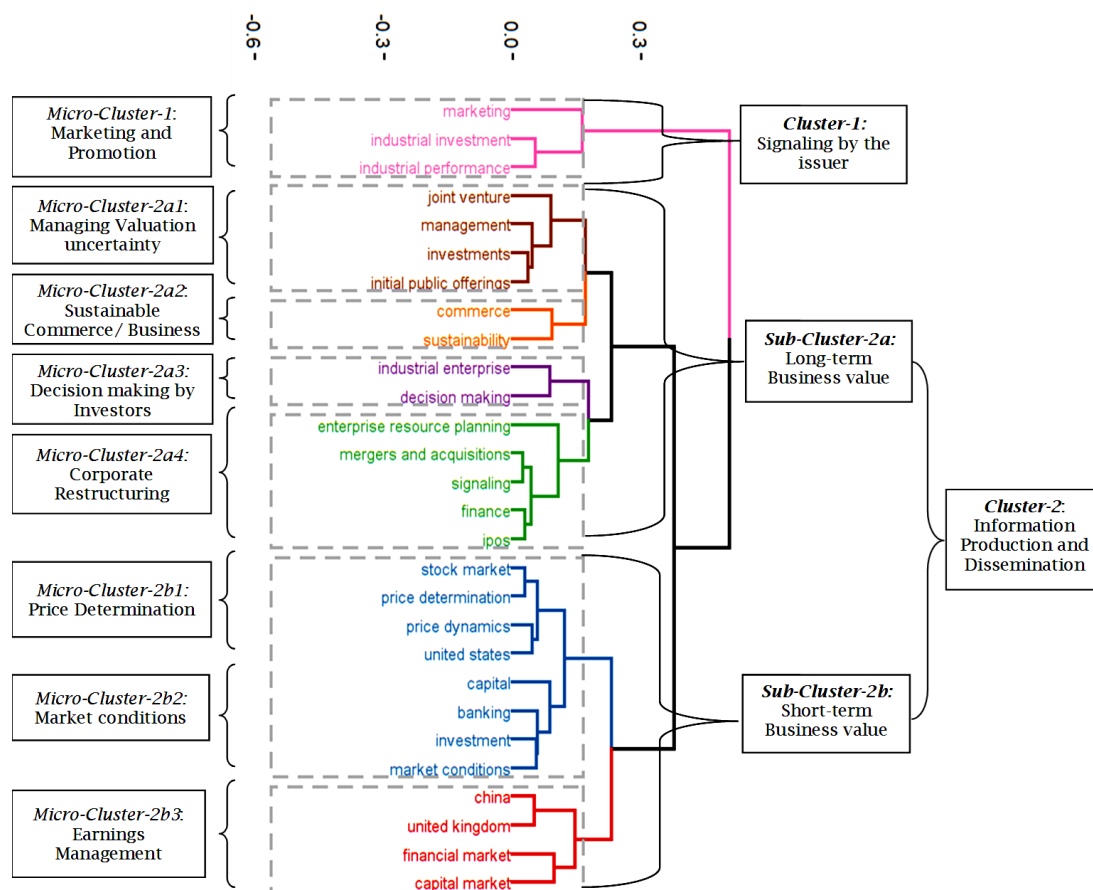
This method is effective when studies cite key scientific journals (McCain, 1990). Such research articles can be grouped under a single topic or factor. Densely packed articles in a subfield or factor form its intellectual core; therefore, each sector or factor develops its own intellectual body (Hsiao & Yang, 2011).

### 4.4. Multidimensional scaling

After performing factor analysis, we use multidimensional scaling (MDS) to explore the conceptual structure of the published research by creating a graphical representation of the various fields and subfields, as shown in Figure 5. The perceptual mapping approach (Shiau & Dwivedi, 2012) converts co-occurrence into a measure of similarity. MDS places items on a two-dimensional scale, with distance indicating similarity. Closer fields are more closely related and correlate better (Van Eck & Waltman, 2008).

Factor analysis, combined with multidimensional scaling, applied to IPO-related research papers, reveals two core clusters and seven subclusters.

Figure 5. Hierarchical cluster analysis



Source: BiblioShiny package (Aria & Cuccurullo, 2017).

## 5. DISCUSSION: MAIN TOPICS OF CLUSTERS

### 5.1. Cluster 1: Signalling by the issuer

As shown in Figure 5, prepared using the BiblioShiny (bibliometrix package), Marketing is the primary theme identified in this cluster, based on the IPO literature (Aria & Cuccurullo, 2017). Financial analysts generate and disseminate information about firms (Bai et al., 2016) that influences the long-term value of the company. This cluster highlights the role of the issuer and team, such as the underwriters' ability to utilise this information to estimate demand and support their marketing strategies. Zhang et al. (2015) presented evidence that analyst recommendations enhance underwriters' marketing efforts and decrease IPO failure by signalling a positive view of the firm. Importantly, marketing creates both short-term and long-term value for an IPO company. Consequently, the issuer's signalling efforts assist the underwriter in promoting the IPO and shaping IPO pricing (Merton, 1987; Booth & Chua, 1996; Zhang, 2004; Cook et al., 2006).

### 5.2. Cluster 2: Information production and dissemination

This cluster involves providing information about the IPO before and after its implementation, which is crucial for successful subscription and long-term value. Any ambiguity in their recommendations

influences investors' diverse beliefs, which in turn affects IPO subscription (Neave & Scott, 2019). This is because investors' varied beliefs impact the IPO's price determination process and the occurrence of underpricing. Furthermore, in the IPO after-market, investors' differing beliefs lead to varied responses to the information, affecting the IPO firm's share value in the market and its long-term sustainability (Dambra et al., 2018). Extending the research, Loureiro (2013) argues that the underwriter's reputation reduces information asymmetry and improves the accuracy of analysts' current earnings forecasts, thereby creating long-term value.

This cluster is further divided into long-term and short-term business values (Sub-Clusters-2.a and 2.b).

#### 5.2.1. Sub-Cluster-2.a: Long-term business value

This sub-cluster primarily comprises articles on accounting disclosures by the IPO sector, which is part of the firm's effort to enhance the quality of information. This improvement aims to achieve good short-term returns and positively affect long-term firm value. In this context, Rajan and Servaes (1997) argue that IPO analysts' over-optimism regarding their long-term growth prospects negatively impacts the value of their shares in the long run.

It has been divided into four micro-clusters to understand the implications of the Sub-Cluster-2a. The literature is tied to numerous areas of business information creation, which are illustrated by the micro-clusters.

*Micro-Cluster-2.a.1: Managing valuation uncertainty*

The first micro-cluster, linked to core IPO research and information asymmetry theory, focuses on managing valuation uncertainty. Since limited information is available about the IPO firm, valuing a newly listed company remains a complex and uncertain process. However, analysts' processing of information about the IPO firm can help reduce valuation uncertainty somewhat by providing a coherent valuation model. Supporting this, Borochin et al. (2018) argue that analyst recommendations carry more weight and effectively help resolve investor uncertainty about a company's value.

Additionally, Mudambi et al. (2012) hypothesize that international enterprises with diversified joint ventures and larger analyst networks are regarded as more valuable by investors and face less valuation uncertainty. The market perceives a multinational firm's intangible assets, such as its financial network, as crucial to its future success and as a positive signal to market participants. According to Ragozzino et al. (2018) and Blomkvist and Vulcanovic (2020), pre-IPO activities, such as joint ventures or mergers and acquisitions, act as a bridge of information to credibly communicate details and attract analyst interest, thereby reducing value uncertainty for the IPO firm.

*Micro-Cluster-2.a.2: Sustainable commerce/business*

The core IPO literature based on signalling theory is also connected to sustainable commerce as a smaller aspect within the broader body of research, emphasising economic benefits through sustainable and valuable businesses. This is supported by studies from Kim (2019) and Akkus et al. (2021), which show that IPO firms with reputable underwriters tend to be more sustainable. The issuer often appoints reputable underwriters, and their involvement acts as a signal to attract better analyst coverage after the IPO listing. Additionally, Ryoo et al. (2020) argue that analyst recommendations from reputable lead underwriters are more informative and less biased, leading to improved and more sustainable value for the firm.

*Micro-Cluster-2.a.3: Decision-making by investors*

This micro-cluster is another important element connected to the main literature on information flows in IPOs. Concerning investors' decision-making, the issuing company must optimise the flow of information to minimise costs associated with gathering information for investors. With support from underwriters and analysts, the issuing firm enhances informational accuracy, thereby improving investor perceptions of the firm's value. Otherwise, the firm will incur additional expenses due to an underpriced IPO. Zhang et al. (2020) used media tones to illustrate this point. According to them, if the media tone is vague, investor decision-making becomes more costly due to higher information acquisition expenses in the absence of clear, positive signals, and low-risk businesses may underprice themselves to differentiate themselves from high-risk firms.

*Micro-Cluster-2.a.4: Corporate restructuring*

IPO literature rooted in the theory of information asymmetry also explores this specific micro-cluster or theme within the broader field of finance. According to this theme, post-IPO acquisitions or other strategies aimed at creating and absorbing new information depend on the firm's long-term value to generate synergy. Arikan and Capron (2010) note that the acquirer's pre-IPO relationships with the underwriter, staff, and analysts have a significant influence on the firm's value. The market reflects this information in the share price if the pre-issue underwriter and their team, such as analysts, are retained as acquisition advisers. Furthermore, a longer lock-up period enhances a firm's value. Wu and Reuer (2021) state that firms communicate information to their prospective acquirers through media coverage, analyst coverage, and IPO underpricing to attain a higher valuation of the business.

*5.2.2. Sub-Cluster-2.b: Short-term business value*

This is the second sub-cluster identified in the literature, emphasising the issuing firm's short-sighted focus on short-term gains from their corporate activities and discussing the role of managing information asymmetry in achieving this immediate aim. The sub-cluster is divided into three micro-clusters: IPO pricing, market conditions, and IPO earnings management.

*Micro-Cluster-2.b.1: Price determination and price dynamics of the IPO (underpricing)*

This micro-cluster encompasses the IPO literature on underpricing, including investment, pricing dynamics, regulation, negotiation, management incentives, complexity, and macroeconomic factors such as currency exchange rates. These elements are grounded in information processing and signalling theory and relate to the core literature of IPO analysts.

Expanding on the theme of price determination and dynamics, according to Galbraith and Merrill (2001), competitive information in the IPO firm's prospectus reduces investors' search costs, boosts optimism, and correlates with the IPO share's aftermarket price rise, leading to underpricing. Chahine et al. (2020) argue that issuers influence IPO information by employing investor relations experts to shape the media tone in their favour, resulting in changes in pricing dynamics and a stock run-up after listing, which causes underpricing. Deng and Zhou (2016) observe an increase in underpricing and believe that the IPO firm's early favourable returns are driven by investors' over-optimism, incentivised by issuers to manipulate price dynamics in their favour instead of information acquisition.

Related to the theme of price determination, Sahoo (2014) found that analyst recommendations influence the underpricing of IPOs. Analyst "subscribe" recommendations are seen as optimistic, encouraging issuers to set higher offer prices and reducing underpricing. Similarly, Dambra et al. (2018) and Jia et al. (2019) suggest that analysts' optimistic recommendations contribute to IPO underpricing.



*Micro-Cluster-2.b.2: Market conditions affecting IPOs*

The IPO literature indicates that company-specific and market factors influence IPO pricing. Pastor and Veronesi (2005) show that predicted market returns, overall profitability, or past uncertainties about average future IPO returns determine IPO cycles. Chang et al. (2006), Klein and Li (2009), and Boeh and Dunbar (2014) suggest that companies tend to rely more on macroeconomic conditions when there is less analyst attention, implying that investors leave behind weak idiosyncratic information when making investment decisions.

*Micro-Cluster-2.b.3: Earnings management by IPO firms*

The issuer manipulates earnings to meet short-term objectives such as securing an attractive IPO price, increasing subscription rates, and enabling quick corporate restructuring. However, recent research challenges this view. Companies that restrict earnings management tend to attract stronger analyst coverage after their IPO, as noted by Peng et al. (2021) and Zhang et al. (2021). This is because the perceived higher value of transparency is incorporated into the firm's valuation and reflected in analysts' coverage of the company.

## 6. LIMITATIONS AND SUGGESTIONS FOR FUTURE RESEARCH

Bibliometric analysis has limitations. This study accomplishes quantitative analysis and objectivity using citation and co-citation analysis. Despite utilising numerous research publications, including relatively new studies that have revisited IPO literature, these articles cannot overturn the results of highly cited, decades-old papers. This analysis identifies two clusters, six sub-clusters, and micro-clusters within the IPO literature. Our review identified research gaps, as presented below.

### 6.1. Marketing and promotion

According to the literature on core IPOs, underwriters' marketing efforts generate both short-term and long-term advantages for IPOs. Media attention and underwriter promotion before a share issue add value (see Tetlock et al. (2008), Drake et al. (2014), Peress (2014), Liu et al. (2014), Twedt (2016), and Chen et al. (2019)). Furthermore, studies by Gao and Ritter (2010) and Cervellati et al. (2013) examined roadshows as a means of reducing IPO information asymmetry.

Thus, previous IPO research has linked underwriters' media and marketing efforts as signals that help set the issuer's desired offering price. According to these studies, these signals help reduce information asymmetry, leading to higher secondary market prices for IPOs and reduced underpricing. In the pre-IPO market, it is important to analyse analyst recommendations from the perspective of information asymmetry, as this affects marketing, demand for the IPO, and the valuation of the IPO company.

### 6.2. Managing valuation uncertainty

The existing literature related to core IPO research demonstrates how IPO value uncertainty is addressed through underwriter reputation

(Roosenboom, 2007), grey markets (Derrien & Kecskés, 2007; Chang et al., 2017), and pre-IPO corporate restructuring (Ragozzino et al., 2018; Blomkvist & Vulcanovic, 2020). Analysts' recommendations for the firm help resolve uncertainty regarding their valuations (Borochin et al., 2018). The theories of information asymmetry and signalling are the foundational theories in this context.

However, there is a gap in the literature on the impact of pre-IPO analyst recommendations on valuation uncertainty and the understanding of the role of issuer agencies and other stakeholders in setting the offering price. Therefore, further research is needed to explore how pre-IPO analyst recommendations influence investors' perceptions of company value. In this context, both quantitative and qualitative methods can help elucidate investors' perspectives on analyst recommendations.

### 6.3. Commerce and sustainability

The literature cited by the core studies on IPO posits that the IPO firm's sustainable business practices can be categorised into two groups. First is signalling theory, and the other is information asymmetry theory. Related to the information asymmetry arguments, Corwin and Schultz (2005) suggest that a reputable underwriter team can enhance analyst coverage of an IPO following its IPO, thereby reducing information asymmetry. Vithanage et al. (2016) and Ryoo et al. (2020) recognise the importance of an underwriting team in reducing information asymmetry and creating long-term value. The prior effort is tied to the underwriter team's ability to overcome information asymmetry to generate more value over time.

There is limited research on the agency theory explanation for IPO pricing anomalies and abnormal returns that an IPO firm provides to its investors. Regarding agency theory, Arthurs et al. (2008) suggest that IPO mispricing is a complex phenomenon that is amplified by agency structures. New studies may investigate the agent-owner relationship, its connection to information asymmetry, and how it impacts the firm's value.

### 6.4. Price determination and price dynamics of the IPO (underpricing)

Pre-issue analyst coverage and endorsement of an IPO in emerging economies, such as India or China, may influence the pricing dynamics of the IPO. Because different types of investors have access to varying amounts of information, uninformed investors seek market signals to improve their trading success by narrowing the knowledge gap.

Reviewing the primary IPO analyst literature, Sahoo (2014) examined the relationship between underpricing and pre-issue analyst coverage in Indian IPOs and found that analyst recommendations contribute to IPO underpricing. No existing research on emerging markets assesses the influence of pre-IPO and post-IPO analyst recommendations on investors' ability to process external information that could impact a company's long-term value. Further research on underpricing could examine this aspect and investigate the impact of analysts' recommendations on long-term share value.

## 7. CONCLUSION

This study examines the primary IPO literature. Citation, co-citation, and factor analysis methods are used to identify clusters in the IPO literature related to the underlying research. We identified various evolving themes that could serve as a foundation for future research, as they highlight critical issues in the IPO literature. The main clusters in the research are categorised using factor analysis (also known as multidimensional scaling), which traces the development of the research over time, as analysed by the researchers.

One of the sub-clusters we identify within the signalling cluster relates to the marketing efforts demonstrated by the underwriter team to attract potential investors' attention. This sub-cluster also includes media coverage as market signals. According to the thematic analysis, marketing has strong connections to the environment. The generation and acquisition of information are economically valuable for a firm aiming to be profitable and valuable in the long term.

The literature cited by the core papers on IPO analysts, managing valuation uncertainty, corporate restructuring activity (such as joint ventures, mergers, acquisitions, and ERP), commerce and sustainability, decision-making, IPO price determination and dynamics (including underpricing),

market conditions affecting IPOs, and earnings management in IPO markets influencing price determination are six micro-clusters related to the business value theme. Micro-clusters include managing valuation uncertainty. Through theme analysis, we found that corporate and environmental responsibility have received limited attention and are loosely connected to other IPO topics. Although price determination and dynamics relate to IPO literature, they are seldom thoroughly examined through the lens of information asymmetry and signalling theory. Further exploration of some study areas could help address existing research gaps.

Furthermore, the IPO firm's financial history influences the company's long-term commercial viability. Analysts assist investors in selecting a firm by analysing useful financial information. Our bibliometric analysis showed that analysts play a vital role in making short- and long-term, as well as micro-level decisions, including company reorganisation and earnings management.

Future studies can expand this body of knowledge in the context of public challenges related to agency theory. This research will aid academics and practitioners in identifying potential hazards in IPO decision-making, improving their ability to negotiate using key knowledge, and building long-term value through short-term contributions.

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