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Article

The Role of Female Directors' Influence on Investment Efficiency Under Cost Stickiness: Evidence From Korean Firms

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Abstract

This study explores the impact of female directors on the investment efficiency of Korean firms, especially under conditions of cost stickiness. Using data from firms listed on the Korean Stock Exchange between 2014 and 2021, regression is employed to determine the relationship between female board representation and investment efficiency. The results show that female directors do not significantly affect investment efficiency under typical economic conditions, but their influence becomes more pronounced during periods of cost stickiness. In these circumstances, the presence of female directors is associated with enhanced investment efficiency, suggesting that they promote more disciplined financial strategies under economic stress. These findings advance the understanding of gender diversity in corporate governance, highlighting the conditions under which female directors are most effective. The study also offers valuable insights for policymakers and investors, underscoring the strategic importance of gender diversity on corporate boards in enhancing firm performance during challenging economic times.

Keywords: female directors; investment efficiency; cost stickiness
JEL: G34, G32, J16, M14

1. Introduction

Investment efficiency is a critical determinant of firm performance and long-term growth. However, firms often face challenges arising from cost stickiness—an asymmetry in which costs do not decrease proportionally with declining sales—resulting in suboptimal investment decisions and inefficiencies. This asymmetry, often stemming from managerial discretion in cost adjustments, tends to exacerbate investment problems, particularly during periods of economic contraction.

Amid growing concerns about corporate governance, gender diversity on boards, particularly the presence of female directors, has attracted increasing attention as a potential factor in enhancing board effectiveness and mitigating inefficiencies. Prior studies suggest that female directors often exhibit distinct behavioral traits such as higher ethical standards, greater risk aversion, and more conservative decision-making, which may help curb excessive investment and improve transparency (Croson and Gneezy, 2009; Faccio et al., 2016; Barua et al., 2010). However, the empirical evidence on the impact of gender diversity remains mixed, with contextual factors playing a critical role.

The Korean corporate environment provides a unique and valuable setting to examine these issues. In particular, Korea's corporate landscape is undergoing an unprecedented transformation as traditional Confucian hierarchies confront modern mandates for gender diversity. Two features make this context especially distinctive. First, in early 2020, an amendment to the Capital Markets Act was mandated the presence of female directors on the boards of publicly listed companies, representing one of the most significant interventions in corporate gender diversity globally. This mandate was implemented within a society where female board representation remains one of the lowest among developed economies, with many firms having few or no female directors. Second, Korea's Confucian corporate culture, characterized by hierarchical decision-making and male-dominated networks, creates significant structural barriers. Traditional Korean society has exhibited a strong preference for sons over daughters, a phenomenon that is deeply rooted in Confucian patriarchy.

Against this backdrop, the interplay between regulatory mandates and deeply rooted cultural norms creates a uniquely complex environment for female directors. While legal reforms have increased the numerical presence of women on boards, deeply entrenched social attitudes and organizational practices continue to limit their substantive influence. In Korea, this relationship is especially significant, as deeply rooted cultural norms have historically marginalized female voices in corporate governance. This creates a natural experiment for examining the conditional effectiveness of female directors. As a result, gender has become an increasingly pivotal factor shaping the behavior of directors and strategic decision-making processes.

Prior research highlights inherent differences in values, perceptions, and attitudes between male and female

directors (Croson and Gneezy, 2009; Amin et al., 2023, 2024). Female directors, in particular, are often associated with higher ethical standards, a greater tendency toward risk aversion, and more conservative decision-making compared to their male counterparts (Faccio et al., 2016). These traits have been shown to enhance accounting transparency and firm performance through practices such as reducing discretionary accruals and managing real earnings (Barua et al., 2010; Francis et al., 2015).

Despite these positive aspects, the impact of female directors is not always uniform, often depending on organizational context. Social identity theory and gender tokenism suggest that diversity may induce conflicts within the group (Williams and O'Reilly, 1998; Ashforth and Mael, 1989) or be ignored by the majority (Westphal and Milton, 2000), undermining rational decision-making process. This dynamic could limit their ability to influence key corporate decisions.

Furthermore, this study focuses on the impact of female directors under economic stress, such as cost stickiness, which refers to the asymmetrical response of costs to changes in sales, driven by managerial discretion in cost adjustments (Homburg and Nasev, 2008). This phenomenon can negatively impact investment efficiency, as firms may overinvest in during periods of sales decline due to adjustment frictions (Kim and Chung, 2017; Koo, 2011; Yang, 2012). While effective monitoring mechanisms, such as institutional investors or foreign shareholders, have been shown to mitigate these effects, this study proposes that female directors could serve as a unique mechanism for mitigation. Specifically, in situations of cost stickiness, female directors curb excessive investments and significantly enhance investment efficiency. This study aims to analyze whether gender diversity can serve as a strategic mechanism for mitigating inefficiencies caused by asymmetric cost behavior and to identify the ways in which gender it can improve corporate investment efficiency.

Using data from firms listed on the Korean Stock Exchange between 2014 and 2021, this study employs regression analysis to examine how female board representation interacts with investment efficiency, particularly in the presence of cost stickiness. The empirical results indicate that, under typical economic conditions, the proportion of female directors does not exert a statistically significant effect on investment efficiency. However, this relationship shifts markedly during periods of heightened economic stress, characterized by rigid cost structures and limited managerial flexibility, where female directors' involvement becomes substantially more consequential.

Specifically, the analysis reveals that female directors significantly enhance investment efficiency when firms experience cost stickiness. This suggests that the distinctive behavioral attributes commonly associated with female directors, such as risk aversion and prudence, serve as effective mechanisms for mitigating inefficiencies arising from inflexible cost behavior. These findings advance the literature on gender diversity and corporate governance by demonstrating that the value of female leadership is context-dependent, with their positive impact on firm performance most evident under adverse economic conditions.

This study makes several contributions to the literature. First, it bridges the gap between gender diversity and cost management, offering novel insights into the role of female directors in mitigating the adverse consequences of cost stickiness on investment efficiency. Second, it combines insights from behavioral finance and corporate governance to explain how female directors influence corporate investment decisions, particularly in the context of cost stickiness. Finally, the findings provide actionable insights for firms seeking to enhance investment strategies and strengthen governance practices through gender diversity.

2. Theoretical Background and Hypothesis Development

2.1 Role of Female Directors

Resource dependence theory (Pfeffer and Salancik, 1978) provides a robust framework for understanding how board composition contributes to firm performance by facilitating access to critical external resources, with particular emphasis on the role of female directors on boards in this study. According to Hillman and Dalziel (2003), the board of directors serves not only as a monitor of management but also as a provider of key resources, such as advice, legitimacy, and networks. The effectiveness of this resource provision function depends on the board's collective capital, encompassing both human capital, such as expertise and experience, and relational capital, including external networks and stakeholder ties.

In this context, female directors contribute unique professional experience, networks and stakeholder relationships, expanding the firm's access to new business opportunities and enhancing its legitimacy, especially in environments where sustainable management and stakeholder engagement are highly valued (Kim, 2023). In the Korean setting, where traditional networks have historically limited women's access to influential circles, the appointment of female directors signals a commitment to openness and modernization, thereby strengthening the firm's legitimacy among investors, regulators and customers.

While upper echelons theory (Hambrick and Mason, 1984) explains how directors' demographic and psychological traits shape internal decision-making, resource dependence theory emphasizes the board's critical function in acquiring essential resources from the external environment. Female directors, as shown in prior research, tend to be more risk-averse and less overconfident compared to their male counterparts, leading to more prudent risk management and a reduction in overinvestment (Barber and Odean, 2001; Bernasek and Shwiff, 2001). Their presence broad-

ens the diversity of perspectives within the board, enriches advisory capacity, and elevates the quality of deliberations (Gul et al., 2011; Kim and Starks, 2016). Female directors are also associated with higher attendance rates, more detailed information sharing, and a greater propensity to challenge management, thereby increasing accountability (Adams and Ferreira, 2009).

Moreover, female directors enhance the board's advisory function by introducing perspectives absent in homogeneous groups, potentially leading to superior product development and marketing strategies (Harjoto et al., 2015). Overall, the inclusion of female directors not only improves governance and risk management but also enhances the board's ability to innovate and respond to diverse stakeholder interests.

However, the inclusion of female directors on corporate boards does not always yield uniformly positive outcomes. Some research suggests that increasing gender diversity can introduce challenges to board dynamics, such as communication barriers, reduced cohesion, and a higher likelihood of conflict among members. Social identity theory (Williams and O'Reilly, 1998) and similarity-attraction theory (Jehn et al., 1999) share similar perspectives, positing that people categorize others into in-groups that share similar attributes and out-groups, those perceived as different. These theories suggest that such categorizations can reduce communication, weaken cooperation, and heighten conflict, ultimately undermining group processes and outcomes.

Second, gender tokenism theory suggests that increasing gender diversity on corporate boards does not necessarily translate into substantive influence in decision-making processes (Baik et al., 2024). Symbolic inclusion of female directors remains nominal rather than substantive, due to entrenched power structures favoring majority demographics. Westphal and Milton (2000) argue that without achieving critical mass, gender-diverse boards may exhibit no statistically significant improvement in investment decision quality compared to homogeneous boards. In other words, a critical mass of female directors is necessary for their voices to be heard and their perspectives incorporated into strategic decision-making.

Third, Confucian values offer a framework for explaining the role of female directors in South Korea. Yoon (2019) highlights how Confucian values can significantly impact the participation and influence of women in decision-making processes. The inherent emphasis on hierarchy and deference to authority within Confucianism can create a challenging environment for female directors, silencing their voices and hindering their upward mobility. At the same time, Horak and Suseno (2023) document how informal networks in Korean society systematically exclude women from decision-making, a practice rooted in Confucian values. Additionally, such informal networks are pervasive and often too entrenched for women to penetrate. This social exclusion is aggravated by traditional gender stereotypes, which undervalue their contributions and restrict their access to leadership roles.

2.2 Investment Efficiency

The Modigliani and Miller (1958) theorem asserts that, under the assumption of a perfect capital market, a firm's investment, financing, and dividend decisions are independent and do not affect firm value. However, real-world capital markets deviate significantly from this ideal. Market imperfections, primarily agency conflicts and information asymmetry between managers and external stakeholders, create frictions that can lead to suboptimal investment decisions, manifesting as both underinvestment and overinvestment (Dewi et al., 2020).

Agency theory, as developed by Jensen and Meckling (1976), provides a foundational framework for understanding these inefficiencies. Conflicts of interest arise because managers (agents) may prioritize their own utility over maximizing shareholder (principal) value. This divergence can lead to overinvestment, where managers utilize free cash flow to undertake projects with negative net present value (NPV) simply to expand the firm under their control, as highlighted by Jensen's (1986) free cash flow hypothesis. Information asymmetry exacerbates this by enabling managers to misrepresent the quality of investment projects, resulting in poor projects being funded, while valuable ones are overlooked (Wang and Nishihara, 2025).

Conversely, agency problems and information asymmetry can also result in underinvestment. Myers (1977) first identified the debt overhang problem, in which highly leveraged firms may forgo positive NPV projects because a significant portion of the project's returns would accrue to debtholders rather than equity holders, thus diminishing the incentive for shareholders to invest. Furthermore, Myers and Majluf (1984) demonstrated that information asymmetry regarding the firm's true value can make external financing costly. If managers believe the firm's equity is undervalued by the market, they may be reluctant to issue new shares, fearing dilution of existing shareholders' value. This adverse selection problem increases the effective cost of external capital, potentially leading the firm to pass up valuable investment opportunities that could have been financed with internal funds. Empirical evidence supports the notion that higher information asymmetry generally leads to lower investment efficiency.

Research recognizes that market imperfections can lead to inefficiencies, highlighting the critical role of corporate governance mechanisms, especially board characteristics, in mitigating agency problems and enhancing investment efficiency. Several board traits have been examined for their influence on investment decisions. For instance, board size is considered a factor, with a prior study suggesting larger boards can improve investment efficiency

through enhanced monitoring capabilities or broader expertise (Choi et al., 2013). Board independence, measured by the proportion of independent directors, is another crucial characteristic that strengthens oversight (Kamarudin et al., 2024). Chief Executive officer (CEO) duality, where the CEO also serves as the board chair, has also been studied for its impact on board effectiveness and subsequent investment decisions (Choi et al., 2024; Duru et al., 2016). Ownership structure, including managerial and institutional ownership, interacts with board traits to influence investment efficiency, affecting alignment of interests and monitoring intensity (Choi et al., 2024; Kim and Kim, 2025).

2.3 Hypothesis Development

The influence of female directors on investment efficiency in Korean firms should be considered within a complex institutional and cultural context. Traditionally, Korean society has been shaped by Confucian values and a strong preference for sons, which have historically restricted women's participation in economic and corporate spheres. These deeply embedded norms have resulted in persistently low representation of women on corporate boards, with many firms lacking female directors altogether.

In response to these structural barriers, a significant regulatory intervention was enacted in 2020 with an amendment to the Capital Markets Act, mandating the appointment of female directors in large publicly listed companies. This legislative change represents a pivotal step toward greater board diversity and inclusion in Korea, providing a unique setting to examine the effects of gender diversity on firm outcomes.

Resource dependence theory offers a compelling framework for understanding the potential impact of female directors in this context. It posits that boards are vital conduits for external resources as well as legitimacy—both essential for organizational survival and growth (Hillman and Dalziel, 2003). Female directors, by virtue of their diverse backgrounds and stakeholder relationships, can expand a firm's access to new business opportunities and enhance its legitimacy, particularly in settings where sustainable management and stakeholder engagement are increasingly valued (Kim, 2023). In Korea, where traditional networks have often excluded women from influential circles, the presence of female directors signals a commitment to openness and modernization, thereby strengthening the firm's reputation among investors, regulators, and stakeholders. Recent empirical research underscores both the advantages and challenges associated with board gender diversity. On the positive side, female directors have been found to reinforce the board's monitoring and advisory functions, promote greater transparency and improve the quality of financial reporting (Barua et al., 2010; Francis et al., 2015; Gul et al., 2011). Their risk-averse and prudent decision-making styles can help curb managerial overinvestment and promote more disciplined resource allocation, thereby enhancing investment efficiency (Barber and Odean, 2001; Bernasek and Shwiff, 2001; Baik et al., 2024). Moreover, gender-diverse boards are associated with higher attendance rates, more rigorous information sharing, and a greater willingness to challenge management, all of which contribute to stronger governance and better firm performance (Adams and Ferreira, 2009; Kim and Starks, 2016).

However, several studies caution that the benefits of female board representation are not automatic. In contexts where women remain a small minority, tokenism can limit their substantive influence, and entrenched male-dominated networks may exclude them from informal decision-making processes (Westphal and Milton, 2000; Joecks et al., 2013). Social identity theory suggests that minority directors may be perceived as outsiders, reducing communication and cooperation within the board (Williams and O'Reilly, 1998; Horak and Suseno, 2023). In Korea, these dynamics are exacerbated by Confucian norms prioritizing hierarchy and gendered loyalty, which can further marginalize female directors and limit their impact on strategic decisions (Yoon, 2019; Yang, 2012). Without achieving a critical mass, their contributions may be overlooked or marginalized, diminishing the potential positive effects on investment efficiency.

Taken together, the relationship between the proportion of female directors and investment efficiency in Korean firms is nuanced and context-dependent. When the advantages of board gender diversity are realized, investment efficiency is likely to improve. Conversely, when cultural and structural barriers persist, the impact may be neutral or even negative. Thus, the proportion of female directors on corporate boards is associated with the extent to which female directors can exercise substantive influence, access critical resources, and overcome cultural and structural barriers within the organization. This perspective, grounded in resource dependence theory and recent empirical research, provides a comprehensive foundation for examining the conditional impact of female directors on investment efficiency in the Korean corporate context. Considering these conflicting theoretical perspectives and the specific Korean context, this study proposes the following hypothesis:

Hypothesis 1: The presence of female directors on the board negatively impacts investment efficiency in Korean firms.

Despite significant regulatory reform, such as the 2020 amendment to the Capital Markets Act mandating female representation on boards, Korea's corporate environment remains deeply influenced by Confucian values. These cultural legacies manifest in persistent gender hierarchies, male-dominated networks, and expectations that women prioritize domestic roles over professional advancement (The Korea Times, 2025). Such norms have historically limited women's access to leadership positions

and constrained their substantive influence within corporate governance.

During periods of economic strain, particularly when cost stickiness is present, the relationship between female directors on board and investment efficiency becomes especially pertinent. Cost stickiness describes a situation where costs do not decrease proportionally with declining revenue, often due to managerial reluctance to reduce resources, the presence of adjustment costs, or agency-related constraints (Homburg and Nasev, 2008). This asymmetry in cost behavior can give rise to inefficiencies, such as overinvestment during financial distress, as firms struggle to align expenses with declining revenue in a timely and efficient manner (Banker et al., 2016). Effectively addressing these inefficiencies demands rigorous resource management and cautious decision-making.

Behavioral and governance research suggests that female directors possess distinctive decision-making qualities, such as heightened risk aversion, conservatism, and a focus on long-term stability, which are particularly effective in mitigating inefficiencies exacerbated during economic crises. Empirical evidence demonstrates that firms with greater female board representation or female CEOs have outperformed their counterparts during periods of crisis. For instance, Thornton and Vasilakis (2024) found that firms led by female CEOs achieved higher profitability, stronger valuations, and lower risk-taking during the COVID-19 pandemic, reflecting a preference for stability and sustainable growth under uncertainty. Similarly, Sinha (2023) reported that German firms with female board representation delivered superior stock returns and risk profiles during the pandemic, although these advantages diminished after the crisis.

In environments characterized by cost stickiness, where rigid cost structures exacerbate financial pressure, the behavioral attributes of female directors, such as caution and disciplined capital allocation, can counteract managerial optimism or delayed cost adjustments, which often lead to inefficiencies. Evidence further indicates that female leaders are adept at reducing investment volatility and aligning expenditures with realistic revenue expectations, particularly under adverse economic conditions. Collectively, these findings support the proposition that female directors enhance investment efficiency by restraining overinvestment and ensuring that capital allocation remains disciplined during periods of economic stress. Based on these considerations, we propose the following hypothesis:

Hypothesis 2: Under conditions of cost stickiness, firms with greater female board representation exhibit improved investment efficiency.

3. Research Design

3.1 Data Collection

Table 1 describes the data selection process. The sample for this study comprises Korean firms listed on the Korea Composite Stock Price Index (KOSPI) and the Korea Securities Dealers Automated Quotation (KOSDAQ) from 2014 to 2021, with financial data drawn from the Value Search database (https://www.nicevse.com/vse/main.html). The selection of the 2014–2021 period is grounded in both regulatory developments and data reliability. Specifically, 2014 marks the first year for which comprehensive data on female directors on boards became available. In addition, the 2020 amendments to the Capital Markets Act prohibit all-male boards in companies with total assets over USD 1.44 billion; this provision came into effect in 2022. This study spans both the period before the amendment and the transitional phase. To ensure data consistency, companies in the financial industry are excluded, since they have distinct regulatory and financial frameworks compared to non-financial companies. Additionally, we removed observations with missing financial data. After these adjustments, our final sample comprises 10,265 firm-year observations. Furthermore, all variables were winsorized at the 1% and 99% levels to mitigate the influence of extreme outliers and enhance the robustness of our results.

3.2 Variable Measurements

3.2.1 Investment Efficiency

Investment efficiency is defined in this study as undertaking all positive net present value (NPV) projects that reflect available growth opportunities. A firm's investment is regarded as efficient if its actual investment level aligns with the expected investment level derived from such projects. To measure investment efficiency, we employ an investment decision model that establishes a functional relationship between investment and growth opportunities. Specifically, deviations between the actual investment level and the expected investment level predicted by the model are used to assess efficiency. When a firm's actual investment exceeds the expected level, overinvestment occurs. Conversely, underinvestment arises when actual investment falls below the expected level. Both overinvestment and underinvestment represent inefficiency.

For empirical measurement, this study utilizes the models proposed by Biddle et al. (2009) to quantify investment efficiency as shown in Eqn. 1:

$$\text{Investment}_{i,t} = \alpha_0 + \alpha_1 \text{SGrowth}_{i,t-1} + \varepsilon_{i,t} \quad (1)$$

$\text{Investment}_{i,t}$ is calculated by dividing the sum of the increase in tangible assets and research and development (R&D) expenditures by beginning-of-period total assets. $\text{SGrowth}_{i,t-1}$ refers to the sales revenue growth rate. We estimate a regression model incorporating industry and extract residuals for each firm. Investment efficiency is then measured as the absolute value of these residuals. A smaller absolute residual value indicates higher investment efficiency (Wei and Baek, 2024).

Table 1. Data selection process.

Korean companies for which data on female directors on boards from 2014 to 2021 are available, excluding those in the financial industry	12,765
Less	
Missing financial information	2500
Final data	10,265

3.2.2 Cost Stickiness

Cost stickiness is measured following the methodology of Homburg and Nasev (2008), who emphasize the importance of understanding how the market interprets the cost signal, represented by the ratio of costs to sales. This approach effectively captures asymmetric cost behavior and provides a robust basis for our analysis. To quantify cost stickiness, we employ their approach in which the degree of stickiness (Signal) is assessed when sales decrease compared to the previous period (DumSales = 1) and the cost-to-sales ratio increases relative to the prior period (DumCost = 1). If costs do not decrease proportionally in response to a decline in sales, the cost-to-sales ratio for the current period will exceed that of the previous period. Consequently, a higher degree of cost stickiness (CS) is more likely to produce a positive (+) value for CS as expressed in Eqn. 2.

$$CS_{i,t} = Signal_{i,t} \times DumSales_{i,t} \times DumCost_{i,t} \quad (2)$$

where, $CS_{i,t}$ = the degree of cost stickiness; $Signal_{i,t} = \left(\frac{Cost_{i,t}}{Sales_{i,t}}\right) - \left(\frac{Cost_{i,t-1}}{Sales_{i,t-1}}\right)$; $DumSales_{i,t}$ = 1 if the sales in period t are less than t-1, 0 otherwise; $DumCost_{i,t}$ = 1 i the cost in period t is less than t-1, 0 otherwise.

3.3 Empirical Model

To verify the first hypothesis—that female directors serving on boards affect investment efficiency, we employed the ordinary least squares (OLS) regression model in Eqn. 3:

$$\begin{aligned} IE_t = {} & \beta_0 + \beta_1 Female_t + \beta_2 Size_t + \beta_3 Lev_t + \beta_4 Roa_t \\ & + \beta_5 Growth_t + \beta_6 Loss_t + \beta_7 Ocf_t + \beta_8 Beta_t + \beta_9 Vol_t + \beta_{10} Zscore_t \\ & + \beta_{11} Age_t + \beta_{12} For_t + \beta_{13} Mkt_t + \beta_{14} Da_t + YearD + IndustryD + \varepsilon \end{aligned} \quad (3)$$

where, IE = investment efficiency, calculated as the absolute value of residuals from Eqn. 1; Female = ratio of female directors serving boards, calculated as the number of female directors divided by the total board members; Size = natural logarithm of total assets; Lev = total debt divided by total assets; Roa = net income divided by total assets; Growth = change in total assets for the current year relative to the previous year divided by total assets for the current year; Loss = 1 if a company incurs a loss, 0 otherwise; Ocf = cash flow from operations divided by total assets; Beta = systematic risk; Vol = stock return volatility; Zscore = Altman's z-score, calculated as 1.2 (Working Capital/Total Assets) + 1.4 (Retained Earnings/Total Assets) + 3.3 (Earnings Before Interest and Taxes (EBIT)/Total Assets) + 0.6 (Market Value of Equity/Total Liabilities) + 1.0 (Sales/Total Assets); Age = the firm's age from the year it was listed on the Korean stock market to the current year; For = ratio of foreign investors; Mkt = dummy variable equal to 1 if the firm is listed on KOSDAQ, 0 if listed on KOSPI; YearD = year dummies; industryD = industry dummies; Da = Discretionary accruals measured by the model of Kothari et al. (2005), described in Eqn. 4.

$$Ta_t/A_t = \alpha_0 + \beta_1 (1/A_t) + \beta_2 (\triangle Sales - \triangle Ar)/A_t + \beta_3 Ppe_t/A_t + \beta_4 Roa_t + \varepsilon_t \quad (4)$$

Where, Ta = Net income – cash flow from operations; A = Total assets; Sales = Sales revenue; Ar = Accounts receivable; Ppe = Plant, property, and equipment; Roa = Net income/total assets.

Da represents discretionary accruals, which is used as a proxy for earnings management. A higher value may indicate lower earnings quality, which can distort managerial decision-making and lead to inefficient investment (Linck et al., 2013). It is calculated in accordance with Kothari et al. (2005), estimating industry-year effects for the firms in the sample.

In Eqn. 3, Female is the independent variable and represents the ratio of female directors serving on boards. IE is the dependent variable, representing investment efficiency. For the control variables, Size, is included. According to Anderson et al. (2003), higher asset concentration leads to increased adjustment costs for management, as greater asset concentration amplifies the costs associated with asymmetry in resource reduction. Lev is included in this model, as it influences the spending behavior related to discretionary costs (Bhagat and Welch, 1995). Roa denotes return on assets, indicating a firm's profitability and operational efficiency. Firms with higher Roa signal that they generate greater returns from their asset base, thereby enhancing their capacity to engage in proactive investment activities (Kwon, 2023). Growth is a proxy for growth opportunity. Firms with higher asset growth are generally considered to possess more investment opportunities and thus are more likely to allocate resource efficiently (Li and Chen, 2022). Loss is a dummy variable, coded as 1 for a loss-making firm, 0 otherwise. Firms experiencing losses may adopt a more conservative approach in their investment decisions, potentially leading to lower investment efficiency (Kim and Kim, 2025). Ocf, defined as the ratio of cash flow from operations to total assets, reflects the proportion of earnings

generated from core business activities. Accordingly, Ocf is included as a control variable to account for its potential influence on cost behavior and investment efficiency (Chang and Paik, 2009). Beta indicates a firm's exposure to systematic risk, reflecting each firm's equity returns relative to the market. A higher value of beta implies greater responsiveness to market movements, which in turn affects both risk and expected returns on investment. Vol represents the volatility of a firm's stock returns. Higher volatility means that the firm's stock price is unpredictable, implying a firm's uncertainty and level of risk. Higher stock return volatility is associated with lower investment efficiency, as uncertainty increases the difficulty of optimal capital allocation (Zhou et al., 2024). Altman's Z-score is included in this model, as it measures a firm's financial health and bankruptcy risk. It is computed as the weighted sum of working capital, retained earnings, earnings before interest and taxes, market value of equity, and sales. A lower value of Z-score indicates a higher probability of financial distress, whereas a higher value implies greater financial stability. For represents the proportion of shares held by foreign investors in a firm. Prior research demonstrates that foreign investors possess superior information acquisition and analytical capabilities, which can help constrain managerial tendencies toward inefficient decisions. Age refers to the number of years since the firm's initial listing on the Korean Stock Exchange. As firms mature and accumulate operational experience, their propensity for inefficient investment is expected to decline. Mkt is a dummy variable indicating the segment of the Korean stock market on which a firm is listed. The Korean stock market comprises two primary segments: KOSPI and KOSDAQ, each characterized by distinct economic and regulatory environments. Firms listed on KOSPI are generally larger, exhibit greater managerial stability, and have higher access to foreign investors. In contrast, KOSDAQ-listed firms tend to be smaller in size but are typically more oriented toward growth and innovation. This market distinction captures important heterogeneity in firm characteristics that may influence investment behavior and efficiency.

To evaluate how female directors influence investment efficiency under conditions of cost stickiness, we extend the baseline model by incorporating an interaction term between female board representation (Female) and cost stickiness (CS) in Eqn. 5:

$$\begin{aligned} \mathrm{IE}_t = {} & \beta_0 + \beta_1 Female_t + \beta_2 CS_t + \beta_3 FC_t + \beta_4 \mathrm{Size}_t + \beta_5 \mathrm{Lev}_t + \beta_6 \mathrm{Roa}_t \\ & + \beta_7 \mathrm{Growth}_t + \beta_8 \mathrm{Loss}_t + \beta_9 \mathrm{Ocf}_t + \beta_{10} \mathrm{Beta}_t + \beta_{11} \mathrm{Vol}_t + \beta_{12} \mathrm{Zscore}_t \\ & + \beta_{13} \mathrm{Age}_t + \beta_{14} \mathrm{For}_t + \beta_{15} \mathrm{Mkt}_t + \beta_{16} \mathrm{Da}_t + \mathrm{YearD} + \mathrm{IndustryD} + \varepsilon \end{aligned} \quad (5)$$

where, CS = measure of cost stickiness proposed by Homburg and Nasev (2008), described in section 3.2.2; FC = the interaction term between cost stickiness and female directors serving on boards; see Eqn. 3 for definition of other variables.

4. Empirical Results

4.1 Descriptive Statistics

Table 2 provides the descriptive statistics for the key variables. The first variable, investment efficiency (IE), exhibits a mean value of 0.374 and a standard deviation of 0.300. The median value of IE is 0.276, which is lower than the mean. The second variable, the ratio of female directors serving on boards, demonstrates a mean of 0.044 with a standard deviation (Std) of 0.090. Meanwhile, Cost Stickiness (CS) has a mean value of 4.492 and a standard deviation of 1.844, with Q1, the median, and the third quartile (Q3) all consistently recorded at 5.000.

Table 2. Descriptive statistics.

Variables	Mean	Std	Q1	Median	Q3
IE	0.374	0.300	0.220	0.276	0.455
Female	0.044	0.090	0.000	0.000	0.048
CS	4.492	1.844	5.000	5.000	5.000

(1) Note: (1) IE, investment efficiency; Female, ratio of female directors serving boards; CS, the degree of cost stickiness; Std, standard deviation.

Table 3 presents the correlation coefficients among the key variables. The correlation coefficient between investment efficiency and female representation is 0.039, indicating a positive association. The correlation coefficient between female representation and cost stickiness (CS) is 0.011, also showing a positive association, but this association is not statistically significant (p-value = 0.237). Lastly, the correlation coefficient between IE and CS is –0.003. It is worth noting that while a positive correlation is observed between female representation and IE, this result does not control for other explanatory variables. Thus, the observed association might change when additional control variables are taken into account, highlighting the need for further analysis.

Table 3. Correlation matrix of main variables.

	IE	Female	CS
IE	1.000	0.039	–0.003
		(<0.0001)	(0.741)
Female		1.000	0.011
			(0.237)
CS			1.000

4.2 Regression Results

Table 4 presents the results of testing the first hypothesis using Eqn. 3, which examines the relationship between the proportion of female directors on the board and investment efficiency, with the coefficient for the female variable being statistically significant at the 10% level. The positive

coefficient implies that a higher proportion of female directors is associated with reduced investment efficiency.

This finding is consistent with recent literature highlighting the complex and sometimes limited impact of board gender diversity on firm outcomes. For example, Adams and Ferreira (2009) and Sila et al. (2016) suggest that while the presence of female directors can enhance board monitoring functions, their actual influence may be constrained by organizational culture and prevailing social norms. In the Korean context, characterized by hierarchical and male-dominated corporate governance structures, female directors often face barriers to meaningful participation in decision-making (Yoon, 2019). This can result in the appointment of female directors being more symbolic than substantive, limiting their ability to affect strategic outcomes such as investment decisions. Recent study provides evidence that the effectiveness of board gender diversity depends not only on the numerical representation of women but also on the existence of a supportive organizational culture and the attainment of a critical mass enabling female directors to exercise real influence (Joecks et al., 2023).

Table 5 presents results on how the presence of female directors on boards affects investment efficiency under cost stickiness, where costs do not decrease proportionally with declining sales, often reflecting economic stress or rigid cost structures. While the results indicate that the coefficient for the proportion of female directors is positive, the interaction term between female directors (Female) and cost stickiness (CS) is negative and significant at the 5% level. This finding reveals a more nuanced dynamic: while female board representation alone may not enhance investment efficiency, its effect becomes notably positive when firms face cost stickiness. In detail, under economic stress, a higher proportion of female directors improves investment efficiency.

This finding is consistent with recent empirical studies that underscore the distinctive strengths of female directors in crisis or highly stressful environments. Thornton and Vasilakis (2024) found that firms led by female CEOs outperformed their counterparts during the COVID-19 pandemic, achieving higher profitability and demonstrating more disciplined resource allocation. Similarly, Sinha (2023) found that female directors serving on boards is associated with superior risk management and financial performance during economically stressful periods. Taken together, the positive impact of female directors on investment efficiency becomes most apparent when firms experience economic adversity, highlighting the strategic importance of fostering meaningful gender diversity in corporate governance.

Table 4. Regression results of the first hypothesis.

Variables	Est.	*t*-value
Intercept	0.705	7.360***
Female	0.016	1.830*
Size	–0.006	–1.720
Lev	0.000	0.120
Roa	–0.187	–4.640***
Growth	0.028	4.310***
Loss	0.042	3.950***
Ocf	0.096	2.550***
Beta	0.011	1.140
Vol	0.681	2.760***
Zscore	0.020	33.230***
Age	–0.021	–2.750***
For	0.066	1.740*
Mkt	–0.018	–1.780*
Da	0.135	3.440***
YearD		Included
IndustryD		Included
F-value		78.82***
Adj-R^2		0.143

Note: (1) *** and * denote significance at the 1% and 10% level, respectively. (2) Est., estimate. Variable definitions: IE = investment efficiency; Female = ratio of female directors serving boards; Size = natural logarithm of total assets; Lev = total debt divided by total assets; Roa = net income divided by total assets; Growth = change in total assets for the current year relative to the previous year divided by total assets for the current year; Loss = 1 if a company incurs a loss, 0 otherwise; Ocf = cash flow from operations divided by total assets; Beta = systematic risk; Vol = stock return volatility; Zscore = Altman's z-score, calculated as 1.2 (Working Capital/Total Assets) + 1.4 (Retained Earnings/Total Assets) + 3.3 (EBIT/Total Assets) + 0.6 (Market Value of Equity/Total Liabilities) + 1.0 (Sales/Total Assets); Age = the firm's age from the year it was listed on the Korean stock market to the current year; For = ratio of foreign investors; Mkt = dummy variable equal to 1 if the firm is listed on KOSDAQ, 0 if listed on KOSPI; Da = Discretionary accruals measured by the model of Kothari et al. (2005), described in Eqn. 4; YearD = year dummies; IndustryD = industry dummies.

5. Additional Analysis

Table 6 presents the results of the additional analysis examining how the presence of female directors serving on boards influences investment efficiency in the context of heightened industry competition. The results indicate that the interaction term between female directors and competition is negative and statistically significant at the 5% level. Highly competitive industries exhibit greater volatility, rapid shifts in market dynamics, and elevated levels of

Table 5. Regressions result of the second hypothesis.

Variables	Est.	*t*-value
Intercept	3.571	9.670***
Female	0.182	2.470***
CS	–0.041	–0.960
FC	–0.169	–2.160**
Size	–0.131	–9.370***
Lev	0.025	9.090***
Roa	–0.399	–3.480***
Growth	–0.042	–1.640*
Loss	0.151	3.640***
Ocf	–0.511	–3.070***
Beta	0.039	1.020
Vol	0.536	0.560
Zscore	0.079	34.910***
Age	–0.007	–0.230
For	1.167	7.890***
Mkt	–0.022	–0.580
Da	–0.225	–1.180
YearD	Included	
IndustryD	Included	
F-value	87.43***	
Adj-R^2	0.173	

(1) ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively. (2) See Eqns. 3,5 for variable definitions.

Table 6. Result of additional analysis.

Variables	Est.	*t*-value
Intercept	0.730	7.680***
Female	0.013	1.450
Comp	0.015	0.240
FComp	–0.220	–2.150**
Size	–0.007	–2.030**
Lev	0.000	0.020
Roa	–0.186	–4.610***
Growth	0.027	4.200***
Loss	0.042	3.900***
Ocf	0.094	2.490**
Beta	0.010	0.970
Vol	0.675	2.740***
Zscore	0.019	33.140***
Age	–0.020	–2.620***
For	0.061	1.600
Mkt	–0.017	–1.770**
Da	0.133	3.390
YearD	Included	
IndustryD	Included	
F-value	70.00***	
Adj-R^2	0.141	

(1) *** and ** denote significance at the 1% and 5% level, respectively. (2) Comp = –Herfindahl; Herfindahl = $\sum_{i=1}^{N} Sales_{ijt}^2$, FComp = Female × Comp, (3) See Eqns. 3,5 for other variable definitions.

risk (Kim, 2021). Firms operating in such environments face constant pressure to allocate resources efficiently and adapt swiftly to market changes which may threaten their survival. In these high-risk settings, the governance role of female directors appears especially valuable.

The finding consistent with prior research demonstrating that female directors excel in high-stress and risk scenarios, serving as effective oversight mechanisms and stabilizing forces within organizations. Thornton and Vasilakis (2024) found that female directors are particularly adept at guiding firms through crisis situations. Sinha (2023) and Bernile et al. (2018) also highlighted the superior risk management and performance outcomes of female directors serving on boards during economic crises. Taken together, these findings underscore the risk-averse and detail-oriented approach of female directors which helps firms allocate resources appropriately, thereby enhancing investment efficiency.

6. Conclusion

This study investigates the impact of female directors on investment efficiency in Korean firms, focusing on periods of economic stress characterized by cost stickiness. The findings reveal that under normal conditions, the presence of female directors does not significantly enhance investment efficiency, likely due to persistent cultural and structural barriers within Korean corporate governance. However, during times of economic adversity, when cost stickiness constrains managerial flexibility, female directors play a crucial role in improving investment efficiency. Their risk-averse and detail-oriented approach helps firms avoid overinvestment and promotes more disciplined resource allocation.

These findings highlight the contextual nature of gender diversity's benefits in corporate governance. While regulatory reforms such as the amendment to the Capital Markets Act mandating female representation on boards, are meaningful advances, their impact remains constrained unless accompanied by deeper organizational and cultural transformation enabling female directors to exercise genuine influence. The Korean context, marked by deeply rooted Confucian norms and hierarchical corporate structures, provides a unique setting to examine these dynamics.

Our findings have several important implications for Korean policymakers and corporate governance reforms. First, the 2020 Capital Markets Act amendment represents a necessary but incomplete step toward effective gender diversity. Our evidence suggests that merely mandating female representation without addressing cultural integration challenges is insufficient; strategies such as board training programs for collaborative decision-making and cultural sensitivity could enhance the effectiveness of female direc-

tors. The Korean government could also incentivize firms to exceed minimum female representation requirements to achieve the critical mass necessary for meaningful influence. Furthermore, our findings indicate that firms with greater female board representation have operated more effectively during periods of economic stress, treating gender diversity as a strategic risk management tool rather than merely a compliance requirement. This approach appears to improve financial performance and competitiveness under cost pressures.

Despite these important contributions, there are several limitations and we suggest directions for future research. First, this study relies primarily on quantitative analysis using archival data, which may not capture the full complexity of board dynamics which can influence female director effectiveness. Additionally, our reliance on cost stickiness as a proxy for economic stress may not encompass all forms of challenging conditions. Second, the study's reliance on board gender composition as the primary measure of diversity may not capture other important dimensions of diversity that could influence investment efficiency. The interaction between female directors and other board characteristics, such as board size, independence, or industry expertise, is not comprehensively examined.

Future research should empirically evaluate the efficacy of complementary policy interventions designed to augment the impact of gender diversity mandates. Empirical investigations could focus on the role of board training programs, mentorship initiatives, and cultural change interventions in generating actionable recommendations for policymakers and corporate governance.

Availability of Data and Materials

All data reported in this paper will be shared by the corresponding author upon reasonable request.

Author Contributions

JL and SK designed the research study. JL performed the research and analyzed the data. SK provided the help and advice on the interpretation of the results. JL and SK wrote the manuscript. Both authors contributed to editorial changes in the manuscript. Both authors read and approved the final manuscript. Both authors have participated sufficiently in the work and agreed to be accountable for all aspects of the work.

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Conflict of Interest

Suyon Kim is from RoadTech Co., Ltd. This company had no role in the study design, data collection and analysis, decision to publish, or preparation of the manuscript.

References

Adams RB, Ferreira D. Women in the boardroom and their impact on governance and performance. Journal of Financial Economics. 2009; 94: 291–309. https://doi.org/10.1016/j.jfineco.2008.10.007

Amin A, Rehman RU, Ali R. Lone founders, family owners and borrowing cost: are female directors influential? International Journal of Manpower. 2023; 44: 900–917. https://doi.org/10.1108/IJM-02-2022-0097

Amin A, Ali R, Ur Rehman R. Effects of female CEO and female CFO on internationalization and firm performance. Corporate Governance: The International Journal of Business in Society. 2024; 24: 1577-1596. https://doi.org/10.1108/CG-12-2022-0512

Anderson MC, Banker RD, Janakiraman SN. Are selling, general, and administrative costs "sticky"? Journal of Accounting Research. 2003; 41: 47–63. https://doi.org/10.1111/1475-679X.00095

Ashforth BE, Mael F. Social identity theory and the organization. Academy of Management Review. 1989; 14: 20–39. https://doi.org/10.5465/amr.1989.4278999

Baik D, Chen CX, Godsell D. Board gender diversity and investment efficiency: Global evidence from 83 country-level interventions. The Accounting Review. 2024; 99: 1–36. https://doi.org/10.2308/TAR-2022-0251

Banker RD, Basu S, Byzalov D, Chen JY. The cofounding effect of cost stickiness on conservatism estimates. Journal of Accounting and Economics. 2016; 61: 203–220. https://doi.org/10.1016/j.jacceco.2015.07.001

Barber BM, Odean T. Boys will be boys: Gender, overconfidence, and common stock investment. The Quarterly Journal of Economics. 2001; 116: 261–292. https://doi.org/10.1162/003355301556400

Barua A, Davidson LF, Rama DV, Thiruvadi S. CFO gender and accruals quality. Accounting Horizons. 2010; 24: 25–39. https://doi.org/10.2308/acch.2010.24.1.25

Bernasek A, Shwiff S. Gender, risk, and retirement. Journal of Economic Issues. 2001; 35: 345–356. https://doi.org/10.1080/00213624.2001.11506368

Bernile G, Bhagwat V, Yonker S. Board diversity, firm risk, and corporate policies. Journal of Financial Economics. 2018; 127: 588–612. https://doi.org/10.1016/j.jfineco.2017.12.009

Bhagat S, Welch I. Corporate research & development investments international comparisons. Journal of Accounting and Economics. 1995; 19: 443–470. https://doi.org/10.1016/0165-4101(94)00391-H

Biddle GC, Hilary G, Verdi RS. How does financial reporting quality relate to investment efficiency? Journal of Accounting and Economics. 2009; 48: 112–131.

https://doi.org/10.1016/j.jacceco.2009.09.001

Chang SH, Paik TY. The effects of corporate business conditions on the asymmetric cost behavior: Roles of cost management and earnings management. Korean Accounting Review. 2009; 34: 71–107. (In Korean)

Choi JH, Kim MS, Hong SH. Characteristics of board of directors and investment efficiency. Korea International Accounting Review. 2013; 50: 369–398. (In Korean) https://doi.org/10.21073/kiar.2013..50.018

Choi WJ, Kim HJ, Choi KD. Co-CEO structure and investment efficiency. Korea Accounting Information Association. 2024; 42: 137–164. (In Korean) https://doi.org/10.29189/KAIAAIR.42.4.6

Croson R, Gneezy U. Gender differences in preferences. Journal of Economic Literature. 2009; 47: 448–474. https://doi.org/10.1257/jel.47.2.448

Dewi DR, Habbe AH, Arifuddin. The effect of asymmetry information on the investment efficiency and cost of capital with integrated reporting as the moderating variable. Global Scientific Journals. 2020; 8: 2052–2059.

Duru A, Iyengar RJ, Zampelli EM. The dynamic relationship between CEO duality and firm performance: The moderating role of board independence. Journal of Business Research. 2016; 69: 4269–4277. https://doi.org/10.1016/j.jbusres.2016.04.001

Faccio M, Marchica MT, Mura R. CEO gender, corporate risk-taking, and the efficiency of capital allocation. Journal of Corporate Finance. 2016; 39: 193–209. https://doi.org/10.1016/j.jcorpfin.2016.02.008

Francis B, Hasan I, Park JC, Wu Q. Gender differences in financial reporting decision making: Evidence from accounting conservatism. Contemporary Accounting Research. 2015; 32: 1285–1318. https://doi.org/10.1111/1911-3846.12098

Gul FA, Srinidhi B, Ng AC. Does board gender diversity improve the informativeness of stock prices? Journal of Accounting and Economics. 2011; 51: 314–338. https://doi.org/10.1016/j.jacceco.2011.01.005

Hambrick DC, Mason PA. Upper echelons: the organization as a reflection of its top managers. Academy of Management Review. 1984; 9: 193–206. https://doi.org/10.5465/amr.1984.4277628

Harjoto M, Laksmana I, Lee R. Board diversity and corporate social responsibility. Journal of Business Ethics. 2015; 132: 641–660. https://doi.org/10.1007/s10551-014-2343-0

Hillman AJ, Dalziel T. Boards of directors and firm performance: Integrating agency and resource dependence perspectives. Academy of Management Review. 2003; 28: 383–396. https://doi.org/10.5465/amr.2003.10196729

Homburg C, Nasev J. How timely are earnings when costs are sticky? Implications for the link between conditional conservatism and cost stickiness. AAA 2009 Management Accounting Section (MAS) Meeting Paper. 2008. Available at: https://ssrn.com/abstract=1187082 (Accessed: 1 April 2025).

Horak S, Suseno Y. Informal networks, informal institutions, and social exclusion in the workplace: insights from subsidiaries of multinational corporations in Korea. Journal of Business Ethics. 2023; 186: 633–655. https://doi.org/10.1007/s10551-022-05244-5

Jehn KA, Northcraft GB, Neale MA. Why differences make a difference: A field study of diversity, conflict, and performance in workgroups. Administrative Science Quarterly. 1999; 44: 741–763. https://doi.org/10.2307/2667054

Jensen MC. Agency costs of free cash flow, corporate finance, and takeovers. The American Economic Review. 1986; 76: 323–329.

Jensen MC, Meckling WH. Theory of the firm: Managerial behavior, agency costs and ownership structure. Journal of Financial Economics. 1976; 3: 305–360.

Joecks J, Pull K, Scharfenkamp K. Women directors, board attendance, and corporate financial performance. Corporate Governance: An International Review. 2023; 32: 205–227. https://doi.org/10.1111/corg.12525

Joecks J, Pull K, Vetter K. Gender diversity in the boardroom and firm performance: What exactly constitutes a "critical mass?" Journal of Business Ethics. 2013; 118: 61–72. https://doi.org/10.1007/s10551-012-1553-6

Kamarudin KA, Hassan NH, Ismail WAW. Breaking the linear mould: exploring the non-linear relationship between board independence and investment efficiency. Managerial Finance. 2024; 50: 1037–1065. https://doi.org/10.1108/MF-08-2023-0482

Kim D, Starks LT. Gender diversity on corporate boards: Do women contribute unique skills? American Economic Review. 2016; 106: 267–271. https://doi.org/10.1257/aer.p20161032

Kim H, Kim YM. Co-CEOs and R&D investment efficiency. Korean Management Review. 2025; 54: 133–161. (In Korean) https://doi.org/10.17287/kmr.2025.54.1.133

Kim TW. Effect of industrial competition intensity, management strategy, and cash holdings on investment efficiency: Focusing on managerial ability. The Institute of Business Management. 2021; 44: 399–428. (In Korean) https://doi.org/10.33932/rir.44.4.18

Kim Y. Board gender diversity and ESG performance. Korean Management consulting Review. 2023; 23: 201–210. (In Korean)

Kim YJ, Chung MJ. The impact of equity holdings of the national pension on firms' asymmetric cost behavior. The Korean Journal of Business Administration. 2017; 30: 1997–2014. (In Korean) https://doi.org/10.18032/kaaba.2017.30.11.1997

Koo JH. The effect of corporate governance on the asymmetric cost behavior: focusing on manager's ownership, foreign investors' ownership and institutional investors' ownership. The Korean Journal of Management Accounting Research. 2011; 11: 1–34. (In Korean)

Kothari SP, Leone AJ, Wasley CE. Performance matched discretionary accrual measures. Journal of Accounting and Economics. 2005; 39: 163–197.

https://doi.org/10.1016/j.jacceco.2004.11.002

Kwon SH. The effects of industry competition and cash flow on firm's investment efficiency. The Journal of Eurasian Studies. 2023; 20: 1–18. (In Korean) https://doi.org/10.31203/aepa.2023.20.3.001

Li H, Chen J. Does higher investments necessarily reduce stock returns? Pacific-Basin Finance Journal. 2022; 72: 101730. https://doi.org/10.1016/j.pacfin.2022.101730

Linck JS, Netter J, Shu T. Can managers use discretionary accruals to ease financial constraints? Evidence from discretionary accruals prior to investment. The Accounting Review. 2013; 88: 2117–2143. https://doi.org/10.2308/accr-50537

Modigliani F, Miller MH. The cost of capital, corporation finance and the theory of investment. The American Economic Review. 1958; 48: 261–297.

Myers SC, Majluf NS. Corporate Financing and Investment Decisions When Firms Have Information That Investors Do Not Have. Journal of Financial Economics. 1984; 13: 187–221. https://doi.org/10.1016/0304-405X(84)90023-0

Myers SC. Determinants of corporate borrowing. Journal of Financial Economics. 1977; 5: 147–175. https://doi.org/10.1016/0304-405X(77)90015-0

Pfeffer J, Salancik G. The external control of organizations: A resource-dependence perspective. Harper & Row: New York. 1978.

Sila V, Gonzalez A, Hagendorff J. Women on board: Does boardroom gender diversity affect firm risk? Journal of Corporate Finance. 2016; 36: 26–53. https://doi.org/10.1016/j.jcorpfin.2015.10.003

Sinha T. The role of female leadership in times of financial crisis – an analysis during the COVID-19 pandemic. Copernican Journal of Finance & Accounting. 2023; 12: 79–98. https://doi.org/10.12775/CJFA.2023.012

The Korea Times. Confucius vs. Korean women. 2025. Available at: https://www.koreatimes.co.kr/opinion/20250513/confucius-vs-korean-women (Accessed: 10 July 2025)

Thornton J, Vasilakis C. Do female CEOs handle crises better? Evidence from the COVID-19 pandemic. Economics and Business Letters. 2024; 13: 158–171. https://doi.org/10.17811/ebl.13.3.2024.158-171

Wang Z, Nishihara M. Investment and information asymmetry in corporate sustainability: Incentive-auditing contracts and policy insights. International Review of Financial Analysis. 2025; 105: 104435. https://doi.org/10.1016/j.irfa.2025.104435

Wei XL, Baek K. Impact of internal control and audit quality on corporate investment efficiency—focus on Chinese listed companies. Financial Planning Review. 2024; 17: 49–71. (In Korean) https://doi.org/10.36029/FPR.2024.08.17.3.49

Westphal JD, Milton LP. How experience and network ties affect the influence of demographic minorities on corporate boards. Administrative Science Quarterly. 2000; 45: 366–398. https://doi.org/10.2307/2667075

Williams KY, O'Reilly CA. Demography and diversity in organizations: A review of 40 years of research. Research in Organizational Behavior. 1998; 20: 77–140.

Yang DC. The effect of foreign ownership on the asymmetric behavior of cost and dividend. The Korean Journal of Accounting. 2012; 21: 61–91. (In Korean)

Yoon SJ. The organizational culture of the Chaebol and workplace inequality: Stunted mobilities of Korean Chinese Employees in a Beijing Subsidiary. Journal of Contemporary Asia. 2019; 49: 78–103. https://doi.org/10.1080/00472336.2018.1488176

Zhou J, Liu WQ, Li JY. Can investor sentiment explain the abnormal returns or volatility-managed portfolio strategy? Evidence from the Chinese stock market. Emerging Markets Finance and Trade. 2024; 60: 2907–2937. https://doi.org/10.1080/1540496X.2024.2336064