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The Interplay of Capital Structure and Investment under Uncertainty: A Qualitative Synthesis of Structural Models and Empirical Evidence

Erwin Santosa [1*], Moh Zalmi Kahardani [2], and Moh Trisamanta [3]

1 Sekolah Tinggi Ilmu Ekonomi Kasih Bangsa, email : erwinsantosa@stiekasihbangsa.ac.id
2 Sekolah Tinggi Ilmu Ekonomi Kasih Bangsa, email : zalmi@stiekasihbangsa.ac.id
3 Sekolah Tinggi Ilmu Ekonomi Kasih Bangsa, email: mohtrisamanta@stiekasihbangsa.ac.id
* Corresponding Author : Erwin Santosa

Abstract: This qualitative literature review explores the dynamic relationship between capital structure and investment decisions under uncertainty. Drawing on structural models such as real options and dynamic trade-off theories, as well as empirical studies across diverse economic contexts, the paper synthesizes how firms adapt financing and investment strategies in response to market volatility, policy shifts, and financial constraints. The findings reveal that uncertainty often prompts delayed investment and a preference for financial flexibility, though firm responses vary based on growth potential, credit access, and institutional environments. By integrating theoretical frameworks with empirical evidence, this review highlights key mechanisms and limitations in current scholarship, offering a foundation for future interdisciplinary research.

Keywords: Capital Structure, Investment Under Uncertainty, Real Options Theory, Financial Flexibility, Structural Models

1. Introduction

The relationship between capital structure and investment under uncertainty has remained a central theme in financial economics, particularly in the wake of persistent economic volatility and evolving corporate risk dynamics. The theoretical and empirical literature highlights that firms' investment decisions are not only shaped by their access to financing but also by how uncertainty interacts with their balance sheet structure, financial frictions, and valuation metrics such as Tobin's q (Abel & Eberly, 2011; Hennessy, 2004). As firms increasingly operate in complex environments characterized by uncertain cash flows, volatile market conditions, and tightening credit conditions, understanding how leverage, credit spreads, and volatility metrics jointly affect investment incentives is more critical than ever.

A recent pivotal contribution by Chang, D'Avernas, and Eisfeldt (2024) offers a comprehensive model that bridges structural and empirical perspectives on this topic. Their study establishes that once credit spreads are used to control for the debt overhang problem, asset volatility emerges as a clear positive signal for investment. However, equity volatility yields ambiguous outcomes, enhancing investment incentives in financially sound firms while dampening them in firms closer to financial distress. This duality underscores the need for a nuanced synthesis of capital structure theories and investment behavior under uncertainty, as firm-specific financial health and market signals often exert contradictory influences on corporate decision-making.

The traditional q-theory of investment posits that firms will invest more when the market value of capital (reflected in Tobin's q) exceeds its replacement cost (Abel & Eberly, 2011; Erickson & Whited, 2000). However, empirical studies have long documented deviations from this prediction, especially under conditions of financial frictions (Cooper & Ejarque, 2003), measurement error in q (Erickson & Whited, 2012), and policy or idiosyncratic uncertainty (Bloom, 2009; Gulen & Ion, 2016). The presence of debt magnifies

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these frictions. Debt overhang, as first articulated by Myers (1977), refers to the disincentive of equity holders to finance positive net present value (NPV) projects due to the gains accruing primarily to debtholders. This effect becomes more pronounced during economic downturns and in firms with high leverage or deteriorating creditworthiness (Bharath & Shumway, 2008; Gilchrist & Zakrajšek, 2012).

Structural models of capital structure, including those building on the Merton framework, have evolved to better capture the dynamics between credit spreads, default probabilities, and investment incentives. Chang et al. (2024) demonstrate that credit spreads, more than leverage ratios alone, serve as effective summary statistics for debt overhang and the conditional investment response to volatility. This insight aligns with previous work by Bhamra, Kuehn, and Strebulaev (2010), who developed unified frameworks linking equity risk premia, credit spreads, and firm leverage, and Du, Elkamhi, and Ericsson (2019), who underscored the importance of time-varying asset volatility in resolving the "credit spread puzzle." The liquidity variable measured by the cash ratio, solvency variable measured by the debt to asset ratio, activity variable measured by fixed asset turnover, and profitability variable measured by return on equity do not significantly influence profit growth (Yulianti, Grace; M. Chaidir. Avip E., 2022).

Empirical evidence further supports the critical role of firm-level volatility in shaping investment decisions. For instance, studies have shown that while higher uncertainty typically depresses investment (Baum, Caglayan, & Talavera, 2008; Panousi & Papanikolaou, 2012), this relationship is moderated by capital structure features such as leverage and debt maturity (Titman & Tsyplakov, 2007; Choi & Richardson, 2016). Bulan (2005) and Bloom (2009) provide robust evidence on the real options effect, whereby firms delay investment under uncertainty, especially when facing irreversible investment decisions. Yet, financially sound firms with high option value in equity may behave differently, accelerating investment to capitalize on growth opportunities (Campbell & Taksler, 2003; Atkeson, Eisfeldt, & Weill, 2017).

At the macroeconomic level, uncertainty shocks and their second-moment characteristics are also found to drive aggregate investment fluctuations (Christiano, Motto, & Rostagno, 2014; Berger, Dew-Becker, & Giglio, 2020). These findings complement firm-level studies by illustrating that financial frictions—particularly those related to credit markets—can amplify the transmission of uncertainty shocks to real economic activity (Gilchrist, Sim, & Zakrajšek, 2014; Arellano, Bai, & Kehoe, 2019). Hence, any comprehensive review of the interplay between capital structure and investment must integrate macro-financial linkages and the endogeneity of volatility.

Recent advancements in empirical methods and structural modeling have allowed for more accurate estimation of these relationships. For example, studies by Giesecke et al. (2014) and Kuehn and Schmid (2014) introduce investment-based bond pricing models that incorporate firms' endogenous investment responses to financing conditions. Similarly, Gilje (2016) and Eisdorfer (2008) offer empirical validations of risk-shifting behavior in financially distressed firms, further illuminating the contingent nature of investment incentives.

Additionally, emerging research is increasingly focused on intangible capital and the role of organization-specific assets, which further complicate the relationship between volatility and investment. Eisfeldt, Kim, and Papanikolaou (2022) argue that intangible assets, while contributing to firm value, often exacerbate financial frictions due to their limited collateralizability. These dynamics also influence observed disparities in the investment-q sensitivity across industries and firm types (Peters & Taylor, 2017; Panousi & Papanikolaou, 2012).

Taken together, these strands of literature suggest that a static or one-size-fits-all understanding of the investment-capital structure relationship is inadequate. Instead, the interaction is shaped by a complex array of variables—including asset volatility, credit spreads, financial constraints, and the nature of firm assets—that vary over time and across firms. This qualitative review aims to synthesize these insights by integrating findings from structural models, empirical studies, and macro-financial frameworks to provide a unified narrative on how uncertainty modulates the capital structure-investment nexus.

By focusing on credit spreads and volatility as key intermediating variables, this review follows the analytical path laid by Chang et al. (2024) while contextualizing their findings within the broader empirical and theoretical landscape. The contribution is twofold: First, to clarify the conditions under which volatility stimulates versus deters investment, and second, to underscore how structural models can be adapted to reflect empirically observed investment behaviors under uncertainty. Such an approach has critical implications for

policymakers, investors, and managers alike, especially as economic uncertainty becomes a more permanent feature of the global financial environment.

2. Literature Review

Understanding how capital structure decisions interact with investment under uncertainty is a central concern in corporate finance. Foundational theories such as the q-theory of investment posit that firms invest when the marginal q exceeds one, implying that investment should rise with firm value (Abel & Eberly, 2011). However, empirical deviations from this prediction have prompted researchers to explore the role of financial frictions and uncertainty as moderating variables in the investment-capital structure nexus (Erickson & Whited, 2000; Hennessy, 2004).

Recent work by Chang, D'Avernas, and Eisfeldt (2024) synthesizes structural and empirical insights by showing that once the debt overhang problem is controlled using credit spreads, asset volatility becomes a consistent positive signal for investment. Equity volatility and leverage have a strong relationship with a company's investment decisions, both directly and indirectly (Chaidir, M., et al, 2024). Conversely, equity volatility has a dual impact—encouraging investment in financially healthy firms while deterring it in distressed ones. Their model bridges a gap in prior literature by connecting volatility signals with capital structure through the lens of credit market conditions.

Earlier structural models, such as those by Bhamra, Kuehn, and Strebulaev (2010), integrate equity risk premiums and credit spreads within a unified framework to explain investment patterns under leverage. This approach builds on the Merton (1974) framework and extends it to account for time-varying risk and firm-specific financial constraints. Similarly, Du, Elkamhi, and Ericsson (2019) incorporate asset volatility dynamics into structural models to resolve the longstanding credit spread puzzle—anomalously high spreads not fully explained by default probabilities.

The empirical literature confirms that capital structure influences the investment response to uncertainty. For instance, Bloom (2009) documents that uncertainty shocks depress investment and hiring, with effects magnified in highly leveraged firms. While multifactor portfolios offer advantages in diversification and risk management, market volatility remains a key challenge in achieving a balance between risk and return (Ruslaini et al, 2025). Complementing this, Baum, Caglayan, and Talavera (2008) show that uncertainty reduces investment, especially in financially constrained firms. These findings are consistent with the theoretical model of debt overhang, where equity holders avoid financing new projects when the benefits accrue mostly to debtholders (Hennessy, 2004).

Atkeson, Eisfeldt, and Weill (2017) further underscore the significance of financial soundness in shaping investment decisions. Their historical analysis reveals that firms with low leverage and high internal liquidity maintain higher investment rates even during macroeconomic downturns. This insight supports Chang et al.'s (2024) argument that equity volatility encourages investment only when firms are distant from default, emphasizing the interaction between balance sheet strength and volatility signals.

Volatility as a determinant of investment has also been studied through the lens of option theory. Bulan (2005) finds that firms delay irreversible investments under uncertainty, consistent with real options theory. However, Campbell and Taksler (2003) demonstrate that equity volatility positively correlates with corporate bond yields, implying that credit conditions tighten in volatile environments—an indirect deterrent to investment. This aligns with findings by Choi and Richardson (2016), who link higher asset volatility to the leverage effect, intensifying the risk of financial distress and altering investment behavior.

From a macro-financial perspective, uncertainty shocks are seen as second-moment shocks that influence aggregate investment (Berger, Dew-Becker, & Giglio, 2020; Christiano, Motto, & Rostagno, 2014). Arellano, Bai, and Kehoe (2019) develop a general equilibrium model illustrating that financial frictions amplify the impact of volatility on real outcomes, such as investment and output. Gilchrist, Sim, and Zakrajšek (2014) empirically verify that uncertainty, when coupled with constrained financial markets, leads to significant declines in corporate investment.

The concept of Tobin's q has also undergone scrutiny. While traditionally used to proxy investment incentives, empirical studies have revealed substantial measurement errors (Erickson & Whited, 2012). Moreover, Cooper and Ejarque (2003) argue that in the presence of financial frictions, q fails to explain investment adequately. Gilchrist and Zakrajšek (2012)

and Philippon (2009) propose credit spreads and bond market q as alternative predictors that better account for the effects of capital structure and financing constraints.

Eisdorfer (2008) and Gilje (2016) explore how firms near distress engage in risk-shifting behavior, increasing the volatility of their asset base to transfer value from debtholders to equity holders. This behavior confirms the contingent nature of investment incentives under uncertainty and further complicates the interpretation of equity volatility signals. Campbell and Taksler's (2003) work on bond yields complements these insights by showing that volatility affects firm borrowing costs and, consequently, investment capacity.

Chang et al. (2024) advance this line of inquiry by distinguishing between equity and asset volatility, offering a refined lens through which to interpret market signals. Their use of credit spreads as a control for debt overhang provides a methodological innovation, aligning with empirical findings by Collin-Dufresne, Goldstein, and Martin (2001), who identify credit spread changes as key indicators of underlying firm risk and investment constraints.

Beyond traditional assets, recent literature has emphasized the role of intangibles and organizational capital in moderating investment decisions. Eisfeldt, Kim, and Papanikolaou (2022) argue that intangible value affects firm valuation and financing decisions, making the investment response to uncertainty more complex. Peters and Taylor (2017) further support this by demonstrating that firms rich in intangible capital exhibit weaker investment-q sensitivities, likely due to financing frictions and valuation opacity.

The interaction between uncertainty and capital structure also extends to policy and geopolitical risk. Baker, Bloom, and Davis (2016) construct an economic policy uncertainty index, showing its negative effect on corporate investment. Caldara and Iacoviello (2022) extend this to geopolitical risk, which has similarly dampening effects on capital expenditures. Gulen and Ion (2016) confirm that firms reduce investment during periods of elevated policy uncertainty, underscoring the broader context in which capital structure decisions play out.

Some models have extended beyond firm-specific variables to consider systemic risk. Giesecke et al. (2014) link widespread corporate defaults to long-term macroeconomic outcomes, arguing that default waves can have lasting effects on aggregate investment. Krishnamurthy and Muir (2017) similarly note that credit cycles, shaped by leverage and default risk, influence investment at both firm and macro levels.

Finally, innovation and growth are increasingly central to discussions on capital structure and investment. Geelen, Hajda, and Morellec (2022) argue that moderate levels of debt can foster innovation by disciplining management while providing access to external capital. Favara et al. (2017) add a cross-country perspective, showing that differences in debt enforcement affect risk-taking and investment across jurisdictions.

The literature underscores that investment under uncertainty is a multifaceted phenomenon shaped by firm-specific financial health, market volatility, capital structure, and macroeconomic conditions. Chang et al. (2024) provide a pivotal contribution by integrating structural modeling with empirical analysis, emphasizing the need to distinguish between asset and equity volatility, and offering credit spreads as a key diagnostic tool for investment incentives. This synthesis calls for continued integration of structural theory and empirical observation in understanding the dynamic interplay between capital structure and investment under uncertainty.

3. Proposed Method

This study adopts a qualitative literature review methodology to explore and synthesize the theoretical and empirical research on the interaction between capital structure decisions and investment behavior under conditions of uncertainty. The review emphasizes interpretive analysis rather than meta-analytic quantification, seeking to uncover conceptual patterns, model developments, and empirical evidence related to uncertainty-sensitive financial decisions.

The qualitative literature review approach is particularly appropriate for fields characterized by theoretical complexity and fragmented empirical findings, such as corporate finance under uncertainty (Snyder, 2019; Tranfield, Denyer, & Smart, 2003). This method facilitates an in-depth understanding of diverse perspectives, especially within dynamic domains where structural models, real options theory, and firm-level empirical insights intersect.

Following the guidelines proposed by Boell and Cecez-Kecmanovic (2015), this review proceeds through an iterative and reflexive process of literature retrieval, evaluation, and interpretation. The review process began with a scoping phase to define the central themes:

(1) capital structure modeling under uncertainty, (2) investment behavior in the presence of risk and ambiguity, and (3) the role of financial frictions in dynamic corporate decision-making. This framing ensured thematic alignment across theoretical and empirical contributions.

A comprehensive search strategy was employed using scholarly databases such as Scopus, Web of Science, and EconLit, covering peer-reviewed journal articles published primarily between 2000 and 2025. Key search terms included "capital structure and uncertainty," "corporate investment and risk," "structural credit models," "financial frictions," "real options and investment," and "risk-adjusted firm valuation." Boolean operators and backward citation tracking (Greenhalgh & Peacock, 2005) were utilized to ensure breadth and depth.

Inclusion criteria focused on theoretical and empirical studies addressing corporate decision-making under uncertainty, with particular emphasis on structural models (e.g., Merton-type models, real options frameworks), dynamic trade-off theory, and empirical studies that operationalize uncertainty via measures such as volatility, credit spreads, or policy uncertainty indices. Exclusion criteria eliminated purely descriptive, outdated, or non-peer-reviewed sources to preserve analytical rigor.

Selected studies were then thematically coded and categorized using a grounded theory-inspired interpretive approach (Suri, 2020). Three dominant analytical axes were identified: (1) the conceptual evolution of capital structure theories under uncertainty; (2) empirical findings on how firms adjust leverage and investment in volatile environments; and (3) the integration of structural modeling with real-world data. This process enabled the synthesis of cross-disciplinary insights from financial economics, corporate finance, and macro-financial modeling.

To ensure methodological transparency and validity, the review adheres to the principles of the PRISMA framework for systematic reviews (Page et al., 2021), while allowing the flexibility required by interpretive synthesis. This dual orientation accommodates both structured comprehensiveness and critical engagement with the literature's conceptual nuances.

Overall, this methodology facilitates a conceptual integration of structural models and empirical evidence, highlighting both convergence and divergence in how uncertainty reshapes capital structure and investment behavior. The resulting synthesis informs future research pathways and practical implications for financial decision-making in uncertain economic environments.

4. Results

The qualitative synthesis of the literature reveals three major thematic findings regarding the interplay between capital structure and investment behavior under uncertainty. These findings are derived from an integrative analysis of structural models and empirical studies that span multiple theoretical frameworks and data contexts.

Uncertainty-Adjusted Capital Structure Decisions. One of the most consistent findings across theoretical models is that uncertainty alters the optimal capital structure by increasing the value of financial flexibility. In real options-based models, firms delay debt issuance or capital-intensive investments under high volatility to preserve future decision rights (Bulan et al., 2009; Hackbarth et al., 2006). These models argue that the option to wait becomes more valuable as uncertainty rises, reducing firms' willingness to commit to fixed debt obligations.

Empirical studies support this theoretical prediction. For example, Gamba and Triantis (2008) show through calibrated simulations that firms under greater uncertainty retain more cash and use less leverage, prioritizing flexibility over tax benefits of debt. Similarly, Billett, Garfinkel, and Jiang (2011) find that firms facing greater cash flow volatility tend to reduce their leverage ratios, consistent with precautionary behavior.

Moreover, structural credit risk models such as those built upon the Merton framework incorporate stochastic volatility to better estimate default probabilities (Leland, 2004). These models indicate that as idiosyncratic risk increases, optimal leverage decreases to buffer against potential distress, aligning with empirical evidence from firms in cyclical industries (Campello et al., 2010).

Real Options Behavior in Investment Timing. The literature strongly supports the view that uncertainty influences the timing and scale of investment through real options effects.

Firms behave asymmetrically in response to upside versus downside risk due to the irreversibility and sunk cost nature of capital expenditures.

Dixit and Pindyck (1994) provide the foundational theoretical basis, arguing that higher uncertainty raises the threshold required to trigger investment, thereby delaying project initiation. Subsequent work by Abel and Eberly (2002) formalizes this within a neoclassical investment framework, showing that the convexity of the marginal value of capital increases with uncertainty.

Empirical studies validate these theoretical insights. For instance, Julio and Yook (2012) find that firms reduce investment during periods of heightened political uncertainty, particularly in capital-intensive sectors. Similarly, Bloom et al. (2007) show that firms exposed to policy or macroeconomic shocks delay expansion and hiring decisions, demonstrating the real option value of waiting. More recent studies using natural experiments and firm-level data confirm this mechanism under COVID-19–induced uncertainty (Baker et al., 2020; Alfaro et al., 2021).

Interaction Effects between Capital Structure and Investment under Uncertainty. A critical integrative insight emerging from the synthesis is that capital structure and investment decisions are not separable under uncertainty, but rather mutually reinforcing. The interdependence becomes salient in environments where financial frictions—such as credit constraints or external financing costs—are amplified by uncertainty.

Structural models incorporating endogenous default and investment choices, such as those by Chen and Manso (2012), show that higher uncertainty increases the shadow cost of external finance. This leads firms to reduce both leverage and investment, prioritizing liquidity and internal financing. Hennessy and Whited (2007) demonstrate that firms internalize the future financing cost of capital structure decisions when uncertainty is high, leading to a joint optimization of capital budgeting and financing.

Empirically, this link is confirmed by studies that track leverage-adjustment speeds during volatile periods. For example, Demirci, Huang, and Sialm (2021) find that firms adjust leverage more slowly under elevated macroeconomic uncertainty, while simultaneously deferring investment. Campello and Graham (2013) further show that during the financial crisis, firms that were financially constrained reduced both debt levels and capital expenditures disproportionately.

Recent evidence also highlights sectoral and contextual heterogeneity. Firms in R&D-intensive industries, for instance, respond differently due to intangible asset dynamics. Kim and Kung (2021) find that high-uncertainty firms in technology sectors rely more on equity financing and internal reserves, adjusting both capital structure and innovation investment cautiously.

Summary of Key Findings

Thematic Area	Key Insight	Representative Studies
Capital Structure under Uncertainty	Firms reduce leverage to preserve flexibility	Gamba & Triantis (2008); Hackbarth et al. (2006)
Investment Timing	Uncertainty delays investment via real options	Dixit & Pindyck (1994); Julio & Yook (2012)
Joint Optimization	Capital structure and investment co-adjust under uncertainty	Hennessy & Whited (2007); Campello et al. (2010)

5. Discussion

The qualitative synthesis presented in this paper offers a cohesive narrative that integrates structural modeling and empirical evidence to explain how capital structure and investment interact under uncertainty. In this Discussion section, we interpret these findings through the lens of existing scholarship and contrast them with eight empirical studies that illuminate various facets of this relationship.

Asset Volatility as a Positive Investment Signal. Chang, D'Avernas, and Eisfeldt (2024) demonstrate that asset volatility—when adjusted for debt overhang via credit spreads—consistently signals increased investment, regardless of firm leverage. This aligns with the measurement of firm-level financial soundness advanced by Atkeson, Eisfeldt, and Weill (2017), who show that fluctuations in asset volatility, rather than leverage, drive variation in the distance-to-insolvency of U.S. firms across business cycles. Both studies reinforce that asset volatility carries valuable information that, once filtered through credit markets, can inform optimal investment timing and capital structure decisions.

Equity Volatility, Credit Spreads, and Firm Distress. Chang et al. further reveal that equity volatility has a non-monotonic relationship with investment: positive for financially sound firms, negative for distressed firms, due to debt overhang effects. This duality echoes findings by Bollerslev et al. (2013), who show that firm-level variance risk premia (VRP) strongly predict credit-default swap spreads, especially for lower-rated firms facing higher uncertainty. Equity volatility thus feeds into credit premia and amplifies underinvestment tendencies where leverage is elevated.

Macro Uncertainty, Credit Supply, and Investment. Complementing these firm-level effects, macro-level studies find that elevated uncertainty reduces credit supply, exacerbating investment shortfalls. An IMF-affiliated model highlights how exogenous uncertainty shocks cause banks to contract balance sheets and reduce lending, thereby depressing real investment. This complements Chang et al.'s emphasis on credit spreads as intermediating variables linking volatility and investment flows.

Financial Frictions and General-Equilibrium Amplification. Gilchrist, Sim, and Zakrajšek (2014) empirically validate that aggregate investment declines sharply under financial frictions compounded by uncertainty (e.g., credit tightness), closely aligning with the equilibrium framework proposed by Arellano, Bai, and Kehoe (2019). These frameworks show that across firms, uncertainty and tight credit markets jointly magnify the investment response even beyond idiosyncratic triggers.

A meaningful extension of our synthesis involves a structured comparison with eight notable empirical investigations. Atkeson, Eisfeldt & Weill (2017): They quantify financial soundness using a distance-to-insolvency metric, showing that asset volatility drives the measure more than leverage. This supports our finding that asset volatility is a robust investment signal. Bollerslev et al. (2013): Their demonstration that firm-level VRP predicts credit spreads—even controlling for leverage—reaffirms Chang et al.'s insight that volatility-based metrics matter beyond traditional capital structure ratios.

Arellano, Bai & Kehoe (2019): Their calibrated general-equilibrium model indicates systemic amplification of uncertainty via financial frictions, matching our finding of compound effects across macro and micro levels. Christiano, Motto & Rostagno (2014) / Berger et al. (2020): Both underscore that uncertainty shocks act as second-moment news shocks, leading to widespread declines in economic activity, including corporate investment. These findings support the broader macro-financial dimension in our review.

Valenzuela et al. (2024) (via the international corporate bond study summarized in turn0search2): They find that heightened economic policy uncertainty (EPU) correlates with wider credit spreads in international bonds, especially for financially constrained firms. This mirrors our emphasis on heterogeneity in the investment response based on firm-level soundness. Longstaff & Schwartz (1995) and Collin-Dufresne et al. (2001): Found negative relationships between interest rates and credit spreads, and confirmed that leverage and volatility jointly determine credit yield dynamics. These results provide further empirical validation of volatility's central role in credit risk and investment decisions.

Engle's variance risk research (e.g., variance risk premia studies): Extending VRP analysis into credit forecasting, these works further affirm the relevance of volatility-based metrics over simplistic leverage ratios. Gilchrist & Zakrajšek (2012): Demonstrating the predictive power of credit spreads and business cycle fluctuations, they highlight that q-based investment models are insufficient under frictions and uncertainty; credit spreads serve as more reliable predictors.

Across the studies considered, there is convergence on several key dimensions: Asset volatility as a positive investment signal when filtered through credit conditions. Equity volatility's ambiguous signaling power, contingent on firm soundness. Credit spreads as central intermediaries, better capturing debt overhang and default risk than leverage ratios alone. Macro-financial feedback loops, where uncertainty shocks in credit markets feed into real investment declines across firms.

Where divergence exists, it often centers on methodological precision and measurement of uncertainty. Bollerslev et al. emphasize variance risk premia, while Chang et al. distinguish between equity and asset volatility; both augment leverage-based models but use different empirical proxies. Atkeson et al. measure distance-to-insolvency, focusing on firm health trajectories, whereas Valenzuela et al. foreground policy uncertainty indices and country-level heterogeneity. Macro models by Arellano et al. and Christiano et al. incorporate financial markets in dynamic frameworks, while firm-level studies (e.g., longstaff & collins) rely on cross-sectional credit spread analyses. Nevertheless, these differences are complementary

rather than contradictory, collectively enriching our understanding of how capital structure and investment decisions respond to uncertainty across multiple analytical levels.

Our qualitative synthesis advances three conceptual contributions. Unified role of credit spreads: Credit spreads emerge as the key mechanism through which both asset and equity volatility are translated into investment incentives, bridging structural and empirical literatures. Firm heterogeneity matters: Financial soundness—not just leverage—determines whether volatility increases or dampens investment, supporting firm-level policy and managerial implications around risk management and capital buffers. Importance of multi-dimensional uncertainty: Both firm-specific and macro uncertainty contribute to investment decisions, especially through channels such as coordination failures in credit markets and second-moment shocks at the aggregate level.

While informative, our interpretation has limitations. First, most existing studies remain U.S.-centric; differences in debt enforcement, financial market structure, or regulatory regimes across countries warrant further investigation—especially as emerging-market evidence (e.g., Valenzuela et al., 2024) suggests heterogeneity in credit-spread sensitivity. Second, measurement challenges persist: differing proxies for volatility (realized versus implied versus VRP) and credit conditions yield variation in estimated effects. Future research could unify these proxies within structural-estimation frameworks to achieve consistency. Third, the role of intangible assets and organizational capital remains underexplored relative to traditional asset classes. As firms become more intangible-heavy, the application of volatility-based investment signals may evolve, requiring new model calibrations and empirical testing.

Finally, dynamic panel studies that trace firm-level responses across cycles—similar to Atkeson et al.'s historical soundness measure—should be extended to emerging contexts, technological disruption, and pandemic-induced uncertainty to validate and generalize our findings. The synthesis presented here confirms that capital structure and investment decisions are deeply interlinked with uncertainty, mediated through credit market signals such as spreads and volatility metrics. Through qualitative integration of structural models (e.g., Merton-based models, general equilibrium frameworks) and empirical evidence, we find consistent support for the dual role of volatility—as a positive signal in robust firms and as a deterrent in distressed contexts—filtered by credit conditions and firm financial health. This enriched understanding has practical implications: from corporate risk management to policymaking under uncertainty, it underscores the need for tailored financial strategies and regulatory frameworks that account for volatility's nuanced effects across firms.

6. Conclusions

This qualitative literature review has synthesized key insights from structural models and empirical studies to understand how firms adjust capital structure and investment strategies under uncertainty. The interplay between leverage and investment is found to be highly sensitive to both firm-specific factors (e.g., financial constraints, growth opportunities) and macroeconomic uncertainty (e.g., policy volatility, credit market conditions). Structural models such as the real options framework and dynamic trade-off theory provide a robust theoretical foundation to capture the value of waiting, the costs of financial distress, and the intertemporal trade-offs in financing decisions (Bhamra, Kuehn, & Strebulaev, 2010; Hackbarth, Miao, & Morellec, 2006).

Empirical evidence supports the theoretical proposition that uncertainty tends to delay investment and encourages firms to maintain financial flexibility, often leading to conservative capital structures (Gulen & Ion, 2016; Alfaro et al., 2018). Moreover, firm behavior appears heterogeneous: high-growth and less constrained firms tend to exploit debt markets during periods of low uncertainty, whereas risk-averse or financially constrained firms adopt precautionary behavior (Chen et al., 2022; Arellano, Bai, & Kehoe, 2019). The review also reveals that policy and institutional factors—such as taxation, monetary policy regimes, and bankruptcy laws—significantly modulate the impact of uncertainty on capital structure decisions.

Overall, this synthesis reveals a convergence between structural modeling and empirical studies in recognizing the multidimensional role of uncertainty. However, divergences persist regarding the magnitude and direction of responses, especially across countries, sectors, and firm sizes. This underscores the need for more integrative frameworks that combine quantitative modeling with contextual variables.

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