ASSET PRICING, MARKET INTEGRATION, AND CONTAGION: A BIBLIOMETRIC PERSPECTIVE

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Abstract

This paper provides a comprehensive bibliometric analysis of the existing literature concerning the broader asset pricing literature, with a particular focus on the topics of market integration, financial contagion, risk transmission, and institutional quality across developed, emerging, and frontier financial markets. Using a large bibliographic database and a controlled thesaurus-based keyword harmonization procedure, the study maps the intellectual structure, thematic evolution, and clustering of the research within the literature over the period 1980–2025. The analysis reveals that asset pricing research has expanded substantially over the past decades, yet it remains highly fragmented across several independent research streams. Multifactor asset pricing models, financial integration and globalization, volatility spillovers and contagion, ESG-related risk, and emerging and frontier market studies are shown to evolve largely in isolation from one another. Bibliometric evidence suggests that asset pricing studies primarily focus on factor construction and model performance, while integration and contagion are predominantly viewed as financial stability or macroeconomic elements, with limited consideration given to their implications for asset pricing. Similarly, ESG-related research forms a rapidly growing but thematically segmented cluster, and market classifications are typically employed as descriptive categories rather than as structural dimensions of pricing dynamics. By adopting a comprehensive framework, this paper complements the existing literature by explicitly linking these segmented research domains and by documenting how their thematic trajectories overlap, diverge, and evolve in response to major economic events and structural changes in global financial markets. The findings acknowledge the need for more integrated research approaches that jointly consider asset pricing, market integration, contagion mechanisms, and institutional context, and they provide a structured foundation for future empirical and policy-oriented investigations in globally interconnected financial systems.

Keywords: *Asset pricing; Bibliometric analysis; Market integration; Financial contagion; Risk premium; ESG; Emerging and frontier markets*

JEL Classification Codes: *F36, F62, F65, C01, C22, C32, C58, G01, G12, G14, G15, G18, G32, Q56*

1. Introduction and Literature Review

Asset pricing remains one of the foundational topics in finance because it seeks to explain how risk translates into return and how investors are compensated through the existing risk premium. At its core, we observe that the field of asset pricing has been largely dominated by linear asset pricing models that are of the factorial sort. These types of models employ a varied selection of both tradable and non-tradable risk factors to explain expected returns (Kleibergen, 2009). The existing literature provides countless examples of the different approaches that have been used to construct such factors. The first construction approach is largely grounded in economic theory, where the market portfolio itself is considered the primary source of risk, as in the Capital Asset Pricing Model (CAPM) of Sharpe (1964). A second stream of literature argues that constructing risk factors from firm-level characteristics, exemplified by the 3-Factor and 5-Factor models of Fama and French (1993, 2015), which remain widely applied benchmarks and highly appraised models. Lastly, a third approach that is statistical in nature, extracts factors without requiring explicit economic interpretation, as seen in the Arbitrage Pricing Theory (APT) of Ross (1976). Regardless of construction, the central logic of these varied methods is that exposure to various

sources of risk, whether tradable or non-tradable, should award investors with a given level of compensation in the form of a risk premium (Giglio and Xiu, 2021; Feng, Giglio, and Xiu, 2020).

However, the growing proliferation of proposed factors has led to what is commonly described by the existing literature as a "factor zoo." The concept of a factor "zoo" refers to the ever-growing collection of risk factors that have been proposed in the domain of asset pricing. Researchers have identified hundreds of variables that appear to explain differences in asset returns, ranging from the well-known factors such as size, value, and momentum, to more specialized or market-specific characteristics. Because of this abundance or volume of risk factors, the literature often describes the situation as a "zoo" of factors. In practice, the term captures the challenge of navigating through this wide variety of possible risk factors and deciding which ones are truly relevant, robust, and economically meaningful for a given research. At the same time, we note the issue related to the false-positive detection of risk factors, which tends to hamper the efficiency of various asset pricing models and methodologies. Hence, this issue demands the implementation of various filters and tools in order to mitigate the inclusion of redundant and weak potential risk factors. Andriollo, Robotti, and Zhang (2024) highlight how this proliferation and misidentification create both redundancy and misspecification, making it difficult to isolate the factors that truly drive asset pricing. Especially when considering that weak identification can lead to false positives that incorrectly conclude that a factor is priced in when, in fact, it is not (Bryzgalova, 2015; Giglio, Xiu, and Zhang, 2022).

The challenge of distinguishing relevant from irrelevant factors makes it essential to implement robust statistical procedures for factor selection, particularly in developing and frontier financial markets, where institutional quality is weaker, and volatility remains higher than in developed financial markets. The existing literature shows that these markets exhibit a higher risk premium compared to their developed peers, which can be explained by key or unique characteristics that pertain to developing and frontier financial markets. We consider illiquidity, capital controls, weaker institutions, a weaker regulatory framework, and informational gaps as key drivers of excess risk premium (Barry, Peavy, and Rodriguez, 1998; Bekaert and Harvey, 2003). More recent evidence confirms that institutional quality and regulatory frameworks remain decisive in shaping volatility and equity risk premium (Yilmazkuday, 2025). Menshchikova (2024) and González-Sánchez (2022) further demonstrate that risk premiums in emerging and frontier financial markets are persistently elevated due to various local fundamentals. Local fundamentals refer to a set of characteristics that influence the financial environment in which the process of asset pricing is conducted. This term contains both geographical and regional factors, such as market size, level of development, regional integration, and exposure to external shocks, while also including various economic conditions, such as inflation, exchange rate volatility, fiscal policy, and institutional quality. It can also be argued that local fundamentals are not transitory shocks but stable characteristics that impact and influence the response of financial markets to both domestic and external developments. While at the same time, we argue that the aforementioned local fundamentals can also interact with global cycles to create higher levels of uncertainty. These conditions suggest that developing and frontier financial markets should systematically command higher risk premiums, but they also raise the question of how integration with global financial markets changes the pricing dynamics.

Another relevant aspect is that the process of globalization has made financial markets increasingly interconnected, amplifying the transmission of shocks. Evidence shows that risk originating in developed markets often spills over to emerging peers through channels of market integration and via the contagion effect (Qiu and Xie, 2022). Crisis episodes, such as the "Global Financial Crisis" of 2007-2011 and the COVID-19 Pandemic, demonstrate how international comovements intensify during stress periods (Vuong et al., 2022; Mishra and Mishra, 2022; Kaya and Kasuganti, 2025). More recently, the Russia–Ukraine conflict has further highlighted the role of geopolitical shocks in shaping volatility and risk transmission across both developed and

developing financial markets (Truong, Friday, and Nguyen, 2025; Li, Tong, and Guan, 2025). We nevertheless argue that the process of market integration can bring both benefits and vulnerabilities. On the one hand, it provides an additional layer of pricing efficiency and more diverse investment opportunities, as well as the promotion of capital movement from market to market and from region to region. On the other hand, the process of market integration can also act as a net transmitter of volatility during periods that are characterized by the presence of endogenous and exogenous factors and shocks. Hence, this results in the dreaded contagion effect, impacting financial markets on a global scale. Thus, we argue that the diversification benefits are, in fact, counterbalanced by the impact of the contagion effect and also by the prevalence of volatility spillovers that occur during turbulent periods that are characterized by the presence of endogenous and exogenous shocks. Cevik et al. (2024) show that systemic risk transmission mechanisms such as macroeconomic linkages, weak institutions, and investor herding are disproportionately affecting less resilient markets, further exacerbating the impact of contagion effects.

The implications that flow from this level of market integration for asset pricing are substantial. For the case of developed financial markets, market integration has been shown to produce strong comovements, with indices such as the DAX, CAC40, FTSE100, and S&P500, which are displaying cointegration relationships (Kadiri et al., 2024). In emerging markets, however, integration does not simply increase comovements but also influences the appearance of a portion of risk premium, which can be attributed to the impact of market integration and the various effects, such as volatility spillovers and, ultimately, the contagion effect. This is owed to the fact that more developed markets act directly as net transmitters of shocks and volatility (Naeem et al., 2023). We further argue that this portion of the risk premium represents a distinct component of return that is attributable to exposure to systematic risks and to the influence of developed financial markets. This dual structure, related to the formation mechanism of the risk premium, which contains the local risk factor elements plus the integration-driven components, can further complicate the asset pricing puzzle, making the process of decomposition of the risk premium crucial.

An additional dimension that emerges as a consequence of increasing market integration and institutional harmonization is the rise of environmental, social, and governance (ESG) considerations. Within the scope of this paper, the impact of ESG is therefore not treated as a primary driver of asset pricing evolution, but as an additional layer that is dependent on the level of market development, disclosure standards, and level of global integration. Once considered strictly through the lens of non-financial reporting, ESG elements, and mainly ESG stocks and indices, are now recognized as both relevant and tradable risk factors, and financial instruments, within their own market segments. Lauria et al. (2025) provide evidence that ESG indices now behave like priced factors in developed markets, while Lin et al. (2025) shows that their role in emerging markets is gaining a less stable and less tradable form. It can be argued that this aspect is influenced by the adoption and implementation of the ESG frameworks. Additionally, it can be further argued that the emergence and institutionalization of ESG considerations are closely linked to periods of financial and economic stress rather than evolving in isolation. Major crisis episodes have historically acted as catalysts for regulatory reform, enhanced disclosure requirements, and shifts in investor risk perception. The "Global Financial Crisis" of 2007–2011, in particular, exposed governance failures, social externalities, and environmental risks that had been systematically underpriced or ignored within conventional asset pricing frameworks. In this context, ESG factors gained relevance not as simple ethical or governance concerns, but as mechanisms through which downside risk, systemic vulnerability, and even uncertainty could be partially assessed and managed. From a bibliometric perspective, this implies that the expansion of ESG-related research is not purely the result of theoretical evolution alone, but is strongly shaped by various shifts in regulation, market development, and perceptions of risk that occurred in the wake of major episodes of endogenous and exogenous shocks.

Namely, in developed economies, the implementation of the ESG framework is increasingly institutionalized through mandatory disclosure requirements, regulatory standards, and supervisory enforcement, which promotes its integration into asset pricing. By contrast, in developing and emerging markets, ESG adoption and implementation remain largely voluntary, often driven by firm-level considerations, investor pressure, or alignment with international benchmarks rather than being regulatory driven. This uneven integration of ESG into asset pricing across various types of markets, both developing and developed, reflects the broader theme of this research: That the pricing of risk is greatly influenced by the level of market development, institutional strength, and also the level of market integration into the global financial system. To this end, the present paper adopts a comprehensive bibliometric approach to systematically examine the evolution, structure, and thematic fragmentation of the literature that focuses on asset pricing, market integration, contagion dynamics, risk premium formation and transmission, ESG factors, and the differentiation between developed, emerging, and frontier financial markets. Rather than contributing new empirical or model-based approaches, the objective is to map how these related research domains have developed over time, how they intersect, and where they remain conceptually or methodologically disconnected. In this sense, the present bibliometric investigation serves not as a simple descriptive approach, but as an analytical tool that allows for the identification of dominant research clusters, emerging themes, and persistent gaps within the existing literature. More specifically, the analysis aims to capture how the expansion of asset pricing research has coincided with the increasing relevance of globalization, financial integration, and systemic risk, and how these forces have progressively incorporated institutional and regulatory dimensions such as ESG considerations into asset pricing frameworks. While individual strands of the literature have addressed factor proliferation, contagion effects, volatility spillovers, or institutional quality, existing research often treats these topics as distinct empirical problems. The bibliometric perspective adopted in this paper allows for an explicit assessment of whether such segmentation is also reflected in citation structures, keyword co-occurrences, and thematic evolution across time.

By examining the literature across multiple time frames, the study documents how major economic and financial events, such as episodes of financial liberalization, global crises, and periods of heightened uncertainty, have shaped academic focus and redirected research efforts. This temporal dimension is essential for understanding not only the emergence of new themes, such as ESG investing or systemic risk, but also the persistence or decline of established topics related to asset pricing models, market integration, and risk transmission mechanisms. In doing so, the bibliometric analysis provides insights into whether the literature has progressed toward a more unified understanding of global pricing dynamics or has continued to focus on the segmentation of the aforementioned topics. Considering the fact that the identified asset pricing literature has expanded substantially over the past decades, the bibliometric investigation could reveal a persistent degree of fragmentation regarding the explored topics and subjects. A similar trend can be identified in the existing bibliometric investigations, which follow the thematic segmentation of the underlying literature, rather than providing an overall perspective capable of capturing the evolution of asset pricing, financial integration, contagion effects, and institutional development across markets.

We further acknowledge that other bibliometric studies that focus on asset pricing and multifactorial models do exist and provide valuable insights into the intellectual structure of this avenue of research. For instance, Rossi and Ferreira (2019) conduct a bibliometric analysis centered on the CAPM, APT, and Fama–French variation of models, focusing on the citation networks and the historical development of pricing paradigms. Similarly, Ali and Bashir (2022) attempt to map the evolution of asset pricing research with a particular focus on factorial models and anomalies. However, these studies remain largely focused only on the underlying asset pricing models, while ignoring the impact of various endogenous and exogenous shocks. At the same time, we note that financial markets are treated exclusively as efficient environments, with a reduced or

almost no clear difference in operating between developed, emerging, and frontier markets. Moreover, issues regarding the impact of elements such as globalization, financial integration, contagion, and institutional quality and development are ignored, resulting in a bibliometric representation of asset pricing alone, with no real connections to other elements and developments that impact and affect it.

We also have to observe the emergence of another bibliometric research cluster that is formed by studies exclusively dedicated to financial integration and globalization. Patel et. al. (2022), for example, provide a comprehensive bibliometric review of financial market integration, focusing on the market integration process, market comovements, and the liberalization process. Additional bibliometric investigations that are inspired by the international finance literature can be associated with the evolution of the process of market integration and the use of various openness indicators, which aim to determine the level of integration among various countries and regions. While these contributions offer detailed information related to the aspects of the integration process, they typically reduce the process to a macroeconomic or econometric effect, rather than as a mechanism directly influencing asset pricing, factor relevance, or the formation and transmission of risk premiums between markets.

The bibliometric literature focused on the investigation of the contagion effect and volatility spillover constitutes another developed but yet again, segmented research cluster. Studies such as Nica et. al. (2024) map the evolution of financial contagion research, highlighting various endogenous and exogenous shocks, network structures, and spillover mechanisms. While several bibliometric reviews built upon the connectedness framework of Diebold and Yilmaz (2012) further confirm the focus of this segment of bibliometric analysis on volatility transmission and systemic instability, where the contagion effect is mainly interpreted as a financial stability concern. The explicit link between spillover dynamics and expected returns, factor pricing, or effects on the decomposition of the risk premium remains largely absent from the bibliometric investigations, despite its severe impact on the asset pricing theory.

In contrast to the previous topics, bibliometric investigations related to the topic of risk premium decomposition and cross-market transmission do not appear, to our best knowledge, to have been fully explored within the existing literature. While bibliometric reviews exist on systemic risk, global risk factors, and financial integration, there is no dedicated bibliometric investigation that focuses exclusively on the decomposition of risk premiums or how risk premiums can be imported from larger financial markets via the process of market integration and under the effects of "stylized facts", as described by Cont (2001). This topic is often treated and debated within the broader empirical asset pricing or international finance studies, but is more or less invisible as a standalone bibliometric investigation. This absence can constitute one of the most pronounced gaps identified by the present analysis.

Regarding the ESG literature, which is arguably one of the fastest-growing areas in finance-related bibliometric research, we observe various studies such as Mocanu et. al. (2024), Gherăescu et. al. (2024), and Cippiciani et. al. (2025), which document the rapid expansion of ESG-related themes across finance, banking, and corporate valuation. However, these bibliometric mappings reveal a high degree of thematic isolation. ESG is predominantly treated either as a corporate finance issue or as a standalone factor, with limited attention paid to its regime-dependent nature, institutional conditioning, or interaction with global risk transmission mechanisms. Foundational contributions such as Daugaard (2020) highlight conceptual debates surrounding ESG as a factor, yet these insights have not been systematically embedded within broader bibliometric frameworks that attempt to link ESG to asset pricing and market integration. Lastly, bibliometric studies focusing on emerging and frontier markets form yet another isolated research cluster, largely disconnected from the broader asset pricing and global factor literature. Existing reviews emphasize financial development, persistent volatility, endogenous and exogenous shock exposure, and institutional limitations that are arguably characteristic of developing and frontier financial

markets. However, market classification is typically employed as a descriptive dimension rather than as a structural consideration of asset pricing. The bibliometric literature does not explicitly connect the topics of developed, emerging, and frontier markets through shared global factor structures or the possibility of imported risk premiums, nor does it examine how institutional development level conditions pricing dynamics across markets. Taken together, the bibliometric state of the literature confirms that asset pricing, financial integration, contagion, risk premium transmission, ESG, and market development have been mapped and debated in isolation rather than as interdependent components within a unitary framework. Existing bibliometric studies successfully document depth within individual domains or clusters but fail to capture the structural links that characterize modern financial markets operating under the impact of globalization and heightened uncertainty.

The present study contributes by addressing this gap by adopting a unitary bibliometric framework that integrates these traditionally segmented research clusters. By jointly mapping the evolution of asset pricing models, market integration dynamics, contagion mechanisms, ESG factors, and market development across developed, emerging, and frontier financial markets, this analysis provides a coherent representation of how risk, uncertainty, and pricing mechanisms evolve together. In doing so, it moves beyond descriptive bibliometric investigations and provides an analytical foundation that aligns bibliometric evidence with the existing empirical and theoretical contributions within the broader asset pricing literature.

Beyond identifying these individual gaps, the bibliometric approach further reveals a deeper structural limitation of the existing literature, represented by its segmented architecture. As documented above, bibliometric studies tend to isolate topics and clusters such as asset pricing models, financial integration, contagion dynamics, ESG considerations, or market development into distinct and largely independent research clusters or domains. While each of these clusters has generated valuable insights, their separation has resulted in a fragmented understanding of how risk and uncertainty are priced, transmitted, and transformed across markets operating under different levels of development. Thus, the present study complements and extends this body of work by adopting a unified framework that explicitly integrates these dimensions rather than treating them in a separate manner, as in previous research. By jointly examining the topics of asset pricing, market integration, and contagion mechanisms, cross-market risk premium transmission, ESG factor behavior, and the differentiation between developed, emerging, and frontier markets in a unified manner, this analysis provides a coherent synthesis of themes that have previously been addressed in isolation. In doing so, the paper does not seek to replace existing bibliometric or empirical contributions, but rather to create a single integrated perspective that better reflects the realities of a globally interconnected financial system. This unified approach allows for a more accurate interpretation of how various factors and elements jointly shape asset pricing, thereby advancing the literature beyond the existing and segmented investigations toward a comprehensive understanding of asset pricing under conditions of risk and uncertainty.

Accordingly, the contribution of this paper lies in offering a structured and evidence-based overview of the intellectual landscape regarding the development of various topics that concern modern financial markets. By integrating insights from bibliometric mapping techniques, the study highlights the extent to which asset pricing research has incorporated or failed to incorporate the realities of global market integration, contagion effects, institutional quality and relevance, and the growing role of non-traditional risk dimensions such as the emergence of ESG investing. The findings thus provide a foundation for future research that seeks to move beyond segmented analyses and towards a more comprehensive framework capable of capturing the interconnected nature of modern financial markets and the consequences that stem from this established framework. The remainder of the paper is structured as follows. Section 2 is reserved for the bibliometric investigation related to the evolution of the aforementioned topics, while Section 3 discusses the results obtained. Section 4 discusses policy implications for asset pricing theory,

investors, and policymakers. Lastly, Section 5 discusses directions for potential future research, while Section 6 concludes with the main findings of the study.

2. Bibliometric Investigation of the Existing Literature

This section of the paper showcases the bibliometric investigation employed to investigate the existing literature related to the aforementioned themes. The bibliometric analysis is grounded in a structured and reproducible search conducted using the Web of Science (2025) database, which was selected due to its broad disciplinary coverage and its significant content of scientific production. We argue that the employment of Web of Science (2025) as the main source or database for the bibliometric investigation can be explained by several considerations. Such considerations are mainly related to the quality of the data and journal selectivity that is used within the Web of Science (2025) database, while the consideration related to the overall size of the database takes a secondary role. Existing literature observes that the biggest differences that can be observed between databases can be reduced to the issue of size, coverage, and journal selectivity procedures. For instance, the database provided by Scopus offers a broader journal coverage and, at the same time, a broader pool of documents, while in contrast, the database provided by Web of Science (2025) applies more rigorous indexing and editorial conditions resulting in a more selective database of the core structure of a discipline (Mongeon and Paul-Hus, 2015; Singh et al., 2021). Furthermore, the Web of Science (2025) database offers significant historical depth and stability in citation indexing, which is essential for bibliometric investigations that focus on subjects spanning several decades and rely on consistent citation over long time frames (Archambault et al., 2009).

We consider that this selectivity provides additional stability and historical depth, which is central for bibliometric studies aimed at identifying the conceptual nature, and thematic consolidation and evolution. Employing a database with a broader coverage can introduce marginal or weakly connected elements that increase noise and may obscure the results. This development is also confirmed by various comparative investigations related to the two aforementioned databases. Archambault et al. (2009) argue that, despite the considerable difference in coverage, certain bibliometric indicators and network structures derived from the Web of Science (2025) database are more robust and representative of the existing literature, thus indicating that the rigorous procedures and criteria related to journal selection applied do not negatively impact the evolutionary insights that can be derived. Other comparative studies highlight that Web of Science (2025) offers greater precision in subject classification and citation, which is particularly important when clustering algorithms, co-occurrence networks, and techniques that determine the thematic evolution are employed (Mongeon and Paul-Hus, 2015; Singh et al., 2021). Taken together, these considerations justify the use of the database provided by Web of Science (2025) as being the most appropriate database for the objectives of this investigation.

The search strategy that we have employed was designed to balance both a wide coverage of the chosen subjects as well as their relevance, reflecting the interdisciplinary nature of the research topic, which covers asset pricing theory, financial integration, contagion, and cross-market risk transmission across developed, emerging, and frontier financial markets. The selected search strategy applied within the Web of Science (2025) database was done primarily using the "Topic" (TS) field search in Web of Science, which simultaneously queries article titles, abstracts, author keywords, and Keywords Plus. This choice was motivated by the fact that the terminology employed in the asset pricing literature has evolved substantially over time. Restricting the search to author keywords could result in the exclusion of influential contributions, particularly earlier studies that rely on alternative or old, or even outdated terminology. Hence, by employing the "Topic" field, the strategy captures both foundational and contemporary strands of the literature while reducing the vocabulary selection bias and ensuring a more complete representation of the evolving intellectual landscape. The query employed multiple thematic components using logical OR operators. Core structural concepts such as

"globalization" and "market integration" were included to capture the macroeconomic dimension of cross-border capital flows and interlinked markets. Dynamic and methodological dimensions were incorporated through terms such as "time-varying effects" and "variable-lag Granger", reflecting the growing emphasis in the literature on non-stationarity, regime dependence, and dynamic effects. Market segmentation was explicitly addressed by including "developed markets", "emerging markets", and "frontier markets", ensuring coverage across different stages of market development. Finally, pricing and transmission mechanisms were captured through terms such as "contagion" and "risk premium decomposition". The use of OR operators across these thematic dimensions was intentional and reflects a standard bibliometric practice aimed at maximizing the inclusion of various scientific works at the data collection stage. Alternative search strategies, such as a narrower keyword selection, were also considered; however, given the objective of capturing the long-term conceptual evolution of asset pricing under the impact of various elements such as risk, market integration, and uncertainty, the Web of Science Topic search provided the most consistent and methodologically sound foundation for this type of bibliometric analysis. Following data extraction, an additional set of checks and controls was conducted in the R environment before importing the database into the *Biblioshiny* graphical interface. Specifically, the raw database obtained was converted into a data frame using the *bibliometrix* package developed by Aria and Cuccurullo (2017). A two-stage deduplication procedure was then applied to ensure the integrity of the database. The first stage is represented by the deduplication process, which was based on the DOI and was performed to eliminate duplicate records arising from indexing overlaps or even multiple publication formats. For the second stage, we applied a conservative title-based matching procedure to identify and remove duplicates associated with early access versions and to cover potential missing DOI information. This two-tiered approach minimizes both false positives and false negatives, which is particularly important in the broader finance literature. Additionally, the conservative application of the Title-based matching left most records intact, unless identical titles were accompanied by overlapping metadata, such as authors, year, or journal. Thus, mitigating the risk of excluding distinct contributions and papers. The resulting cleaned dataset constitutes the final database, which was later imported into the Biblioshiny interface for descriptive analysis, conceptual structure mapping, and clustering. The final database consists of 23637 documents, including journal articles, book chapters, and conference proceedings, spanning the period covered by the Web of Science Core

Collection up to 2025. This inclusive strategy, followed by the process of data cleaning and conceptual structuring, is consistent with the practices employed in bibliometric research, which focus on an inclusive data collection process before the cleaning process discussed above (Zupic and Cater, 2015; Aria and Cuccurullo, 2017; Donthu et al., 2021).

Following the preliminary steps related to the construction and filtration of the bibliometric database, an additional data harmonization step was implemented in order to address inconsistencies arising from synonym usage and alternative terminology. Specifically, a custom thesaurus file was constructed and applied within the *Biblioshiny* interface to unify equivalent terms, the thesaurus can be viewed in **Appendix 1**.

We argue that this step ensures that thematically identical concepts are not artificially fragmented across clusters, thereby improving the interpretability and structural coherence of the investigation. The use of this harmonization procedure is also consistent with established best practices in large-scale bibliometric analyses (Zupic and Cater, 2015; Aria and Cuccurullo, 2017). To start the bibliometric investigation, we will focus on the most relevant words contained within the explored database.

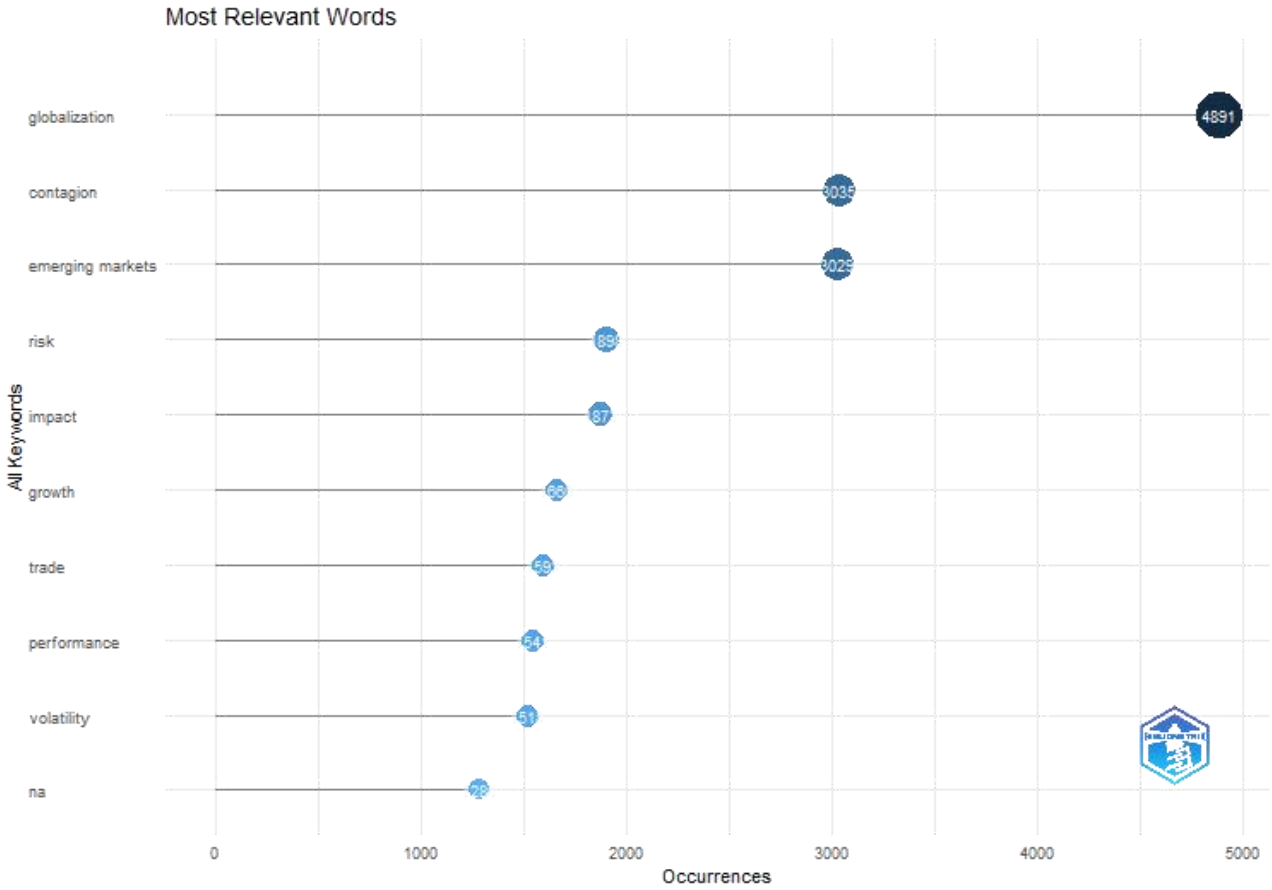

Figure 1, The most relevant keywords identified within the selected database

As can be observed in **Figure 1,** the most relevant keywords identified are globalization, contagion, emerging markets, and risk. We consider that the dominance of the identified keywords can be explained by the relevance of the underlying topics that pertain to the keywords. Furthermore, the keywords and their main underlying topics are connected, as globalization favors the volatility spillover from market to market, thus resulting in the contagion effect, which has a larger impact on emerging and frontier financial markets. In comparison, the general level of downside risk increases in most financial markets. Additional exploration of the relevant keywords pattern results in the creation of a word cloud graph, which provides a visually appealing representation of the most relevant keywords identified within the selected database. The resulting graphical approach, which contains the most relevant keywords identified, can be observed in **Figure 2.**

Figure 2, Word cloud composed of the most relevant terms identified

As can be observed in the resulting word cloud of **Figure 2,** the central words identified in the database are globalization, contagion, emerging markets, risk, and volatility. Other complementary keywords that have been identified range from spillovers, crisis, policy, financial crisis, cointegration, and market integration. Thus, we consider that the word cloud created can provide relevant insights concerning the dominant topics identified in the literature regarding risk and uncertainty. While the complementary topics identified cannot be ignored, as the general evolution within this field of research has already proved, the central topics cannot be investigated without the inclusion of the secondary or complementary topics and themes. Given the insights provided by the word cloud, we will further proceed by investigating the evolution of the central and secondary topics that can be identified in the database.

Thus, we have identified the main and secondary trending topics that can be extracted from the selection of articles employed. The results obtained can be observed in **Figure 3,** where we note that the main central themes or topics are "emerging markets", "market integration", and "financial globalization", which cover a rather broad time frame. Followed by complementary or secondary themes or topics such as "spillover", "contagion", and "risk", which appear to have gained more traction during the last decade. In addition, we can observe the emergence of other relevant topics that pertain to crisis episodes and exogenous and endogenous shocks, which tend to become emerging topics during periods of time that are characterized by the presence of such events. Lastly, the graphical approach manages to capture the emergence of new topics that are related to the ESG framework, such as "ESG performance" and "climate policy", which, arguably, can be considered new and emerging topics, as their presence and emerging relevance can be observed only for the last 3 or 4 years.

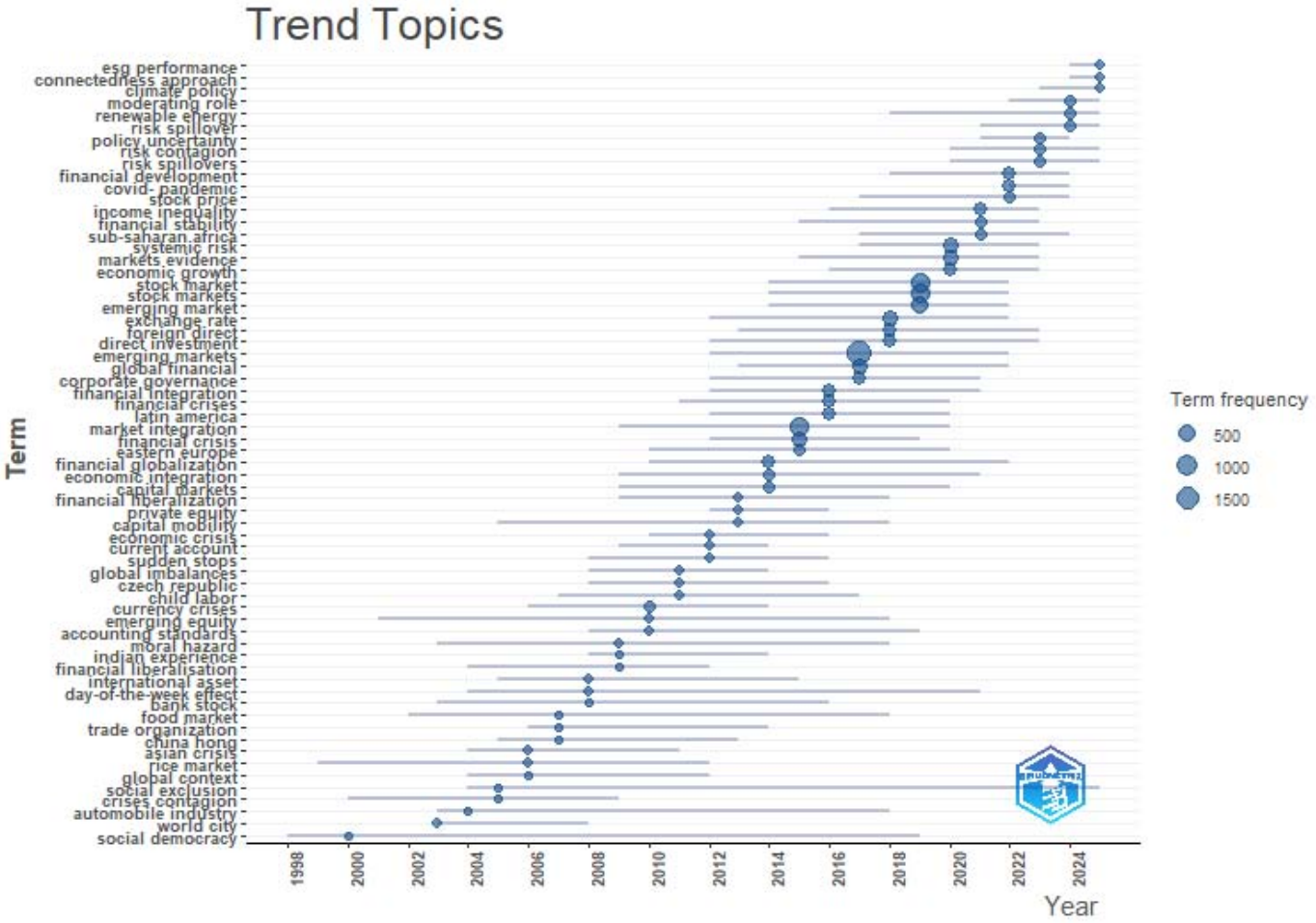

Figure 3, Evolution of central and secondary topics over time by keywords

As can be observed from the previous graphical results, the main topics of themes that dominate this particular research field tend to revolve around two main themes. First and foremost, globalization, which became a relatively "hot" topic starting in the early 1990s, as liberalization, the availability of financial information, and reduced trading costs facilitated a more geographically diverse portfolio diversification. Under this particular trend, it comes as no surprise that the second dominant theme appears under the topic of emerging markets. It can be argued that the initial novelty element of such markets, combined with the possibility to offer a given level of hedging and increased levels of returns, captured the interest of both institutional and retail investors alike. Hence, this trend is showcased by the thematic evolution graph of **Figure 4.**

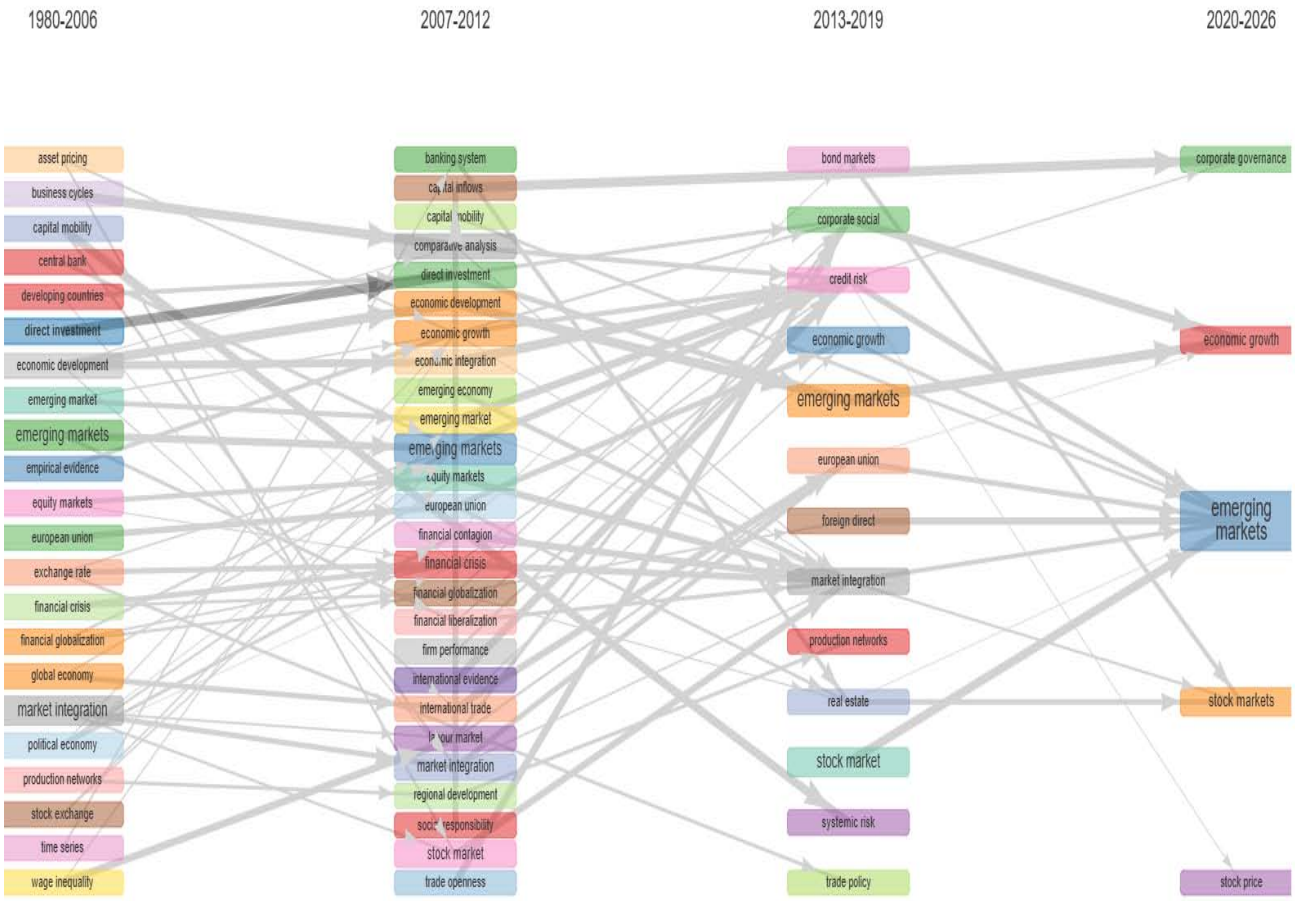

Figure 4, Analysis of the thematic evolution of the literature

Given the evolution of the dominant themes, it can be argued that the effects and influences that impact asset pricing, which flow from various elements such as the process of globalization and market integration, are relevant to the field of asset pricing. Furthermore, a direct consequence of this process, we observe the growing interest in emerging and frontier financial markets, as can be observed in **Figure 4,** while for the last time frame identified, the themes merge. At the same time, the topic related to various shocks and systemic risk has gained significant traction during the same time period. This evolution can be attributed to several factors, such as the negative impact of various shocks, which resulted in volatility spillover from market to market and ultimately, to the emergence of the contagion effect. Moreover, the rich number of themes identified in the time frames that can be viewed in **Figure 4** indicates the evolutionary path of the existing literature. While at the same time suggesting the concentration of the literature towards several central themes, which can be observed in the last two time frames used. Given the thematic evolution of the main topics, we have decided to further investigate the paired relevance of the themes by considering the implementation of a co-word network analysis instrument provided within the "bibliometrix" R package. The co-word analysis provides relevant information regarding the occurrence of the most relevant pairs of keywords that appear within the same document or article. The method further calculates the number of occurrences and, based on this computation, provides an intuitive network in a graphic format, which can be observed in **Figure 5.**

We observe in the resulting network that the main pillars are the keywords "emerging markets", "contagion", and "globalization", which form separate clusters composed of related topics or keywords that flow logically from these main pillars. We note that the most relevant topics and keywords contained within the aforementioned clusters relate to contagion, cointegration, financial crisis, systemic risk, and liquidity, and are nested within this particular cluster. While within the globalization cluster, we observe the prevalence of keywords that relate to

development, trade, innovation, and institutions. Furthermore, we observe that the main clusters share several key links, which is in line with the previous results, given the existing connections and effects that flow from cluster to cluster.

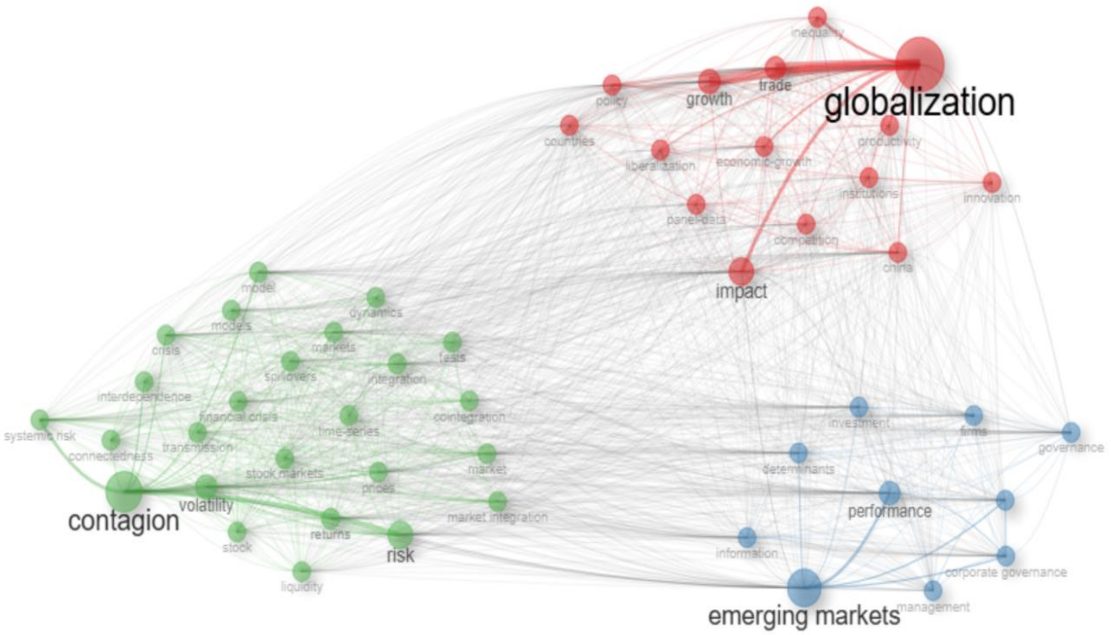

Figure 5, Co-word network for the selected database

Given the occurrence of various related keywords contained within the main clusters identified, we have decided to further expand on the results provided by the co-word network analysis by exploring the most relevant or significant topics that pertain to the main clusters identified and to the broader literature explored. To do this investigation, we have employed the conceptual structure map tool. The resulting map illustrates the conceptual structure derived via the Multiple Correspondence Analysis (MCA) on keywords. We can observe the emergence of five major research clusters: firstly, the financial risk, contagion, and volatility market in red, followed by the second cluster containing market integration and cointegration in purple, succeeded by the third cluster of information and investment determinants, marked in green, followed by the fourth cluster of corporate governance and emerging markets, in yellow, and, lastly, the globalization, innovation, and economic growth cluster, marked in blue. The spatial arrangement highlights the evolution from microeconomics studies to macroeconomic and systemic risk perspectives.

It can be argued that the central cluster, marked in red, is dominated by papers and articles focused on financial risk, volatility transmission, and contagion, closely linked to the smaller cointegration cluster, marked in purple, which emphasizes long-run market relationships. We argue that the identified themes align directly with the analysis of market integration and contagion effects developed in later sections of this study. In contrast, the governance cluster, marked in yellow, and the globalization cluster, in blue, represent broader institutional and macroeconomic perspectives, focusing on company performance and cross-region development dynamics. The last cluster, information-investment, marked in green, connects microeconomic determinants with broader market performance, acting as a conceptual bridge between corporate and financial domains.

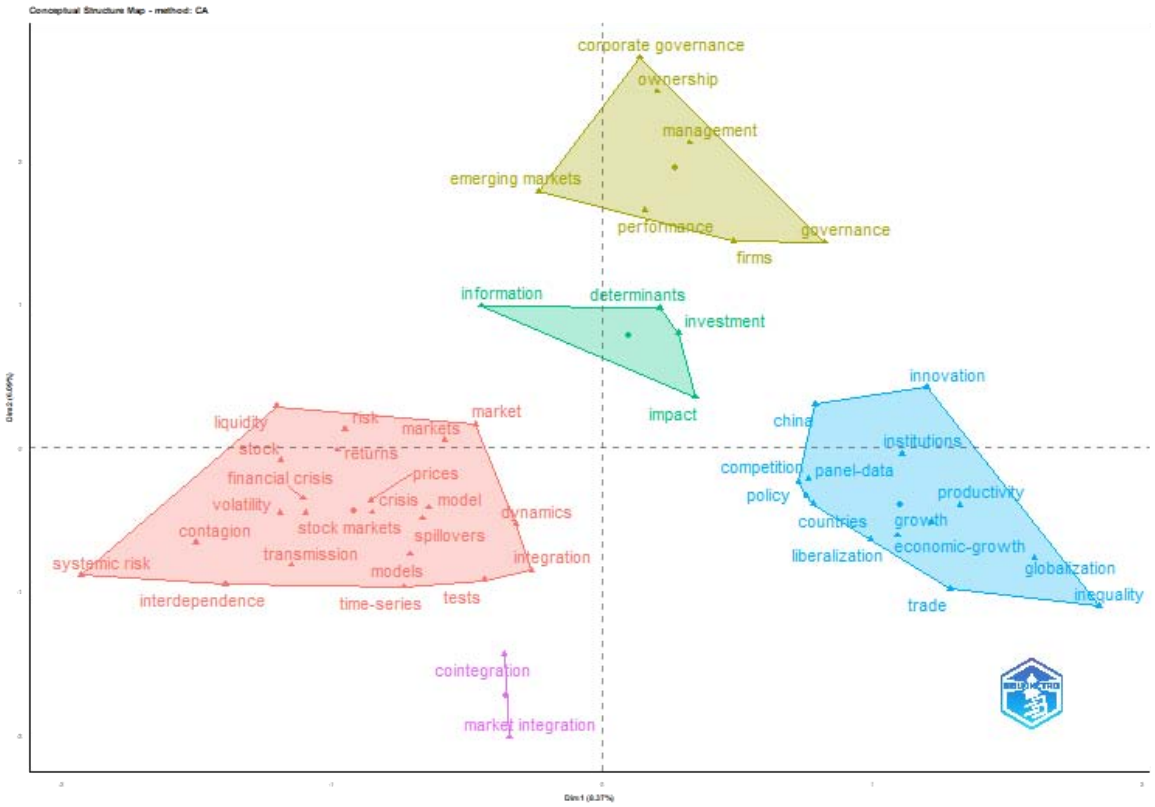

Figure 6, Conceptual Structure Map of the literature on the topics of risk and uncertainty

Given the resulting clusters detected and showcased in the Conceptual Structure Map of **Figure 6,** we will further proceed to investigate the magnitude of development for each cluster by employing a correspondence analysis within the "bibliometrix" package, to detect and illustrate the development degree of each cluster.

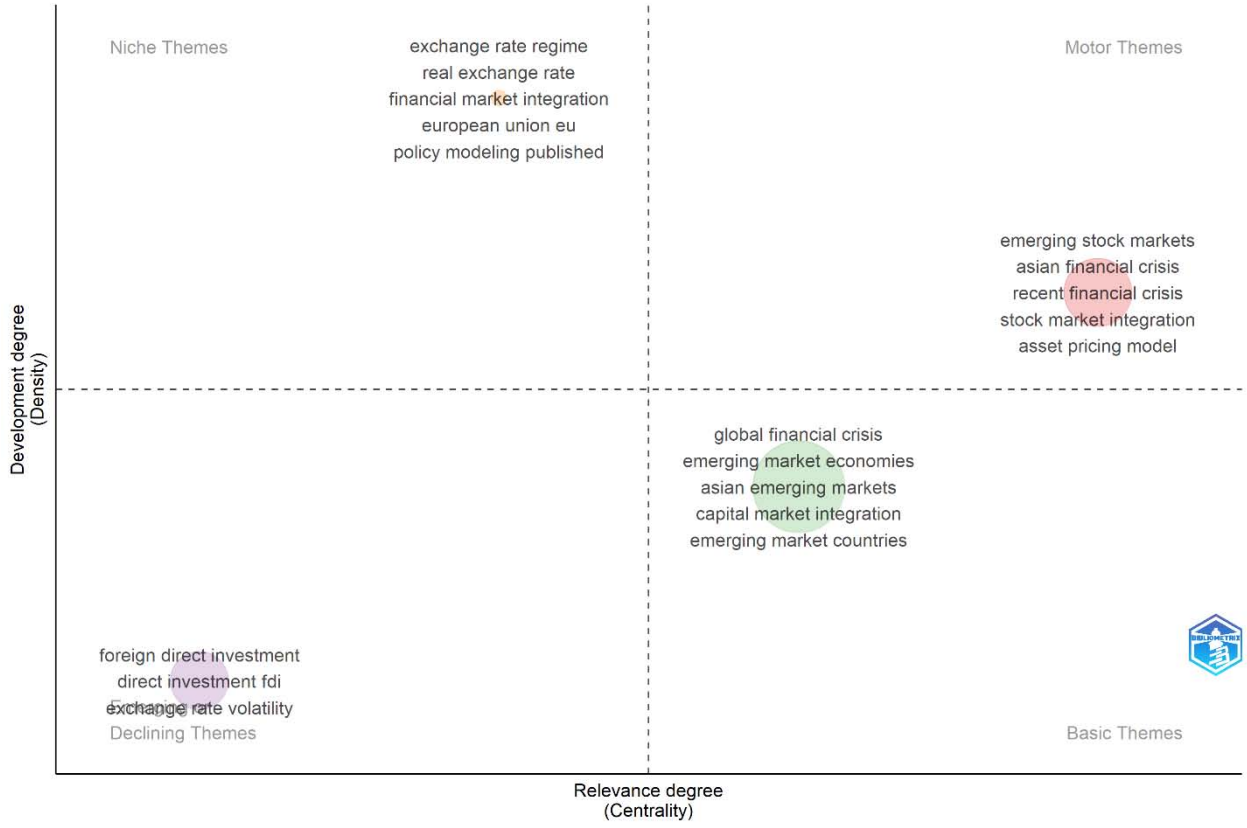

Figure 7, Development degree of the main clusters by keywords

As we can observe in **Figure 7,** the key or central clusters are emerging markets, financial contagion, and market integration in the basic themes category, which is characterized by a high level of centrality and density. It can be argued that these are the main topics of interest for the literature concerning asset pricing. It can also be noted that the size of the bubble is related to the occurrences of the topic or theme within the cluster. Hence, we can observe that the themes in question are indeed a quite researched subject. Additionally, the second relevant cluster identified pertains to the themes of financial contagion and crisis, systemic risk, and asset pricing models clusters or themes. The aforementioned themes are located within the motor themes category, which are characterized by high centrality and high density, and can be considered as driving themes that are central to the discipline. At the same time, we note the presence of volatility within the declining themes quadrant.

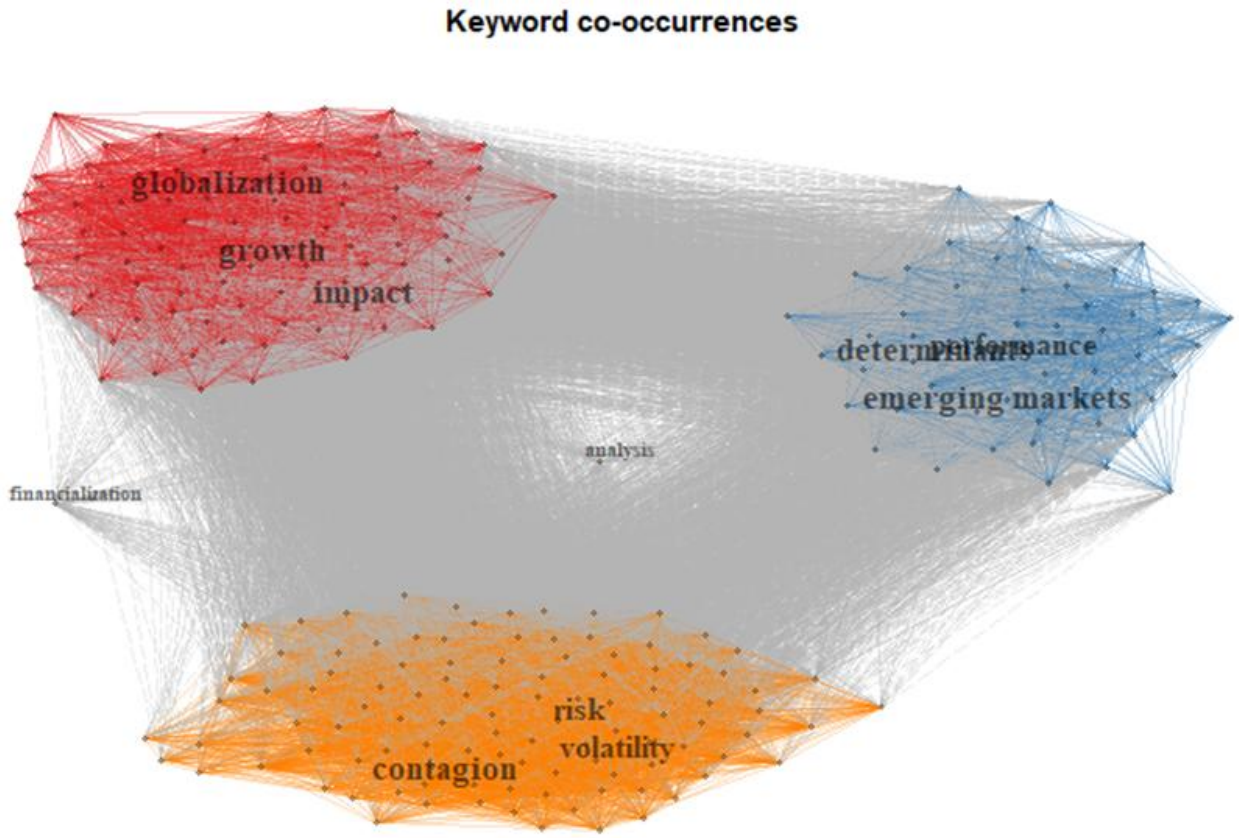

Figure 8, Keyword co-occurrences for the main clusters identified

This tendency is also evident in **Figure 8,** which showcases how most of the other topics and keywords fall within the broader categories previously discussed and how the existing literature has largely developed around these main directions. With this in mind, we have decided to expand the thematic evolution identification process by employing all the keywords of the selected articles and papers contained within the given database. Furthermore, to better capture the continuous evolution of the topics, as well as the emergence of new topics, which is largely influenced by various factors such as crisis episodes, we have also decided to employ four different time spans. Thus, the main time spans or frames employed are the following:

Table 1, The four time spans employed to investigate the thematic evolution

Period	Years	Economic and Literature Contexts
1. Pre-globalization and the early market integration phase	1980–2006	Expansion of empirical finance; emerging markets literature; pre-crisis risk modeling (with the ARCH/GARCH expanding popularity, the main thesis of EMH contested and debated)
2. The "Global Financial Crisis" of 2007-2011 and immediate aftermath	2007–2012	Focus on the impact of contagion, systemic risk, volatility spillovers, financial stability, and financial links
3. Post-crisis reform and the unconventional policy era of QE and ZIRP/NIRP	2013–2019	Studies on the impact of QE, macroprudential policy, interconnectedness, the emergence and the rise in popularity of cryptocurrencies, and market microstructures
4. Pandemic shock and the episodes of geopolitical turbulence	2020–2025	COVID-19 shock, digital finance, sustainability, green finance, geopolitical events, and the resulting volatility

To analyze the evolution of research themes within the asset pricing literature, the bibliometric investigation adopts a time segmentation strategy based on four distinct time spans, summarized in **Table 1**. This segmentation reflects major structural breaks in the global financial system that shaped how risk, uncertainty, and cross-market interactions are conceptualized and modeled from both theoretical and empirical approaches. Given that bibliometric clustering captures thematic intensity and co-occurrence patterns, meaningful interpretation requires anchoring these patterns within the economic context. The first period, spanning 1980–2006, corresponds to the pre-globalization and early market integration phase. This era is characterized by the consolidation of modern empirical finance following the development of various extensions of the highly acclaimed CAPM and the emergence of multifactorial asset pricing models. Additionally, the expansion of emerging markets research, alongside early investigations into international portfolio diversification and market comovements, reflects a growing recognition and interest in cross-border capital flows. At the same time, the increasing popularity of ARCH and GARCH type of models signals a shift toward modeling conditional heteroskedasticity and towards the acknowledgment of the impact of "stylized facts", challenging the Efficient Market Hypothesis. Moreover, the literature in this period predominantly treats risk as quantifiable and stationary, while the concept of uncertainty was largely ignored.

The second period, covering the 2007–2012 period, is defined by the emergence of the "Global Financial Crisis" of 2007-2011 and its immediate aftermath. This episode represents a profound rupture in both financial markets and the academic literature. The crisis exposed the limitations of pre-crisis risk models, particularly their inability to capture systemic risk, the nonlinear evolution of the contagion effect, and the amplification mechanisms that have been developing via the process of market integration. As a result, the literature experienced a sharp thematic shift toward market integration, volatility spillovers, network structures, and lastly, contagion dynamics. Risk is no longer treated as an isolated phenomenon but as a system-wide construct, increasingly sensitive to feedback loops and tail dependencies. This period marks a transition from a predominantly risk-based approach towards various settings where the concept of uncertainty becomes more relevant or even central.

The third period, spanning 2013–2019, corresponds to the post-crisis reform era and is characterized by the widespread use of unconventional monetary policy instruments. Central banks adopted large-scale asset purchase programs alongside prolonged zero interest rate policies (ZIRP), where nominal policy rates are maintained at or near zero rates, while in several cases, policymakers resorted to negative interest rate policies (NIRP), under which policy rates fall below zero in an effort to stimulate lending and risk-taking when conventional tools are exhausted. These regimes fundamentally altered the asset pricing environment by compressing discount rates, weakening the traditional risk–return relationship, and structurally reducing yields across asset classes. As a consequence, the literature increasingly documents a systematic search for yield, both

across alternative assets and across markets, with capital flows extending toward emerging and frontier financial markets. Asset pricing research during this phase places greater emphasis on the role of monetary policy transmission, global liquidity cycles, regulatory constraints, market structure, and the measurement of market integration as key drivers of asset prices and risk premiums. At the same time, the emergence of new asset classes, most notably cryptocurrencies, further challenges standard valuation frameworks and the notion of intrinsic value. Overall, this period reflects a growing recognition that asset prices are shaped not only by market fundamentals, but also by persistent policy regimes and institutional constraints operating through global financial and market integration.

The fourth period, spanning 2020–2025, is defined by overlapping global shocks, beginning with the COVID-19 pandemic and extending into geopolitical tensions, supply-chain disruptions, and even climate risks. This period is characterized by extreme levels of uncertainty, rapid regime shifts, and the increasing prominence of sustainability and ESG considerations in asset pricing. It can also be argued that the time period reflects a growing emphasis on non-financial risk sources, digital finance, and the interaction between economic, political, and environmental shocks. Unlike earlier phases, uncertainty in this period is of high interest for the economic environment, reinforcing the need for frameworks that move beyond traditional risk measures that ignore the concept of uncertainty.

Taken together, these four periods provide a coherent structure for investigating how the asset pricing literature evolves in response to constantly evolving economic realities. By aligning bibliometric analysis with historically grounded structural drivers, the study ensures that observed thematic transitions reflect genuine intellectual shifts rather than consequences of data segmentation. Thus, this temporal approach serves as a valid foundation for interpreting the clustering results while also showcasing the evolution of the themes in the literature on asset pricing. Thus, the division of the thematic evolution investigation into four broad time frames can be justified by the abundance of events, both geopolitical and economic, that have occurred. At the same time, the occurrence of the aforementioned elements not only contributed to the direct evolution of the broader economic aspects but has also left a lasting impact on the existing literature by shifting the attention to newer emergent topics and themes. With this in mind, for a visual confirmation of the aforementioned considerations, we will return to the graphical results obtained for the thematic evolution analysis, which can be viewed in **Figure 4.**

Considering the main results obtained after the implementation of the thematic evolution analysis and according to the selected time frames, we can observe a rather robust and logical evolution that is largely shaped by both the events and conditions that dominated the economic landscape at a given time, and also by the shifting interest of the academic world towards various topics that range from asset pricing and globalization to trade policies, financial crisis and financial contagion. Moreover, we can observe that the dominating themes in each time frame are closely aligned with the aforementioned elements. For instance, for the first time frame of 1980 to 2006, we note the predominance of market integration, financial globalization, and emerging markets. While at the same time, we note the appearance of the financial crisis topic, which can be owed to the various crisis episodes of Latin America and other developing countries, as well as the Dot-Com bubble burst. Followed by the 2007-2012 period, which is dominated by the themes of financial crisis, financial contagion, emerging markets, and, to a certain degree, by the topic of market integration. Followed by the 2013-2019 frame, where we note the appearance of themes such as systemic risk, bond markets, and the European Union, which can be attributed to the impact of the Sovereign Debt Crisis of 2013. Lastly, the 2020-2025 period is dominated by fewer topics, which can be arguably considered a direct evolution or a direct focus succeeding the previous time frame. The topics in question revolve around the issues of pricing, economic growth, and emerging markets, thus signaling an increasing interest in such topics.

Building on these observations, the importance of the identified thematic developments is further investigated through the application of network-based clustering techniques to the co-occurrence structure of keywords. In order to capture the conceptual architecture underlying the thematic evolution described above, the analysis relies on community detection methods applied to the All Keywords field, which integrates both author keywords and Keywords Plus, thus providing coverage of both intentional and emergent terminology within the literature. Before clustering, the database was subjected to a systematic cleaning procedure, as previously described. The identification of thematic clusters is conducted primarily using the Louvain method, which optimizes modularity to detect densely connected clusters within weighted networks and is widely employed in bibliometric research due to its computational efficiency and interpretability. To assess the stability of the resulting cluster structures, a complementary analysis using the Spinglass method is performed as a robustness check. The high degree of concordance observed between the two methods suggests that the detected thematic configurations are structurally stable and not driven by properties that pertain to the algorithms themselves. Given this consistency, the discussion of results is based on the Louvain partition, while the Spinglass outcome serves to validate the persistence and coherence of the identified communities.

To ensure methodological consistency across algorithms and time periods, identical parameter settings are employed throughout the clustering and thematic evolution procedures. These settings govern keyword selection thresholds, cluster formation criteria, weighting schemes, labeling conventions, and the temporal segmentation highlighted in **Table 1**. Moreover, the complete set of methodological settings, including the clustering parameters and the selected temporal breakpoints, are reported in **Appendix 2**, while the main text focuses on the economic interpretation of the results. Given the thematic evolution, we will further proceed to investigate the development degree for each of the time frames employed by using a clustering approach using the Louvain method. The development degree represents the current level of evolution of the existing literature, as well as the trajectory of various topics identified within the existing literature, across time. In line with standard bibliometric practice, the map is constructed along two dimensions: internal cohesion, captured by density, and external relevance, captured by centrality. Together, these dimensions allow for the classification of themes according to their level of development and their structural relevance within the broader research domain.

Themes that are located in the lower-left quadrant are classified as emerging themes, characterized by low density and low centrality. These topics remain weakly developed and only marginally connected to the core literature, yet they represent potential avenues for future research as they gradually gain scholarly attention. The lower-right quadrant captures fundamental themes, which display high centrality but relatively low internal development.

The upper-left quadrant shows the niche themes, which are internally well-developed but remain peripheral to the main research streams. These themes are typically specialized and specific, adding additional depth to the literature. Finally, the upper-right quadrant contains motor themes, defined by both high density and high centrality. These themes form the intellectual backbone of the field, driving research agendas and shaping its evolution through their strong internal structure and extensive connections to other topics. Overall, the development degree highlights a literature organized around a limited set of highly developed core themes, complemented by peripheral, emerging, and foundational topics that collectively signal both consolidation and diversification in ongoing research. The investigation starts with the analysis of the first-time frame employed, which covers the 1980-2006 period, and can be observed in **Figure 9**.

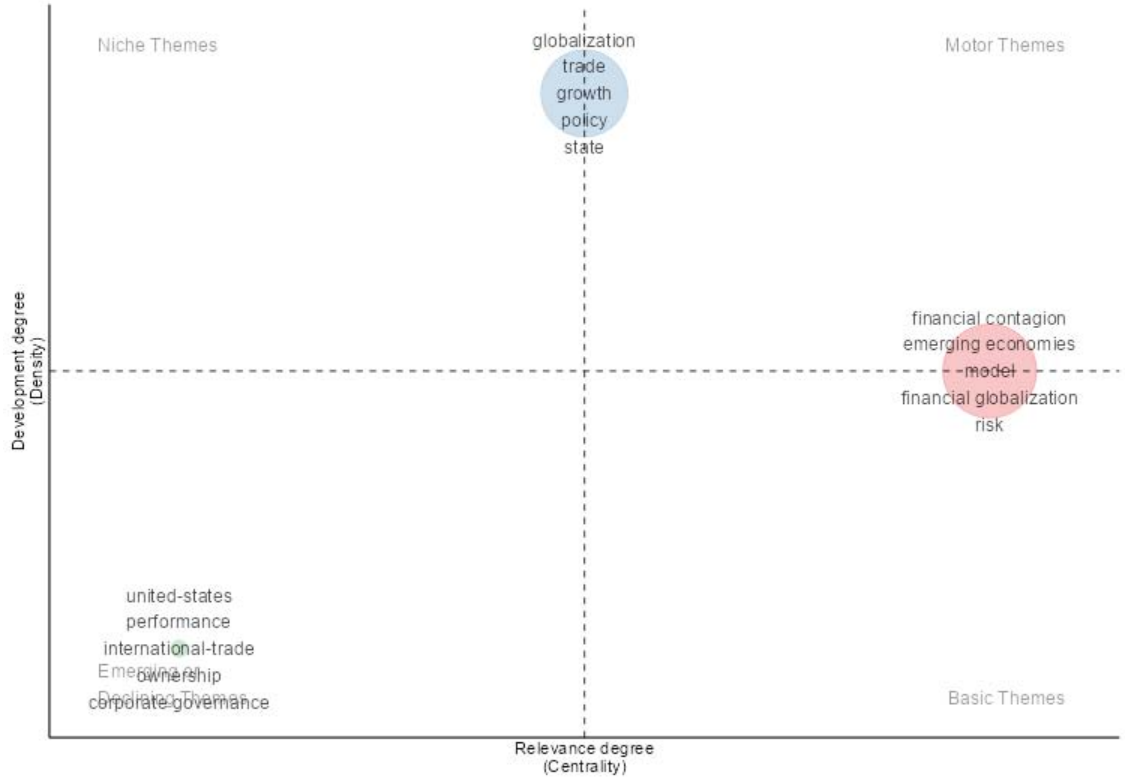

Figure 9, Development degree of the main clusters for the 1980-2006 period, using the Louvain method

As can be observed from the resulting graph, we note several relevant themes. For instance, the presence of financial contagion, emerging markets, and financial globalization as basic themes, followed by the appearance of the globalization, trade, and economic growth and policy within the niche themes, suggests a broader focus on the trade and liberalization elements combined with the effects of market integration that dominated the period. The financial contagion theme reflects the interest of scholars and researchers in identifying the downside of the integration process. Other relevant themes can be spotted in the emerging theme category, namely, we note the international trade and corporate governance themes as central to the ongoing development of the existing literature at the time. With this in mind, we will proceed to investigate the succeeding time frame of 2007-2012.

The results obtained for the second time frame are reported in **Figure 10** and suggest a rather different evolution when compared directly against the first time frame investigated. It can be argued that this evolution of themes can be attributed to the impact of the GFC of 2008-2012.

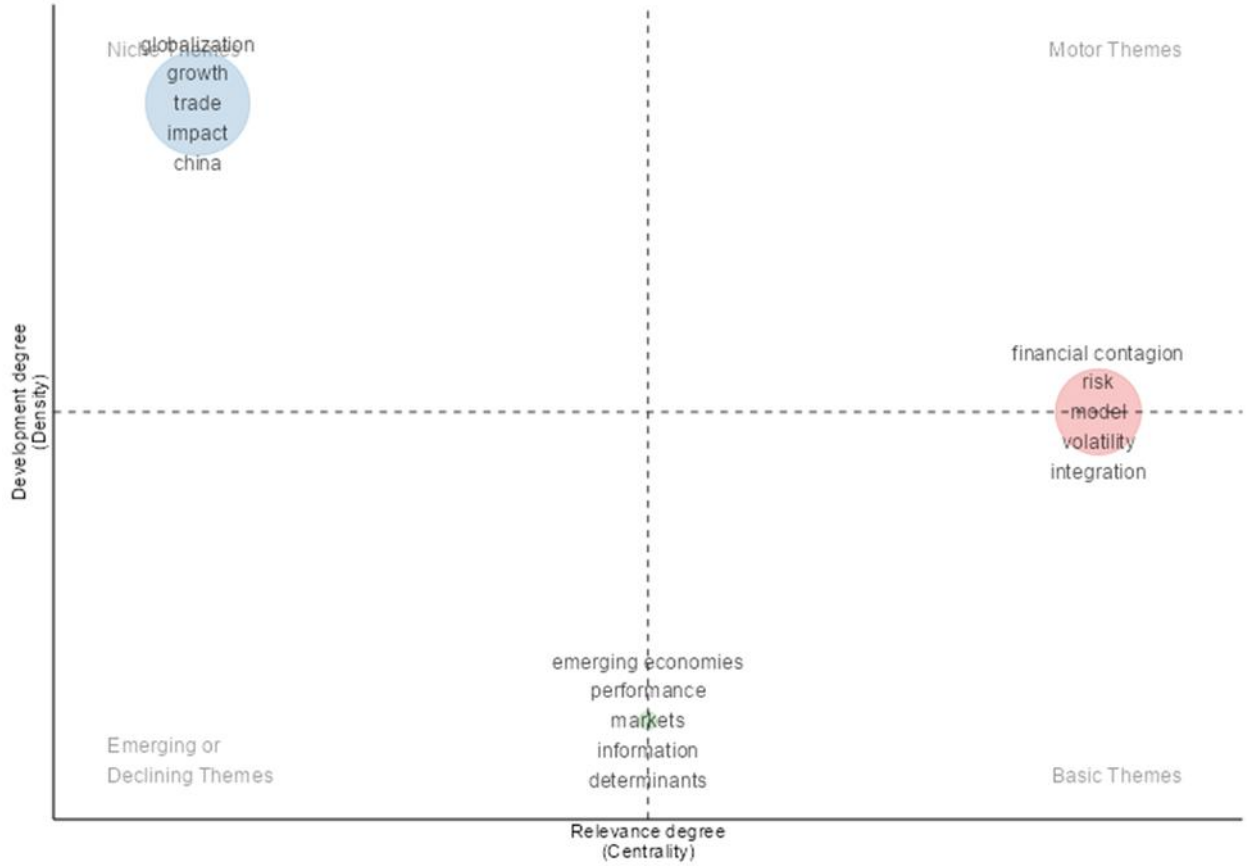

Figure 10, Development degree of the main clusters for the 2007-2012 period, using the Louvain method

As previously mentioned, the results obtained for the second time frame suggest a refocus from the theme environment of the previous period of time. We consider that, given the selected time frame, the main focus of the literature, at this stage, largely revolved around the GFC of 2008-2012 and the resulting global fallout. As such, we observe that the main themes are contained within the basic theme and motor theme categories. With the financial contagion, systemic risk, integration, and volatility dominating the basic themes categories, and thus reflecting the large focus on the impact of the "Global Financial Crisis". While other themes such as globalization, trade, and economic growth dominate the niche themes, arguably signaling the reduced interest of researchers in this particular cluster. Given the results obtained for the second time period investigated, we will further proceed to investigate the third time frame of 2013-2019.

The results obtained for the investigation of theme development for the third time frame are reported in **Figure 11,** and it can be argued that the main themes identified reflect the interest of the literature and the general interest of the public in the ongoing economic events, such as the Sovereign Debt Crisis.

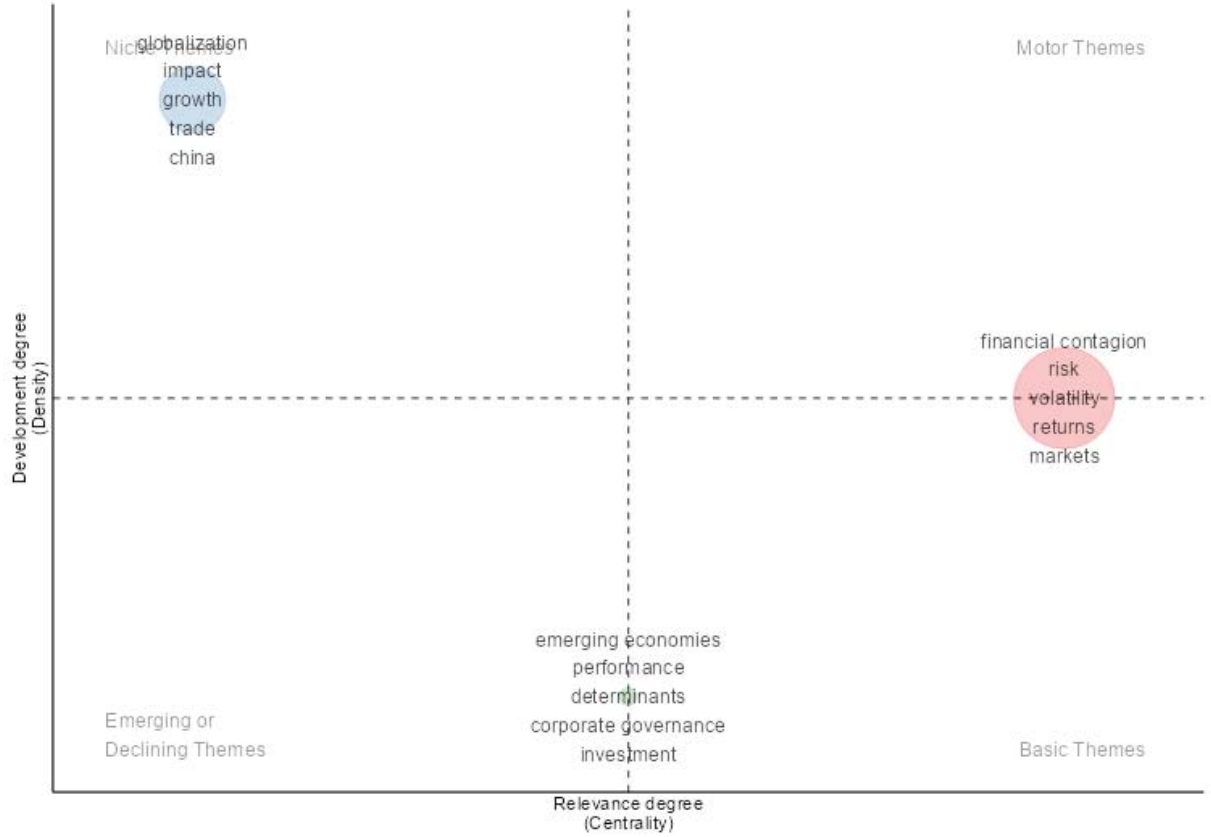

Figure 11, Development degree of the main clusters for the 2013-2019 period, using the Louvain method

For the third time frame employed, we can observe the dominance of the main themes that pertain to financial contagion, risk, volatility, and financial markets, both emerging and developed. While at the same time, we note the emergence of the corporate governance cluster, which indicates the increased attention towards the topic of ESG. Furthermore, we note that the interest in the clusters of economic growth, trade, and the globalization process itself remains as key elements within the niche category. Albeit at a lower intensity than in the previous time frame investigated. With this in mind, we will further proceed to investigate the last time segment left, covering the period of time of 2020-2025, the results for which are reported in **Figure 12.**

It can be argued that the results obtained for the development degree of the main clusters for the 2020–2025-time frame are influenced, to a certain degree, by a plethora of endogenous and exogenous shocks, combined with various geopolitical developments and policy responses that have greatly influenced and shaped the economic landscape of today.

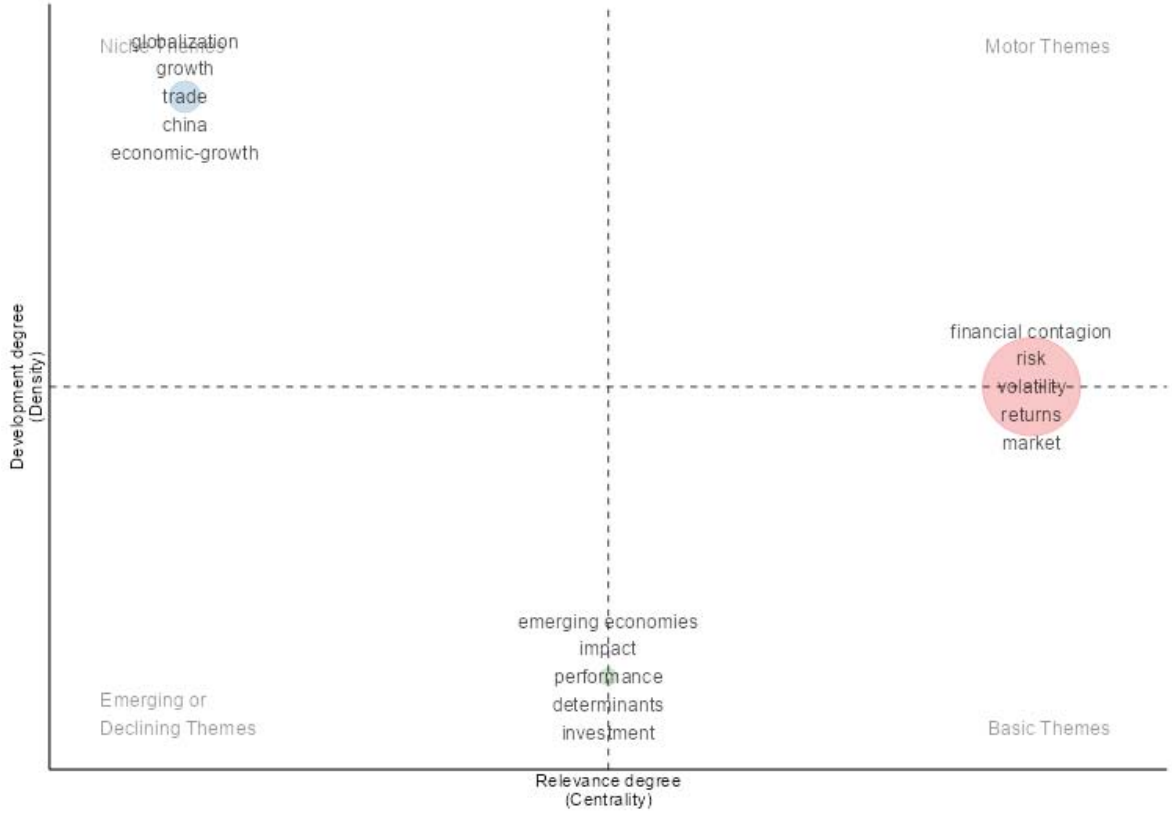

Figure 12, Development degree of the main clusters for the 2020-2025 period, using the Louvain method

For the last time frame employed, we can observe that the impact of exogenous and endogenous shocks has contributed to the development of themes such as systemic risk, volatility, and the theme of financial contagion. This can be attributed to the general uncertainty that dominates the last time frame employed, which is characterized by endogenous and exogenous shocks on the one hand, while ongoing geopolitical events and discourse may also contribute significantly on the other hand. Nevertheless, we also note the absence of the ESG topic or theme, which arguably gained substantial traction with themes such as corporate governance, social responsibility, and corporate social responsibility, which are constantly evolving and developing over this particular time frame.

Given the previous results regarding the development degree of the main clusters, obtained by using the Springlass method, we have also decided to expand our bibliometric approach by also employing the Louvain method. This augmentation of the existing results serves two main purposes: on the one hand, it allows for a comparison between the methods and a robustness check, while on the other hand, it allows for a natural expansion of the bibliometric investigation conducted. Thus, to ensure comparability, we will maintain the same structure and division in various time frames, as used in the Springlass approach. As such, the results obtained under the Springlass methodology approach begin with the first selected time frame, namely the one covering the 1980-2006 period, for which the results obtained are reported in **Figure 13.**

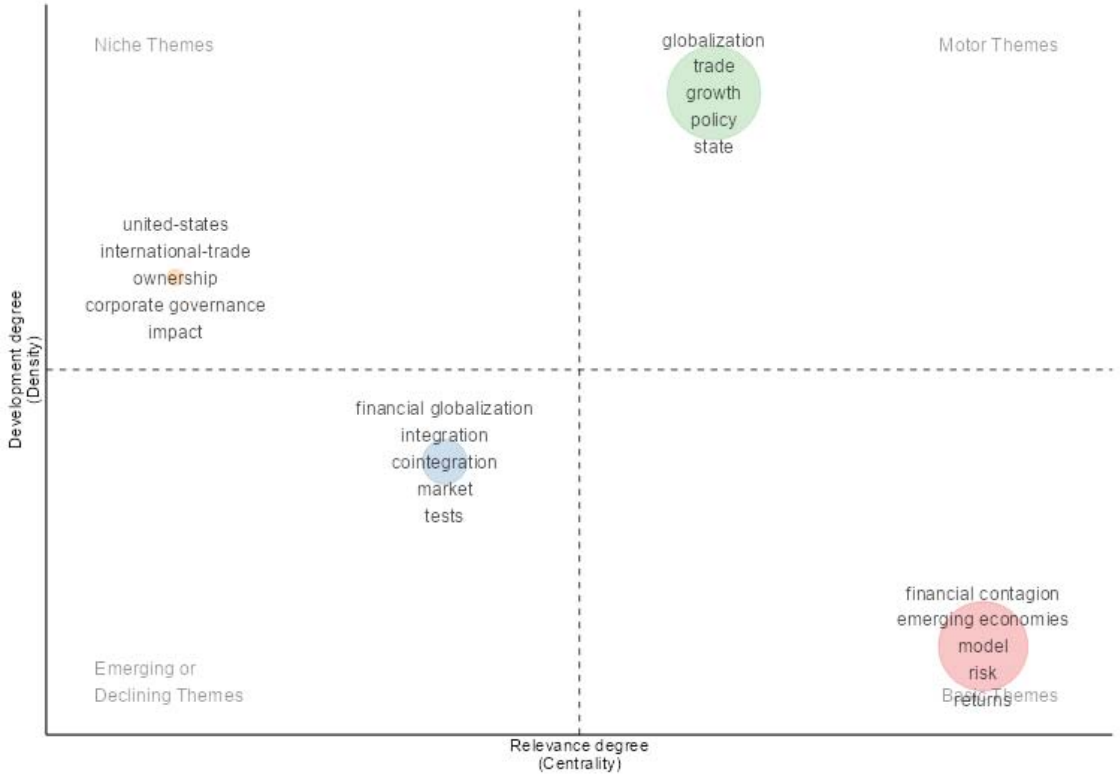

Figure 13, Development degree of the main clusters for the 1980-2006 period, using the Springlass method

The results obtained under the Springlass approach indicate a concentration of basic themes such as financial contagion, emerging economies, risk and returns, followed by the presence of themes such as financial globalization, market integration, and cointegration as emerging themes. It can be argued that the results obtained for this particular time frame capture both the concentration of papers in the aforementioned themes, as well as the general interest of the academic community towards the process of globalization and its advantages and disadvantages. This can also be showcased by the presence of themes such as globalization, trade, economic growth, and economic policy within the motor themes category.

While at the same time, the impact of various endogenous and exogenous shocks across the globe, in both developed and emerging markets, remains the most relevant and highly concentrated topic. This can be argued in light of certain events, such as the Dot-Com Crash, the Asian Financial Crisis, and other similar episodes that occurred around various emerging markets, such as sovereign debt defaults, as in the episode of the Russian Financial Crisis and default on ruble-denominated bonds in 1998, followed by other endogenous and exogenous shocks.

We also note the appearance of several relevant niche themes, such as ownership and corporate governance, which arguably may indicate the beginning of academic interest towards this segment of the literature, which, at a later stage, evolve into the ESG concepts known today. With this in mind, we will proceed to showcase and discuss the results obtained for the 2007-2012-time frame, within the Springlass method. The results obtained are reported in **Figure 14.**

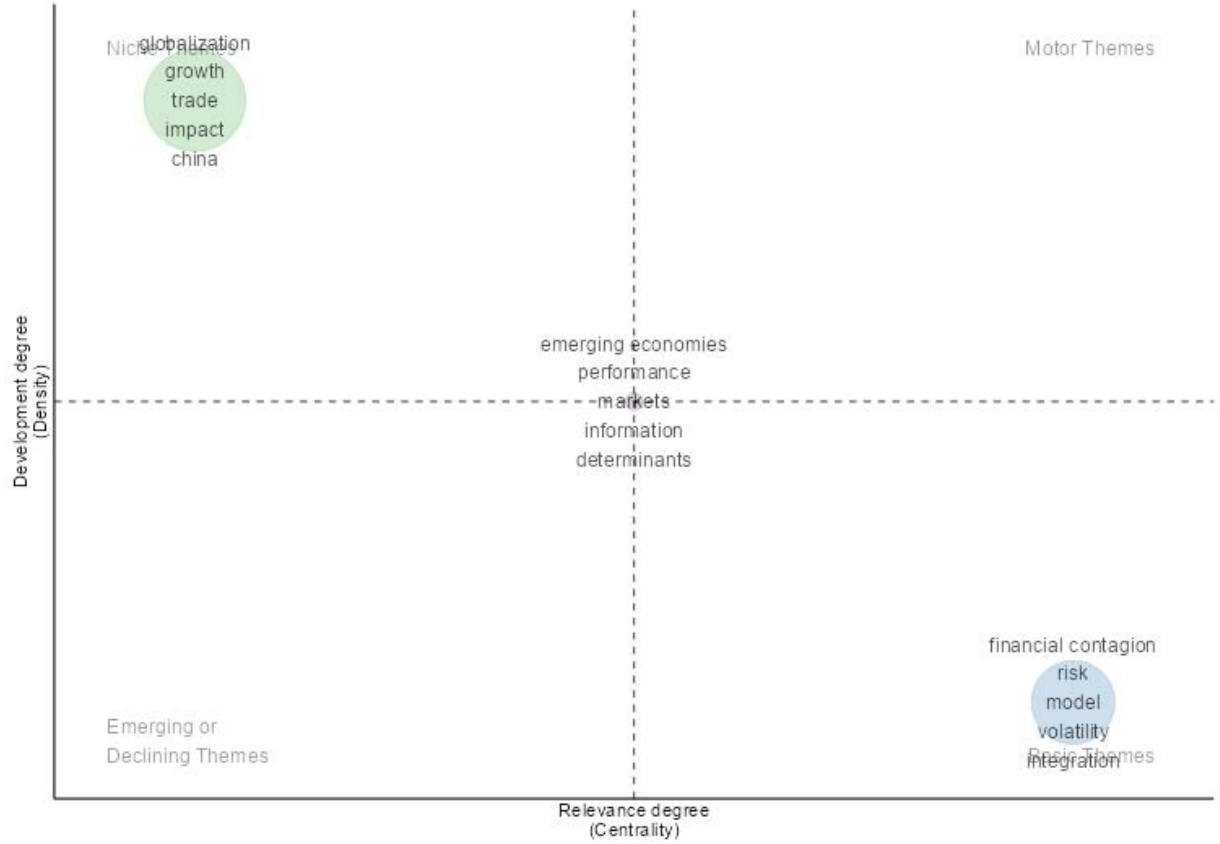

Figure 14, Development degree of the main clusters for the 2007-2012 period, using the Springlass method

The results obtained for the 2007-2012-time frame can be observed in **Figure 14.** We note that the Springlass approach operates a minimization of the existing themes in clusters that are ordered by the relevance of the topic for that particular time frame. As such, we note that the basic themes for the 2007-2012-time frame are strongly related to the "Global Financial Crisis" of 2007-2011, on the topics of contagion, risk, and excess volatility. At the same time, we notice the presence of the integration topic as a basic theme, suggesting the growing interest of the academic community in how the process of market integration itself can act as a net transmitter of volatility during periods characterized by the presence of endogenous and exogenous shocks. While for niche themes, we observe the topics of globalization, economic growth, trade, and economic impact. Arguably, the topics reflect the impact of the financial crisis on various regions and the destruction of capital that followed. While the topic of economic impact may represent the negative consequences of the financial crisis on several countries and also the immediate shock succeeding the GFC, which is represented by the Sovereign Debt Crisis, which is arguably a shock that occurred exclusively within the European Union. Moreover, the results obtained manage to capture the main topics that dominate the literature of the time frame investigated. Moreover, we can observe that the results obtained are concentrated towards a handful of dominant clusters, which can suggest the relevance and significance of these particular clusters for the asset pricing literature.

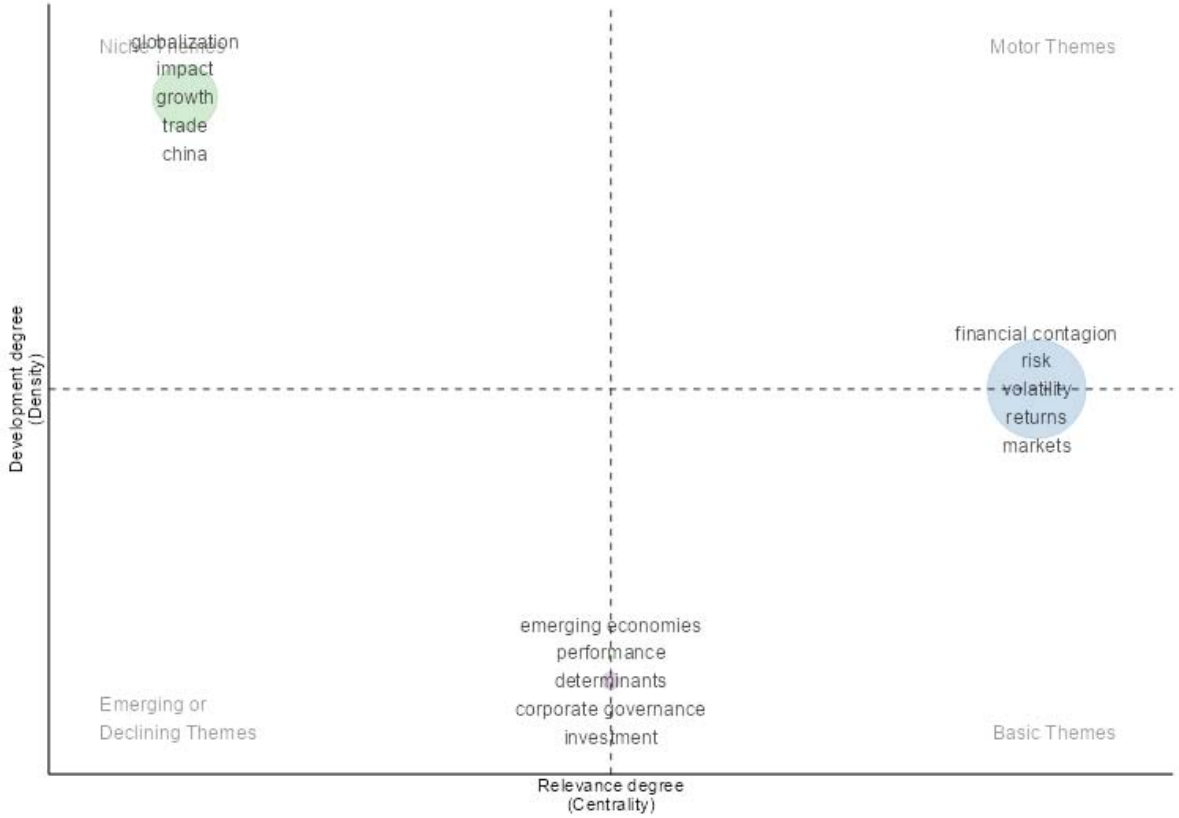

Figure 15, Development degree of the main clusters for the 2013-2019 period, using the Springlass method

The results obtained for the third time frame employed under the Springlass methodology can be observed in **Figure 15.** We observe the dominance of various themes, such as the financial, risk, volatility and contagion themes that are highly central and also share a high degree of density, which arguably indicates that the impact of the "Global Financial Crisis" of 2007-2011 increased the interest of the academic community and of the investing public towards the investigation of risk and the contagion effect as well. We also observe the occurrence of the emerging markets theme within the basic themes category, while the topics of globalization, economic impact, and economic growth are located within the niche category.

Lastly, we observe the emergence of the ESG segment of the literature with themes such as performance, investment, and corporate governance. What is also relevant for our study is the dominance of the contagion effect theme, which was previously identified, suggesting that the topic of contagion remains a permanent research subject and often resurfaces in the wake of large endogenous or exogenous shocks that, given the impact of this particular effect, have a global reach.

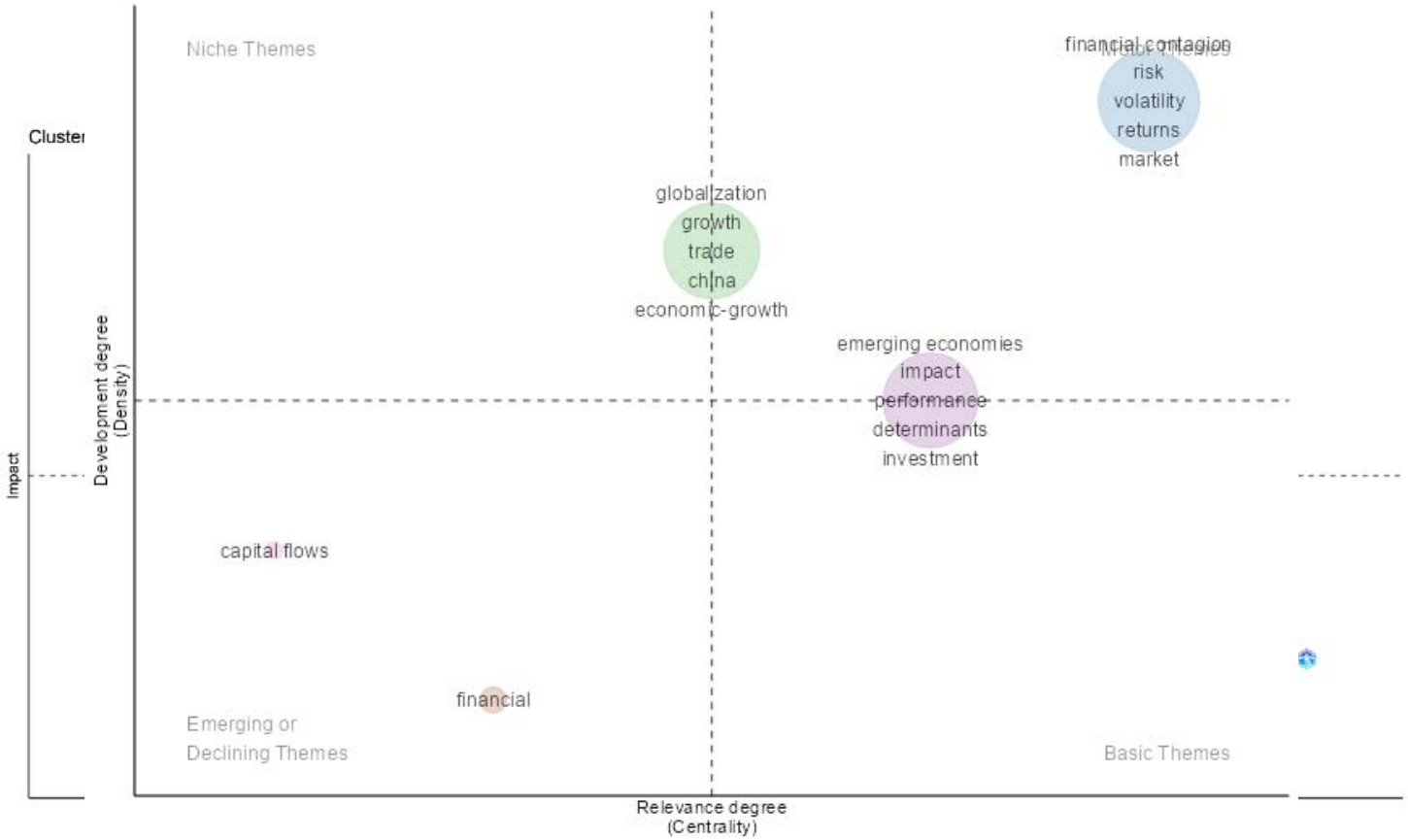

Figure 16, Development degree of the main clusters for the 2020-2025 period, using the Springlass method

The results obtained for the last time frame employed under the Springlass methodology can be observed in **Figure 16.** We observe that the main clusters identified are largely oriented towards the topics of financial contagion, risk, volatility, and returns, which are located within the motor theme section. This cluster is followed by globalization, economic growth, and trade, which have been identified as both niche and motor themes. The topics of emerging markets, performance, and determinants that deal with the formation of the risk premium fall within the basic themes category. We also observe that the Springlass approach provides similar results as the Louvain method. While at the same time, confirming the main findings, we observe that the Springlass method manages to also capture certain additional themes that are related to adjacent topics, hence allowing for a better interpretation of the academic interest in certain topics within the selected time frame.

Additionally, the dual use of the Louvain and the Springlass methods allows for more relevant insights to be drawn and to better understand the most relevant themes that dominate or influence the literature. We also note the failure of the methods to better identify and capture other relevant clusters and themes, one of the most important being the emergence of the ESG theme, which represents a major and highly impactful theme. Given the results obtained for the development degree of the main clusters with both the Springlass and the Louvain methods, we will further proceed to investigate the centrality and impact of the main themes and topics that relate to the subject of this paper. To approach this task, we have employed the clusters by document coupling tool nested within the "bibliometrix" package. Hence, the main results obtained from this analysis are presented in **Figure 17.**

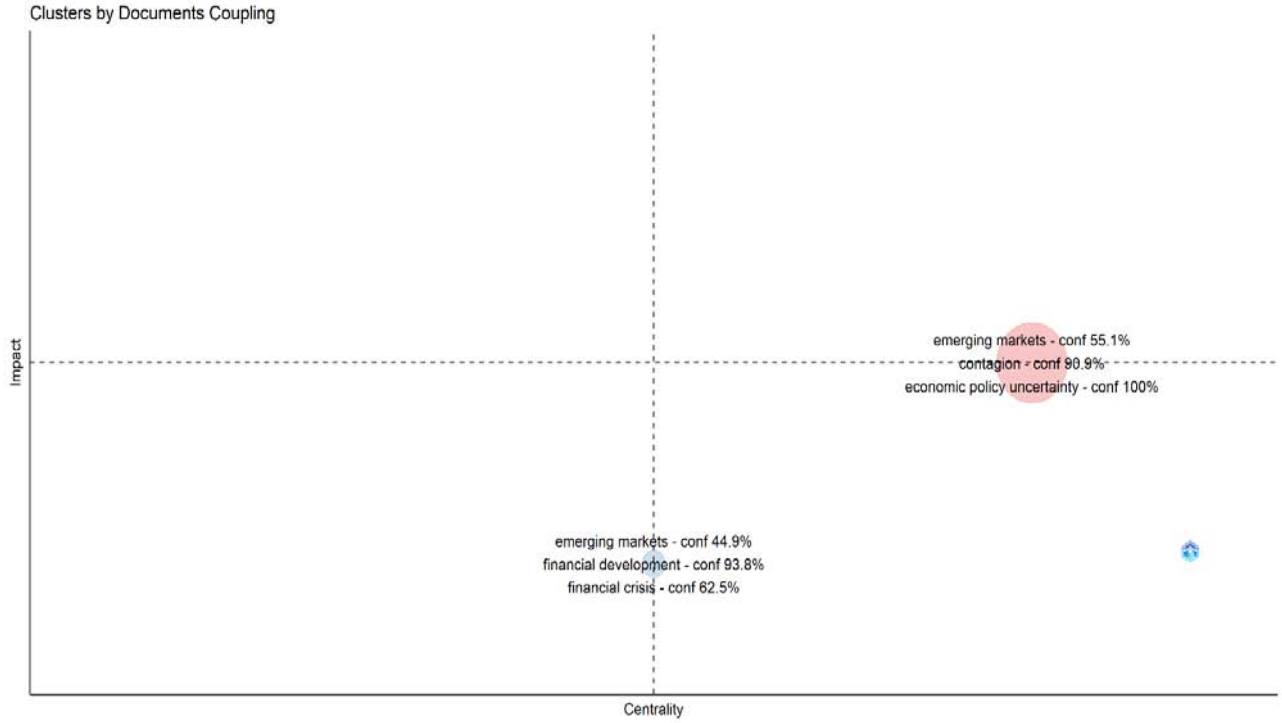

Figure 17, Most relevant themes identified using the clusters by document approach

The result obtained after applying the cluster by document analysis across the literature database employed indicates the dominance of six main themes. We further argue that most secondary or adjacent themes that have been previously identified and debated can also be placed under the umbrella of the six main themes or categories shown in the clusters by document analysis. Furthermore, we consider that the main themes identified are not only central to the literature regarding the topics of asset pricing but are also the pillars of this discipline. The clusters identified, namely emerging markets, financial development, financial crisis, contagion, and economic policy uncertainty, manage to reflect distinct yet interlinked research paths. The high centrality of topics such as financial development and financial crisis indicates their foundational role in linking different areas of the literature, while the strong impact of clusters like contagion and economic policy uncertainty suggests that these themes are at the forefront of recent academic interest. The presence of emerging markets across both axes underlines its bridging role between traditional financial studies and newer debates surrounding uncertainty and systemic contagion effects.

Before concluding the bibliometric investigation concerning the evolution of the literature, we have also decided to inspect the most relevant ten papers, by citations, for the overall collection of data, and for the time slice or time frame division previously showcased. In addition, a brief description related to the main contributions, results, methodologies, and considerations for the aforementioned top ten papers will be included. Hence, we will begin by exploring the top ten most relevant papers, by number of citations, for the overall time frame, which covers the 1980-2025 period.

Table 2, The top ten most relevant papers by citation, for the 1980 – 2025 period

Paper	Author	Number of Citations
Better to Give than to Receive: Predictive Directional Measurement of Volatility Spillovers	Diebold and Yilmaz (2012)	3650
No Contagion, Only Interdependence: Measuring Stock Market Comovements	Forbes and Rigobon (2002)	2402
Location, Competition, and Economic Development: Local Clusters in a Global Economy	Porter (2000)	2396
The China Syndrome: Local Labor Market Effects of Import Competition in the United States	Autor, Dorn, and Hanson (2013)	1891
Does Globalization Affect Growth? Evidence from a New Index of Globalization	Dreher (2006)	1879
Financial Contagion	Allen and Gale (2000)	1866
The Information Content of Stock Markets: Why Do Emerging Markets Have Synchronous Stock Price Movements?	Morck, Yeung, and Yu (2000)	1714
Opaque Financial Reports, R2, and Crash Risk	Hutton, Marcus, and Tehranian (2009)	1637
The Nature and Growth of Vertical Specialization in World Trade	Hummels, Ishii, and Yi (2001)	1501
How Does Insertion in Global Value Chains Affect Upgrading in Industrial Clusters?	Humprey and Schmitz (2002)	1445

Starting with the works of Diebold and Yilmaz (2012), who investigate the issue concerning the volatility spillover which occurs in financial markets, by focusing on the US stock market, bond market, foreign exchange, and, lastly, the commodities market. The selected methods to investigate volatility spillover are the use of a generalized vector autoregressive framework, which aims to identify the total and directional volatility spillovers among the aforementioned markets. The results and contributions nested within their paper showcase the impact of the market volatility spillover, underlining the importance of volatility spillovers from key stock markets to other types of markets, such as the bond market, during periods that are characterized by the presence and impact of various endogenous and exogenous shocks. The following paper of Forbes and Rigobon (2002) deals with questions related to market comovements and market correlation, while also investigating the impact of certain endogenous and exogenous shocks. Their study aims to indicate whether contagion, which is often the result of various crisis episodes, influences the level of market correlation. Nevertheless, the results obtained after investigating this issue in various scenarios, such as the 1997 Asian crisis, the 1994 Mexican Devaluation shock, and, lastly, the 1987 US Market crash, indicate that the contagion effect is not the main driver of comovements, but rather, as the authors note, interdependence.

While the work of Porter (2000) debates and argues that the ever-changing economic landscape that is shaped by the process of globalization is still characterized by the presence of clusters of various economic conglomerates and sectors that appear to be almost exclusive to developed economies. This development of large financial centers within developed economies or markets can also be traced to the dominance of financial hubs or centers. While the paper of Autor, Dorn, and Hanson (2013) deals with the impact of globalization and open markets on the American economy. This study also underlines the increased development of the Chinese economy and how, via the mechanisms of globalization combined with a general outsourcing policy of major companies, developing economies can become manufacturing-oriented hubs. At the same time, another element related to the impact and effects of globalization is debated within the work of Dreher (2006), who investigates the effects from a tridimensional approach, focused on economic,

political, and social integration. The results obtained indicate that overall, the impact of globalization is positive, as it favors economic growth within various regions and groups of countries.

Returning to the dominant theme related to contagion, we note that the work of Allen and Gale (2000) attempts to investigate the contagion effect from an equilibrium perspective. At the same time, the authors note the impact of uncertainty and the importance of institutions. Another relevant element pertaining to asset pricing is presented by Morck, Yeung, and Yu (2000), who investigate the impact of information on the pricing mechanism in both developed and developing financial markets. The results obtained indicate a given level of informational inefficiency within developing and emerging financial markets, in contrast to the higher levels of informational efficiency identified in developed financial markets. Similarly, Hutton, Marcus, and Tehranian (2009) investigate the impact of financial reporting practices and how an opaque financial reporting approach may signal an additional source of risk for investors, as companies with poor financial stability may cosmeticize their financial reports, and hence provide an additional source of risk. The study also focuses on the effects of the Sarbanes-Oxley Act, suggesting that management can hide less information in this new regulatory environment.

Additionally, the paper of Hummels, Ishii, and Yi (2001) focuses on the process of global integration explained through the volumes of trade. At the same time, the paper explores the process of vertical chains, which consider the import and export of various goods that are subsequently used to produce other final or intermediary goods for future export. Finally, the paper of Humprey and Schmitz (2002) debates the impact of globalized markets via their participation in global value chains, while at the same time, it provides insights related to the impact of this evolution on emerging markets and how participation in global markets influences risk, returns, and factor relationships. The result obtained for this initial analysis of the top ten most relevant papers, for the entire time frame employed, indicates the dominance of at least two main themes. First and foremost, the theme of contagion, which deals with the impact of various episodes and endogenous and exogenous shocks that have the potential to propagate among various financial markets, is followed by the theme of globalization and integration. We consider that the themes are highly connected, as the process of globalization and the general market and economy integration started in the 1980s and lasted until at least the early 2000s, which facilitated the spreading of the contagion effect and various market comovements on a global scale. Given this, we will continue to investigate the literature evolution by discussing the top ten most relevant articles for the 1980-2006-time frame.

Table 3, The top ten most relevant papers by citation, for the 1980 – 2006 period

Paper	Author	Number of Citations
No Contagion, Only Interdependence: Measuring Stock Market Comovements	Forbes and Rigobon (2002)	2402
Location, Competition, and Economic Development: Local Clusters in a Global Economy	Porter (2000)	2396
Does Globalization Affect Growth? Evidence from a New Index of Globalization	Dreher (2006)	1879
Financial Contagion	Allen and Gale (2000)	1866
The Information Content of Stock Markets: Why Do Emerging Markets Have Synchronous Stock Price Movements?	Morck, Yeung, and Yu (2000)	1714
The Nature and Growth of Vertical Specialization in World Trade	Hummels, Ishii, and Yi (2001)	1501
How Does Insertion in Global Value Chains Affect Upgrading in Industrial	Humprey and Schmitz (2002)	1445

Clusters?		
Is Group Affiliation Profitable in Emerging Markets? An Analysis of Diversified Indian Business Groups	Khanna and Palepu (2002)	1448
Global production networks and the analysis of economic development	Henderson et. al. (2002)	1341
Plants and Productivity in International Trade	Bernard et. al. (2003)	1290

The most relevant papers identified for the 1980 – 2006 time slice mainly address the impact of globalization and market integration across developed and emerging economies. While some papers have been previously discussed and identified within **Table 2,** we argue that the main themes covered by those papers mainly deal with the process of globalization. This result also indicates that the main motor themes for the 1980 – 2006-time slice are related to the process of globalization itself, while also discussing the impact of contagion and how the process of globalization may influence the volatility spillover across markets. To this end, we consider that the previously discussed papers of Forbes and Rigobon (2002) regarding the impact of market comovements and market correlation during periods of endogenous and exogenous shocks, followed by the papers of Allen and Gale (2000), and Morck, Yeung, and Yu (2000), reflect the growing interest of both academics and practitioners to the potential of volatility spillover and contagion that can occur under crisis conditions. We also argue that this increased level of interest can be attributed to the occurrence of various episodes of endogenous and exogenous shocks, such as the Dot-Com Crash of 2001 and the Asian Financial Crisis of 1997, within this time segment. While the papers of Porter (2000), Dreher (2006), Hummels, Ishii, and Yi (2001), and Humprey and Schmitz (2002) mainly focus on the impact of globalization, while at the same time considering its advantages and disadvantages that follow. Thus, reflecting the growing interest in the topic of globalization and market integration.

Furthermore, the newly added papers deal with a diverse selection of themes; for instance, the work of Khanna and Palepu (2002) debates the performance of diversified business groups in an emerging market context. While also trying to approximate the impact of the globalization process on their operations and profitability. The work of Henderson et. al. (2002) considers the implementation of a global production network framework to investigate certain aspects related to the consumption and production of various companies and firms in a globally integrated environment. At the same time, the authors also acknowledge the impact of globalization via the economic and geopolitical uncertainty that can impact the behavior of companies and also provide additional potential sources of risk for investors. Lastly, the paper of Bernard et. al. (2003) deals with the impact of globalization and international trade on the exports of various goods from the US. At the same time, the impact of monetary developments is considered in the form of a dollar appreciation, which leads to fewer exports and more imports.

The resulting shift in the most relevant literature of the 1980-2006-time frame reflects the main considerations of that time, which largely focus on the impact of globalization on domestic companies and their production. We consider that this identification is relevant, as it captures the impact of globalization and also reflects the concerns related to global competitiveness. We also note that this particular time frame is also marked by the process of outsourcing of production capabilities from developed markets towards developing and emerging ones, a process largely influenced by the low production and labor costs that are dominant in such markets. At the same time, the list of top ten papers confirms the interest regarding the impact of endogenous and exogenous shocks, which remains high, especially given the crisis episodes that have occurred during this time frame. Thus, given the picture that is shown by the most relevant papers identified for the 1980 – 2006-time frame, we will proceed to investigate the 2007–2012-time frame.

Table 4, The top ten most relevant papers by citation, for the 2007 – 2012 period

Paper	Author	Number of Citations
Better to Give than to Receive: Predictive Directional Measurement of Volatility Spillovers	Diebold and Yilmaz (2012)	3650
Opaque Financial Reports, R2, and Crash Risk	Hutton, Marcus, and Tehranian (2009)	1637
The external wealth of nations mark II: Revised and extended estimates of foreign assets and liabilities, 1970–2004	Lane and Milesi-Ferretti (2007)	1218
Is gold a safe haven? International evidence	Baur and McDermott (2010)	1170
The Case for Regional Development Intervention: Place-Based versus Place-Neutral Approaches	Barca, McCann, and Rodríguez-Pose (2012)	903
Index Investment and the Financialization of Commodities	Tang and Xiong (2012)	853
Trade liberalization, exports, and technology upgrading: Evidence on the impact of MERCOSUR on Argentinian firms	Bustos (2011)	809
Individualism and momentum around the world	Chui, Titman, and Wei (2010)	760
Ownership concentration, foreign shareholding, audit quality, and stock price synchronicity: Evidence from China	Gul, Kim, and Qiu (2010)	757
High idiosyncratic volatility and low returns: International and further US evidence	Ang et. al. (2009)	744

The results obtained after the identification of the top ten most relevant articles for the 2007-2012-time slice are reported in **Table 4.** As can be noted, two relevant papers that have been previously discussed reappear, namely, the work of Diebold and Yilmaz (2012), which deals with the impact of volatility spillover, followed by the paper of Hutton, Marcus, and Tehranian (2009), which presents the additional risk exposure that can be attributed to various reporting standard inefficiencies and issues. The dominance of the aforementioned papers within this time segment can be attributed to the impact and consequences of the "Global Financial Crisis" of 2007-2011, which resulted in extreme volatility spillovers on a global scale, and to the emergence of the contagion effect. At the same time, the opaque financial reporting and the opaque nature of the underlying derivatives that were at the base of this crisis episode have attracted a large amount of attention, as reflected by the paper of Hutton, Marcus, and Tehranian (2009).

Furthermore, we note the inclusion of additional papers that are relevant for this particular time-frame, starting with the work of Lane and Milesi-Ferretti (2007). The aforementioned paper examines the process of financial integration on a global scale, with close attention given to the scale and speed of the process itself. The main findings indicate that the process of financial integration follows a faster pace within developed financial markets or economies, while developing and emerging markets are lagging. Another relevant aspect discussed is the impact of various endogenous and exogenous shocks, such as financial crisis episodes. The main consequence of such episodes is the slowing of the process of financial integration. At the same time, the work of Baur and McDermott (2010) investigates the impact and performance of employing gold as a safe haven asset to hedge and anchor portfolios during various periods of time. The investigation also employs two distinct forms of the safe haven effect, namely the weak and strong forms. In the case of the weak form, gold does not move in a similar manner with other

assets, in effect being uncorrelated. While in the strong form, the performance of gold follows an opposite trajectory to most financial assets during periods of endogenous and exogenous shocks, being, in fact, anticorrelated to a given extent. Lastly, one concluding element draws attention to the limited impact of gold as a safe-haven asset in developing and emerging markets, where it recorded a rather subpar performance compared to developed markets.

The paper of Barca, McCann, and Rodríguez-Pose (2012) investigates the impact of globalization on the economic policy development at the regional level, and why it remains a relevant subject even under the impact of various effects and consequences that flow from the process itself. One key aspect worth considering is the clear significance and influence of various economic regions, especially in the case of the European Union, where regional development is also impacted by the economic status or development of the country, which can be either a developed or developing, or emerging economy. This issue is of utmost importance from both an economic and financial point of view, as we have previously observed when investigating the impact of market integration within the European cases. Continuing with the investigation of the papers, we will discuss the work of Tang and Xiong (2012), who investigate the impact of financialization on the commodity market. The results indicate that commodity prices have become more sensitive to financial shocks and portfolio readjustments rather than being driven solely by supply and demand fundamentals for the given commodity. From an asset pricing perspective, this integration of commodities into the broader financial system reduces their relevance as alternative diversification options or as potential hedges while introducing new channels of risk transmission. Moreover, the heightened volatility and cross-commodity correlation documented in their study reinforce the idea that uncertainty in financial markets spills over into various other markets, thus amplifying exposure to global risk factors. The paper of Bustos (2011) shows the benefits of regional trade agreements under the MERCOSUR trade agreement and how such free trade policies enhance both economic and firm performance. At the same time, the author argues that the potential benefits of free trade agreements, regional or otherwise, can also extend and positively impact the technological level of countries or regions that adhere to such agreements.

At the same time, the work of Chui, Titman, and Wei (2010) provides an explanation that is nested within the behavioral finance field regarding the returns of momentum strategies. The study also employs the individualism index of Hofstede (2011) to divide investors into two main groups: one with low levels of individualism and the other with high levels of individualism. The results obtained for a global selection of potential investors indicate significant differences for various regions, in accordance with the behavior, risk appetite, and individualism score of investors. While the work of Gul, Kim, and Qiu (2010) investigates stock prices comovements or synchronicity in a more limited environment represented by the Chinese stock market. The paper also provides evidence that the ownership structure, foreign shareholding, and audit quality significantly influence the incorporation of firm-specific fundamentals into stock prices. The study also shows that high ownership concentration, particularly when the largest shareholder is the government itself, price comovements reflect less firm-specific fundamentals but rather market-wide movements.

Lastly, Ang et. al. (2009) investigate the employment and the impact of past idiosyncratic volatility as a risk factor that can explain, to a given degree, future returns. The main purpose of the study is to compose a factor model based on the 3-Factor Model of Fama and French (1993), for which the addition of the idiosyncratic past volatility would augment the pricing ability of the model. To this end, the authors propose two variants of the 3-Factor Models: a local variant, which employs local factors only for each region, such as North America, Europe, and Asia. While for the global variant that is built using the global set of factors employed for the whole selection, 23 developed financial markets or economies. The results obtained indicate that the developed financial markets investigated are integrated to a given extent and share a tendency towards

comovements.

Given the discussion related to the most relevant papers for the 2007 – 2012 period, we argue that the main driving themes are reflected by the impact of globalization, financialization, market comovements, and volatility spillover. Nevertheless, we should not ignore the theme related to the impact of the "Global Financial Crisis" of 2007-2011, which is also a relevant topic for the aforementioned time slice. While at the same time, the topics and themes of opaque financial reporting standards and financial instruments such as derivatives are also especially relevant within this time frame. With this in mind, we will further proceed to investigate the most relevant papers for the 2013-2019-time slice.

Table 5, The top ten most relevant papers by citation, for the 2013 – 2019 period

Paper	Author	Number of Citations
The China Syndrome: Local Labor Market Effects of Import Competition in the United States	Autor, Dorn, and Hanson (2013)	1891
The KOF globalisation index–revisited	Gygli et. al. (2019)	1219
Measuring the Frequency Dynamics of Financial Connectedness and Systemic Risk	Barunik and Krehlik (2018)	1175
Systemic risk and stability in financial networks	Acemoglu, Ozdaglar, and Tahbaz-Salehi (2015)	1007
Premature deindustrialization	Rodrik (2016)	921
On the Foundations of Corporate Social Responsibility	Liang and Renneboog (2017)	776
Financial Networks and Contagion	Elliot, Golub, and Jackson (2014)	630
The Global Crisis and Equity Market Contagion	Bekaert et. al. (2014)	468
Dynamic connectedness and integration in cryptocurrency markets	Ji et. al. (2019)	421
How Likely Is Contagion in Financial Networks?	Glasserman and Young (2015)	367

Starting with the paper of Autor, Dorn, and Hanson (2013) was previously discussed and showcased in **Table 2,** which examines the impact of globalization and open markets on the American economy. The study also showcases the increased development of the Chinese economy and how, via the mechanisms of globalization combined with a general outsourcing policy of major companies, developing economies can become manufacturing centers. It can be argued that the primacy of this paper within this time segment can be attributed to the increased economic development and economic results recorded in China within this time segment. As such, we will proceed with the work of Gygli et. al. (2019), who provide an updated approach regarding the KOF Globalization Index, which includes a clear distinction between the de facto and de jure measurements regarding the multiple dimensions of globalization, such as political, economic, and social dimensions. The index itself represents a viable and relevant tool for practitioners and researchers alike, as it provides the most relevant information regarding the process of globalization. Another crucial aspect of this revision is the separation between the more classical trade globalization that leads this particular field, and the framework of financial globalization. While the paper of Barunik and Krehlik (2018) proposes a novel framework for measuring financial connectedness, integration, and systemic risk that explicitly accounts for time-varying effects. Their approach decomposes volatility spillovers into short, medium, and long-term components, allowing a detailed understanding of how shocks propagate across financial institutions over time. The relevance of this study to our work lies in its time-varying perspective on volatility and risk, which corresponds to our interest in various time-varying empirical

approaches. By capturing both the temporal and structural dimensions of risk transmission, the aforementioned paper provides an important benchmark for understanding how financial shocks and uncertainty affect market dynamics, complementing more traditional asset-pricing approaches that assume static risk factors or constant risk exposures.

Another relevant paper that also directly links to our approach and interest regarding market integration and contagion is represented by the work of Acemoglu, Ozdaglar, and Tahbaz-Salehi (2015). The aforementioned authors show how the level of interconnectedness can serve as a mechanism for contagion propagation across various financial markets. The results obtained are in line with certain considerations that indicate that the process of market integration, under the influence of "stylized facts," can act as a net transmitter of volatility and, ultimately, contagion, during periods characterized by the presence of endogenous and exogenous shocks. Similarly, Elliot, Golub, and Jackson (2014) confirm the same pattern, namely, that integration facilitates the flow of volatility spillovers and contagion from asset to asset or from market to market. While also discussing that the process of diversification, while initially meant to act as a hedge for the portfolio or to ensure additional returns, can also contribute to the propagation of contagion.

Another relevant paper identified via the bibliometric analysis is the work of Rodrik (2016), which discusses one key element or result of the globalization process. The element in question is represented by the tendency to outsource various manufacturing activities and jobs towards more profitable regions, while the previous regions that hosted the aforementioned manufacturing capabilities switch to a service-oriented economy. This approach poses significant consequences to future economic growth, as the switch towards a more service-oriented economy demands a new framework to ensure future economic growth. While geopolitical tensions and various trade frictions may also negatively impact the prospect of economic growth in the now service-oriented economies. While the paper of Liang and Renneboog (2017) introduces the concept of Corporate Social Responsibility (CSR) and investigates a number of 23.000 companies globally spread out, for the impact and relevance of CSR and, by extension, ESG characteristics, and how such elements can impact the performance at the firm level.

We also note that the work of Ji et. al. (2019) attempts to implement and extend the framework of Diebold and Yilmaz (2012), but in the case of cryptocurrencies, where they observe a given level of integration or interdependency. Hence, suggesting that the cryptocurrency market is also subject, to a given extent, to the impact and effects of "stylized facts". While the issue of volatility spillover and contagion is also present within this niche of the market, especially present during periods that are characterized by the presence of various endogenous and exogenous shocks.

Lastly, Bekaert et. al. (2014) investigate the dynamics and impact of market contagion during the "Global Financial Crisis" of 2007-2011, showcasing how shocks in major financial markets propagate on a global scale. Their analysis indicates that extreme market movements in one region significantly increase the likelihood of large comovements in other markets, highlighting the role of market integration and the systemic amplification of shocks. Complementing this perspective, Glasserman and Young (2015) explore contagion in financial networks from a theoretical and quantitative standpoint, assessing the probability of contagion in the case of an institutional failure. Hence, demonstrating that the structure of interbank exposures and the distribution of shocks are critical determinants of systemic risk, with highly interconnected networks being prone to contagion and volatility spillover. Taken together, these studies underscore the importance of understanding both comovements and network interdependencies of various markets when assessing systemic risk and the transmission of financial shocks. Thus, it provides a foundation for incorporating contagion and time-varying risk into asset pricing. Given the results obtained for this particular time slice or period, we will further proceed to investigate the last time frame covering the period from 2020 to 2025.

Table 6, The top ten most relevant papers by citation, for the 2020 – 2025 period

Paper	Author	Number of Citations
Covid-19 Pandemic, Oil Prices, Stock Market, Geopolitical Risk, and Policy Uncertainty Nexus in the Us Economy: Fresh Evidence from the Wavelet-Based Approach	Sharif, Aloui, and Yarovaya (2020)	1033
Financial Contagion during the COVID-19 Crisis	Akhtaruzzaman, Boubaker, and Sensoy (2021)	608
The Contagion Effects of the COVID-19 Pandemic: Evidence from Gold and Cryptocurrencies	Corbet, Larkin, and Lucey (2020)	582
Corporate Governance in China: A Survey	Jiang and Kim (2020)	505
Return Connectedness across Asset Classes around the Covid-19 Outbreak	Bouri et. al. (2021)	450
Do ESG Ratings Promote Corporate Green Innovation? A Quasi-Natural Experiment Based on Syntao Green Finances ESG Ratings	Wang et. al. (2023)	447
Globalization, Corporate Finance, and the Cost of Capital	Stulz (2022)	402
The Impact of COVID-19 on Emerging Stock Markets	Topcu and Gulal (2020)	391
Does ESG Certification Add Firm Value?	Wong et. al. (2021)	359
Heterogeneous Impacts of Wars on Global Equity Markets: Evidence from the Invasion of Ukraine	Boubaker et. al. (2022)	337

The results of the bibliometric investigation obtained for the 2020-2025-time frame indicate the prevalence of the contagion effect and the COVID-19 Pandemic topics, followed by the process of market integration and globalization. We also note the emergence of the ESG theme regarding the benefits and advantages it provides in relation to firm value. Thus, starting with the work of Sharif, Aloui, and Yarovaya (2020), who investigate the level of market integration simultaneous with the impact of the COVID-19 pandemic, by employing a varied methodology consisting of a wavelet-based approach, and implicitly, a Granger Causality Test within the wavelet framework. The main results obtained indicate the propagation of volatility spillover and the emergence of the contagion effect on an international scale. While the general level of economic uncertainty peaked given the designation of the COVID-19 Pandemic as a systemic risk, which also propagated from market to market, impacting the stock markets, bonds, and even commodities such as oil prices.

Another paper that focuses on the impact of the COVID-19 Pandemic is represented by Akhtaruzzaman, Boubaker, and Sensoy (2021), which investigates the spreading of the contagion effect between financial and non-financial firms from China and from the G7 group of countries. The authors implement a dynamic conditional correlation (DCC) approach via a DCC-GARCH model, which is aimed at capturing the fluctuations related to the level of correlations between the aforementioned markets, and to a certain extent, to capture the emergence and spreading of the contagion effect. The results obtained indicate that companies from these countries and geographical boundaries, financial and non-financial alike, experience a significant increase in conditional correlations in their returns. However, the magnitude of correlations is higher for financial firms during the shock, arguably suggesting the importance of their role in financial contagion transmission.

Given this, we proceed with the work of Corbet, Larkin, and Lucey (2020), who focus exclusively on the impact of the pandemic on gold and the cryptocurrency market. The chosen methodology relies on a GARCH framework applied to hourly returns, combined with the

employment of daily returns for robustness, in order to investigate the dynamic correlations between financial assets. The key highlight of the investigation indicates that during severe episodes of endogenous and exogenous shocks, the assets that are generally perceived as having the status of safe haven are impacted similarly by the contagion effect and volatility spillovers. Hence, the authors question the role and relevance of such assets as potential hedges or safe havens during episodes of severe crisis.

As previously mentioned, we have observed the emergence of the ESG theme among the most relevant papers of the 2020–2025-time frame. Starting with the work of Jiang and Kim (2020), which argues in favor of adopting the ESG framework related to governance and social responsibility, in a similar manner as American or Western firms for companies in China. The main difference between the companies residing in China and other companies, such as American ones, is the government ownership in the Chinese companies. Hence, the authors suggest that the implementation of a corporate governance framework could be beneficial for the performance of the companies. At the same time, the work of Wong et. al. (2021) focuses on the benefits of the ESG certification for Malaysian companies, which provides certain advantages to the firms, such as a reduced cost of capital. The results obtained also indicate a given level of positive response from the equity market, which results in a higher number of investors who align their investment preferences with the ESG framework. This implies that ESG disclosure may also be beneficial in the context of emerging and frontier financial markets, as it provides a given amount of added value to companies that adhere to the ESG framework and, as a consequence, may also attract more foreign investors and capital. Lastly, the study of Wang et. al. (2023) examines the potential of ESG ratings to promote corporate green innovation within Chinese companies. The authors employ a quasi-natural experiment created by the rollout of SynTao Green Finance ESG assessments, showing that the introduction of an external ESG evaluation mechanism can influence and even improve innovative behavior. Arguably, this effect is achieved through improved transparency and reduced information asymmetry, which also provides the added benefit of attracting more capital and investors that share the same ESG-oriented focus and goals.

Returning to the dominating theme of integration and contagion during the COVID-19 Pandemic, the paper of Bouri et. al. (2021) explores the intricate integration mechanism and its given level across various asset classes during the outbreak. The methodology applied draws experience from the work of Diebold and Yilmaz (2012), but augments the methodology by applying a time-variable parameter value at risk approach. The results obtained indicate a strong case for the volatility spillover and contagion effects, which have impacted the entire selection of financial assets, from stocks and bonds to commodities and cryptocurrencies. The authors also suggest that financial firms and companies witnessed the largest volume of volatility and uncertainty, thus prompting policymakers to react with a combined toolset represented by fiscal and monetary interventions. Another relevant paper is represented by Topcu and Gulal (2020), which examines the impact of the pandemic shock in the context of emerging markets, focusing on the magnitude, timing, and transmission of the shock. The results obtained indicate that emerging markets experienced a sharp decline in equity prices during the early stages of the pandemic, but the extent of the impact varied substantially depending on structural characteristics, policy response, and exposure to global financial conditions of each country or region. The authors argue that the initial reaction was largely driven by global risk aversion and uncertainty, while domestic factors such as the severity of the outbreak, government containment measures, and intervention measures and policies played an important stabilizing role.

Another relevant paper is that of Stulz (2022), who argues that the ongoing integration of international financial markets is reshaping the cost of capital by effectively transforming global markets into a highly connected investment environment. In this environment, firms that are sufficiently large and visible to attract international investors benefit from a lower cost of equity, primarily because risk is shared across a broader investor base. This wider dispersion of risk

exposures naturally compresses equity risk premiums, with the strongest effects observed in economies that are opening to global markets that are also extending to already integrated financial systems. Moreover, when firms from developing markets raise capital in advanced markets, they do more than access cheaper financing, as they also import stronger governance standards and more sophisticated monitoring mechanisms, which further reinforce investor confidence. Furthermore, the author highlights that globalization also changes the very definition of systematic risk: once firms are part of a global investment set, risks that appear undiversifiable from a domestic perspective can be diversified internationally. Consequently, relying on traditional frameworks can lead to overstated costs of capital. Concluding, the paper underscores how globalization alters both the measurement and pricing of risk, requiring asset pricing models to account for market integration, governance, and the evolving structure of global uncertainty.

Lastly, the paper of Boubaker et al. (2023) examines how the Russia–Ukraine conflict propagated through global equity markets, emphasizing the heterogeneous nature of war-induced shocks across regions and market structures. Their findings show that geopolitical conflict operates as a powerful source of uncertainty, with volatility spillovers that are neither uniform nor linear. While European markets absorbed the strongest and most persistent volatility shocks, other regions experienced various responses shaped by a multitude of factors such as energy dependence, trade exposure, and increased baseline geopolitical risk. The key highlight of the paper is that the conflict influenced the persistence of volatility, highlighting that such major geopolitical shocks fundamentally modify the risk premium environment rather than just being limited to increasing the short-term uncertainty.

3. Comments

Given the results obtained, we can note that the geographical patterns observed in the bibliometric results should not be interpreted just as differences in academic focus across various countries or regions. But rather, we argue that they reflect relevant structural elements that deal with the main financing mechanisms that are employed and can also indicate the main avenue for risk transmission. Hence, geography can serve, to a given extent, as a proxy that indicates the main distinction between the level of market development and the quality of institutions. An important implication of this institutional interpretation can be the limited visibility of ESG-related themes in the core bibliometric structures depicted in **Figure 4** and in **Figure 5**. While ESG-related concepts do appear in the dataset, they do so through indirect keywords such as corporate governance and corporate social responsibility, and remain rather peripheral relative to dominant themes such as risk, volatility, market integration, and contagion. This pattern should not be interpreted as an absence of the ESG themes from the asset pricing literature, but rather as evidence that ESG has not yet consolidated into a central and unified research cluster within the core asset pricing literature. Instead, ESG remains institutionally conditioned, and unevenly integrated across markets, which is consistent with its stronger presence in developed, market based financing systems and its weaker diffusion in bank based or institutionally constrained environments. At the same time, we note that the most notable distinction captured by geography is between market based financing and bank-focused financing.

We note that in market based financing, which generally prevails in developed countries and markets, and in other large financial hubs, financing and risk sharing are done primarily through financial markets. In such cases, various financial assets such as bonds and shares play a central role in financing companies, while the prices of the aforementioned assets act as transmitters of information related to the overall economic environment or to firm characteristics. Thus, as a direct consequence, various shocks or critical information related to the financial position of companies can swiftly be incorporated in asset prices, thus leading to pronounced volatility, stronger contagion effects, and high sensitivity of returns. We also argue that the research in market-oriented financing focuses on various topics such as asset pricing models, market integration, and volatility, which have been identified in the bibliometric analysis employed.

In contrast, in the case of bank based financing, which is characteristic of the majority of continental European economies, and also to a very large share of emerging and frontier markets. In such a bank oriented financing system, the primary consideration is the over-reliance on borrowing in the form of either relationship-based lending or, more commonly, via the balance sheet intermediation process operated by banks or other financial institutions similar in scope to banks. Hence, as a consequence, the risk transmission process is mostly restricted to the credit channel and thus has a weaker impact on price adjustments of shares or other financial assets, as financial intermediaries are the ones that absorb the initial shock. Thus, this leads to a delay in the price responses but can contribute to an increase in systemic risk, as the balance sheet of such intermediaries can become impaired and affected by non-performing credits or loans. Consequently, the literature that is associated with these regions focuses on financial stability, institutional quality, governance, and crisis management, themes that are identified in the corresponding bibliometric clusters.

Furthermore, it can be argued that the main structural differences showcased can also help explain the evolution of the literature across the four time periods considered in **Table 1**. During the pre-globalization and early market integration phase, research from market based systems focused on the development and testing of asset pricing models, while bank based systems emphasized market efficiency and institutional constraints. Following the "Global Financial Crisis" of 2007-2011, the convergence of these systems under conditions of stress led to a surge in research on contagion, systemic risk, and the level of market integration. Hence, it affects the traditional distinction between market based and bank based financing approaches and the dynamics associated with them. In the more recent time period, which is largely characterized by geopolitical fragmentation and heightened levels of uncertainty, the divergence between the two main financing approaches gained traction once again. As market based systems are driving research on factor instability and ESG impact on pricing, while the bank based systems are focusing on resilience, regulation, and institutional reform. The distinction between market-based and bank-based financing is particularly relevant for interpreting the ESG-related clusters. In market based financing systems, ESG considerations are rapidly reflected in asset prices through investor demand, disclosure standards, and portfolio rebalancing. In contrast, in bank based financing and institutionally weaker systems or markets, ESG transmission is often mediated by regulatory frameworks and policy interventions rather than market pricing mechanisms alone. This asymmetry contributes to the uneven geographical diffusion of ESG as a priced factor, a pattern that is clearly reflected in the bibliometric results. Overall, the bibliometric evidence suggests that the evolution of asset pricing research cannot be disentangled from the institutional context in which financial markets operate. The observed geographical and thematic clustering reflects fundamental differences in how economies finance investment, allocate risk, and transmit shocks. Recognizing the role of financing regimes provides a complete interpretative framework that links the bibliometric findings to the broader economic and financial realities of the underlying literature.

4. Policy Implications

This section of the paper is reserved for a comprehensive discussion related to the potential policy implications and recommendations that stem from the present study. Given the nature of the study and the methodological approaches implemented, we have decided to include within this section both the policy implications that can be derived from the most relevant papers identified in the bibliometric study as well as the policy implications and recommendations resulting from the current study. Hence, we begin the discussion with the most influential contributions identified across the full sample period and within each of the selected time frames that provide a basis for deriving the policy implications that reflect empirical findings as well as the general evolution of themes shaping the literature on asset pricing, market integration, contagion effect, volatility

spillover, and institutional development. We argue that these implications emerge from the persistence of specific themes and methodological approaches that characterize the evolution of financial research over the last few decades.

As such, a first and major policy implication deals with the systemic nature of risk under conditions of market integration and its global impact. The consistent prominence of studies focusing on volatility spillovers, market integration, and contagion, debated in various works such as Diebold and Yilmaz (2012), Forbes and Rigobon (2002), Allen and Gale (2000), Barunik and Krehlik (2018), Bekaert et al. (2014), and Bouri et al. (2021), across multiple time periods indicates that financial instability is linked to the level of integration between markets and various asset classes. From a policy perspective, this recurrence suggests that regulatory architectures designed around domestic financial systems are poorly aligned with the empirical realities of integrated global markets. As shocks originating in one segment of the financial system are rapidly transmitted across borders and asset classes, implying that effective financial stability policies must rely on internationally coordinated policy decisions that account for various transmission channels and mitigate the negative impact and consequences of shocks.

A second policy implication relates to the impact of the process of market integration, which is arguably both a beneficial factor to market growth and development, while at the same time, acting as a potential avenue for risk transmission and volatility spillovers, as reflected by the sustained influence of studies addressing globalization, capital movement, and international financial linkages (Dreher, 2006; Hummels et al., 2001; Lane and Milesi-Ferretti, 2007; Gygli et al., 2019; Stulz, 2022). Hence, it can be argued that the bibliometric evidence suggests that market integration cannot be interpreted only as a positive process that enhances efficiency and capital allocation. Instead, it fundamentally reshapes the pricing of risk and amplifies exposure to global shocks. For policymakers, this implies that liberalization and market openness policies must be evaluated jointly with their implications for volatility spillovers, vulnerability to various external factors, and the evolution of risk premiums across various market segments. Thus, market integration without adequate regulatory capacity and institutional quality may accelerate the propagation of shocks rather than mitigate them.

A third policy implication that emerges from the increasing emphasis on the time-varying nature of risk, financialization, and regime-dependent dynamics under integrated market conditions. Highly cited contributions and papers such as Ang et al. (2009), Tang and Xiong (2012), Barunik and Krehlik (2018), and Bouri et al. (2021) highlight that correlations, volatility, and factor relevance evolve and intensify during periods of stress, particularly in highly integrated markets. From a regulatory standpoint, this challenges the continued reliance on static risk measures in stress testing, capital assessments, and supervisory models. The bibliometric prominence of these studies supports the need for dynamic policy instruments that incorporate time-varying effects and metrics related to the process of market integration, which could allow regulators to better anticipate the nonlinear nature of various shocks.

A fourth implication concerns the asymmetric integration of developed, emerging, and frontier markets within the global financial system, as reflected by influential studies examining price formation mechanisms, information incorporation, and capital flows under varying degrees of market integration (Morck et al., 2000; Khanna and Palepu, 2002; Gul et al., 2010; Topcu and Gulal, 2020). The bibliometric evidence suggests that differences between these markets are not only descriptive but are related to the level of market integration and quality of institutions. Policymakers in emerging and frontier economies face the dual challenge of increasing levels of market integration that attract capital, while having the downside of additional risk exposure to various external shocks and even the potential of imported risk premiums from other developed financial markets. This implies that market integration strategies must be accompanied by improvements in market infrastructure, transparency, and regulatory enforcement to ensure that the benefits of market integration do not come at the cost of excessive systemic vulnerability.

A fifth and more recent implication arises from the growing prominence of ESG-related research within the context of integrated financial markets, as reflected by highly cited contributions such as Liang and Renneboog (2017), Jiang and Kim (2020), Wong et al. (2021), Wang et al. (2023), and Stulz (2022). The bibliometric clustering of ESG studies alongside themes of globalization, corporate governance, and cost of capital indicates that sustainability considerations are increasingly transmitted through market-based mechanisms rather than remaining confined to firm-level or regulatory discussions, as identified in the thematic evolution of clusters from the previous section. We argue that from a policy perspective, this implies that ESG frameworks influence capital allocation and risk pricing most effectively in markets that are supported by strong institutional environments and a high quality of financial disclosure. While in less integrated or institutionally weaker markets, ESG transmission is more likely to occur through regulatory mandates rather than market pricing alone. Consequently, ESG-oriented policies must account for differences in market development levels, institutional quality, and disclosure capacity across developed, developing, and frontier financial markets.

Taken together, the policy implications derived from the bibliometric investigation regarding the most relevant papers point to a central conclusion. Namely, that financial markets operate as highly integrated systems, in which asset pricing, risk transmission, and stability are jointly determined and influenced by various elements such as globalization, institutional quality, and also, time-varying dynamics. The persistence of market integration and contagion effects across multiple decades indicates that effective policy responses require a holistic approach that may provide better results in comparison to a segmented regulatory perspective. The bibliometric findings therefore support a shift towards more coordinated policy frameworks capable of addressing the complex and evolving nature of global financial markets and that can also account for the various effects and impacts that stem from the process of market integration. Given the policy implications derived from the existing literature through the lens of the most relevant papers identified, we will further proceed to discuss the policy implications that can be derived from the present paper.

We consider that the bibliometric analysis conducted in this study yields several policy implications that stem not from individual empirical findings, but from the structural organization, thematic fragmentation, and historical evolution of the asset pricing literature itself. By mapping how research themes co-evolve, and reconnect across time, the analysis highlights systematic gaps between theory, empirical modeling, and policy concerns. These gaps carry important implications for asset pricing theory, investors, and financial policymaking.

A first implication concerns the dominant role of static modeling paradigms within asset pricing research. Bibliometric clusters centered on factor models and asset pricing theory remain largely segregated from adjacent streams addressing financial crises, contagion, or market integration. This persistent separation suggests that relevant policy concerns and insights about instability, uncertainty, and volatility transmission have not been fully internalized into mainstream pricing frameworks. From a policy perspective, this implies that risk assessments and regulatory stress-testing exercises that rely on conventional asset pricing intuition. Which may understate the importance of regime shifts, structural breaks, and evolving covariance structures. The bibliometric evidence thus supports calls for policy frameworks that recognize the conditional and state-dependent nature of risk, rather than relying on time-invariant assumptions contained in traditional valuation and capital adequacy models.

Second,the bibliometric results indicate that research on the topics of market integration, globalization, and contagion has evolved as a parallel but largely disconnected literature. Market integration and spillover dynamics are predominantly framed as macroeconomic or financial stability concerns, with limited explicit linkage to expected returns or risk premium formation. This separation has direct policy implications. It suggests that prudential regulation and macro-financial surveillance often treat market integration as an external constraint rather than as an endogenous

mechanism that reshapes pricing dynamics. Policymakers should therefore interpret the process of market integration not only as a source of capital allocation or diversification but also as a structural force that modifies how risk is priced, transmitted, and amplified across various markets. Bibliometric fragmentation in this area underscores the need for regulatory frameworks that jointly monitor the intensity of market integration and potential pricing distortions, particularly during periods characterized by the presence of endogenous and exogenous shocks.

A third implication concerns the treatment of emerging and frontier financial markets within the existing literature. Bibliometric clusters focused on these markets tend to emphasize financial development, volatility, and institutional weakness, while remaining weakly connected to global asset pricing and the impact of market integration. This segmentation implies that policy discussions often frame developing markets as isolated systems rather than as integral components of a globally interconnected financial system. From a policy standpoint, this supports the view that a portion of the risk premium observed in these markets reflects exposure to external transmission channels rather than only to domestic fundamental factors. Consequently, policies aimed solely at attracting capital flows may be insufficient if they do not address the institutional and structural factors that can increase global risk transmission. Strengthening market infrastructure, disclosure standards, and instruments for risk management emerges as a necessary step to potential policy reforms that incorporate both the negative and positive aspects of market integration.

The bibliometric evidence also provides important insights into the rapid expansion of ESG-related research. While ESG has become one of the fastest growing thematic clusters in finance, the literature remains highly segmented, with limited integration into asset pricing, contagion effects, or market integration research. ESG is predominantly treated either as a corporate finance concern or as a standalone factor, rather than as a potential component of broader risk transmission mechanisms. This fragmentation has policy implications for regulators and ESG oriented investors. As it suggests that ESG-related regulation and disclosure initiatives may overestimate the universality of ESG pricing effects across markets with varied institutional quality. Policymakers should therefore recognize that the effectiveness of ESG frameworks is conditional on market development, governance standards, and informational reliability, and that uniform regulatory approaches may produce different outcomes across developed, emerging, and frontier markets.

Lastly, the bibliometric findings point to a broader policy lesson, given the fact that the existing literature, and by extension, many policy frameworks, treat asset pricing, market integration, contagion, ESG, and market development as largely separate subjects. This segmentation limits the ability of policymakers to anticipate how shocks propagate through globally interconnected financial systems and how regulatory interventions in one domain may affect pricing dynamics in another. The evidence supports the need for a shift towards a more integrated policy approach that accounts for the evolution of pricing mechanisms, institutional structures, and transmission channels. Rather than attempting to limit market integration or suppress volatility, effective policy should focus on the routes through which risk is transmitted. This entails enhancing transparency, coordinating cross-border regulatory oversight, strengthening institutional resilience in developing markets, and incorporating dynamic risk considerations into regulatory models. In an environment characterized by evolving factor relevance, deepening market integration, and recurring global shocks, financial stability increasingly depends on managing the process of market integration itself, rather than treating it as an external anomaly.

5. Future Research Directions

Given the results obtained within the current unified bibliometric investigation concerning asset pricing under the impact of various elements, we argue that several future research opportunities may arise in the form of additional bibliometric methods that could be extended by integrating full-text modeling and citation-network dynamics to capture not only thematic proximity but also the direction and intensity of intellectual influence across subfields. Second, future studies may explicitly link bibliometric structures with empirical outcomes by examining whether periods of thematic evolution in the literature coincide with improvements in asset pricing performance or forecasting accuracy. Third, the growing role of geopolitical risk, climate-related shocks, and regulatory fragmentation suggests the need to study how exogenous and endogenous structural events reshape research priorities and alter the perceived relevance of various risk factors over time. Finally, greater attention should be given to emerging and frontier markets, where the interaction between institutional development, market integration, and risk pricing remains underrepresented in the literature despite its increasing importance. Addressing these directions would further enhance our understanding of how the entire field of asset pricing research evolves in response to structural changes in the global financial system. Furthermore, concerning potential empirical research avenues, we propose the development and testing of a time-varying asset pricing model that can follow the linear nature of a factorial model which manages to incorporate and account for the impact of various endogenous and exogenous shocks, and to also account for the impact of market integration, especially when considering the volatility spillovers and contagion effect that are influenced by it. Alternatively, we consider that the implementations of a similar model in a nonlinear setting could also yield particularly relevant results, especially given the impact of various endogenous and exogenous shocks that have occurred in the last two decades.

6. Conclusions

In conclusion, this paper attempts to address a fundamental but consequential question in modern finance, namely, how the evolution of asset pricing research reflects the interaction between risk, uncertainty, market development, institutional quality, and global financial integration. By employing a comprehensive bibliometric framework, the analysis moved beyond isolated empirical findings and instead examined how academic interest itself has evolved, clustered, and fragmented in response to economic events, market transformations, and structural shifts in the global financial system. In doing so, the study provides a relevant perspective on how different strands of the literature collectively shape our understanding of how and which risks are priced, under what conditions, and across which financial markets.

The bibliometric evidence highlights a persistent tension within asset pricing research. On the one hand, the literature remains anchored in linear and factorial asset pricing models that implicitly assume stable risk exposures and well-defined pricing structures. On the other hand, adjacent research streams such as those focusing on financial crises, contagion, volatility spillovers, and market integration manage to document environments characterized by instability, regime shifts, and nonlinear transmission mechanisms. The limited linking between these bodies of work, as revealed by the clustering and co-occurrence patterns, suggests that asset pricing theory has not fully internalized the implications of global interconnectedness and structural change. As a result, the pricing of risk is often treated as a singular problem, without any impact from other external or internal factors, despite overwhelming evidence that modern financial markets operate within highly integrated systems.

A central conclusion emerging from the analysis is that asset pricing cannot be meaningfully interpreted without reference to the degree of market development and institutional quality. The bibliometric structure of the literature shows that developed markets dominate research on factor models, pricing efficiency, and return predictability, while emerging and frontier markets

are more frequently associated with themes of volatility, financial development, crises, and institutional constraints and limitations. This separation is not merely descriptive. It reflects a deeper conceptual divide in how risk is understood and modeled across various market types. The findings support the interpretation that part of the observed risk premium in less developed markets compensates investors for exposure to global transmission channels rather than purely domestic fundamentals, a distinction that remains underexplored in the asset pricing literature as a whole.

The role of market integration emerges as a unifying theme across time and topics. Bibliometric patterns show that integration intensifies during periods of systemic stress, coinciding with a surge in research on contagion, volatility spillovers, and financial networks. This temporal alignment reinforces the view that integration acts as both a conduit for capital movement and a mechanism for amplifying shocks. Importantly, the literature tends to treat integration either as a macroeconomic condition or as a stability concern, rather than as a structural determinant of pricing dynamics. The results of this study suggest that this separation limits the explanatory power of existing models and obscures the channels through which global risks become priced across markets.

The analysis also sheds light on the rapid expansion of ESG-related research and its uneven incorporation into asset pricing frameworks. While ESG has become one of the fastest-growing topics in finance, bibliometric evidence indicates that it remains thematically isolated from research on market integration, contagion, and cross-market risk transmission. This fragmentation mirrors empirical ambiguities regarding the factor status of ESG topics across different market environments. The findings imply that ESG-related risks and returns are inherently conditional on institutional quality, disclosure standards, and market liquidity, reinforcing the argument that factor relevance is endogenous.

Taken together, the contributions of this paper are threefold. First, it demonstrates that the evolution of asset pricing research is shaped by structural forces such as globalization, institutional quality, and systemic risk, factors that are insufficiently integrated into mainstream pricing frameworks. Second, it shows that the fragmentation of the literature into thematic clusters has constrained the potential development of unified models capable of capturing time variation, market integration and risk transmission across markets. Third, by synthesizing these strands within a single bibliometric framework, the paper provides a bridge between asset pricing theory, financial stability research, and institutional finance. The implications of these findings are both methodological and substantive. From a research perspective, future work should move toward integrative frameworks that treat factor relevance, risk transmission, and market structure as jointly evolving components rather than isolated topics or factors. From a policy and regulatory standpoint, the results underscore the importance of monitoring not only domestic market conditions but also the pathways through which global shocks propagate across financial systems. In an environment characterized by recurrent crises, geopolitical fragmentation, and accelerating financial integration, stability depends less on insulating markets than on understanding and managing the mechanisms through which risk is transmitted and priced.

Lastly, the central message of this paper is that risk premiums are not fixed objects, but conditional outcomes shaped by evolving exposures, institutional context, and the degree of market integration. Recognizing this reality requires a shift away from segmented perspectives and towards unified analytical approaches that reflect the complexity of modern financial markets. By mapping how the literature itself has evolved in response to these challenges, this study contributes to a more coherent understanding of asset pricing in an increasingly interconnected world.

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Appendices

The thesaurus file, reported in **Appendix 1**, standardizes equivalent terms while preserving conceptual distinctions where relevant from an economic standpoint. It mainly provides an additional layer of filtration in order to deal with a multitude of synonyms and similar terms that denote the same concept or element. For additional information related to the thesaurus, please check the table below.

Appendix 1, The "thesaurus" file employed for synonym filtering

FROM	TO
globalization	globalization
financial globalization	market integration
global market integration	market integration
International market integration	market integration
capital market integration	market integration
economic integration	market integration
developed economies	developed markets
advanced economies	developed markets
advanced markets	developed markets
emerging economies	emerging markets
developing economies	emerging markets
emerging financial markets	emerging markets
EM	emerging markets
frontier economies	frontier markets
frontier financial markets	frontier markets
FM	frontier markets
time varying effects	time-varying effects
time-varying parameters	time-varying effects
dynamic effects	time-varying effects
parameter instability	time-varying effects
regime switching	regime shifts
regime-switching models	regime shifts
structural breaks	regime shifts
structural change	regime shifts
volatility spillover	volatility spillovers
volatility transmission	volatility spillovers
spillover effects	volatility spillovers
financial crisis	financial crisis
cross-market volatility	volatility spillovers
financial contagion	contagion
crisis contagion	contagion

systemic contagion	contagion
risk transmission	risk transmission
systemic risk	systemic risk
financial instability	financial instability
asset pricing models	asset pricing
multifactor models	multifactorial models
factor models	multifactorial models
risk premia	risk premium
equity premium	risk premium
Risk Premium Decomposition	Risk Premium Decomposition
variable lag Granger	Granger causality
Granger causality tests	Granger causality
causality analysis	Granger causality
ESG investing	ESG
environmental social governance	ESG
sustainable investing	ESG
climate risk	climate risk
endogenous shocks	endogenous shocks
exogenous shocks	exogenous shocks

Appendix 2, Settings employed for the cluster analysis

This appendix reports the technical settings and methodological specifications employed in the clustering and thematic evolution analyses presented in the main text. The purpose of this appendix is to ensure full transparency and reproducibility of the bibliometric procedures, while allowing the main body of the paper to focus entirely on the economic interpretation.

Component	**Specification**
Keyword field	All Keywords (Author Keywords + Keywords Plus)
Number of keywords	150
Minimum cluster frequency	10 occurrences per 1000 documents
Weighting index	Inclusion index weighted by word occurrence
Minimum weight threshold	0.50
Number of labels per cluster	5
Label size	3
Synonym List	Yes, the word thesaurus of **Appendix 1** was employed
Clustering algorithms	Louvain (primary), Spinglass (robustness)
Temporal segmentation	Four periods, as discussed in **Table 1**
Temporal cut-off points	2006, 2013, 2019