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Financial Distress under Macroeconomic–Financial Uncertainty: An Interactive Analysis between the Growth-at-Risk Indicator and Corporate Governance Mechanisms

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Abstract:

This study aims to analyze the relationship between macroeconomic–financial uncertainty, the Growth-at-Risk (GaR) indicator, and corporate governance in explaining financial distress, through the development of an analytical framework that links macroeconomic risks with institutional factors influencing firms' stability. The study adopts a descriptive, analytical, and deductive approach, based on a review of recent literature and reports issued by international financial institutions, particularly the International Monetary Fund (IMF) and the Bank for International Settlements (BIS).

The study finds that higher levels of macroeconomic–financial uncertainty contribute to the tightening of financial conditions and increase the risks of financial distress, while the GaR indicator provides an effective early-warning tool for identifying systemic risks. Furthermore, the findings reveal that corporate governance plays a moderating role by mitigating the transmission of economic shocks to firms and enhancing their resilience capacity. The study recommends adopting integrated models that combine macroeconomic risk indicators with corporate governance mechanisms to support financial stability and improve the prediction of financial distress.

Keywords: Financial distress; Growth-at-Risk (GaR); Macroeconomic–financial uncertainty; Corporate governance; Financial conditions.

I. Introduction

In the contemporary macroeconomic environment, financial uncertainty has become one of the most prominent challenges facing both financial systems and firms. It is closely associated with the risks of financial distress and declining economic growth, to the extent that anticipating the adverse consequences of such risks has become a fundamental concern for policymakers and financial analysts (Huang et al., 2024; Prasad et al., 2019). Among the methodological tools developed in the recent economic literature to measure these risks, the Growth-at-Risk (GaR) framework represents a significant advancement, as it establishes a link between current financial conditions and the future distributional prospects of Gross Domestic Product (GDP) growth. In particular, it focuses on the downside tail of the growth distribution, which reflects periods of heightened risk and potential economic deterioration (Prasad et al., 2019).

On the other hand, financial distress constitutes a central concept in the financial and accounting literature. It refers to a situation in which an economic entity faces difficulties in meeting its financial obligations, including a decline in its debt repayment capacity or a severe deterioration in profitability (Altman, E. I., 1968). Numerous studies have demonstrated that corporate governance mechanisms such as management quality, ownership structure, and the presence

of independent oversight committees, play a significant role in reducing the likelihood of financial distress by improving transparency, strengthening risk monitoring, and enhancing decision-making efficiency (Bin Yousaf et al., 2024). Although there is a general consensus that governance mechanisms alone do not constitute a sufficiently strong predictor of financial distress, they provide significant analytical value when integrated with traditional financial indicators within predictive models (Li et al., 2021).

Within a macroeconomic–financial uncertainty environment, financial distress risks may intensify and adversely affect economic growth and financial stability. This highlights the need to integrate GaR approaches and institutional governance analysis in order to better understand the dynamics of financial distress within firms and financial systems (Huang et al., 2024). This literature-based integration contributes to providing a more comprehensive perspective on the economic and institutional factors that determine firms' exposure to risks and shape financial conditions, particularly in emerging markets characterized by elevated levels of financial uncertainty.

Building upon the aforementioned analytical framework, the research problem revolves around the extent to which the macroeconomic–financial uncertainty environment contributes to deepening financial distress risks, and whether corporate governance frameworks are capable of assuming an effective mitigating role in reducing these risks. Such a role may occur through improving monitoring mechanisms, enhancing decision-making efficiency, or limiting opportunistic behaviors in the context of financial shocks and unstable expectations. Accordingly, the central research question can be formulated as follows:

To what extent do financial uncertainty dynamics contribute to reshaping the probability of financial distress within the emerging role of corporate governance?

In response to this research problem, the study seeks to achieve a set of interconnected objectives. First, it aims to analyze the dynamic structure of the Growth-at-Risk (GaR) indicator and examine its sensitivity to changes in financial conditions, as well as its ability to explain the likelihood of financial distress, particularly under adverse economic growth scenarios. Second, the study seeks to assess the moderating role played by corporate governance mechanisms in mitigating financial distress risks within contexts characterized by high levels of macroeconomic–financial uncertainty. Finally, the study aims to develop a set of practical policy recommendations based on the analytical findings, thereby contributing to the promotion of financial stability and the enhancement of corporate governance frameworks in line with the orientations of international financial institutions and the requirements of long-term financial sustainability.

II. Section One: Theoretical Frameworks of the Study and Previous Literature

1. Definition of Financial Distress:

Financial distress represents a financial imbalance faced by a firm as a result of the insufficiency of its resources and capabilities to meet its short-term obligations. This imbalance primarily arises from the lack of equilibrium between the firm's various resources (internal and external) and its short-term liabilities that have already fallen due or are expected to become payable in the near future (Al-Ghali & Rachdi Sultani, 2016, p. 64).

2. Causes of Corporate Financial Distress:

There are multiple causes of corporate financial distress, all of which ultimately stem from poor management. Management is primarily responsible when a firm reaches a situation characterized by the inadequacy of its adopted operational, investment, and financing policies. The inadequacy of operational policies is reflected in several indicators, including the failure to fully utilize production capacity, low labor productivity per hour, weak machine productivity per hour, high employee turnover rates, wastage of raw materials and finished goods, a high proportion of low-quality production, frequent interruptions of machinery and production lines due to the absence of regular maintenance programs, and weak product quality control.

The persistence of such production-related problems without timely corrective actions leads to rising costs and declining profitability, which may undermine the firm's competitive advantage and weaken its market position. Moreover, some firms undertake investment projects without conducting adequate feasibility studies, thereby increasing the likelihood of project failure. Likewise, relying on the opinions or recommendations of either specialists or non-specialists when selecting and implementing capital investments may result in substantial financial losses that exceed the firm's capacity to absorb or sustain. As losses continue to accumulate and investment returns remain negative, discontinuing business operations may become a more rational economic decision to minimize the losses borne by shareholders. Furthermore, the inefficient allocation of investments among capital assets may trigger liquidity crises that threaten the firm's survival and long-term continuity.

Similarly, if a firm adopts a financing policy that relies heavily on borrowing, this may lead to financial failure. When the debt ratio becomes excessively high and actual earnings before interest and taxes decline below expected levels, the firm may face significant difficulties in covering its fixed financial obligations, which increases the probability of bankruptcy. This risk becomes even greater when borrowed funds are used to finance long-term investments whose costs cannot be recovered except over an extended period.

Based on the above, corporate failure can generally be attributed either to **external causes** related to economic conditions, such as economic recessions, rising interest rates, and instability in economic policies, or to **internal causes**, mainly represented by poor management. Since most internal causes are directly subject to managerial control, many researchers emphasize the greater importance of internal managerial factors in explaining financial distress. The main causes can be summarized as follows (Cherif, 2007, pp. 37–39):

- Insufficient and inadequate capital.

- Weakness of management control and supervision.
- Negligence and poor management practices.
- Lack of experience in the field of activity.
- Occurrence of natural disasters.
- Inefficiency and poor utilization of available resources.
- Lack of sound and appropriate advice.
- The existence of unexpected obstacles and constraints.
- Fraud, falsification, and non-compliance with laws and regulations.

However, it is important to note that many cases of financial distress occur as a result of the interaction between both internal and external factors. External factors may be considered as a challenge that tests the firm's management capacity to overcome external difficulties and maintain normal economic activity. Moreover, there are rare cases of financial distress in which highly competent management fails due to severe external circumstances, while in other cases firms with weak managerial capabilities may continue operating due to favorable external conditions that provide suitable opportunities for survival (Sadiq, 1998, p. 420).

3. Methods and Procedures for Addressing Financial Distress:

The methods adopted to deal with financially distressed firms vary according to the severity of the failure they have reached. If the firm's future prospects remain promising, and creditors are willing to cooperate with the firm in order to maintain a profitable long-term relationship, creditors may offer voluntary concessions. Such concessions may include extending the maturity period of debts, reducing the value of outstanding liabilities by a certain percentage, or combining both approaches.

However, if the firm's future prospects are less favorable, but creditors prefer to preserve the firm because its value as a going concern exceeds its liquidation value, the appropriate solution is to rehabilitate the firm through reorganization. The objective of the reorganization process is to restructure the firm's capital structure in order to reduce the level of indebtedness and, consequently, decrease the burden of fixed financial obligations imposed on the firm.

Finally, if there is no realistic possibility of restoring the firm's profitability and overcoming its financial difficulties, and if its liquidation value exceeds its value as a going concern, the appropriate solution is the liquidation of the firm. The liquidation process requires undertaking legal procedures that include declaring the firm's bankruptcy, gradually and systematically liquidating its assets, and distributing the liquidation proceeds fairly among creditors. Fair distribution, in this context, refers to applying a priority order for certain claims according to the legal rights associated with each type of security.

In practice, however, large firms often benefit from government support, as public authorities may intervene at an appropriate time to protect them from bankruptcy. Furthermore, some firms facing bankruptcy may be integrated into financially successful entities. In certain cases, such mergers or acquisitions have been carried out despite the existence of monopolistic structures tolerated by governments, based on the belief that the negative consequences of bankruptcy could be more harmful than maintaining the continuity of such firms (Cherif, 2007, p. 40).

4. Uncertainty Conditions (Conditions of Ambiguity):

Uncertainty conditions, also referred to as conditions of ambiguity, describe situations in which no information is available regarding the probabilities of occurrence of each possible outcome associated with decision alternatives. Therefore, decision-makers rely on the use of certain criteria to select the most appropriate alternative and reach an optimal decision. From an economic perspective, uncertainty is considered a state characterized by unknown facts, outcomes, or potential events whose occurrence depends on uncertain probabilities. Accordingly, knowledge of uncertainty is based on forecasts regarding the emergence of a specific economic situation. The available knowledge concerning the future management of economic policies reflects the possibility of the occurrence of a particular economic phenomenon (Boujrada, 2022, pp. 319–323).

Uncertainty can also be defined as a state of instability and tension within the economic environment, where future outcomes and changes cannot be accurately predicted. Uncertainty conditions may arise from several factors, including economic policies, unexpected events, financial market fluctuations, and economic growth slowdowns (Bouqras, 2024, pp. 74–75).

5. Literature Review

The study of **financial distress** within the context of **macroeconomic–financial uncertainty** represents one of the significant areas in contemporary financial research, given its strong relationship with overall financial stability and the resilience of firms and institutions in facing economic shocks. This topic is linked to two interconnected research streams. The first concerns the study of the **Growth-at-Risk (GaR)** indicator, which provides a quantitative framework for measuring economic growth risks under specific financial conditions. The second relates to the growing interest of numerous studies in examining the role of **corporate governance mechanisms** in mitigating financial distress risks and economic volatility.

Analyses of financial distress in contemporary economic and financial literature are embedded within a broader framework known as macroeconomic–financial uncertainty, which reflects a state of increasing financial market volatility, uncertainty surrounding economic policies, and instability in future growth expectations. This approach has enabled researchers to examine the determinants of financial vulnerability from multiple perspectives, combining macro-financial indicators, credit behavior, and institutional environments. Early studies indicate that rising financial uncertainty

leads to tighter financial conditions, declining investment, and increased probabilities of financial distress at both the corporate and national economic levels (Bloom, 2014; Baker et al., 2016).

Within this context, the Growth-at-Risk (GaR) indicator has emerged as an advanced analytical framework developed by international financial institutions, particularly the International Monetary Fund (IMF), to measure downside risks to economic growth rather than relying solely on average expected growth values. Studies by Adrian et al. (2019) and Prasad et al. (2019) demonstrate that GaR establishes a relationship between current financial conditions and the probability distribution of future economic growth, with particular emphasis on the lower tail of the distribution, which captures scenarios of severe recession and widespread financial distress. This literature shows that tighter financial conditions and increased macroeconomic uncertainty shift the growth distribution downward, thereby increasing the likelihood of systemic financial distress.

Furthermore, the Global Financial Stability Reports issued by the International Monetary Fund emphasize that periods of elevated financial uncertainty coincide with increased vulnerability of corporate and financial institutions' balance sheets, particularly in emerging economies. This occurs as debt accumulation and weak capital markets amplify the effects of economic shocks (IMF, 2020; IMF, 2023). These reports highlight that GaR represents an effective tool for policymakers to anticipate latent risks before they develop into actual financial distress crises. However, they primarily focus on macro-financial variables without sufficiently addressing institutional dimensions.

In parallel, financial literature has extensively examined the role of corporate governance in reducing financial distress risks, both at the firm level and across the financial system as a whole. Studies such as Shleifer and Vishny (2012) and Ali (2023) indicate that governance quality particularly in terms of investor protection, transparency, and board independence, contributes to reducing opportunistic behavior and improving resource allocation efficiency. More recent studies confirm that corporate governance mechanisms enhance firms' ability to absorb financial shocks and reduce the probability of distress during periods of heightened uncertainty (Jonathan Crook et al., 2021).

At the macroeconomic level, reports issued by the Bank for International Settlements (BIS) indicate that the quality of institutional frameworks and governance plays a crucial role in determining the transmission of financial shocks to the real economy. Countries characterized by strong governance structures and effective regulatory systems experience less severe effects from financial tightening compared with countries with weaker institutions (BIS, 2021). These reports further emphasize that the absence of sound governance amplifies the impact of financial uncertainty on GaR and increases the likelihood of entering vicious cycles of financial distress and economic growth slowdown.

Despite this accumulation of knowledge, the literature review reveals a clear research gap represented by the limited number of studies that explicitly integrate the (GaR) indicator, macroeconomic-financial uncertainty, and the role of corporate governance within a unified analytical framework. Most existing studies either focus on (GaR) as a quantitative tool for risk prediction or examine corporate governance as an independent factor mitigating financial distress, without analyzing the moderating role that governance may play in reducing the adverse impact of financial uncertainty on financial conditions and economic growth.

Accordingly, the literature confirms the importance of (GaR), financial uncertainty, and corporate governance as fundamental analytical components for understanding the dynamics of financial distress. However, it lacks integrated approaches based on international financial institutions' reports to explain how these factors interact within high-risk environments. Addressing this gap represents the main objective pursued by the present study.

III. Section Two: The Methodological Framework of the Study and the Relationship between Growth-at-Risk (GaR), Macroeconomic-Financial Uncertainty, and Corporate Governance in Explaining Financial Distress

1. Data and Methodology

This study is based on analyzing the relationship between Growth-at-Risk (GaR), macroeconomic-financial uncertainty, and corporate governance in explaining financial distress, from an integrated perspective that combines macroeconomics and institutional finance. This perspective is based on the assumption that financial distress is not merely a reflection of firms' internal vulnerabilities, but rather the outcome of a dynamic interaction between macro-financial conditions, levels of economic and financial uncertainty, and the quality of corporate governance mechanisms that determine a firm's ability to absorb and adapt to external shocks.

To achieve the objectives of the study, the paper relies on a set of macroeconomic and microeconomic indicators that reflect the nature of the relationships among the study variables. At the macroeconomic level, the study relies on Growth-at-Risk (GaR) indicators as a measure of the likelihood of adverse economic growth scenarios, in addition to macroeconomic-financial uncertainty indicators that capture the degree of volatility in economic and financial conditions, such as financial tightening, market fluctuations, rising risk premiums, and credit conditions.

At the firm level, corporate governance quality is assessed through a set of mechanisms, including board independence, the effectiveness of audit committees, ownership structure, the quality of disclosure and transparency, and the efficiency of internal control and risk management systems. Conversely, financial distress is measured using indicators reflecting the firm's ability to meet its obligations, liquidity levels, leverage, profitability, and business continuity, in addition to financial distress prediction indicators widely adopted in the financial literature.

The study seeks to examine how the effects of macroeconomic risks, measured through the GaR framework, are transmitted to the microeconomic level of firms, while analyzing the role played by corporate governance in limiting or amplifying the transmission of these risks. Therefore, the study does not merely interpret financial distress as a direct

consequence of internal financial variables, but rather considers it as an outcome of a complex interaction between the macroeconomic environment and internal institutional characteristics.

From a methodological perspective, the study adopts the descriptive analytical approach through reviewing and analyzing relevant economic and financial literature related to the Growth-at-Risk (GaR) framework, macroeconomic–financial uncertainty, corporate governance, and financial distress. The objective is to develop an integrated theoretical framework capable of explaining the causal relationships among these variables. The study also relies on the deductive analytical approach to interpret the mechanisms of risk transmission from the macroeconomic level to the microeconomic level and to clarify the moderating role exercised by corporate governance in mitigating the impact of economic and financial shocks on the probability of financial distress. This approach is consistent with recent developments in the literature on macro-financial economics and corporate risk management.

Classification of the Study Variables:

Variable Type	Variable	Definition
Independent Variable	Growth-at-Risk (GaR)	A forward-looking indicator that measures the probability of low economic growth scenarios by analyzing the lower tail of the probability distribution of growth, thereby reflecting the level of future aggregate risks.
Dependent Variable	Financial Distress	A situation in which a firm faces difficulties in fulfilling its financial obligations due to the interaction of internal and external factors, affecting its liquidity, solvency, and continuity.
Moderator Variable	Corporate Governance	A set of organizational and control mechanisms that ensure efficient firm management, enhance transparency, accountability, and risk management, thereby limiting the transmission of macroeconomic shocks to firms' financial performance.
Explanatory Variables	Macroeconomic–financial uncertainty, financial conditions, credit conditions, market volatility, and financing costs	Variables reflecting the nature of the economic and financial environment in which firms operate and contributing to explaining changes in aggregate risk levels and the probability of financial distress.

This methodological framework enables the development of an integrated analytical model that links macroeconomic risk indicators, represented by Growth-at-Risk (GaR), with the quality of corporate governance as a mechanism for mitigating the effects of economic and financial shocks, ultimately explaining financial distress within a framework that combines macroeconomic determinants and internal institutional factors.

This approach contributes to providing a more comprehensive understanding of financial distress, going beyond traditional models based solely on financial indicators by integrating macroeconomic and institutional dimensions within a unified theoretical framework consistent with recent developments in macroeconomic–financial literature and risk management research.

2. The Growth-at-Risk (GaR) Indicator and Macroeconomic Risks

The Growth-at-Risk (GaR) indicator has emerged as a modern analytical tool in economic literature for measuring downside risks to future Gross Domestic Product (GDP) growth by linking current financial conditions to the conditional distribution of future economic growth, particularly in entities exposed to increasing financial vulnerabilities (Adrian, Boyarchenko & Giannone, 2019, as cited in the indicator overview).

Studies show that GaR goes beyond traditional growth forecasts by focusing on the lower tail of the growth distribution (such as the 5th percentile), which captures scenarios of severe recession or economic deterioration. This approach is similar to the concept of Value-at-Risk (VaR) in risk management, but applied at the macroeconomic level. Furthermore, GaR provides a valuable measurement tool for monetary and macro-financial policies, as it can be used to assess potential financial pressures and their impact on future growth by establishing links between financial conditions and financial markets.

The literature also demonstrates that macroeconomic uncertainty, which may include policy uncertainty, increased market volatility, or debt-related risks, is associated with higher downside risks to economic growth. This implies that economic growth becomes more vulnerable to deterioration when aggregate uncertainty levels rise. Empirical studies indicate that higher macroeconomic uncertainty is associated with negative shifts in the growth distribution, which is consistent with GaR predictions that unstable economic conditions increase the likelihood of weak future growth performance.

3. Corporate Governance and Financial Distress

In the literature on financial distress, numerous studies have found that corporate governance mechanisms represent important determinants of improving firms' financial performance and reducing the risks of bankruptcy or financial distress. At the level of ownership structures and governance mechanisms, studies such as *"The Effect of Ownership Structure on Financial Distress"* indicate that institutional and managerial ownership are significantly associated with a

lower probability of corporate financial distress, suggesting that governance can play a preventive role against economic shocks.

Similarly, research entitled “*Predicting Financial Distress Using Corporate Governance Measures*” demonstrates that corporate governance enhances the predictive power of financial distress models, particularly when combined with financial and economic variables. This indicates that governance mechanisms are not sufficient on their own but provide valuable additional information for financial risk assessment and analysis.

The literature further supports the existence of a negative relationship between the effectiveness of governance mechanisms and financial distress risks across various sectors. For instance, a study focusing on banks in the Middle East and North Africa (MENA) region found that multi-level institutional governance mechanisms reduce the likelihood of financial distress, highlighting the importance of both bank-level governance and national institutional frameworks in determining financial risk tolerance.

Other analytical studies have also shown that governance influences risk asymmetry and financial decision-making processes, thereby contributing to improving the integrity of financial reporting and reducing risks associated with information asymmetry in financial markets.

4. Integrating GaR and Corporate Governance within the Context of Financial Uncertainty

Despite the significant contributions of separate strands of literature addressing GaR and uncertainty or corporate governance and financial distress, a clear research gap remains regarding the integration of these three dimensions within a comprehensive analytical framework. While GaR provides a quantitative perspective on the relationship between macro-financial conditions and future economic risks, there is a growing need to incorporate institutional factors, particularly governance quality, into such models in order to understand whether firms with strong governance structures are better able to mitigate financial distress risks arising from macroeconomic uncertainty shocks.

Some theoretical contributions suggest that institutional and policy quality can modify the impact of monetary policies on GaR-related risks. This supports the argument that the institutional environment may reduce structural vulnerabilities affecting economic growth and financial distress risks.

Based on the above discussion, contemporary literature confirms the importance of GaR, financial uncertainty, and corporate governance as essential analytical dimensions for understanding economic and financial risks. However, further comparative and analytical research is required to integrate these dimensions into a unified model capable of explaining financial distress within a financially unstable environment. This represents the central direction pursued by the present study.

IV. Section Three: The Relationship between Growth-at-Risk (GaR), Macroeconomic–Financial Uncertainty, and Corporate Governance in Explaining Financial Distress

1. Financial Distress in the Context of Macroeconomic–Financial Uncertainty

Financial distress represents one of the central concepts in the literature of financial economics and risk management. It refers to a situation in which a firm faces increasing difficulties in fulfilling its contractual obligations due to deteriorating financial performance or an imbalance in its financing structure. Financial distress goes beyond a mere decline in profitability to include weak liquidity, excessive indebtedness, and a reduced capacity to generate operating cash flows, which may, in advanced stages, lead to restructuring or bankruptcy (Ziani, 2022, p. 73).

However, the analysis of financial distress is no longer limited to the internal determinants of firms. It has become closely associated with the macroeconomic environment, particularly amid the increasing manifestations of macroeconomic–financial uncertainty. The Global Financial Stability Report issued by the International Monetary Fund (IMF) indicates that higher levels of economic and political uncertainty contribute to tighter financial conditions, increased market volatility, and higher risk premiums, which negatively affect firms’ ability to access financing and maintain business continuity (IMF, 2023).

Accordingly, financial distress in the contemporary context is understood as the outcome of an interaction between internal vulnerabilities within the firm’s structure and external shocks generated by macroeconomic fluctuations and global financial conditions.

2. Macroeconomic Financial Conditions and Downside Growth Risks

Financial conditions represent a key transmission channel through which economic shocks are transferred to the real sector. They include interest rates, yield spreads, market volatility, credit conditions, and asset prices. When financial conditions tighten, financing costs increase and liquidity decreases, thereby intensifying the probability of financial distress among firms.

Within this context, the International Monetary Fund developed the Growth-at-Risk (GaR) framework as an analytical tool that measures the distribution of future economic growth rather than focusing solely on its average level. The framework places particular emphasis on the lower tail of the distribution, which reflects severe adverse growth scenarios (Prasad et al., 2019). It relies on quantile regression methodology to estimate the impact of current financial conditions on the probability of future low economic growth.

The GaR framework highlights that tighter financial conditions do not only affect average economic growth but also increase the likelihood of severe negative growth outcomes over the medium term. This implies that underlying systemic risks may be greater than those reflected by traditional indicators (Prasad et al., 2019). Furthermore, the International Monetary Fund (2024) emphasizes that rising uncertainty expands the distribution range of future growth and increases downside risks, particularly when financial shocks coincide with structural imbalances within the financial system.

From this perspective, corporate-level financial distress can be viewed as a microeconomic manifestation of downside growth risks at the macroeconomic level, as firms are directly affected by deteriorating financial conditions and rising recession probabilities.

3. Macroeconomic–Financial Uncertainty as a Risk Amplification Factor

Economic uncertainty represents a central factor in explaining fluctuations in economic and investment activity. Higher uncertainty leads to the postponement of investment decisions, increased preference for liquidity holdings, and higher risk premiums demanded by investors and financial institutions. The International Monetary Fund's analysis shows that periods of elevated uncertainty are associated with stronger negative shocks in financial markets and weaker financing conditions available to firms (IMF, 2024).

This environment interacts with firms' financial vulnerabilities through several channels, including:

- **Higher cost of capital.**
- **Tighter lending conditions.**
- **Declining value of collateral assets.**
- **Reduced cash flows due to weaker aggregate demand.**

Therefore, uncertainty should not be considered merely as an external variable; rather, it represents an amplification mechanism of risks that increases the probability of transmitting macroeconomic shocks into firm-level financial distress, which may subsequently evolve into systemic crises.

4. The Role of Corporate Governance in Mitigating Financial Distress

Corporate governance is defined as the framework through which firms are managed and monitored to ensure accountability, transparency, and the protection of stakeholders' rights. Recent literature demonstrates that effective governance mechanisms, such as board independence, active audit committees, and ownership concentration, contribute to improving financial reporting quality and limiting opportunistic behaviors, thereby reducing the probability of financial distress (Nursal et al., 2020).

Studies also indicate that firms with strong governance structures possess greater capacity to manage risks during periods of financial instability, as governance enhances internal control systems, promotes financial discipline, and limits excessive indebtedness or poorly evaluated investment risks. In this context, sound governance is associated with lower systemic risks and reduced exposure of firms to macroeconomic shocks (**Systemic Risk Study, 2023**).

Consequently, corporate governance represents a preventive factor that mitigates the impact of macroeconomic–financial uncertainty on financial distress by improving risk management practices and enhancing institutional resilience.

5. Integration of GaR and Corporate Governance in Explaining Financial Distress

Integrating the **Growth-at-Risk (GaR)** framework with corporate governance determinants enables the construction of a comprehensive analytical model linking:

- **Macroeconomic financial conditions.**
- **The distribution of growth risks in the downside tail.**
- **Internal corporate vulnerabilities.**
- **The quality of governance mechanisms.**

In an environment characterized by high uncertainty, tightening financial conditions increase the probability of adverse growth scenarios (Prasad et al., 2019), which consequently raises financial distress risks at the corporate level. However, effective governance may operate as a **mitigation channel**, reducing the transmission of macroeconomic risks to the microeconomic level.

Accordingly, financial distress in this study can be considered as the outcome of a dynamic interaction between:

- **Macroeconomic risks measured through GaR.**
- **Financial conditions and credit constraints.**
- **The quality of corporate governance mechanisms.**

This integrated perspective provides a coherent theoretical foundation for analyzing financial distress within a comprehensive **macro-financial framework** that combines aggregate economic determinants with institutional factors.

V. Analysis of Results

Recent literature in financial economics indicates that the interpretation of financial distress is no longer based solely on the analysis of firms' internal financial indicators independently from the economic environment. Instead, it has increasingly relied on a multi-level analytical framework that integrates macroeconomic factors and institutional factors. Within this context, the Growth-at-Risk (GaR) framework emerges as a forward-looking model that measures the probability of adverse economic growth scenarios by analyzing the impact of current financial conditions on the lower tail of the probability distribution of future growth. The role of this indicator is not limited to predicting economic slowdown; it also extends to identifying the accumulation of systemic risks that may gradually transmit to the real sector, thereby affecting firms' ability to maintain operations and fulfill their financial obligations.

Conversely, macroeconomic–financial uncertainty represents the environment in which these risks emerge. Higher uncertainty related to economic policies, financial volatility, or global crises contributes to tighter financing conditions and higher costs of capital, thereby increasing firms' vulnerability and weakening their ability to withstand external shocks. Therefore, uncertainty should not be viewed merely as an independent variable, but rather as a risk amplification mechanism that increases the likelihood of transmitting aggregate risks to the microeconomic level of firms.

However, the transmission of these shocks into financial distress does not occur uniformly across all firms. The magnitude of this transmission depends largely on the quality of corporate governance mechanisms. Firms characterized by effective control systems, independent boards of directors, competent audit committees, and sound risk management policies are more capable of absorbing the effects of economic shocks compared with firms operating under weak governance structures, which are often associated with higher agency problems, ineffective internal controls, and inefficient financing and investment decisions.

Accordingly, the relationship among the three variables can be interpreted through an integrated causal sequence. Rising macroeconomic–financial uncertainty leads to tighter financial conditions, which is reflected in higher risk levels captured by the GaR indicator and a decline in the expected lower bound of future economic growth. As these conditions are transmitted to the real sector, firms face increasing liquidity pressures, declining profitability, and rising indebtedness, thereby increasing the probability of financial distress. In contrast, corporate governance plays a moderating role by limiting the transmission of macroeconomic shocks to firms' financial performance, enhancing their resilience and ability to continue operations.

Therefore, the relationship between Growth-at-Risk, macroeconomic–financial uncertainty, and corporate governance represents a dynamic and multi-level relationship. In this framework, the GaR indicator reflects the level of future aggregate risks, macroeconomic–financial uncertainty represents the primary source of these risks, while corporate governance constitutes an institutional mechanism for mitigating their effects. Financial distress, in turn, represents the final outcome of the interaction among these variables within an economic environment characterized by volatility and uncertainty.

Table (2-1): Proposed Framework for the Relationship among the Study Variables

Variable	Classification	Impact Mechanism	Expected Effect on Financial Distress
Macroeconomic–financial uncertainty	External macro-financial shock	Increases market volatility, credit tightening, and risk premiums	Positive effect; increases the probability of financial distress
Growth-at-Risk (GaR)	Forward-looking aggregate risk indicator	Measures the probability of low-growth scenarios through the lower tail of the growth distribution	Higher GaR risks are associated with higher probabilities of financial distress
Corporate governance	Internal governance mechanism	Enhances monitoring, risk management, decision-making efficiency, and disclosure quality	Negative effect; reduces the probability of financial distress
Financial distress	Dependent variable	Reflects the outcome of the interaction between aggregate risks and firm characteristics	Represents the final output of the analytical model

Source: Prepared by the researchers

The results presented in Table (2-1) reveal that the proposed model is based on the integration of four main components, each performing a distinct explanatory function within the study framework. First, macroeconomic–financial uncertainty represents the external source of risks, as its increase leads to tighter financial conditions, greater market volatility, and higher financing costs, negatively affecting firms' ability to obtain the financial resources necessary to sustain their operations.

Second, the Growth-at-Risk (GaR) indicator performs the role of a forward-looking measure that translates these macroeconomic conditions into future probabilities of economic growth outcomes. Unlike traditional growth indicators that focus on average growth rates, GaR emphasizes severe downside scenarios reflecting elevated systemic risks. Therefore, an increase in GaR-related risks should not be interpreted merely as an economic forecast, but rather as an early warning signal of increased exposure to financial distress.

Conversely, corporate governance plays a preventive role within the model by limiting the transmission of aggregate shocks to the firm level through stronger internal controls, improved risk management, and more rational financing and investment decisions. This explains the negative relationship between governance quality and the probability of financial distress.

Accordingly, the table confirms that financial distress represents the outcome of the interaction between aggregate risks and institutional factors. This reflects the integrated nature of the theoretical model adopted by the study, which extends beyond traditional explanations based solely on internal financial indicators.

Following the identification of the nature and roles of the variables within the theoretical model, it becomes necessary to clarify the causal pathways through which economic and financial shocks are transmitted from the macroeconomic level to the microeconomic level. The relationship among the study variables is not direct but occurs through several successive stages, beginning with rising uncertainty levels, followed by tighter financial conditions, increased growth risks, and ultimately financial distress, while corporate governance intervenes as a moderating variable influencing the strength of this relationship. Table (2-2) presents these pathways sequentially, illustrating the logic of the analytical model adopted in the study.

Table (2-2): Causal Pathways of the Relationship among Variables

Causal Pathway	Explanation	Expected Outcome
Macroeconomic–financial uncertainty → Tightening financial conditions	Increased volatility and policy uncertainty raise financing costs and reduce liquidity	Increased economic vulnerability
Tightening financial conditions → Higher GaR	The probability of adverse growth scenarios in the lower tail of the distribution increases	Higher systemic risks
Higher GaR → Increased financial distress	Lower expected growth weakens firms' revenues and cash flows	Higher probability of financial distress
Corporate governance → Mitigation of GaR effects	Effective monitoring and risk management reduce shock transmission to firms	Lower probability of financial distress
Corporate governance × Macroeconomic–financial uncertainty	Governance acts as a moderating variable in the relationship between the macroeconomic environment and financial distress	Enhanced institutional resilience and reduced shock effects

Source: Prepared by the researchers

The findings presented in Table (2-2) indicate the existence of an interconnected causal chain beginning with rising levels of macroeconomic–financial uncertainty, which leads to tighter financial conditions through increased market volatility, higher financing costs, and stricter credit requirements. This results in greater economic vulnerability at both the macroeconomic and firm levels.

These developments directly affect the Growth-at-Risk (GaR) indicator, as the probability of low or negative growth scenarios increases, reflecting higher systemic risks embedded within the economic environment. As these risks are transmitted to the real sector, firms experience increasing financial pressures, including declining operating revenues, reduced cash flows, and higher financing burdens, thereby increasing the likelihood of financial distress.

The results also demonstrate that corporate governance does not only affect financial distress directly but also performs a moderating role in the relationship between aggregate risks and financial distress. As governance quality improves through effective internal controls, board independence, and efficient risk management, the transmission of economic shocks to firms' financial performance decreases, thereby strengthening their resilience and ability to operate in environments characterized by high uncertainty.

Consequently, the pathways illustrated in the table confirm that explaining financial distress requires adopting a multi-level perspective that integrates macroeconomics and corporate governance. In this framework, macroeconomic–financial uncertainty represents the source of risks, the Growth-at-Risk (GaR) indicator serves as a measurement and forecasting tool, while corporate governance constitutes a mechanism for limiting the transmission of these risks to firms. Financial distress therefore emerges as the final outcome of the dynamic interaction among these variables.

VI. Conclusion

This study concludes that explaining financial distress in the contemporary economic environment can no longer rely solely on firms' internal financial indicators independently from their surrounding economic conditions. Instead, it requires adopting an integrated analytical approach that captures the dynamic interaction between aggregate risks and institutional characteristics. Within this framework, the study highlights that financial distress represents the outcome of accumulated shocks resulting from increased levels of macroeconomic–financial uncertainty and tightening financial conditions. These shocks gradually transmit from the macroeconomic level to the microeconomic level of firms, leading to declining liquidity, higher financing costs, and reduced capacity to meet financial obligations, thereby increasing the probability of financial distress and threatening financial stability.

The study also demonstrates that the Growth-at-Risk (GaR) indicator represents one of the most important modern tools for anticipating economic risks due to its ability to measure the probability of adverse growth scenarios by focusing on the lower tail of the probability distribution of economic growth. This feature makes GaR a forward-looking indicator capable of providing early warning signals regarding the accumulation of systemic risks before their actual materialization.

Conversely, the study shows that corporate governance is not limited to promoting compliance and monitoring mechanisms; rather, it plays a strategic role in reducing the transmission of macroeconomic shocks to firms' financial performance. This is achieved through improving risk management efficiency, enhancing the quality of financing and investment decisions, and strengthening transparency and institutional discipline. Therefore, financial distress can be interpreted as the outcome of a three-dimensional interaction involving: aggregate risks measured through the GaR indicator, levels of macroeconomic–financial uncertainty, and the quality of corporate governance mechanisms. This provides a more comprehensive theoretical framework compared with traditional models based solely on historical financial indicators.

From a conceptual perspective, this study contributes to enriching the literature on macro-financial economics by proposing a multi-level analytical framework that integrates systemic risk measurement tools with corporate governance mechanisms in explaining financial distress. It addresses part of the existing research gap between macro-financial studies

and institutional studies. Furthermore, it highlights the importance of moving from descriptive and historical approaches toward forward-looking models based on the analysis of future risk distributions, thereby enhancing the ability of researchers and policymakers to understand the dynamics of economic shock transmission and contain their effects before they develop into widespread financial crises.

1. Main Findings of the Study

- The study confirms that financial distress is a multi-dimensional phenomenon resulting from the interaction between macroeconomic factors and internal institutional factors, rather than being solely the consequence of internal financial imbalances.
- It demonstrates that higher levels of macroeconomic–financial uncertainty lead to tighter financial conditions, increased financing costs, and greater corporate vulnerability, thereby raising the probability of financial distress.
- It establishes that the Growth-at-Risk (GaR) indicator is an effective forward-looking tool for monitoring downside growth risks and providing early warning signals regarding the accumulation of systemic vulnerabilities.
- It highlights that corporate governance plays a significant moderating role in limiting the transmission of economic and financial shocks to firms' financial performance, thereby enhancing their resilience and continuity.
- It concludes that integrating the GaR indicator with corporate governance determinants provides a more effective analytical framework for explaining financial distress compared with traditional models based exclusively on historical financial indicators.

2. Recommendations

- Enhance the use of the Growth-at-Risk (GaR) indicator within macroprudential supervision frameworks and early warning systems to detect systemic risks before their escalation.
- Develop financial stress-testing models by incorporating macroeconomic–financial uncertainty indicators and the GaR framework when assessing financial system stability.
- Modernize corporate governance frameworks by strengthening board independence, improving audit committee effectiveness, and enhancing risk management and internal control systems.
- Require firms, particularly listed companies and financial institutions, to disclose the effects of aggregate risks and uncertainty levels within governance and sustainability reports.
- Encourage firms to adopt more flexible financing policies, diversify funding sources, and improve liquidity management and financial structures in order to withstand periods of economic volatility.
- Strengthen coordination between monetary authorities, regulatory bodies, and corporate governance institutions to establish an integrated framework for managing macroeconomic and institutional risks.

3. Future Research Perspectives

- Conduct empirical studies to test the proposed model using advanced econometric techniques, such as Quantile Regression, Structural Vector Autoregressive Models (SVAR), and Panel Data Models, in order to validate causal relationships among the study variables.
- Apply the proposed framework to emerging and developed economies to conduct international comparative analyses on the impact of macro-financial conditions and corporate governance on financial distress.
- Investigate sectoral differences in the moderating role of corporate governance, particularly across the banking sector, industrial sector, and service sector.
- Extend the model by incorporating modern uncertainty indicators, including the Economic Policy Uncertainty Index (EPU), geopolitical risk indicators, and climate change risk measures, and analyze their effects on Growth-at-Risk and financial stability.
- Develop hybrid predictive models based on artificial intelligence and machine learning techniques to integrate macroeconomic and institutional indicators for early financial distress prediction, thereby improving the effectiveness of early warning systems and decision-making processes.

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