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Board Gender Diversity and Risk Management in Corporate Financing: A Study on Debt Structure and Financial Decision-Making

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Abstract: Purpose: This study examines the role of board gender diversity in shaping corporate financial decisions, particularly in terms of debt structure and risk management. Focusing on the Tehran Stock Exchange, it explores how female representation on boards influences long-term and short-term leverage decisions, focusing on the moderating effect of board compensation. **Design/Methodology:** Utilising a quantitative ex post facto design, the study analyses data from 114 companies listed on the Tehran Stock Exchange between 2017 and 2021. Multivariate regression techniques, including year- and industry-fixed effects, are employed to investigate the relationship between board gender diversity, debt structure, and risk-taking behaviour. **Findings:** The results reveal a significant negative relationship between female board representation and long-term debt, suggesting that companies with more female directors tend to adopt more conservative debt structures, thereby reducing risk. Additionally, the findings demonstrate that board compensation moderates this relationship by curbing managerial risk-taking, further improving financial decision-making. **Originality/Value:** This research provides novel insights into the intersection of board gender diversity and risk management in financial decision-making, particularly in the context of a developing economy like Iran. It also offers practical implications for firms seeking to optimise their debt structures while maintaining sound risk management practices.

Keywords: board gender diversity; debt structure; risk management; corporate financing; Tehran Stock Exchange

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1. Introduction

The role of gender diversity on corporate boards has become a pivotal area of interest as firms strive for balanced financial decision-making and effective risk management strategies. This study builds on this discourse by examining how female representation on corporate boards influences debt structure and risk-taking in financing decisions, particularly in the context of emerging markets such as Iran. While traditional finance theory emphasises the importance of strategic debt management to maintain liquidity and mitigate agency conflicts, this research investigates whether the presumed risk aversion attributed to female directors contributes to more conservative debt structuring. Through exploring board diversity within Iran's distinct socio-cultural and regulatory environment, this study highlights the potential of gender-diverse boards to foster financial resilience and ethical governance practices in response to market uncertainties.

The impact of gender diversity on corporate decision-making, particularly concerning financial decisions and risk management, has received growing attention in recent years. In today's dynamic business environment, strategically managing debt and risk is crucial to ensuring corporate financial sustainability. This study builds on this growing body of research by examining the influence of board gender diversity on financial risk management, particularly in the context of corporate debt structure in Iran.

Rooted in traditional finance theories, firms must carefully manage various risk factors, such as liquidity and refinancing risks, to achieve optimal financial outcomes. Debt maturity decisions are crucial in managing financial risks by balancing short-term obligations with long-term financial stability. This study investigates whether female directors, perceived as more risk-averse, prefer debt structures that reduce financial risk and mitigate potential agency conflicts between shareholders and managers.

By exploring the moderating role of board compensation, this research aims to provide further insights into how gender diversity and financial incentives influence corporate risk management. Iran's unique socio-cultural and regulatory context presents an opportunity to contribute to the broader literature on gender diversity and risk management in emerging markets. The findings of this study are expected to offer practical implications for corporate governance and risk management frameworks, aligning with the themes of the special issue on financial analysis and risk management.

2. Literature Review

The impact of female directors on corporate decision-making has garnered extensive scholarly attention, particularly in promoting diversity and enhancing governance practices. This study builds upon this foundation by investigating the influence of female board representation on financing decisions and debt structure choices within the unique context of Iran. Unlike Western countries, where corporate governance structures and cultural norms differ significantly, Iran presents a distinctive setting to explore these dynamics. The gender ethics framework suggests that women exhibiting higher moral standards may prefer shorter-maturity debt to align with shareholder interests, thus mitigating debt-related agency problems. Additionally, behavioural perspectives propose that female directors, presumed to exhibit greater risk aversion, may opt for longer-maturity debt to effectively manage liquidity and refinancing risks.

Rooted in traditional finance theories, corporations navigate various factors to determine the optimal debt maturity structure, including liquidity/refinancing risk, mispricing risk, and under/overinvestment problems. This choice is crucial for financial policy and serves as a regulatory mechanism to address manager–shareholder agency conflicts. Long-term debt financing allows managers to shield themselves from constant monitoring, potentially deviating from the optimal debt maturity choice and imposing costs on shareholders.

In recent years, scholars have extensively probed the impact of female directors on corporate decision-making across various domains, including dividend policy, executive compensation, and mergers and acquisitions. Studies have shown that female directors tend to emphasise monitoring and accountability, which can influence decisions related to debt maturity structure. The gender ethics framework posits that women, exhibiting higher moral standards, are more attuned to ethical concerns than men. Applying this framework to debt maturity structure choices suggests that female directors may display less self-interest, potentially preferring longer-maturity debt to align with shareholder interests and mitigate debt-related agency problems.

Additionally, considering managerial risk aversion, it has been proposed that female directors, presumed to exhibit greater risk aversion, may make safer financial decisions than their male counterparts. Short-term debt is considered costlier for risk-averse executives due to higher liquidity/refinancing risk costs and increased external monitoring through refinancing.

This research seeks to unravel the impact of board gender diversity on companies' financing decisions and debt maturity structure choices, explicitly focusing on Iran's unique socio-cultural and regulatory environment. It questions whether female representation on the board decreases long-term leverage, aligning with the gender ethics framework, or increases it, aligning with the behavioural perspective. Additionally, the study explores the moderating role of board compensation in this relationship.

In contrast to prior studies like Abobakr and Elgiziry (2016) and Harris (2014), which focus on how board characteristics influence corporate financial leverage, our study brings a unique perspective by examining not only the direct effect of board gender diversity on debt structure but also how this relationship is moderated by board compensation. This additional layer of analysis provides novel insights into how compensation structures shape the impact of gender diversity on financial decision-making. This topic has not been extensively covered in prior research. Furthermore, our focus on the Tehran Stock Exchange (TSE) offers valuable context from a developing economy, contributing to the broader literature on how cultural and regulatory environments influence the dynamics of corporate governance, particularly in non-Western contexts. This focus on the Iranian market adds depth to the discussion by examining how women in leadership positions function within a patriarchal society, providing insights distinct from those of the studies mentioned.

Empirical testing was conducted on data from 114 companies listed on the Tehran Stock Exchange (TSE) from 2017 to 2021, utilising multivariate regression with year- and industry-fixed effects. The results align with the gender ethics framework, revealing that female representation on the board reduces long-term leverage. Furthermore, the findings indicate that board compensation strengthens this relationship, underscoring the positive impact of higher board compensation on aligning management and shareholder interests and reducing managerial risk-taking.

This research contributes to the literature by examining the impact of board gender diversity on financing decisions and debt maturity structure choices in Iran, a developing country with distinct cultural and governance practices. Additionally, it pioneers in exploring the moderating role of board compensation, providing valuable insights into the complex dynamics of corporate governance and financial decision-making in a non-Western context.

Gender diversity has received substantial attention in the business literature (Labelle et al. 2015; Richards 2003; Rosser et al. 2024). The literature on board gender diversity and its impact on corporate decision-making has burgeoned in recent years, reflecting a growing recognition of the importance of diversity in governance structures (Duppati et al. 2020; Peng et al. 2023; Said et al. 2022; Ullah et al. 2020). Studies have examined various aspects of corporate behaviour influenced by female board representation, including dividend policy, executive compensation, and mergers and acquisitions.

One area of particular interest is the relationship between board gender diversity and debt maturity structure choices. Li and Zeng (2019) found systematic differences in debt maturity structure choices with the presence of female directors, suggesting that female directors may prefer short-term debt to align managerial and shareholder interests. This finding aligns with the gender ethics framework, which posits that women exhibiting higher moral standards may be more attuned to ethical concerns and less self-interested in their decision-making than men.

Adams and Ferreira (2009) also highlight the positive role of female directors in monitoring and holding managers accountable, which can influence decisions related to debt financing. The emphasis on monitoring and accountability may lead female directors to prefer shorter-maturity debt, which subjects managers to more frequent external monitoring through refinancing.

From a behavioural perspective, Brockman et al. (2010) suggest that short-term debt may be costlier for risk-averse executives due to higher liquidity/refinancing risk costs. Female directors, presumed to exhibit greater risk aversion, may opt for longer-maturity debt to mitigate these costs and make safer financial decisions.

The literature suggests that female board representation can influence debt maturity structure choices through various mechanisms, including monitoring, accountability, and risk aversion. The empirical evidence supports the notion that board gender diversity is associated with differences in corporate financial decision-making, highlighting the importance of diversity in governance structures for effective risk management and shareholder value creation.

In the study by Datta et al. (2021), the relationship between board gender diversity and financing decisions is also examined. However, the leverage decision in our research is different. In Datta et al. (2021), decisions related to debt maturity were considered. The data were used as follows. Compustat item codes are provided in parentheses: ST3: Percentage of debt maturing in three years or less divided by total debt. ST5: Percentage of debt maturing in five years or less divided by total debt. However, in our research, the basis is on long-term and short-term debt according to the balance sheet. Although Iran has banned interest-based activities according to Islamic laws, the bank interest rates (and market rates) differ for short-term and long-term financing, with higher bank interest rates for short-term facilities. In Datta et al. (2021), the impact of compensation on the relationship between board gender diversity and financing decisions was also addressed. Still, they defined compensation based on Compustat as executive equity-based compensation. The sum of the value of new stock options (using the modified Black–Scholes method) is granted to the firm's CEO and CFO as a percentage of the total compensation paid to them. However, in Iran, it is not possible to use data related to stock-based compensation because they include only a few companies, reducing the sample size, and it is not usually disclosed. We used board compensation disclosed in general financial reports. Therefore, the differences presented in the reporting structure in Iran may affect research findings. Given Iran's economic and political environment, such as the lack of effective governance mechanisms, weak risk management practices, and a weak culture of responsibility, it seems that examining the impact of board gender diversity on long-term debt (specifically in the present study) and the moderating effect of board compensation on this relationship is valuable.

3. Theoretical Framework and Hypotheses

3.1. Debt Structure

This study is situated within the Agency Theory paradigm, a foundational corporate finance framework that examines the relationships and conflicts of interest between principals (shareholders) and agents/management (Daryaei et al. 2022; Zadeh et al. 2022; Pouryousof et al. 2022; Shandiz et al. 2022; Zadeh et al. 2023). Within this context, exploring debt structure choices, financial decisions, and corporate governance, particularly regarding board gender diversity, is inherently linked to addressing agency conflicts. By investigating how the composition of the board, specifically the inclusion of women, influences decision-making processes, managerial risk-taking behaviour, and the alignment of interests between directors and shareholders, this study seeks to contribute to understanding agency dynamics in corporate settings.

According to traditional finance theory, companies must carefully weigh various factors, such as liquidity/refinancing risk, mispricing risk, and underinvestment/overinvestment problems, to achieve an optimal debt maturity structure. The choice between long- and short-term debt can serve as a robust monitoring mechanism for reducing agency conflicts within organisations. Short-term debt, for example, can effectively lower agency costs by subjecting managers to more frequent external monitoring due to the necessity of refinancing (Rajan and Winton 1995; Stulz 2001). However, separating ownership and control may incentivise managers to deviate from the optimal debt maturity structure to avoid monitoring, often at the expense of the shareholders.

Debt structure, a critical determinant of corporate success and growth, is pivotal in a company's ability to thrive and survive in competitive markets (Mohammadi and Zanjirdar 2020). Abor (2008) underscores the heightened risk of bankruptcy associated with elevated debt levels, highlighting the delicate balance required in managing debt obligations. In addition to shareholder–manager conflicts, a fundamental conflict of interest exists between shareholders and creditors, further complicating the decision-making process surrounding debt maturity structure. This complexity is compounded by agency problems, information asymmetry, firm size, and financial distress, significantly influencing companies' optimal debt structure choices (Huang et al. 2016).

Research findings on the relationship between leverage and debt maturity (leverage structure decisions such as short-term or long-term debt) present diverse perspectives and conclusions. Diamond (1991), for instance, argues that companies with high leverage may prefer long-term debt to mitigate the risk of inefficient liquidation, thereby providing additional time for debt repayment. Conversely, Flannery (1986) posits that higher debt levels enable companies to manage refinance risk effectively by issuing long-term debt securities. However, Shan (2019) presents a contrasting viewpoint, suggesting a negative impact of leverage on debt maturity and proposing that agency costs may be alleviated by reducing leverage or shortening debt maturity periods (Hosni Al-Ghar and Rahimian 2018). The interplay between leverage and debt maturity, influenced by firm value, market conditions, and regulatory environments, remains a nuanced and evolving study area within corporate finance.

The focus of the paper is on debt structure. Our research refers to debt structure as using short-term versus long-term debt. We have used the structure in the balance sheet for long-term debt and the long-term debt ratio (long-term debt to assets) to measure leverage structure decisions. Thus, we do not focus on debt maturity. However, some arguments regarding debt maturity are cited. According to the theoretical and empirical foundations presented in the article, three different arguments about the impact of women on the board of directors on debt structure are provided, including risk aversion view, ethical view, and the view that gender diversity of the board has no relationship with debt structure decisions. If the impact of board gender diversity on long-term leverage is positive, the risk aversion view of women is confirmed. If negative, the ethical view of women is confirmed. The third view (no relationship) is confirmed if there is no significant relationship. The article text was reviewed for clarification, and additional explanations were provided.

This study's theoretical framework draws upon the rich literature within Agency Theory and traditional finance theory to elucidate the complex dynamics of debt structure choices, financial decision-making processes, and corporate governance practices. By examining the impact of board gender diversity on these phenomena, this research aims to contribute valuable insights to academic scholarship and practical policymaking in corporate finance and governance.

3.2. Board Gender Diversity

Gender theory posits that women contribute uniquely to economic success, stemming from their distinct moral development and values. Empirical evidence consistently supports that women often exhibit higher ethical standards, demonstrating greater sensitivity to social relationships and more vital adherence to rules and regulations. Within corporate governance contexts, gender diversity on boards has been recognised as a significant determinant of decision-making processes, particularly in corporate risk-taking behaviours (Barnett et al. 1994; Geiger and O'Connell 1998; Chun 2005; Datta et al. 2021; Levi et al. 2014; Linley et al. 2007; Peterson and Seligman 2003).

Female representation on corporate boards has emerged as a critical factor influencing various dimensions of corporate governance, financial performance, and risk management. Research indicates that the presence of female directors contributes to enhanced corporate governance practices, reduced risk-taking, and improved financial performance outcomes (Catalyst 2017; Chen et al. 2017; Sila et al. 2016). From an Agency Theory perspective, female directors are perceived as effective monitors of managerial behaviour, often demanding greater accountability and exhibiting lower tolerance for opportunistic behaviours (Adams and Ferreira 2009; Sepasi and Abdoli 2015).

The value of gender diversity within corporate boards extends beyond mere representation to encompass a broader range of competencies, perspectives, and decision-making styles. Studies have shown that diverse boards, including those with a significant proportion of female members, are likelier to engage in thorough deliberation, consider a more comprehensive array of viewpoints, and make more informed decisions. This diversity of perspectives is precious in complex and dynamic business environments, where innovative solutions and adaptive strategies are essential for organisational success.

Furthermore, research suggests that gender-diverse boards are better equipped to navigate and mitigate various forms of corporate risk. Women, on average, exhibit greater risk aversion than men, leading to more cautious decision-making processes and a reduced propensity for engaging in high-risk activities (Sun and Zhang 2021). This risk-averse behaviour can serve as a valuable counterbalance to the potentially overconfident and risk-seeking tendencies often associated with male-dominated leadership structures (Adams and Ferreira 2009). As such, the presence of female directors can contribute to a more balanced and prudent approach to risk management within organisations.

Moreover, gender diversity on corporate boards has been linked to improved stakeholder relations and enhanced corporate reputation. Companies with diverse boards are perceived as more inclusive, socially responsible, and attuned to the needs and preferences of various stakeholder groups, including employees, customers, and investors (Terjesen et al. 2016). This positive perception can translate into tangible organisational benefits, including increased brand loyalty, employee morale, and investor confidence.

In addition to its effects on corporate governance and risk management, gender diversity on boards can also have significant implications for organisational innovation and performance. Research suggests that diverse teams, including individuals with diverse gender identities, are more innovative and better able to adapt to changing market conditions (Carter et al. 2017). By bringing together individuals with different backgrounds, experiences, and perspectives, gender-diverse boards can foster a culture of creativity, collaboration, and open-mindedness, thereby driving organisational innovation and competitive advantage.

However, despite the growing recognition of the benefits of gender diversity on corporate boards, women continue to be underrepresented in leadership positions within many organisations. The "glass ceiling" phenomenon, systemic barriers, and unconscious biases often impede women's advancement to senior leadership roles (Hoyt and Murphy 2016).

Addressing these barriers and promoting greater gender diversity within corporate leadership structures requires concerted efforts from organisations, policymakers, and society.

In conclusion, gender diversity on corporate boards plays a crucial role in shaping organisational outcomes, including corporate governance practices, risk management strategies, stakeholder relations, innovation, and performance. By harnessing female directors' unique perspectives, experiences, and decision-making styles, organisations can enhance their effectiveness, resilience, and competitiveness in today's dynamic business environment. Efforts to promote greater gender diversity within corporate leadership structures are a matter of social justice and equality and a strategic imperative for sustainable business success.

3.3. Board Gender Diversity and Debt Structure

Research exploring the intersection of board gender diversity and debt structure offers valuable insights into the complex dynamics of corporate decision-making processes. Evidence suggests that women, on average, exhibit greater moral and ethical sensitivities than their male counterparts. Surveys and studies across various professions, including accounting, auditing, sales, and among students, consistently indicate higher levels of moral development, conservative ethical viewpoints, and greater adherence to ethical standards among women (Bernardi and Arnold 1997; Larkin 2000; O'Donnell and Johnson 2001; Dawson 1997; Pierce and Sweeney 2010; Albaum and Peterson 2006).

The choice of a company's leverage and debt maturity structure is a critical decision that can significantly impact its financial health, performance, and risk profile. According to Agency Theory, managers may be motivated by self-interest and select a debt maturity structure that is not aligned with the best interests of shareholders. Specifically, managers may opt for long-term debt to avoid the frequent external monitoring associated with refinancing short-term debt (Brockman et al. 2010; Datta et al. 2005).

In the context of board gender diversity, the presence of women in executive and boardroom positions introduces a potentially moderating influence on debt structure decisions. Assuming that female executives possess higher moral and ethical sensitivities, they may be more inclined to make decisions that align with shareholders' interests and corporate governance principles. As such, female executives may prefer short-term debt, which offers enhanced transparency, accountability, and alignment with shareholder interests, without fearing market scrutiny or external monitoring.

However, the relationship between board gender diversity and debt structure is multifaceted and influenced by various factors, including organisational culture, industry dynamics, and regulatory frameworks. While the presence of women in leadership roles may contribute to more ethical and transparent decision-making processes, it is essential to recognise that gender diversity alone may not guarantee optimal outcomes. Effective governance mechanisms, robust risk management practices, and a culture of accountability are equally crucial for ensuring sound debt structure decisions and safeguarding shareholder interests.

Moreover, the impact of board gender diversity on debt structure may vary across different contexts and organisational settings. Cultural norms, societal expectations, and institutional factors can shape how gender diversity influences company decision-making processes. For example, in patriarchal societies where traditional gender roles are deeply entrenched, the presence of women in leadership positions may face more severe resistance (resistance of other leadership officials of the organisation) or encounter implicit biases that hinder their influence on strategic decisions, including debt structure choices (Datta et al. 2021).

However, it is essential to note that although the presence of women in strategic roles may improve ethical and transparent decision-making processes, this impact requires the presence of effective governance mechanisms, robust risk management practices, and a culture of responsibility. In other words, the effect of board gender diversity on leverage decisions may vary across different contexts and organisational settings, including cultural norms, social expectations, and institutional factors. In Iran, we witness weak corporate governance, risk management, and a culture of responsibility. Additionally, cultural norms, such as the patriarchal society of Iran, may prevent women from significantly influencing financial decisions, like leverage decisions, despite their physical presence in strategic decision-making processes. Therefore, this raises the question of whether the presence of women on the board of directors in Iran, based on the existing literature and empirical evidence, can lead to more ethical and transparent financing decisions or whether organisational settings and cultural norms prevent this impact.

Empirical research on the relationship between board gender diversity and debt structure has yielded mixed findings, highlighting the need for further investigation and nuanced analysis. While some studies suggest a positive association between female representation on boards and adopting more conservative debt policies (Datta et al. 2021; Choi et al. 2017; Ho et al. 2015; Larkin 2000), others find no significant relationship or even observe contradictory results (Bajtelsmit and VanDerhei 1997; Hinz et al. 1997; Jianakoplos and Bernasek 1998; Levin et al. 1988; Sundén and Surette 1998). These inconsistencies underscore the complexity of the underlying mechanisms and the importance of considering contextual factors in understanding the impact of gender diversity on corporate decision-making.

Future research could explore the mediating and moderating factors influencing the relationship between board gender diversity and debt structure. Longitudinal studies tracking changes in board composition and debt policies over time could provide valuable insights into the causal mechanisms underlying observed associations. Qualitative research methods, such as interviews and case studies, could offer deeper insights into the decision-making processes and dynamics within boardrooms and executive suites.

In conclusion, the relationship between board gender diversity and debt structure is a complex and multifaceted phenomenon that warrants careful examination and analysis. While the presence of women in leadership positions may contribute to more ethical, transparent, and shareholder-aligned decision-making processes, the impact of gender diversity on debt policies is contingent upon various contextual factors and organisational dynamics. By advancing our understanding of these dynamics, researchers can contribute to developing more effective governance practices and strategies for promoting diversity, equity, and inclusion within corporate boardrooms.

3.4. Hypotheses Development

Exploring the intricate relationship between board gender diversity and debt structure involves synthesising various theoretical perspectives and empirical evidence to formulate hypotheses that capture the nuanced dynamics. This section delineates three main arguments guiding the investigation into the impact of board gender diversity on debt structure choices. Subsequently, it proposes hypotheses grounded in theoretical frameworks and empirical observations.

- First Argument: Ethical Inclinations and Debt Structure

The first argument posits that female executives with higher ethical inclinations and moral standards tend to make decisions that align more closely with shareholder interests, particularly in debt structure choices. Drawing from the gender ethics framework, which suggests that women are more attuned to ethical considerations such as disclosure, integrity, and conflicts of interest (Ho et al. 2015; Larkin 2000), it is hypothesised that firms with female directors will exhibit a preference for shorter-term debt.

Female executives, presumed to be less self-interested than their male counterparts, are expected to opt for shorter-term debt to avoid the scrutiny associated with long-term financing arrangements. This expectation stems from the notion that shorter debt maturity structures impose more immediate accountability and transparency, mitigating potential agency conflicts between management and shareholders (Choi et al. 2017). Consequently, female executives are anticipated to encounter fewer debt-related agency problems, leading to a more optimal alignment of debt maturity structures with shareholder interests.

- Second Argument: Risk Aversion and Debt Maturity Structure

The second argument centres on the risk tolerance of directors, mainly focusing on the risk-averse nature often attributed to female executives. Building upon the premise that risk-averse individuals exhibit a preference for safer financial decisions and tend to avoid exposure to uncertainty (Bajtelsmit and VanDerhei 1997; Hinz et al. 1997; Jianakoplos and Bernasek 1998; Levin et al. 1988; Sundén and Surette 1998), it is hypothesised that female directors will opt for a more conservative approach to debt maturity structure.

Under this perspective, female executives are expected to favour longer-term debt arrangements to mitigate liquidity and refinancing risks associated with short-term financing. Short-term debt instruments, characterised by higher liquidity/refinancing risk costs and increased external monitoring through refinancing, may be perceived as less favourable by risk-averse female directors (Brockman et al. 2010). Therefore, it is posited that female directors will exhibit a propensity towards more extended debt maturity structures, reflecting their risk-averse nature and preference for safer financial strategies.

- Third Argument: Competing Perspectives and Firm Performance

The third argument acknowledges the existence of mixed evidence regarding the impact of board gender diversity on firm performance, introducing competing perspectives that warrant further exploration. While some studies have suggested a positive relationship between board gender diversity and various performance metrics (e.g., Catalyst 2017; Chen et al. 2017; Sila et al. 2016), others have found inconclusive or even negative associations (e.g., Adams and Ferreira 2009).

In light of these conflicting findings, it is imperative to consider the potential moderating effects of factors such as directors' compensation on the relationship between board gender diversity and firm performance (Jane Lenard et al. 2014; Datta et al. 2021; Cumming et al. 2024; Gormley et al. 2023). Directors' compensation is a way to match the interests of management and shareholders and influences managerial risk-taking behaviours (Brockman et al. 2010; Datta et al. 2021). Therefore, it is hypothesised that the relationship between board gender diversity and financial leverage is contingent upon the level of board compensation, with higher compensation levels strengthening the association between gender diversity and leverage decisions.

3.5. Formulated Hypotheses

H1. *Board gender diversity has a significant effect on the long-term leverage of companies.*

The literature suggests that female executives with higher ethical inclinations and lower self-interest are more likely to favour shorter debt maturity structures, aligning better with shareholder interests. Consequently, it is hypothesised that firms with greater board gender diversity will prefer shorter-term debt arrangements, leading to lower long-term leverage ratios compared to those with less diverse boards.

H2. *Board compensation strengthens the relationship between gender diversity and financial leverage.*

Directors' compensation is a mechanism to align management and shareholders' interests and influences managerial risk-taking behaviours. Higher levels of board compensation are expected to reinforce the impact of board gender diversity on financial leverage decisions, with firms offering higher compensation packages exhibiting a stronger association between gender diversity and leverage choices.

The hypotheses in this study are developed to explore the nuanced impacts of board gender diversity on debt structure choices, informed by ethical and risk aversion theories. Female directors are often associated with heightened ethical standards and a preference for conservative financial strategies. This suggests that board gender diversity may reduce reliance on long-term debt. This aligns with the hypothesis that a gender-diverse board structure reduces agency conflicts by enhancing transparency and aligning with shareholder interests. Additionally, by investigating the moderating role of board compensation, this study extends prior research to assess whether compensation structures amplify the risk-averse inclinations of female directors, potentially curbing excessive leverage. These hypotheses contribute to a deeper understanding of how board diversity shapes financial risk management, particularly within developing economies.

4. Research Methodology

4.1. Design

The research methodology adopted for this study is a quantitative ex post facto design chosen to rigorously investigate the formulated hypotheses regarding the relationship between board gender diversity and debt structure choices among companies listed on the Tehran Stock Exchange (TSE). This design facilitates examining causal relationships between variables by analysing data collected after the events of interest have occurred (Nassirzadeh et al. 2023).

Methodological Choices and Exclusion of Certain Industries

This study adopted a quantitative ex post facto design, which allowed the authors to investigate the causal relationships between board gender diversity and debt structure by analysing data after the events of interest have occurred. This approach provided reliable insights into the effects of gender diversity on financial decision-making.

a. Exclusion of Certain Industries: The study explicitly excluded financial institutions, investment companies, banks, insurance firms, leasing companies, and financial intermediaries from its sample. These sectors were left out to maintain data homogeneity because these industries operate under distinct regulatory and financial conditions that could skew the analysis. Financial institutions, for instance, often have different debt structures due to capital adequacy regulations and specific leverage rules that do not apply to non-financial firms. By focusing on operating companies, the study ensured that its findings regarding gender diversity and debt decisions were relevant and comparable across industries without distortions caused by sector-specific factors.
b. Contextual Relevance: The study drew on a sample from the Tehran Stock Exchange (TSE)-listed companies over five years (2017–2021). The selected companies were required to have consistent fiscal years and active trading without significant interruptions, ensuring the analysis reflected the firms' ongoing business activities. By selecting firms that have not undergone prolonged trading halts, the study ensured that the data were not biased by irregular trading patterns that could misrepresent a firm's financial stability.

4.2. Data Collection

Data for this study were primarily sourced from the Rahavard Novin 3.8 software and the audited financial statements released by the TSE. These sources provided comprehensive and reliable information for thoroughly analysing the investigated variables. Audited financial statements ensured the accuracy and credibility of the financial data used in the study (Eghbal et al. 2024; Zadeh et al. 2023).

4.3. Population and Sample

The population under scrutiny encompasses all companies listed on the TSE during the five years from 2017 to 2021. To ensure the sample's representativeness and validity findings, specific criteria were employed for sample selection:

Excluding certain entity types, such as investment companies, financial intermediaries, holdings, banks, insurance firms, and leasing companies, from the sample maintained homogeneity and focus on operating companies relevant to the study's objectives.

Consistency in activity and fiscal year: The selected companies needed to maintain consistent activity and fiscal year throughout the observed period to facilitate accurate comparison and analysis of financial data.

Accessibility of information: Adequate information required for calculating the research variables needed to be accessible for each selected company to ensure the feasibility of data analysis.

Exclusion of instances with prolonged trading halts: Instances of trading halts lasting longer than three months were considered exclusionary to avoid potential data distortions due to irregular trading activity irregularities.

Fiscal year-end alignment: The selected companies' fiscal year-end needed to align with the calendar year-end (20 March) to ensure consistency in reporting periods and facilitate comparability of financial data across companies.

Based on these criteria, a systematic sample comprising 114 companies was derived, totalling 570 firm years of observation. The sample selection process ensured the inclusion of companies that are representative of the population under study while adhering to the specified criteria for sample inclusion.

4.4. Analytical Approach

The analytical approach employed in this study involved Ordinary Least Squares (OLS) regression analysis, incorporating year- and industry-fixed effects. OLS regression is a widely used statistical technique for estimating the relationships between variables in regression models. By including year- and industry-fixed effects in the regression model, the analysis controlled for potential time and industry-specific factors that could influence the variables of interest, thereby enhancing the robustness and reliability of the results.

4.5. Hypotheses Testing

The hypotheses regarding the relationship between board gender diversity and debt structure choices were rigorously tested using the OLS regression analysis. The regression model allowed for examining the hypothesised relationships while controlling for potential confounding variables. Statistical tests, such as *t*-tests and F-tests, were conducted to assess the coefficients' significance and the regression model's overall fit.

4.6. Validity and Reliability

Ensuring the validity and reliability of the study findings was paramount to drawing accurate conclusions and making meaningful interpretations. To enhance internal validity, rigorous data cleaning procedures were implemented to eliminate errors and inconsistencies in the collected data. Additionally, sensitivity analyses were conducted to assess the robustness of the results to different model specifications and assumptions.

The research methodology employed in this study was designed to provide a comprehensive and rigorous analysis of the relationship between board gender diversity and debt structure choices among companies listed on the Tehran Stock Exchange. By adopting a quantitative ex post facto design, utilising reliable data sources, employing stringent sample selection criteria, and employing advanced statistical techniques, the study aimed to generate valuable insights into the factors influencing debt structure decisions in the context of board gender diversity.

4.7. Model and Variables

Following Datta et al. (2021) and as it is described in Table 1, the following model was used to test the hypotheses:

$$\begin{aligned} Leverage_{it} = \; & \alpha + \beta_1 Female_{it} + \beta_2 Comp + \beta_3 Comp * Female_{it} + \beta_4 Size_{it} + \beta_5 MTB_{it} \\ & + \beta_6 FixedAssets_{it} + \beta_7 Profitability_{it} + \beta_8 ROA_{it} + \beta_9 AGE_{it} \\ & + \beta_{10} SalesGrowth_{it} + \varepsilon_{it} \end{aligned} \quad (1)$$

Table 1. Variables and measurements.

Variable		Label	Measurement
Dependent	Leverage structure	Leverage	Long-term debt divided by the market value of total assets
Independent	Board gender diversity	Female	Equal to 1 if there is at least one female board member and 0 otherwise
	Board compensation	Comp	Equal to 1 if board compensation is greater than the industry average, and 0 otherwise
Control	Firm size	Size	Natural log of total assets
	Market-to-book ratio	MTB	Market-to-book value of total assets
	Fixed asset ratio	Fixed assets	Plant, property, and equipment (PPE) divided by total assets
	Profitability	Profitability	Income reported for the current period
	Return on assets	ROA	Earnings before interest and tax divided by total assets
	Firm age	AGE	Current fiscal year minus first fiscal year

4.8. Findings

The descriptive statistics presented in Table 2 offer valuable insights into the variables under examination. Net financing, represented by debt, demonstrates a mean of 9,028,997, indicating considerable variability in the funding amounts across the sample companies. The maximum observed value of 399,976,695 in 2018 for Iran Khodro Company highlights the substantial financing undertaken by certain firms, while the minimum value of 45,543 in 2016 for Piazar Agro Industrial Company underscores the diversity in financing needs among companies.

Table 2. Descriptive statistics of the variables.

Variable	Mean	Median	SD	Max.	Min.	Skewness	Kurtosis
Leverage	0.5568	0.5501	0.206704	1.27394	0.03143	0.12557038	0.01155
Female	0.0323	0	0.164572	1	0	3.7551189	4.21278
MTB	6.11	3.21	2.89	51.68	0.250	0.9149	1.2670
Fixed Assets	43,335,584	442,779	16,492,437	18,476,568	9737	5.967334	4.77706

Table 2. *Cont.*

Variable	Mean	Median	SD	Max.	Min.	Skewness	Kurtosis
Profitability	2,078,434	257,788	156,487	382,775,011	−155,050,040	−3.165395	4.5467
ROA	0.15	0.12	0.1631	0.83	−0.40	0.5437	0.8525
AGE	25.66	22.00	13.6914	66	6	1.15041	0.32694
Sales Growth	0.47	0.36	0.8552	15.28	−0.91	3.59613	0.67899

Regarding debt structure choice, as measured by leverage, the mean value stands at 0.5568, indicating the average proportion of debt to total assets across the sample companies. The range of Leverage values is considerable, with a maximum of 1.27394 observed for Iran Khodro Company in 2017 and a minimum of 0.03143 for Shahdiran Company in 2019. These variations in leverage reflect differences in companies' debt management strategies and risk preferences.

In terms of board gender diversity, represented by the proportion of female directors (Female), the mean value is 0.0323, indicating limited diversity in board composition across the sample companies. Out of 570 firm years and 114 companies over five years, only 59 instances exhibit gender diversity on the board, reflecting the underrepresentation of women in corporate leadership roles in the context of the Tehran Stock Exchange.

An analysis of skewness and kurtosis coefficients for all variables indicates positive skewness, suggesting that the data distribution is skewed towards higher values, and kurtosis coefficients are within an acceptable range, indicating normal distribution. Notably, the composition of the board of directors exceeds the industry average in 38% of the sample, showing variations in board diversity across companies.

Following a thorough assessment of regression assumptions, multivariate regression analysis incorporating year- and industry-fixed effects was conducted to explore the relationship between board gender diversity, long-term leverage, and the moderating role of board compensation, as presented in Table 3.

Table 3. Summary estimation results.

$$Leverage_{it}=\alpha+\beta_1 Female_{it}+\beta_2 Comp+\beta_3 Comp*Female_{it}+\beta_4 Size_{it}+\beta_5 MTB_{it}+\beta_6 FixedAssets_{it}+\beta_7 Profitability_{it}+\beta_8 ROA_{it}+\beta_9 AGE_{it}+\beta_{10} SalesGrowth_{it}+\varepsilon_{it}$$

Variable	Coefficient	SE	t-Statistic	Sig.	VIF
Constant	−3.53	4.7	−0.75	0.45	-
Female	−1.09	0.49	−2.23	0.02	1.57
Comp	0.056	0.34	3.14	0.035	2.65
Comp*Female	0.089	0.47	4.04	0.018	3.18
Size	0.2	0.089	2.24	0.04	1.156
MTB	0.14	0.078	1.84	0.065	2.03
Fixed Assets	−0.15	0.075	−2.07	0.038	1.78
Profitability	−3.4	0.72	−5.97	0.00	2.5
ROA	−0.63	0.63	−1.00	0.31	1.79
AGE	−0.18	0.64	−0.27	0.78	2.38
Sales Growth	0.15	0.64	0.23	0.82	2.59
R^2	0.38		Adjusted R^2		0.30
F-statistic (*p*-value)	44.76 (0.00)		Durbin–Watson statistic		2.12

The reported F-statistic, with a p-value smaller than 0.05 (p-value < 0.05), signifies the overall model's significance, indicating that the independent variables jointly explain a significant portion of the variance in the dependent variable. The coefficient of determination (R^2) of 0.38 means that the variables included in the regression model explain 38% of the observed variation in long-term leverage.

The regression coefficient for board gender diversity (Female) is estimated at −1.09, with a p-value of 0.0254. This negative coefficient suggests that an increase in board gender diversity is associated with a decrease in long-term leverage, supporting the first hypothesis. The statistically significant p-value indicates that this relationship is unlikely to have occurred by chance alone, providing robust evidence for the negative association between board gender diversity and long-term leverage.

Furthermore, the regression coefficient for the interaction term between board gender diversity and board compensation (Comp*Female) is estimated at 0.089, with a p-value of 0.018. This positive coefficient suggests that board compensation amplifies the impact of board gender diversity on long-term leverage, supporting the second hypothesis. The statistically significant p-value indicates that the moderating effect of board compensation on the relationship between board gender diversity and long-term leverage is unlikely due to random variation, providing strong evidence for the moderating role of board compensation.

Overall, the multivariate regression analysis findings support the hypothesised relationships between board gender diversity, board compensation, and long-term leverage among companies listed on the Tehran Stock Exchange. These findings contribute to a deeper understanding of the factors influencing debt structure decisions in the context of board diversity and compensation practices, with implications for corporate governance and financial management strategies.

4.9. Robustness Tests: Addressing Endogeneity

Endogeneity issues, such as omitted variable bias and reverse causality, must be addressed to improve the credibility of the findings. One approach would be introducing an instrumental variable (IV) analysis to help mitigate these concerns. For example, external factors, such as changes in gender equality policies or legal requirements for female board representation, could serve as valid instruments. These instruments would isolate the exogenous variation in gender diversity, thus addressing concerns of reverse causality between board diversity and leverage. Additionally, the paper should discuss how factors like firm culture or the external regulatory environment may have been omitted from the analysis and how these factors could potentially bias the results.

We used robustness tests to address potential endogeneity issues affecting the relationship between board gender diversity and leverage decisions. We applied Heckman's (1979) model combined with an instrumental variable to address potential selection bias.

In the Heckman model, the base model we tested (in Table 3) deals with endogenous issues related to "self-selection", meaning that female directors may join companies with specific characteristics. We used a conditional logistic regression model to estimate the probability of creating gender diversity as a function of firm-specific characteristics (X variables include size, profitability, growth opportunities, leverage, abnormal returns, fixed asset ratio, and the standard deviation of stock returns over the fiscal year).

Table 4 tests for endogeneity to strengthen the reliability of its conclusions.

$$Female_{it} = \alpha + Y_s + \tau_t + \beta_1 Gender\ Equality_{it} + \theta X_{it} + \varepsilon_{it} \tag{2}$$

The results in Table 4 indicate that the coefficient of gender diversity, without considering the dependent variable used and without fixed effects, is positive and statistically significant at the 1% level. Therefore, our results support previous findings in favour of the first hypothesis, confirming that gender diversity is an important and influential factor in a company's leverage decisions. Including fixed effects, the coefficient remains positive and statistically significant at the 1% level, further supporting our findings that gender diversity is a crucial characteristic impacting corporate leverage decisions.

Table 4. Instrumental variables regression and Hausman test for endogeneity.

Variable	**Coefficient (t-Statistic)**
Female	2.37 (0.01)
Size	−0.087 (0.67)
Profitability	0.056 (0.045)
MTB	−0.035 (0.098)
Lev	−0.078 (0.108)
ABN_Earn	−0.091 (0.99)
Fixed-Asset	−0.187 (0.98)
RET_STD	0.87 (0.98)
Adjusted R^2	0.246

The endogeneity of the board gender diversity variable was examined. The gender diversity of the board of directors is an endogenous variable, and the average gender diversity in the industry can be an instrumental (exogenous) variable. Therefore, the endogeneity of this variable was checked using the 2SLS method.

$$〖Female〗\_it = \alpha + \beta\_1 \; 〖Ind\text{-}Female〗\_it + \sum Controls + \varepsilon\_it \qquad (3)$$

In this model, Ind-Female is the average gender diversity of the industry, and $\sum$ Controls are the control variables of the model (1).

Fisher's statistic in this estimate is 2.87, and its significance level is 0.003, which indicates the effect of the instrumental variable (gender diversity of the industry) on the independent variable (gender diversity).

In the second stage, the dependent variables (Leverage) are regressed on the predicted values obtained from the gender diversity of the first stage along with the control variables:

$$\begin{gathered} 〖Leverage〗\_it = \alpha + \beta\_1 \; 〖Female\text{-}Predicted〗\_it + \beta\_2\, Comp + \\ \beta\_3\, Comp{*}Female\text{-}Predicted〗\_it + \sum Controls + \varepsilon\_it \end{gathered} \qquad (4)$$

This stage examines the impact of the exogenous component of board gender diversity on debt structure, isolating any potential endogeneity. If the coefficient on the predicted board gender diversity is statistically significant in the second stage, it indicates a causal impact on debt structure.

The coefficient β_1 (Female-Predicted) has an estimation of −0.98, and its significance level and t-statistics are 0.002 and 2.43, respectively, which indicates the significant impact of gender diversity on the debt structure. Also, the β_3 coefficient (Comp*Female-Predicted) is 0.073, and its significance level and t-statistics are 0.034 and 3.48, respectively, which shows that the remuneration of the board of directors highlights the effect of gender diversity on the debt structure.

4.10. Ethical Considerations

The study recognises the need for ethical diligence throughout the research process. Although no explicit participant interaction or sensitive personal data are involved in the study, ethical issues related to data privacy and confidentiality are paramount. The study utilises publicly available audited financial statements and data from the Rahavard Novin software, which compiles financial data for listed companies on the TSE.

Potential ethical issues stem from using secondary data related to corporate governance, such as board compensation details and debt structure decisions, which could reflect corporate strategies. As such, the researchers ensure that no confidential or proprietary information that could harm individual firms or stakeholders is disclosed. Data anonymisation and compliance with the ethical guidelines of financial research, such as respecting the corporate governance laws in Iran and abiding by data protection regulations, are upheld throughout the study.

Additionally, the research navigates the socio-cultural sensitivity surrounding gender roles in Iran, ensuring that the results are interpreted objectively without cultural bias despite the patriarchal context in which the study is situated.

5. Discussion

The role of a company's board of directors is crucial in overseeing executive management and safeguarding shareholder interests. Extensive research has highlighted the value of board diversity, noting that female members bring unique experiences and ethical perspectives. Board diversity can manifest through observable characteristics such as race, gender, and age as well as intangible qualities like education and work experience. Our study supports the notion that female directors exhibit a heightened focus on monitoring activities and tend to prefer short-term debt instruments to align the interests of managers and shareholders. This finding underscores the belief that increased female representation enhances corporate risk management practices. From both social and economic perspectives, it is imperative to advocate for gender equality in management positions, as discriminatory practices can hinder effective human resource utilisation and impede organisational performance.

Our study has revealed a negative association between board gender diversity and long-term leverage, which aligns with the gender ethics framework. Contrary to behavioural perspectives suggesting women's risk aversion influences debt structure decisions, our findings suggest otherwise, consistent with prior research. We found that board compensation strengthens the relationship between board gender diversity and debt structure. This indicates that higher levels of board compensation contribute to better alignment of management and shareholder interests while mitigating managerial risk-taking behaviours. These results align with the literature by Brockman et al. (2010) and Datta et al. (2021), highlighting the importance of board composition and compensation practices in shaping corporate financial decisions.

Agency Theory provides a robust framework for describing the results of this study. Agency Theory elucidates the conflicts of interest between principals (shareholders) and agents (managers). This theory is particularly apt for examining corporate governance issues, such as board composition and its impact on financial decisions.

Agency Theory posits that agents may act in their self-interest, potentially at the expense of principals. Female directors, hypothesised to exhibit higher ethical standards, can mitigate these conflicts by aligning debt structure decisions more closely with shareholder interests.

The study supports the hypothesis that companies with female directors prefer shorter-term debt, reducing long-term leverage. This decision aligns with the principal's interest by enhancing transparency and accountability and mitigating agency conflicts.

Agency Theory also addresses risk-taking behaviours in corporate decision-making. Female directors, being more risk-averse, are expected to favour financial strategies that minimise risk, thereby protecting shareholder value. Female directors' preference for longer-term debt reflects a conservative approach to debt management, reducing liquidity and refinancing risks, which aligns with shareholders' desire for stability and lower risk exposure.

Agency Theory highlights the complexity of incentive structures. Directors' compensation plays a crucial role in aligning the interests of managers and shareholders, influencing risk-taking behaviours and financial decisions. The study reveals that directors' compensation moderates the impact of board gender diversity on financial leverage. Higher compensation levels strengthen the relationship between gender diversity and conservative leverage decisions, indicating that well-compensated female directors are more effective in reducing agency costs.

In summary, Agency Theory comprehensively explains the study's findings. Female directors on corporate boards contribute to more ethical, risk-averse decision-making and enhanced alignment of managerial actions with shareholder interests. The moderation effect of directors' compensation further underscores the importance of incentive structures in mitigating agency conflicts and achieving optimal corporate governance outcomes. This theoretical framework supports the empirical results and offers valuable insights into the dynamics of board composition and financial decision-making in the context of gender diversity. Here are some of the contributions of the current study:

5.1. Novel Insights in Financial Decision-Making and Risk Management

a. Gender Influence on Corporate Financing: This study provides new evidence on how female board representation impacts financial decisions, specifically in debt structure and risk management. The research shows that female directors tend to favour more conservative financial strategies, such as reducing long-term debt. This risk-averse behaviour supports the view that gender diversity can act as a moderating force in corporate risk-taking, promoting stability during periods of financial decision-making. This is particularly valuable in corporate governance frameworks where risk mitigation is critical.

b. Moderating Role of Board Compensation: A key finding of this study is the moderating effect of board compensation on the relationship between gender diversity and debt structure. This insight is novel because it highlights how compensation structures can influence the extent to which female directors' risk-averse behaviours affect financial decisions. It suggests that well-compensated female directors may be better positioned to ensure financial prudence and alignment with shareholder interests.

c. Application to a Developing Economy: The study's focus on Iran adds value to the existing literature by exploring gender diversity in a non-Western context. Iran's distinct socio-cultural and regulatory environment, which includes Islamic finance principles and corporate governance limitations, offers a unique setting to understand how gender diversity influences financial behaviour. The research expands the discussion beyond Western economies, providing insights into how female board representation could influence risk management strategies in emerging markets. This is particularly relevant for economies where corporate governance structures might not be as robust as those in more developed countries.

5.2. Contribution to the Broader International Literature

a. Broader Implications for Gender Diversity: By focusing on a developing economy like Iran, the paper offers significant contributions to the global literature on gender diversity and corporate governance. It highlights how cultural and institutional factors affect the role of women in decision-making, offering comparative insights for other developing economies with similar socio-economic characteristics. For example, the patriarchal norms in Iran may limit female directors' influence. Still, the study shows that where they can exert influence, they can significantly impact financial risk management decisions.

This study adds value to the global discussion on gender diversity and corporate governance by illustrating how these factors play out in an Iranian context. The Iranian market, characterised by complex regulatory structures and societal norms regarding gender roles, provides an ideal setting to explore the broader impact of female participation in board decisions. The study extends the conversation beyond the typical Western-centric perspectives, where much of the literature has focused. It highlights how board gender diversity affects financial risk-taking and management, which may differ based on cultural and regulatory environments. The research underscores the necessity of promoting gender diversity in corporate governance to improve decision-making processes, especially in emerging markets. It highlights the potential benefits of including women in key decision-making roles to enhance risk management strategies in corporate finance.

b. Expanding the Scope of Corporate Governance Studies: Most studies on gender diversity have concentrated on developed economies, with Western governance structures at the forefront. This paper contributes to the global discussion by showing that even in countries with weaker governance mechanisms, gender diversity still plays a crucial role in shaping ethical financial decisions. The unique challenges faced by Iranian corporations—such as economic instability and regulatory limitations—allow for a broader understanding of how board gender diversity can drive better risk management outcomes across different economic and cultural landscapes.
c. Contextual Significance: Iran's Islamic finance system, where interest-based transactions are prohibited, creates a unique backdrop for studying financial decision-making. This context further emphasises the need for ethical governance and conservative financial practices—to which female directors can contribute significantly. The findings suggest promoting gender diversity in such contexts could lead to more ethical and transparent financial management. This provides a valuable case study for international governance bodies and policymakers looking to enhance global diversity and risk management practices.

In conclusion, the paper provides new perspectives on how board gender diversity intersects with corporate financial risk management in emerging markets like Iran. Its insights into the role of female directors in promoting conservative debt structures and its focus on the moderating role of compensation systems enrich the global discourse on corporate governance, diversity, and risk management.

6. Conclusions

This study highlights the critical role of board gender diversity in corporate risk management and financial decision-making. The findings indicate that female directors contribute to more conservative debt structures, reducing overall financial risk, mainly through shorter-term debt instruments. Furthermore, the moderating effect of board compensation strengthens the alignment between management and shareholder interests, enhancing risk mitigation and improving the ethical governance of the firms.

From a practical perspective, the results underscore the importance of promoting gender diversity on corporate boards to optimise financial decision-making and manage risk effectively. Companies prioritising diversity can benefit from improved risk management practices and more sustainable financial structures. Policymakers and regulators may also consider these findings when developing frameworks to encourage gender diversity and robust governance practices in corporate boards, particularly in emerging markets.

6.1. Study Limitations and Their Impact on Generalizability

6.1.1. Geographical and Cultural Context

The study is conducted within Iran's specific socio-cultural and regulatory framework, a developing economy with distinct cultural and institutional norms. These norms, particularly regarding gender roles and corporate governance, differ significantly from those in Western and other global economies. Iran's patriarchal context may impose implicit biases and resistance against female board members, which might not be as pronounced in different regions. Therefore, while the findings offer valuable insights into the influence of board gender diversity on debt structure and risk management, they may not be readily generalisable to countries with different governance standards, regulatory frameworks, and cultural settings.

6.1.2. Exclusion of Specific Industries

The study excludes several vital industries, including financial institutions, banks, insurance firms, and investment companies. Due to regulatory and financial constraints specific to their sectors, these industries tend to have distinct capital structures, leverage practices, and risk management approaches. The exclusion ensures data homogeneity but limits the scope of the findings. Thus, the results might not apply to industries where sector-specific regulations influence leverage and debt decisions. Further studies that include a broader range of industries could provide more comprehensive insights.

6.1.3. Timeframe of the Study

The data collection spans five years (2017–2021), a relatively short period to capture long-term trends in board gender diversity and financial decision-making. While the study does account for fixed-year effects, longer-term studies might reveal different patterns or changes in gender dynamics and risk management over time, especially in crisis periods or periods of economic recovery. Extending the time limit could also mitigate the influence of short-term economic conditions, such as market fluctuations or changes in government policies, which may have influenced the results within the selected period.

6.1.4. Corporate Governance and Board Compensation

The study highlights board compensation as a moderating factor in the relationship between board gender diversity and debt structure. However, the specific governance mechanisms in place in Iran, such as weaker corporate governance structures and lack of transparency, may further limit the applicability of the results to other countries with more robust governance frameworks. In economies with better-developed accountability and transparency standards, the moderating effect of board compensation on financial decision-making might operate differently.

6.1.5. Data Source and Availability

The reliance on the Rahavard Novin software and audited financial reports ensured the study's accuracy. However, these sources may not fully capture the nuanced dynamics of board discussions or the informal influences in boardrooms. Additionally, this reliance on secondary data limits the study's ability to incorporate qualitative insights into how gender diversity shapes financial decision-making.

6.1.6. Recommendations for Future Research

Future research could benefit from expanding the geographical scope to include cross-country comparisons, especially in countries with differing levels of board gender diversity and corporate governance structures. Additionally, longitudinal studies could assess the long-term effects of female board representation on financial decision-making, especially during economic volatility. Researchers could also explore qualitative data, such as interviews or case studies, to better understand the interpersonal dynamics within diverse boards. The study's limitations, such as its focus on companies listed on the Tehran Stock Exchange, suggest that future research should explore the broader application of these findings across different industries and regions. Further exploration of other factors, such as economic instability and regulatory frameworks, could provide deeper insights into the relationship between board composition, risk management, and corporate finance.

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References

Abobakr, Mohamed Galal, and Khairy Elgiziry. 2016. The effect of board characteristics and ownership structure on the corporate financial leverage. *Accounting and Finance Research* 5: 1–14. [CrossRef]

Abor, Joshua. 2008. Agency theoretic determinants of debt levels: Evidence from Ghana. *Review of Accounting and Finance* 7: 183–92. [CrossRef]

Adams, Renée B., and Daniel Ferreira. 2009. Women in the boardroom and their impact on governance and performance. *Journal of Financial Economics* 94: 291–309. [CrossRef]

Albaum, Gerald, and Robert A. Peterson. 2006. Ethical Attitudes of Future Business Leaders: Do They Vary by Gender and Religiosity? *Business & Society* 45: 300–21. [CrossRef]

Bajtelsmit, Vickie L., and Jack L. VanDerhei. 1997. A Risk Aversion and Pension Investment Choices. In *Positioning Pensions for the Twenty-First Century*. Edited by Michael S. Gordon, Olivia S. Mitchell and Marc M. Twinney. Philadelphia: University of Pennsylvania Press.

Barnett, Tim, Gene Brown, and Ken Bass. 1994. The Ethical Judgments of College Students regarding Business Issues. *Journal of Education for Business* 69: 333–38. [CrossRef]

Bernardi, Richard A., and Donald F. Arnold Sr. 1997. An Examination of Moral Development within Public Accounting by Gender, Staff Level, and Firm. *Contemporary Accounting Research* 14: 653–68. [CrossRef]

Brockman, Paul, Xiumin Martin, and Emre Unlu. 2010. Executive Compensation and the Maturity Structure of Corporate Debt. *The Journal of Finance* 65: 1123–61. [CrossRef]

Carter, Mary Ellen, Francesca Franco, and Mireia Gine. 2017. Executive Gender Pay Gaps: The Roles of Female Risk Aversion and Board Representation. *Contemporary Accounting Research* 34: 1232–64. [CrossRef]

Catalyst. 2017. 2016 Catalyst Census: Women and Men Board Directors. Available online: https://www.catalyst.org/research/2016-catalyst-census-women-and-men-board-directors/ (accessed on 6 December 2024).

Chen, Jie, Woon Sau Leung, and Marc Goergen. 2017. The impact of board gender composition on dividend payouts. *Journal of Corporate Finance* 43: 86–105. [CrossRef]

Choi, Jaewon, Dirk Hackbarth, and Josef Zechner. 2017. Granularity of Corporate Debt. Available online: https://ssrn.com/abstract=3055884 (accessed on 5 April 2024).

Chun, Rosa. 2005. Ethical Character and Virtue of Organisations: An Empirical Assessment and Strategic Implications. *Journal of Business Ethics* 57: 269–84. [CrossRef]

Cumming, Douglas, Xiaohu Guo, and Lukai Yang. 2024. REITs board gender diversity: The spillover effect of the Big Three campaign. *Journal of Economics and Finance* 48: 889–923. [CrossRef]

Daryaei, Abbas Ali, Yasin Fattahi, Davood Askarany, Saeed Askary, and Mahdad Mollazamani. 2022. Accounting Comparability, Conservatism, Executive Compensation-Performance, and Information Quality. *Journal of Risk and Financial Management* 15: 489. [CrossRef]

Datta, Sudip, M. A. I. Iskandar-Datta, and Kartik Raman. 2005. Managerial Stock Ownership and the Maturity Structure of Corporate Debt. *The Journal of Finance* 60: 2333–50. [CrossRef]

Datta, Sudip, Trang Doan, and Francesca Toscano. 2021. Top executive gender, board gender diversity, and financing decisions: Evidence from debt structure choice. *Journal of Banking & Finance* 125: 106070. [CrossRef]

Dawson, Leslie M. 1997. Ethical differences between men and women in the sales profession. *Journal of Business Ethics* 16: 1143–52. [CrossRef]

Diamond, Douglas W. 1991. Debt Maturity Structure and Liquidity Risk. *The Quarterly Journal of Economics* 106: 709–37. [CrossRef]

Duppati, Geeta, Narendar V. Rao, Neha Matlani, Frank Scrimgeour, and Debasis Patnaik. 2020. Gender diversity and firm performance: Evidence from India and Singapore. *Applied Economics* 52: 1553–65. [CrossRef]

Eghbal, Maryam, Farzaneh Nassirzadeh, and Davood Askarany. 2024. The Relationship Between Non-additivity Valuations, Cash Flows and Sales Growth. *Computational Economics* 64: 429–59. [CrossRef]

Flannery, Mark J. 1986. Asymmetric Information and Risky Debt Maturity Choice. *The Journal of Finance* 41: 19–37. [CrossRef]

Geiger, Marshall A., and Brendant T. O'Connell. 1998. Accounting Student Ethical Perceptions: An Analysis of Training and Gender Effects. *Teaching Business Ethics* 2: 371–88. [CrossRef]

Gormley, Todd A., Vishal K. Gupta, David A. Matsa, Sandra C. Mortal, and Lukai Yang. 2023. The big three and board gender diversity: The effectiveness of shareholder voice. *Journal of Financial Economics* 149: 323–48. [CrossRef]

Harris, Cindy K. 2014. Women directors on public company boards: Does a critical mass affect leverage? Paper presented at 2014 Proceedings of the Northeastern Association of Business, Economics, and Technology, State College, PA, USA, October 23–24.

Heckman, James J. 1979. Sample selection bias as a specification error. *Econometrica: Journal of the Econometric Society*, 153–61. [CrossRef]

Hinz, Richard P., David D. McCarthy, and John A. Turner. 1997. Are women more conservative investors? Gender differences in participant directed pension investments. In *Positioning Pensions for the Twenty-First Century*. Philadelphia: University of Pennsylvania Press, pp. 91–103.

Ho, Simon S. M., Annie Yuansha Li, Kinsun Tam, and Feida Zhang. 2015. CEO Gender, Ethical Leadership, and Accounting Conservatism. *Journal of Business Ethics* 127: 351–70. [CrossRef]

Hosni Al-Ghar, Masoud, and Nezamoddin Rahimian. 2018. The effect of CEO overconfidence on debt maturity structure in companies listed on the Tehran Stock Exchange. *Asset Management and Financing* 6: 98–106. [CrossRef]

Hoyt, Crystal L., and Susan E. Murphy. 2016. Managing to clear the air: Stereotype threat, women, and leadership. *The Leadership Quarterly* 27: 387–99. [CrossRef]

Huang, Ronghong, Kelvin Jui Keng Tan, and Robert W. Faff. 2016. CEO overconfidence and corporate debt maturity. *Journal of Corporate Finance* 36: 93–110. [CrossRef]

Jane Lenard, Mary, Bing Yu, E. Anne York, and Shengxiong Wu. 2014. Impact of board gender diversity on firm risk. *Managerial Finance* 40: 787–803. [CrossRef]

Jianakoplos, Nancy Ammon, and Alexandra Bernasek. 1998. Are Women More Risk-Averse? *Economic Inquiry* 36: 620–30. [CrossRef]

Labelle, Réal, Claude Francoeur, and Faten Lakhal. 2015. To Regulate Or Not To Regulate? Early Evidence on the Means Used Around the World to Promote Gender Diversity in the Boardroom. *Gender, Work & Organisation* 22: 339–63. [CrossRef]

Larkin, Joseph M. 2000. The Ability of Internal Auditors to Identify Ethical Dilemmas. *Journal of Business Ethics* 23: 401–9. [CrossRef]

Levi, Maurice, Kai Li, and Feng Zhang. 2014. Director gender and mergers and acquisitions. *Journal of Corporate Finance* 28: 185–200. [CrossRef]

Levin, Irwin P., Mary A. Snyder, and Daniel P. Chapman. 1988. The Interaction of Experiential and Situational Factors and Gender in a Simulated Risky Decision-Making Task. *The Journal of Psychology* 122: 173–81. [CrossRef]

Li, Yiwei, and Yeqin Zeng. 2019. The impact of top executive gender on asset prices: Evidence from stock price crash risk. *Journal of Corporate Finance* 58: 528–50. [CrossRef]

Linley, P. Alex, John Maltby, Alex M. Wood, Stephen Joseph, Susan Harrington, Christopher Peterson, Nansook Park, and Martin E. P. Seligman. 2007. Character strengths in the United Kingdom: The VIA Inventory of Strengths. *Personality and Individual Differences* 43: 341–51. [CrossRef]

Mohammadi, S. A., and M. Zanjirdar. 2020. Cash Flow Risk and Capital Structure Decisions. Paper Presented at 4th International Conference on Financial Management, Business, Banking, Economics, and Accounting. Available online: https://civilica.com/doc/1126996 (accessed on 2 December 2020).

Nassirzadeh, Farzaneh, Davood Askarany, and Solmaz Arefi-Asl. 2023. The relationship between changes in corporate governance characteristics and intellectual capital. *Journal of Risk and Financial Management* 16: 133. [CrossRef]

O'Donnell, Ed, and Eric N. Johnson. 2001. The Effects of Auditor Gender and Task Complexity on Information Processing Efficiency. *International Journal of Auditing* 5: 91–105. [CrossRef]

Peng, Xuhui, Yi-Chen Lan, Jingduan Li, and Hanlu Fan. 2023. Board gender diversity, national culture, and water disclosure of multinational corporations. *Applied Economics* 55: 1581–602. [CrossRef]

Peterson, Christopher, and Martin E. P. Seligman. 2003. Character Strengths before and after September 11. *Psychological Science* 14: 381–84. [CrossRef]

Pierce, Bernard, and Breda Sweeney. 2010. The Relationship between Demographic Variables and Ethical Decision Making of Trainee Accountants. *International Journal of Auditing* 14: 79–99. [CrossRef]

Pouryousof, Azam, Farzaneh Nassirzadeh, Reza Hesarzadeh, and Davood Askarany. 2022. The Relationship between Managers' Disclosure Tone and the Trading Volume of Investors. *Journal of Risk and Financial Management* 15: 618. [CrossRef]

Rajan, Raghuram, and Andrew Winton. 1995. Covenants and collateral as incentives to monitor. *The Journal of Finance* 50: 1113–46. [CrossRef]

Richards, Wendy. 2003. Gender, Diversity and Trade Unions: International Perspectives. *Gender, Work & Organisation* 10: 508–11. [CrossRef]

Rosser, Heidi, Irene Ryan, and Barbara Myers. 2024. Unmasking the politics of policy-driven change (or not) for gender diversity. *Gender, Work & Organization* 31: 133–51. [CrossRef]

Said, Mona, Rami Galal, and Mina Sami. 2022. Gender diversity, productivity, and wages in private Egyptian firms. *Applied Economics* 54: 4433–48. [CrossRef]

Sepasi, S., and L. Abdoli. 2015. The effects of female board representation on firm value and financial performance. *Financial Accounting & Auditing Research* 8: 39–58.

Shan, Yuan George. 2019. Managerial ownership, board independence and firm performance. *Accounting Research Journal* 32: 203–20. [CrossRef]

Shandiz, Mohsen Tavakoli, Farzaneh Nassir Zadeh, and Davood Askarany. 2022. The Interactive Effect of Ownership Structure on the Relationship between Annual Board Report Readability and Stock Price Crash Risk. *Journal of Risk and Financial Management* 15: 268. [CrossRef]

Sila, Vathunyoo, Angelica Gonzalez, and Jens Hagendorff. 2016. Women on board: Does boardroom gender diversity affect firm risk? *Journal of Corporate Finance* 36: 26–53. [CrossRef]

Stulz, René. 2001. Does financial structure matter for economic growth? A corporate finance perspective. In *Financial Structure and Economic Growth: A Cross-Country Comparison of Banks, Markets, and Development*. Cambridge, MA: The MIT Press.

Sun, Xu, and Tianming Zhang. 2021. Board gender diversity and corporate labor investment efficiency. *Review of Financial Economics* 39: 290–313. [CrossRef]

Sundén, Annika E., and Brian J. Surette. 1998. Gender Differences in the Allocation of Assets in Retirement Savings Plans. *The American Economic Review* 88: 207–11.

Terjesen, Siri, Eduardo Barbosa Couto, and Paulo Morais Francisco. 2016. Does the presence of independent and female directors impact firm performance? A multi-country study of board diversity. *Journal of Management & Governance* 20: 447–83.

Ullah, Farid, Ping Jiang, Yasir Shahab, Hai-Xia Li, and Lei Xu. 2020. Block ownership and CEO compensation: Does board gender diversity matter? *Applied Economics* 52: 583–97. [CrossRef]

Zadeh, Farzaneh Nassir, Davood Askarany, Ali Shirzad, and Mahdi Faghani. 2023. Audit committee features and earnings management. *Heliyon* 9: e20825. [CrossRef]

Zadeh, Farzaneh Nassir, Davood Askarany, and Solmaz Arefi Asl. 2022. Accounting Conservatism and Earnings Quality. *Journal of Risk and Financial Management* 15: 413. [CrossRef]