

On Leverage, Uncertainty and ESG

Sur l'effet de levier, l'incertitude et l'ESG

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Abstract

This article examines how economic uncertainty and ESG performance jointly shape corporate capital structure decisions. These dimensions are typically studied separately, focusing either on uncertainty and leverage or on ESG and financing conditions, while their interaction remains underexplored.

A systematic literature review (SLR) is conducted using 27 Scopus-indexed articles (2020–2025), complemented by key theoretical contributions. The analysis is structured around three dimensions: capital structure and uncertainty, capital structure and ESG, and ESG and uncertainty.

The findings show that uncertainty generally leads firms to adopt more conservative financing strategies, although the effect varies depending on firm characteristics and uncertainty type. ESG performance improves financing conditions by reducing information asymmetry, but its effectiveness depends on credibility and institutional context.

The study develops an integrated framework linking uncertainty, ESG, and capital structure, highlighting the need for dynamic and context-dependent corporate financing models.

Keywords: Corporate Financing Decisions, Capital Structure, ESG Performance, Economic Policy Uncertainty, World Uncertainty.

Résumé

Cet article analyse l'effet combiné de l'incertitude économique et de la performance ESG sur la structure du capital des entreprises. La littérature traite généralement ces deux dimensions séparément, en étudiant d'une part l'impact de l'incertitude sur le levier financier et d'autre part le rôle de l'ESG dans l'accès au financement. Leur interaction reste encore insuffisamment explorée, notamment le rôle modérateur de l'ESG.

Pour combler cette lacune, l'étude adopte une revue systématique de la littérature (SLR) basée sur 27 articles indexés dans Scopus (2020–2025), complétée par des contributions théoriques majeures. L'analyse repose sur trois axes : capital structure–incertitude, capital structure–ESG, et ESG–incertitude.

Les résultats indiquent que l'incertitude conduit généralement à des politiques financières plus prudentes, avec des effets hétérogènes selon les caractéristiques des firmes et la nature de l'incertitude. La performance ESG améliore l'accès au financement en réduisant les asymétries d'information, mais son effet dépend de sa crédibilité et du contexte institutionnel.

L'étude propose un cadre conceptuel intégré reliant incertitude, ESG et structure du capital, et souligne la nécessité d'approches dynamiques et contextuelles des décisions financières.

Mots clés : Décisions de financement des entreprises, Structure du capital, Performance ESG, Incertitude de la politique économique, Incertitude mondiale.

Introduction

Corporate financial decision-making is undergoing a profound transformation. Traditionally centred on profitability and risk management, firms are now increasingly required to integrate broader considerations related to sustainability, transparency, and stakeholder responsibility. In this evolving context, environmental, social, and governance (ESG) performance has emerged as a critical dimension influencing corporate strategies. At the same time, firms operate in environments characterized by heightened economic and policy uncertainty, which significantly affects their financing decisions. These developments are not independent; rather, they interact in complex ways that shape how firms determine their capital structure.

Capital structure refers to the manner in which firms combine debt and equity to finance their operations (Frank & Goyal, 2009; Myers, 1984). While debt offers advantages such as tax shields, it also increases financial risk, particularly in uncertain environments. Classical theories, including the Trade-Off Theory and the Pecking Order Theory, have long explained how firms balance these considerations. However, these frameworks were developed under assumptions that do not fully capture the growing importance of sustainability and the increasing volatility of global economic conditions. ESG performance, for instance, is no longer a peripheral concern but a central determinant of firm reputation, investor confidence, and access to capital (Fatemi et al., 2018; Friede et al., 2015).

Despite the growing body of literature on capital structure, economic uncertainty, and ESG performance, these three dimensions have largely been studied in isolation. Existing research has explored how uncertainty affects leverage decisions and how ESG influences financing conditions. However, the combined and interactive effects of uncertainty and ESG on capital structure remain insufficiently understood. In particular, the role of ESG as a conditioning or moderating factor in the relationship between uncertainty and leverage has not been adequately conceptualized or empirically examined.

This gap raises an important research question: How does ESG performance moderate the relationship between economic uncertainty and firms' capital structure decisions?

Addressing this question is essential for advancing both corporate finance and sustainable finance literature. It allows for a better understanding of how firms adapt their financing strategies in environments characterized by both external volatility and increasing sustainability pressures.

To address this issue, this study adopts a systematic literature review (SLR) methodology. The analysis is based on peer-reviewed articles indexed in the Scopus database and published

between 2020 and 2025, complemented by seminal theoretical contributions. This approach enables the identification of dominant trends, contradictions, and research gaps in the existing literature.

The article is structured as follows. Section 1 reviews the literature along three main dimensions: capital structure and uncertainty, capital structure and ESG, and ESG and uncertainty. Section 2 presents the methodology used for article selection and analysis. Section 3 discusses the main findings and proposes an integrated interpretation of the relationships among the three variables. The final section concludes by highlighting key contributions and suggesting directions for future research.

This study contributes to the literature in several ways. First, it provides an integrated perspective by jointly analysing economic uncertainty and ESG performance as determinants of capital structure. Second, it proposes a conceptual interpretation in which ESG acts as a moderating factor influencing firms' financial responses to uncertainty. Third, it identifies key limitations in existing research, including the lack of multidimensional uncertainty measures, insufficient sectoral analysis, and limited attention to dynamic adjustment processes. By doing so, the paper offers a structured foundation for future research aimed at developing more adaptive and context-sensitive models of corporate financing decisions.

1. LITERATURE REVIEW

1.1. Capital Structure and Uncertainty

The relationship between economic uncertainty and capital structure has attracted increasing attention in corporate finance, particularly in the context of global crises, policy instability, and market volatility. While traditional theories such as the Trade-Off Theory and the Pecking Order Theory (Myers, 1984; Myers & Majluf, 1984) provide a foundational understanding of financing decisions, their ability to fully explain firm behaviour under heightened uncertainty remains limited.

From a theoretical perspective, uncertainty affects capital structure through its impact on risk perception, expected cash flows, and financing constraints. The Trade-Off Theory predicts that higher uncertainty increases the expected costs of financial distress, thereby encouraging firms to reduce leverage. Similarly, the Pecking Order Theory suggests that uncertainty exacerbates information asymmetry, making external financing more costly and reinforcing firms' reliance on internal funds.

Empirical evidence largely supports the view that firms adopt more conservative financing strategies under uncertainty (Titman & Wessels, 1988; Khan et al., 2020). However, this dominant pattern is not universal. Recent studies highlight that, under conditions of deep or Knightian uncertainty, firms may increase leverage as a mechanism for risk-sharing with creditors.

These contrasting findings highlight that the impact of uncertainty on capital structure is not uniform but depends on contextual factors such as firm size, sector, and institutional environment. This perspective aligns with the contingency-based view, according to which firm behaviour adapts to environmental conditions. In this regard, El Amili and Akrich (2021) show that higher levels of environmental uncertainty led firms to adopt more adaptive and flexible management practices, reinforcing the idea that financial decisions evolve dynamically in response to external conditions.

Overall, the literature suggests that deleveraging represents the dominant but not universal response to uncertainty, highlighting the need for more dynamic and integrative frameworks.

1.1.1 Empirical Evidence

A substantial body of empirical research supports the view that firms adopt more conservative financing strategies under uncertainty. Studies such as Fama and French (2002) and Titman and Wessels (1988) show that firms with volatile earnings, high intangible assets, or limited collateral tend to reduce leverage in uncertain environments in order to preserve financial flexibility. This deleveraging behaviour is particularly pronounced among financially constrained firms and small and medium-sized enterprises, which face tighter access to external financing (Khan et al., 2020; Schwarz & Dalmácio, 2021).

However, this dominant pattern is not universal. Recent studies introduce important nuances by showing that, under certain conditions, firms may increase leverage in response to uncertainty. Wu and Hu (2024) demonstrate that in contexts of Knightian uncertainty, where probabilities cannot be clearly assigned to future outcomes (Knight, 1921; Ellsberg, 1961), firms may strategically use debt as a mechanism to transfer risk to creditors. This behaviour contrasts with standard predictions and suggests that uncertainty can, in some cases, incentivize risk-shifting rather than risk-avoidance.

The coexistence of these opposing findings highlights the importance of distinguishing between different types of uncertainty. Under measurable risk, where probabilities are known or can be estimated, firms tend to deleverage in line with traditional theories. In contrast, under deep

uncertainty or ambiguity, firms may adopt more aggressive financing strategies, reflecting a shift from precautionary behaviour to strategic risk allocation.

Firm-specific characteristics further condition these responses. Large firms and state-owned enterprises often maintain higher leverage during uncertain periods due to better access to credit markets and, in some cases, implicit government support (Li & Qiu, 2021). In contrast, smaller firms and those operating in emerging markets are more likely to reduce debt levels due to heightened vulnerability and financing constraints (Khan et al., 2020). Sectoral factors also play a significant role. Firms in capital-intensive industries, such as energy and manufacturing, adjust leverage dynamically in response to investment cycles and exposure to commodity price volatility (Im et al., 2022).

In addition, the availability of alternative financing channels influences capital structure adjustments under uncertainty. Trade credit, for example, can act as a substitute for bank financing when credit conditions tighten, thereby altering firms' reliance on formal debt markets (Khan et al., 2020). At the macroeconomic level, uncertainty shocks in financial markets further amplify these dynamics by tightening overall financing conditions and accelerating deleveraging processes (Park, 2024).

1.1.2 Key Insights and Research Gaps

Overall, the literature suggests that deleveraging represents the dominant but not universal response to economic uncertainty. While this finding is consistent with traditional capital structure theories, the existence of opposing behaviours under Knightian uncertainty reveals important limitations in static theoretical frameworks. These contradictions indicate that firms' financing decisions are not solely driven by risk minimization but also by strategic considerations related to risk-sharing and market conditions.

Despite these advances, several gaps remain. First, much of the existing literature treats uncertainty as a homogeneous concept, without adequately distinguishing between its different forms (economic, financial, policy-related, or ambiguity-based), even though these may have fundamentally different effects on leverage decisions. Second, the heterogeneity of firm response, driven by size, sector, and institutional context, is not sufficiently integrated into existing models. Third, most studies focus on short-term adjustments, leaving the long-term dynamics of capital structure under evolving uncertainty largely unexplored.

These limitations point to the need for more comprehensive and dynamic frameworks that account for both the multidimensional nature of uncertainty and the contextual factors shaping

firms' financing behaviour. In particular, they highlight the importance of considering additional mechanisms, such as ESG performance, that may influence how firms respond to uncertainty, an issue explored in the subsequent sections.

1.1.3 Conclusion

In sum, economic uncertainty plays a central role in shaping corporate capital structure decisions, but its effects are neither uniform nor unidirectional. While most firms respond by reducing leverage to mitigate financial risk, others adopt more strategic approaches depending on the nature of uncertainty and their specific characteristics. This complexity underscores the limitations of traditional static models and calls for more nuanced approaches capable of capturing the adaptive and context-dependent nature of financing decisions.

1.2. Capital Structure and ESG

Recently, ESG factors are integral to corporate financial strategies. Firms are assessed based on financial performance and commitment to sustainability and ethical governance (Fatemi et al., 2018; Friede et al., 2015). ESG performance is becoming a key factor in capital structure decisions. Effective ESG practices reduce information asymmetry, boost company reputation, and facilitate financing access. This is especially important in a context of increased market scrutiny and rising investor activism (Khan et al., 2024; Newton et al., 2024). This section analyses the impact of ESG factors on traditional capital structure dynamics and investigates how sustainability priorities affect leverage decisions in various contexts.

1.2.1 Empirical Evidence

Extensive research indicates that robust ESG performance enhances firms' financing conditions. Friede et al. (2015) provide evidence that ESG engagement increases firm value by lowering perceived risk, facilitating improved access to capital under favourable conditions. Fatemi et al. (2018) confirmed that firms with higher ESG disclosure have lower cost of capital. This is driven by enhanced transparency and stakeholder trust.

In emerging markets, ESG initiatives function as strategic tools to address financial constraints. Malik and Kashiramka (2025) demonstrated that companies with proactive ESG disclosures in financially constrained settings gain better access to long-term debt financing, which supports sustainability goals and enhances financial stability.

In developed economies, ESG reputation risks have a growing impact on capital structure decisions. Newton et al. (2024) show that firms under strong ESG scrutiny often shift from

bank loans to bond financing. They do this to improve reputational signalling and diversify their investor base. In contrast, Asimakopoulos et al. (2024) find that firms with high ESG ratings tend to prefer stable and relationship-based bank debt over more volatile market financing. Taken together, these findings suggest that ESG engagement challenges traditional capital structure theories. Khan et al. (2024) found that companies strategically issue equity when ESG sentiment is high, taking advantage of increased valuations, which contradicts the Pecking Order Theory. It forecasts dependence on internal funding and debt prior to issuing equity. This indicates that market conditions influenced by ESG can temporarily alter conventional financing preferences.

Research by Zhao et al. (2024) highlights the need to separate ESG components. The findings indicate that environmental and governance factors have a greater impact on leverage decisions compared to social factors, suggesting that the financial effects of ESG pillars are not consistent. Recent research by Csapi et al. (2024) indicates that firms adhering to ESG principles might achieve an optimal leverage ratio. The equilibrium between debt and equity may enhance financial resilience and sustainability. This nascent investigation combines financial optimization with sustainability alignment.

1.2.2 Key Insights and Gaps

The literature shows that ESG performance affects how firms decide on their capital structure. Strong ESG scores usually help firms obtain debt, lower their funding costs, and adjust the mix between debt and equity. At the same time, the strength and direction of these effects differ across markets, across firms, and with how credible investors judge ESG practices to be.

However, important gaps remain. Many studies use a single, overall ESG score and do not separate environmental, social, and governance pillars, even though each pillar may influence financing in a different way. Sector evidence is also limited, although ESG priorities and financing needs differ clearly between, for example, heavy industry and high-tech firms. In addition, there is a lack of long-term studies that test whether ESG-related changes in capital structure last over time or simply reflect short-term reactions to market sentiment.

1.2.3 Conclusion

ESG factors are changing corporate financing and bringing sustainability into decisions that were once driven mainly by financial metrics. In general, better ESG performance tends to improve access to capital and support financial stability, but the effects are not uniform across

ESG dimensions or sectors. Understanding how firms embed ESG in their long-run capital structure decisions is therefore important for future work in sustainable corporate finance.

1.3.ESG and Uncertainty

The increasing incorporation of ESG factors into corporate strategies has expanded from financial optimization to include risk management and the enhancement of resilience. ESG performance is increasingly recognized as a potential mitigator of firm-level uncertainty, providing reputational protection, fostering stakeholder loyalty, and improving access to financing during periods of volatility (W. Li et al., 2024; Zhang et al., 2024). Many studies highlight the stabilizing role of ESG. However, some researchers argue that ESG does not always protect firms in major crises, particularly when sustainability practices are weak or superficial (Biju et al., 2025; Bongiovanni & Fiandrino, 2024).

In addition, differences in ESG ratings across agencies—stemming from variations in methodologies and evaluation criteria—can introduce inconsistencies in ESG assessments and create additional uncertainty for investors (Benlemlih & Bitar, 2022). This limitation may reduce the reliability of ESG signals and weaken their effectiveness as a stabilizing mechanism. This section reviews the growing literature on how ESG engagement supports corporate resilience under uncertainty. It highlights both the potential advantages of ESG and its limits as a strategic tool in times of stress.

1.3.1 Empirical Evidence

Numerous studies indicate that robust ESG practices can diminish firms' vulnerability to uncertainty. Y. Li et al. (2024) demonstrate that ESG leadership notably reduces the borrowing costs for firms, especially in times of increased financial volatility characterized by sharp fluctuations in market conditions, widening credit spreads, unpredictable spikes in interest rates, or significant swings in equity valuations. These periods are unstable. They often occur with systemic disruptions. Uncertainty in macroeconomic policy is common. Geopolitical crises can happen at the same time. Financing becomes more expensive in these situations. Access to capital is limited. Well-governed companies have an advantage. Transparent firms are also favoured. Zhang et al. (2024) find that companies with high ESG ratings behave more steadily. These companies make more stable investments during downturns. This evidence suggests that strong sustainability practices help firms survive negative shocks.

Jin et al. (2023) show that firms with strong ESG profiles attract more capital during crises. These additional inflows increase liquidity buffers. They also strengthen firms' overall financial

resilience. Likewise, Shrestha and Naysary (2023) find that ESG disclosures raise investor confidence in uncertain markets. They do so by improving transparency and the quality of information signals. As a result, perceived information asymmetry is reduced.

However, ESG strategies are not always effective. Bongiovanni and Fiandrino (2024) show that some green firms suffered larger stock market losses during the COVID 19 crisis. Rigid cost structures were a key factor. Limited operational flexibility also contributed. Biju et al. (2025) report similar limits. Firms with weak governance often dropped ESG initiatives under financial distress. This behaviour undermines the long-term credibility of their sustainability commitments.

Further problems arise from the lack of uniform ESG metrics. Greenwashing also remains widespread. Trahan and Jantz (2023) argue that ESG definitions and ratings differ across providers. This variation reduces the reliability of ESG as a tool for managing uncertainty. It also makes it difficult for investors to identify genuinely sustainable firms. As a result, investors may confuse truly committed companies with those that engage only in symbolic compliance.

1.3.2 Key Insights and Gaps

Studies indicate that ESG performance may enhance corporate resilience in uncertain contexts. It has the potential to enhance stakeholder trust, reduce the cost of capital, and promote more stable investment behaviour. The effectiveness of ESG as a strategic buffer is contingent upon specific conditions. The result depends on the quality of governance, the legitimacy of sustainability practices, and the clarity of ESG reporting criteria.

Many existing studies focus on overall ESG scores. They often do not distinguish between the separate effects of the environmental, social, and governance pillars. Sector- and region-specific differences in ESG effectiveness are also underexplored, particularly in emerging markets with weaker institutions. There is therefore a need for longitudinal research to test whether ESG-based resilience persists across several crisis episodes or weakens over time.

1.3.3 Conclusion

ESG engagement can reduce firm-level uncertainty. Its impact, however, is neither automatic nor universal. The stabilizing benefits of ESG depend on strong governance systems. They also require genuine integration of sustainability into core strategies. Consistent and credible disclosure standards are equally important. Future research should separate the effects of each ESG dimension. It should also examine sectoral and regional differences in ESG outcomes. In

addition, studies need to explore how firms maintain ESG-based resilience across different phases of economic volatility.

2. Conceptual Framework:

Building on the reviewed literature, this study proposes an integrated conceptual framework that links economic uncertainty, ESG performance, and capital structure decisions. While prior research has largely examined these dimensions separately, this paper adopts a unified perspective in which ESG performance conditions firms' financial responses to uncertainty.

In this framework, economic uncertainty is considered the primary external driver influencing corporate financing decisions. High levels of uncertainty, whether economic, financial, or policy-related, tend to increase perceived risk, tighten financing conditions, and reduce firms' willingness to rely on debt. This typically leads to more conservative capital structures, consistent with the predictions of the Trade-Off Theory.

However, empirical evidence also shows that this relationship is not uniform. Firms do not respond to uncertainty in the same way, and this heterogeneity suggests the presence of moderating factors. This study argues that ESG performance represents a key moderating variable that shapes how firms adjust their leverage under uncertain conditions.

Firms with strong ESG profiles tend to benefit from enhanced transparency, reduced information asymmetry, and greater stakeholder trust. These advantages improve access to capital and may mitigate the negative effects of uncertainty on financing decisions. As a result, such firms are better positioned to maintain or even increase leverage when uncertainty rises, compared to firms with weak ESG performance. Conversely, firms with low ESG credibility may face higher financing costs and stronger constraints, leading to more pronounced deleveraging.

Accordingly, ESG performance does not act merely as an independent determinant of capital structure but rather as a conditioning mechanism that influences the strength and direction of the relationship between uncertainty and leverage.

Based on this reasoning, the following research propositions are formulated:

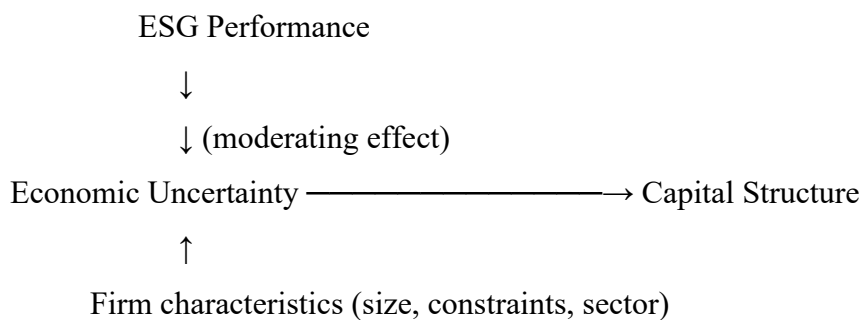
P1: Economic uncertainty negatively affects corporate leverage, leading firms to adopt more conservative capital structures.

P2: ESG performance moderates the relationship between economic uncertainty and leverage, such that firms with higher ESG performance experience a weaker negative impact of uncertainty on debt usage.

P3: The moderating effect of ESG varies across firms depending on characteristics such as financial constraints, sectoral exposure, and institutional environment.

This conceptual framework provides a structured basis for interpreting the empirical findings identified in the literature and highlights the need for dynamic and context-dependent models of capital structure. It also clarifies the analytical positioning of ESG as a moderating variable, thereby addressing the ambiguity observed in prior studies.

Figure 1. ESG-Moderated Capital Structure Model



Source: Authors

3. METHODOLOGY

This study employs a systematic literature review (SLR) to analyse the relationships between economic uncertainty, ESG performance, and corporate capital structure. The SLR approach is particularly suitable for synthesizing fragmented and rapidly evolving research streams, ensuring methodological transparency, replicability, and analytical rigor.

3.1. Data source and search strategy

The literature review is based primarily on the Scopus database, which provides comprehensive coverage of high-quality, peer-reviewed journals in finance, economics, and management. Scopus was selected due to its reliability, standardized indexing system, and advanced filtering capabilities.

A structured keyword search was conducted using combinations of the following terms: “capital structure AND uncertainty”, “economic policy uncertainty AND leverage”, “capital structure AND ESG”, “ESG performance AND financing”, “ESG AND uncertainty”.

These keywords were applied to titles, abstracts, and author keywords to ensure relevance and completeness of the search results.

3.2. Inclusion and exclusion criteria

To ensure consistency and relevance, the review focuses on articles published between 2020 and 2025, reflecting the recent surge in research following major global disruptions, including the COVID-19 pandemic and increased policy uncertainty.

Only peer-reviewed journal articles written in English were included. Conference papers, working papers, book chapters, and non-academic publications were excluded to maintain academic rigor.

Seminal contributions predating 2020 (e.g., Modigliani and Miller, Myers, Fama and French) were selectively included to provide theoretical foundations.

Although priority was given to journals ranked in the upper Scopus quartiles (Q1 and Q2), highly relevant studies from other journals were also considered when they offered significant conceptual or empirical insights.

3.3. Screening and selection process

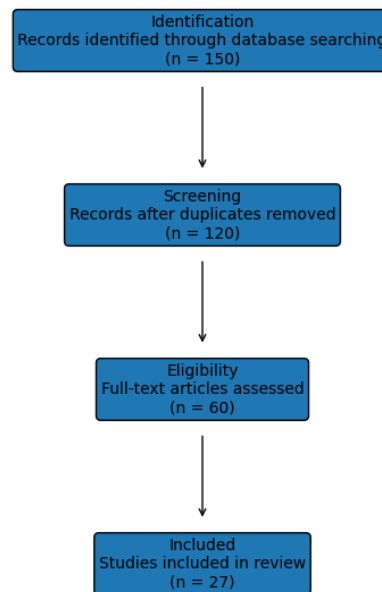
The article selection process followed a structured procedure inspired by the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework to enhance transparency and reproducibility.

The process was conducted in four main stages:

1. **Identification:** The initial keyword search yielded a broad set of articles related to capital structure, ESG, and uncertainty.
2. **Screening:** Titles and abstracts were reviewed to exclude clearly irrelevant studies (e.g., articles not addressing corporate finance or not linked to at least one of the three dimensions).
3. **Eligibility:** Full-text analysis was conducted to assess the relevance and methodological quality of the remaining articles. Only studies explicitly examining at least one of the following relationships were retained:
 - (i) capital structure and uncertainty,
 - (ii) capital structure and ESG performance,
 - (iii) ESG performance and uncertainty.
4. **Inclusion:** After applying these criteria, a final sample of 27 articles was selected for in-depth analysis.

This process can be summarized in a PRISMA flow diagram (Figure 2), which illustrates the number of articles identified, screened, excluded, and retained at each stage.

Figure 2. PRISMA flow diagram



Source: Authors

3.4. Data extraction and classification

For each selected article, key information was systematically extracted, including:

- type and measurement of uncertainty (economic, financial, policy-related, Knightian),
- capital structure indicators (leverage ratios, debt maturity, debt composition),
- ESG metrics (aggregate scores or individual E, S, and G components),
- methodological approach and sample characteristics,
- main empirical findings.

The articles were then classified into three thematic categories:

- (1) capital structure and uncertainty,
- (2) capital structure and ESG,
- (3) ESG and uncertainty.

This classification enables a structured comparison of findings and facilitates the identification of converging and diverging results across the literature.

3.5. Synthesis approach and limitations

The study adopts a qualitative synthesis approach, focusing on identifying recurring patterns, contradictions, and contextual differences rather than conducting a formal meta-analysis. This approach is appropriate given the heterogeneity of methodologies, variables, and measurement techniques across the selected studies.

The final sample of 27 articles is intentionally selective, prioritizing conceptual relevance and analytical depth over exhaustive coverage. While this may limit generalizability, it allows for a more focused and integrative interpretation of the relationships among ESG, uncertainty, and capital structure.

Nevertheless, some limitations should be acknowledged. The reliance on a single database (Scopus) may exclude relevant studies indexed elsewhere. In addition, the qualitative nature of the synthesis may introduce a degree of interpretative subjectivity. These limitations provide avenues for future research, including meta-analytical approaches and broader database coverage.

4. RESULTS AND DISCUSSION

The analysis of the literature reveals that capital structure decisions are increasingly shaped by the joint influence of economic uncertainty and ESG performance. Moving beyond a purely descriptive synthesis, this section provides an integrated interpretation of the underlying mechanisms, aligns the findings with the proposed conceptual framework, and highlights their theoretical and practical implications.

4.1. Economic uncertainty and leverage adjustments

Consistent with Proposition 1, the literature indicates that economic uncertainty generally exerts a negative effect on corporate leverage. In periods of heightened uncertainty, firms tend to reduce debt in order to limit exposure to financial distress risk and preserve financial flexibility (Titman & Wessels, 1988; Li & Qiu, 2021).

This behaviour is explained by three main mechanisms. First, uncertainty increases the volatility of expected cash flows, raising the probability of financial distress. Second, credit supply conditions tighten during uncertain periods, increasing borrowing costs and restricting access to external financing. Third, firms adopt precautionary financial policies, prioritizing liquidity preservation over expansion.

However, this relationship is not uniform. Under conditions of deep or Knightian uncertainty, where probabilities are not well defined, some firms increase leverage as a strategic response to redistribute risk toward creditors (Wu & Hu, 2024). This suggests that corporate responses to uncertainty are not purely defensive but may also reflect strategic financial positioning.

Overall, the evidence highlights a nonlinear and context-dependent relationship between uncertainty and capital structure, challenging static predictions from traditional trade-off and pecking order theories.

4.2. The moderating role of ESG performance

In line with Proposition 2, ESG performance does not directly determine capital structure but conditions how firms respond to uncertainty.

Strong ESG performance modifies the transmission of uncertainty through three interrelated channels:

First, it reduces information asymmetry by improving the quality and credibility of corporate disclosure, which enhances the predictability of firm behaviour for external financiers. Second, it strengthens governance quality and internal risk management systems, leading to more stable financial policies during volatile periods. Third, it enhances stakeholder confidence, which improves firms' ability to maintain access to external financing even when market conditions deteriorate.

As a result, firms with high ESG performance exhibit a weaker sensitivity of leverage to uncertainty shocks compared to firms with low ESG credibility. Conversely, firms with weak ESG practices face stronger financing constraints and tend to adjust capital structure more aggressively during periods of uncertainty.

However, the moderating effect of ESG is contingent on its credibility. Divergences in ESG ratings and concerns about greenwashing reduce the reliability of ESG signals, limiting their ability to mitigate perceived risk (Benlemlih & Bitar, 2022). This implies that ESG functions as a conditional moderator whose effectiveness depends on disclosure quality and institutional trust.

4.3. ESG as a resilience mechanism under uncertainty

Beyond its moderating role, ESG performance also contributes to corporate resilience during periods of financial stress.

Empirical evidence shows that firms with strong ESG profiles tend to maintain more stable access to capital and experience lower financing volatility during crises. This is largely because ESG engagement enhances the firm's long-term legitimacy, strengthens relationships with stakeholders, and signals lower operational and governance risk.

However, ESG does not provide unconditional protection. Its stabilizing effect weakens when ESG practices are superficial or when firms face rigid cost structures that limit operational flexibility. In such cases, ESG-linked strategies may not prevent financial deterioration during major shocks.

Therefore, ESG contributes to resilience only when it is deeply integrated into corporate governance and supported by credible, consistent implementation.

4.4. Integrated interpretation and theoretical implications

The findings suggest that corporate capital structure decisions under uncertainty are best understood through a dynamic and conditional framework rather than static optimality models. Uncertainty influences leverage through competing mechanisms: it increases precautionary behaviour under measurable risk conditions, but may also encourage strategic risk transfer under ambiguous environments. This duality explains the heterogeneous empirical evidence observed in the literature.

Within this context, ESG emerges as a key conditioning factor shaping the sensitivity of financing decisions to uncertainty. By improving transparency, governance quality, and stakeholder confidence, ESG reduces the extent to which firms adjust leverage in response to uncertainty shocks. However, this effect depends on the credibility of ESG practices and institutional conditions.

This interpretation extends traditional capital structure theories by introducing a non-financial conditioning mechanism that shapes financing behaviour under uncertainty. It also reconciles previously contradictory findings by showing that both deleveraging and leverage increases can coexist depending on uncertainty type and firm characteristics.

4.5. Managerial and policy implications

For managers, ESG should be viewed as a strategic financial resource rather than solely a reputational asset. High-quality ESG practices enhance financing flexibility and reduce vulnerability to uncertainty-driven credit tightening.

For investors, ESG performance provides relevant information about a firm's risk management quality and financial stability under volatile conditions, improving risk assessment in uncertain markets.

For policymakers, improving the consistency and comparability of ESG disclosure standards is essential. Greater standardization would enhance the reliability of ESG signals and strengthen their role in capital allocation efficiency.

4.6. Remaining gaps and future research directions

Despite recent advances, several gaps remain. First, the interaction between different types of uncertainty and individual ESG dimensions (environmental, social, governance) remains

underexplored. Second, sectoral and institutional heterogeneity continues to be insufficiently integrated into empirical models. Third, most studies rely on static frameworks, limiting understanding of how capital structure adjusts dynamically over time.

Future research should adopt longitudinal and multi-dimensional approaches to better capture the evolving nature of both uncertainty and ESG-related financial effects.

Conclusion

This study provides an integrated analysis of the relationships between economic uncertainty, ESG performance, and corporate capital structure. While each of these dimensions has been widely examined in isolation, their interaction remains insufficiently understood.

The findings indicate that economic uncertainty generally leads firms to adopt more conservative financing strategies, although this response varies across firms and contexts. More importantly, ESG performance plays a critical moderating role by influencing access to capital, reducing information asymmetry, and strengthening stakeholder trust. However, this effect is conditional on the credibility of ESG practices and the institutional environment.

By proposing an integrated conceptual framework, this study extends traditional capital structure theories and highlights the importance of incorporating sustainability and uncertainty into financial decision-making models. The results underscore the need for dynamic and context-sensitive approaches capable of capturing the complexity of corporate behaviour in uncertain and sustainability-driven environments.

Future research should further explore the interaction between different types of uncertainty and ESG dimensions, as well as sectoral and regional variations. Longitudinal studies would also be valuable in understanding how firms adjust their capital structure over time in response to evolving uncertainty and sustainability expectations.

Overall, this study contributes to a more comprehensive understanding of corporate financing decisions in an increasingly uncertain and sustainability-oriented global economy.

BIBLIOGRAPHY

- Asimakopoulos, P., Asimakopoulos, S., & Li, X. (2024). The combined effects of economic policy uncertainty and environmental, social, and governance ratings on leverage. *European Journal of Finance*.
- Benlemlih, M., & Bitar, M. (2022). Agences de notation ESG entre convergence des objectifs et divergence des notations. *Revue du Contrôle de la Comptabilité et de l'Audit*.
- Biju, A., Geetha, S., Prasad, S., Sasidharan, A., & Jayachandran, A. (2025). ESG–firm performance nexus: Evidence from an emerging economy. *Business Strategy and the Environment*, 34, 3469–3496.
- Bongiovanni, A., & Fiandrino, S. (2024). Does firm environmental performance mitigate the market reaction to COVID-19 uncertainty? *Research in International Business and Finance*.
- Bradley, M., Jarrell, G. A., & Kim, E. H. (1984). On the existence of an optimal capital structure: Theory and evidence. *The Journal of Finance*, 39, 857–878.
- Csapi, V., Ulbert, J., & Tóth-Pajor, Á. (2024). Golden ratio-based leverage targeting and the ESG performance of U.S. and European listed firms. *Research in International Business and Finance*.
- El Amili, H., & Akrich, M. (2021). Stratégie, incertitude de l'environnement et mesure équilibrée de la performance. *Revue du Contrôle de la Comptabilité et de l'Audit*.
- Ellsberg, D. (1961). Risk, Ambiguity, and the Savage Axioms. *The Quarterly Journal of Economics*, 75(4), 643–669.
- Fama, E. F., & French, K. R. (2002). Testing trade-off and pecking order predictions about dividends and debt. *The Review of Financial Studies*, 15.
- Fatemi, A., Glaum, M., & Kaiser, S. (2018). ESG performance and firm value: The moderating role of disclosure. *Global Finance Journal*, 38, 45–64.
- Frank, M. Z., & Goyal, V. K. (2009). Capital structure decisions: Which factors are reliably important? *Financial Management*, 38, 1–37.
- Friede, G., Busch, T., & Bassen, A. (2015). ESG and financial performance: Aggregated evidence from more than 2000 empirical studies. *Journal of Sustainable Finance & Investment*, 5, 210–233.
- Im, H. J., Faff, R., & Ha, C. Y. (2022). Uncertainty, investment spikes, and corporate leverage adjustments. *Journal of Banking & Finance*, 145, 106649.

Jensen, M. C. (1996). Agency costs of free cash flow, corporate finance, and takeovers. In J. S. Bhandari & L. A. Weiss (Eds.), *Corporate bankruptcy* (pp. 11–16). Cambridge University Press.

Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs, and ownership structure. *Journal of Financial Economics*, 305–360.

Jin, Y., Liu, Q., Tse, Y., & Zheng, K. (2023). Hedging COVID-19 risk with ESG disclosure. *International Review of Economics and Finance*.

Khan, M. A., Hassan, M. K., Maraghini, M. P., Paolo, B., & Valentinuz, G. (2024). Valuation effect of ESG and its impact on capital structure: Evidence from Europe. *International Review of Economics and Finance*, 91, 19–35.

Khan, M. A., Qin, X., & Jebran, K. (2020). Uncertainty and leverage nexus: Does trade credit matter? *Eurasian Business Review*.

Knight, F. H. (1921). Risk, uncertainty, and profit. The Online Library of Liberty.

Kraus, A., & Litzenberger, R. (1973). A state-preference model of optimal financial leverage. *Journal of Finance*.

Li, W., Hu, H., & Hong, Z. (2024). Green finance policy, ESG rating, and cost of debt: Evidence from China. *International Review of Financial Analysis*.

Li, X.-M., & Qiu, M. (2021). The joint effects of economic policy uncertainty and firm characteristics on capital structure: Evidence from U.S. firms. *Journal of International Money and Finance*.

Li, Y., Meng, D., & Wang, L. (2024). Performance pressure and annual report text manipulation: Evidence from China. *Business Ethics, the Environment and Responsibility*.

Malik, N., & Kashiramka, S. (2025). ESG disclosure and its impact on firm leverage: The moderating role of quality of financial reporting and financial constraints. *Global Finance Journal*. <https://doi.org/10.1016/j.gfj.2025.101099>

Myers, S. C. (1977). Determinants of corporate borrowing. *Journal of Financial Economics*.

Myers, S. C., & Majluf, N. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics*, 184–221.

Myers, S. C. (1984). The capital structure puzzle. *The Journal of Finance*, 39, 574–592.

Newton, D. P., Ongena, S., Xie, R., & Zhao, B. (2024). Firm ESG reputation risk and debt choice. *European Financial Management*.

Park, J. (2024). Uncertainty shocks, equity financing, and business cycle amplifications. *Journal of Corporate Finance*, 85, 102561.

- Schwarz, L. A. D., & Dalmácio, F. Z. (2021). The relationship between economic policy uncertainty and corporate leverage: Evidence from Brazil. *Finance Research Letters*, 40.
- Shrestha, K., & Naysary, B. (2023). ESG and economic policy uncertainty: A wavelet application. *Finance Research Letters*.
- Shyam-Sunder, L., & Myers, S. C. (1999). Testing static trade-off against pecking order models of capital structure (No. w4722). National Bureau of Economic Research.
- Titman, S., & Wessels, R. (1988). The determinants of capital structure choice. *The Journal of Finance*, 43, 1–19.
- Trahan, R. T., & Jantz, B. (2023). What is ESG? Rethinking the “E” pillar. *Business Strategy and the Environment*, 32, 4382–4391.
- Wu, Y., & Hu, F. (2024). Optimal investment and capital structure under Knightian uncertainty. *International Review of Financial Analysis*, 95, 103451.
- Zhang, C., Farooq, U., Jamali, D., & Alam, M. M. (2024). The role of ESG performance in the nexus between economic policy uncertainty and corporate investment. *Research in International Business and Finance*.
- Zhao, Y., Gao, Y., & Hong, D. (2024). Sustainable innovation and economic resilience: Deciphering ESG ratings’ role in lowering debt financing costs. *Journal of the Knowledge Economy*.