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Debt Capital and Dividend Policy as Complementary Indicators of Firm Valuation

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Abstract: This study investigates the interdependencies between debt capital and dividend policy as complementary factors influencing firm value among corporations listed on the Korea Composite Stock Price Index (KOSPI). Using Tobin's Q as a firm value metric and employing robust econometric techniques (OLS, 2-SLS, and GMM), the analysis reveals that while debt and dividend policies independently reduce firm value, their interaction produces a synergistic effect that increases value. The findings further indicate the dual role of Chaebol ownership structures, which, despite their association with lower firm value, mitigate the negative effects of financial policies. Additionally, firm size is found to negatively impact value, whereas free cash flow has a significant positive effect. By disentangling the complex dynamics of capital structure, dividend strategies, and ownership configurations, this study offers actionable insights for managers, investors, and policymakers. It emphasizes the importance of balanced financial practices and governance reforms tailored to concentrated ownership environments.

Keywords: capital structure; dividend policy; firm value; ownership structure

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1. Introduction

Recent studies on corporate finance emphasize the complex relationship between debt capital and dividend policies (Li & Roberts, 2023) as essential components of firm value optimization. Debt capital, as opposed to equity financing, is particularly attractive to corporations due to its tax advantages, fixed cost structure, and potential to enhance equity value without diluting ownership stakes. The deductibility of interest payments makes debt a cost-effective financing option, especially for fast-growing firms where the return on equity exceeds borrowing costs (Ducret & Isakov, 2024; Ross et al., 2018).

Additionally, leveraging debt strategically aligns capital with specific business activities, such as acquisitions or working capital, while maintaining shareholder control. Beyond its practical benefits, optimal debt levels strike a balance between tax advantages and financial distress costs, minimizing the weighted average cost of capital (WACC) and signaling managerial confidence in profitability (Ross et al., 2018). Despite the fact that debt offers tax advantages, its overuse can lead to financial distress and an increased risk of default (Ross et al., 2018).

Dividends, on the other hand, signal financial stability and reduce information asymmetry, as shown by Bhattacharya (1979) and Lintner (1956, 1962, 1963). However, the interplay between these two mechanisms remains underexplored, particularly in markets with concentrated ownership structures and weak governance frameworks. Oh and Park (2021) expand this discourse by linking corporate sustainable management (CSM) practices to dividend policies, finding that firms with superior CSM practices tend to distribute higher

dividends. However, this positive effect diminishes within Chaebol-dominated firms, reflecting governance inefficiencies. Similarly, Kwon and Han (2019) identify that controlling shareholders in family-owned firms often favor conservative payout policies, prioritizing resource retention over shareholder distributions. These insights highlight the limitations of current financial strategies in addressing governance challenges in family-controlled firms.

Further complicating this situation, Ducret and Isakov (2024) demonstrate significant heterogeneity in the performance of business groups like Korean Chaebols, revealing that outcomes vary based on group-specific resources and unobservable governance traits. These findings reinforce the inadequacy of generalized approaches to studying firm value in markets dominated by conglomerates, where governance complexities exacerbate agency conflicts and undermine the effectiveness of conventional financial strategies.

Despite these advancements, key gaps remain. First, recent studies often focus on individual mechanisms, such as dividends or debt, without fully addressing their interdependencies in shaping firm value. Second, the unique dynamics of Chaebol ownership structures, marked by centralized control and governance inefficiencies, require further exploration to understand how they moderate the impact of debt and dividend policies. Third, few studies address the "Korean discount", a persistent undervaluation of Korean firms linked to governance failures and concentrated ownership (Kang, 2023; Ducret & Isakov, 2020).

This research addresses these gaps by investigating the interdependencies between debt capital and dividend policies as complementary mechanisms for improving firm value, focusing on the unique governance context of Korean Chaebols. Building on the theoretical foundations of Jensen's (1986) agency hypothesis and Bhattacharya's (1979) signaling theory, this study examines how firms use these financial strategies to mitigate agency conflicts, align managerial actions with shareholder interests, and signal financial stability.

This study builds upon the foundational insights of prior research, integrating diverse perspectives on the interplay between leverage, dividends, and firm value. Cooper and Lambertides (2018) highlight the strategic alignment of dividend increases with leverage adjustments to signal financial discipline, while Brockman and Unlu (2009) emphasize institutional factors like creditor rights in shaping payout policies. Theoretical perspectives (Jensen, 1986; Bhattacharya, 1979; Lintner, 1962) and empirical findings (González, 2013; Nielsen, 2005; Harvey et al., 2004) further underline dividends' role in signaling stability and mitigating agency conflicts. In the unique context of Chaebol-dominated Korean firms, characterized by high leverage and governance inefficiencies (Ducret & Isakov, 2020; Kang, 2023), Li and Roberts (2023) and Diedrich et al. (2022) demonstrate the synergistic effects of leveraging dividends and debt to address agency concerns and increase investor confidence.

Therefore, we examine the complex interactions between debt, dividends, and ownership structures within Korea's unique institutional and ownership frameworks. By focusing on KOSPI-listed firms, our research contextualizes these dynamics in the Chaebol-dominated market, where governance inefficiencies exacerbate agency concerns and contribute to the "Korean discount". The findings aim to offer actionable insights for policymakers, investors, and corporate managers, emphasizing the role of balanced financial strategies in enhancing governance, investor trust, and firm value. We conjecture that the concentrated ownership structures in Chaebols while lowering standalone firm value, might moderate the adverse impacts of leverage and dividends on value.

Using a rich dataset from KOSPI and employing standard estimation models, this paper investigates the interdependencies between debt ratio, dividend yield, and Chaebol ownership structures, focusing on their individual and interactive effects on firm value.

We find that debt ratio independently shows a negative and statistically significant impact on firm value (Tobin's Q). This suggests that higher debt levels might harm firm value in Korean corporations. Similarly, dividend yield, which serves as a proxy for dividend policy, exhibits a negative and a statistically significant association with company value, supporting the premise that certain dividend policies might reduce firm value. The interaction of debt and dividend yield shows a positive and statistically significant link, suggesting a mitigating or synergistic influence on firm value. The Chaebol dummy variable, which represents ownership structure, is negatively and significantly related to firm value, implying that independently, Chaebol ownership may have a negative effect. Yet the interaction between debt and the Chaebol dummy is favorably and significantly related with firm value, indicating that Chaebol ownership could mitigate some of the adverse consequences of debt. The interaction between dividend yield and Chaebol dummy is positive and statistically significant, indicating that Chaebol structures can ameliorate the detrimental effects of certain dividend distribution decisions. Furthermore, company size has a negative and substantial effect on firm value, whereas free cash flow has a positive and significant effect, offering more understanding into the control parameters' contribution to firm value.

This study provides significant contributions to the corporate finance literature, shareholder strategy, and policymaking. It advances theoretical debates in capital structure and corporate governance by demonstrating the synergistic interaction between leverage and dividend policies within the unique governance framework of Chaebol-dominated Korean firms. While traditional theories such as Jensen and Meckling (1976) and Jensen's (1986) agency problems and free cash flow hypothesis and signaling theory (Lintner, 1962) are foundational, this study extends them by emphasizing the conditional nature of their application in markets characterized by entrenched ownership and weaker investor protections (La Porta et al., 2000). Specifically, the findings reveal that debt and dividends are not merely standalone mechanisms but complementary tools that, when employed together, mitigate agency conflicts and restore investor trust, particularly in governance environments with concentrated ownership configurations.

Policymakers should develop regulatory frameworks that encourage corporations with concentrated ownership to adopt balanced capital structure and dividend payout strategies.

These regulations should promote standards of excellence in financial management and improve governance transparency to protect shareholder interests and foster sustainable firm value.

The remaining portions of the paper are organized as follows: Section 2 focuses on the literature review and develops the hypotheses in Section 3. Section 4 describes the research methodology, whereas Section 5 features the empirical analysis, including the results and commentary. Finally, Section 6 provides a conclusion.

2. Literature Review

2.1. Debt Capital and Firm Value

Globally, corporate finance authors have extensively investigated the link between debt capital and firm value, with the literature providing many opinions on its mechanics and implications. Debt capital functions as both a signaling instrument and a governance mechanism, influencing business value through managerial incentives, agency costs, and financial architecture.

Ross et al. (2018) argue that debt capital may signal firm value by suggesting managerial confidence in the company's future profitability. Rational corporations optimize their debt levels to balance tax benefits with financial distress costs, ensuring that the marginal tax subsidy equals the marginal cost of debt. Successful businesses with larger

expected profits tend to use more leverage, exploiting interest deductions to lower taxes. Investors view such debt increases as indicators of corporate value, which often leads to rising stock prices.

However, the possibility of managerial opportunism arises, in which managers inflate the amount of debt in order to artificially boost stock values. Despite this, Ross et al. (2018) argue that more valuable firms continue to issue more debt than less valuable firms, ensuring that debt remains a reliable indicator of firm worth.

In contrast, Harvey et al. (2004) examine the governance role of debt in alleviating agency issues, particularly in emerging economies with poor legal safeguards and concentrated ownership structures. In such cases, debt capital can reduce managerial overinvestment by enforcing discipline through debt servicing responsibilities and monitoring procedures. Firms with mismatched managerial incentives—where control rights exceed cash flow rights—lose value, whereas leverage offsets this loss by lowering agency costs (Shleifer & Vishny, 1986, 1992). According to Harvey et al. (2004), the value-enhancing effect of debt is most pronounced in corporations with large assets or limited growth opportunities, as well as significant excessive investment risks.

The value-creation potential of distinct debt types is further distinguished in the literature. According to Harvey et al. (2004), worldwide syndicated loans produce positive abnormal returns due to their strict covenants and monitoring requirements, especially for businesses whose ownership and managerial control are highly separated. However, the strict oversight needed to properly handle agency issues is absent from domestic debt markets in emerging nations, which are frequently impacted by family or governmental control. International debt markets, on the other hand, have greater governance potential since they impose stricter transparency requirements and more robust rights for creditors.

Harvey et al. (2004) and Ross et al. (2018) both emphasize how debt serves as a governance and signaling tool. Harvey et al. (2004) highlight the governance function of debt in lowering agency costs, especially in emerging markets, whereas Ross et al. (2018) concentrate on the signaling impacts of debt in communicating business quality to investors. All of these viewpoints agree that, when properly managed and structured, debt may increase a company's worth. However, they do warn against using too much debt, which can cause financial difficulties or undermine investor trust.

González (2013) elaborates on these points by analyzing the impact of financial leverage on operating performance, especially in times of industry downturn. González (2013) uses a large international panel dataset to show that high-leverage companies have higher operating performance declines during downturns. This is in line with the idea that the costs of financial distress outweigh the disciplinary advantages of debt (Andrade & Kaplan, 1998; Shleifer & Vishny, 1992). However, this effect differs depending on the institutional setting. High debt, for instance, improves operating performance even during downturns in French civil law nations because of improved investor protection and legal enforcement. These results highlight how the effects of debt vary depending on the context, taking into account factors like legal origins, financial trajectory, and the degree of protection afforded to creditors and investors.

Even with these realizations, problems still exist. The universality of theoretical theories is called into question by empirical data. Businesses typically choose wider leverage zones over rigid target debt ratios, according to Graham and Harvey (2001) and Fama and French (2002). Additionally, because businesses modify leverage in response to advantageous market conditions, market timing affects capital structure choices (Baker & Wurgler, 2002). These variations imply that, contrary to earlier theories, the relationship among leverage, governance, and firm value is more dynamic and dependent on firm-specific and market circumstances.

Examining how debt capital and business value interact in the Korean environment provides a chance to close these disparities. Korean businesses function within a distinct institutional framework that is defined by a Chaebol-dominated economy, concentrated ownership, and significant government control. Because of these characteristics, agency conflicts are made worse, which makes the governance role of debt especially important. Furthermore, Korea's sophisticated domestic and global capital markets offer an ideal setting for researching the ways in which market timing, investor protections, and debt arrangements interact to affect business value (Claessens et al., 1999, 2002).

2.2. Dividend Policy and Firm Value

In economic theory, dividend policy has long been a controversial topic (Lang & Litzenberger, 1989). According to Miller and Modigliani's (1961) dividend irrelevance theory, dividend policy has no bearing on firm value in a perfect market. According to the dividend clientele theory and in certain situations, empirical tests provide credence to this viewpoint. But in reality, the presumptions of rational behavior and ideal markets are rarely true (Black & Scholes, 1974; Asquith & Mullins, 1983; Atanassov & Mandell, 2018; Modigliani & Miller, 1963).

On the other hand, value-relevance theories contend that dividends have a major effect on business value. Dividends, according to the Bird-in-Hand hypothesis (Bhattacharya, 1979; Gordon, 1963; Lintner, 1956, 1963), lower perceived risk, which in turn lowers the cost of equity and increases firm value. Likewise, the signaling hypothesis (John & Williams, 1985) emphasizes dividends as a way to communicate expectations for growth and financial stability. Additionally, dividends lower agency costs by lowering free cash flow that could be abused by managers, according to the agency theory (Rozeff, 1982; Jensen, 1986).

There is still conflicting empirical evidence. Profilet (2013) reports a positive association between dividend payouts and share price fluctuations; however, Hussainey et al. (2011) discover a negative correlation. Farinha (2003) found a U-shaped association between payout ratio and insider ownership levels in large UK corporations, which was attributed to managerial entrenchment. In emerging economies, there is a dynamic link between insider ownership and dividends. In Taiwan, Huang et al. (2012) discovered a non-linear relationship between controlling family ownership levels and dividend payouts. Moreover, Jeon et al. (2011) examine the effects of foreign ownership on payout policies in the Korean market, showing how foreign investors influence corporate dividend decisions. Their findings suggest that firms with higher foreign ownership tend to adopt more shareholder-friendly payout policies, aligning with global governance standards. As a result, in less developed nations with concentrated family ownership dividend payouts may be used to resolve the principal-principal agency conflict among majority and minority shareholders (Njoku & Lee, 2024; Kim & Lee, 2024; Tulcanaza-Prieto et al., 2024). Within a less efficient capital market, minority shareholders and stakeholders may rely on dividend payout to determine a company's value (Seth & Mahenthiran, 2022). These inconsistencies demonstrate how dividend consequences are contextually dependent and impacted by market conditions, investor preferences, and tax regimes.

2.3. Interaction of Debt Capital and Dividend Policy

Debt capital, dividend policy, and firm performance are critical areas of inquiry in corporate finance, especially in the context of business groups (BGs). Ducret and Isakov (2024) analyze 1785 listed Korean firms from 2007 to 2019, including 257 affiliated with 63 Chaebols, and find that Chaebol firms, despite lower profitability (ROA), exhibit higher market valuations (Tobin's Q). This valuation premium is attributed to factors such as reputation,

visibility, and perceptions of stability associated with Chaebols, which are consistent with the "too big to fail" hypothesis.

Dividend policies within BGs reflect strategic priorities and control shareholders' preferences. Kwon and Han (2019) document that firms with individual controlling shareholders (family-owned firms) demonstrate lower payout ratios, particularly when ownership stakes are higher, supporting the conservative payout hypothesis. Additionally, payout tendencies at the group level influence all affiliated firms, indicating coordinated financial strategies within family business groups. Similarly, Ducret and Isakov (2020) find that Chaebol-affiliated firms have lower payout ratios than unaffiliated firms, aligning with a preference for reinvestment and internal financing over dividends.

Oh and Park (2021) expand on this by examining the relationship between corporate sustainable management (CSM) and dividend policy. They find a positive association between CSM and dividend levels but note that this relationship is weaker for Chaebol-affiliated firms, reflecting unique governance structures.

On debt capital, Ducret and Isakov observe that Chaebol firms maintain lower leverage and cash holdings post-Asia financial crisis, signaling greater financial resilience. These studies collectively highlight the interactions between governance, ownership, and group affiliation in shaping financial strategies, including dividends and leverage, in Korean firms.

Li and Roberts (2023), by examining the interplay between zero-leverage (ZL) policies and dividend behavior in New Zealand's unique investment environment, extend this conversation. They find that financially constrained firms with larger cash reserves are more likely to adopt zero-leverage strategies. Additionally, their results accentuate the critical role of dividend payouts in shaping capital structure decisions, revealing that dividend-paying firms with growth opportunities are willing to assume short-term debt to maintain consistent dividend distributions. This finding highlights the prioritization of shareholder returns over debt optimization, contributing new insights to the literature by exploring the implications of dividend policies within a small, open economy characterized by a dividend imputation tax system and high ownership concentration.

Cooper and Lambertides (2018) analyze the implications of large dividend increases, demonstrating that such increases signal changes in leverage policy rather than profitability or target leverage adjustments. Using data from 4374 firms, they reveal that dividend-increasing firms exhibit a more convex relationship between leverage and financial surpluses or deficits, which cannot be explained by standard leverage models (e.g., Kayhan & Titman, 2007) or traditional dividend-related variables (e.g., Grullon et al., 2002, 2005). Instead, these increases reflect discretionary changes in financial management, deviating from typical pecking-order behavior.

Their findings also indicate that dividend initiations have even stronger signaling effects, consistent with prior studies (e.g., Officer, 2011). These results highlight how dividend increases convey private information about a firm's intentions to alter leverage policy, offering valuable insights into corporate financial decision-making and signaling theory. Furthermore, they challenge traditional partial adjustment frameworks by showing that leverage adjustments are not adequately captured by conventional dividend policy determinants, such as firm maturity, risk, and investment opportunities. Instead, firms strategically adjust leverage to align with dividend policies, signaling financial discipline and stability.

Nielsen's (2005) study creates an agency model to investigate the trade-off between shareholder control and a tight capital structure in corporate governance. The model suggests that limited shareholder control strikes an optimal balance between external scrutiny to prevent unprofitable investments and internal managerial flexibility to explore

high-return alternatives. It predicts that enterprises with greater investment potential want stronger shareholder power. Empirically, the study examines US corporations using a governance index and discovers that poorer shareholder rights are associated with higher leverage, increased dividend likelihood, and larger payouts. These data demonstrate that enterprises with limited shareholder authority frequently employ leverage and dividends as alternative control mechanisms. Dividends can serve as indicators of financial stability, which attracts investors. The study emphasizes the complex interaction between governance, capital structure, dividend policy, and business value, reinforcing the theoretical model's significance.

Conflicts between shareholders and bondholders can result in agency costs. While shareholders often prefer higher dividends, bondholders favor constraints on payouts to safeguard their claims, viewing excessive dividends as wealth expropriation (Jensen & Meckling, 1976). By reducing free cash flow held by managers, dividend payouts encourage reliance on external financing, which subjects managers to scrutiny by analysts and creditors, as Easterbrook (1984) noted. This external monitoring discourages managerial self-interest but may lead to increased leverage, which raises firm risk, as Easterbrook also warned.

Jensen (1986) argued that limiting excess cash flow through dividend payments addresses overinvestment, aligning managerial decisions with shareholder interests. The availability of surplus cash enables managers to prioritize their own goals, such as firm over-expansion, at the expense of shareholders. Debt, similar to dividends, restricts the funds available to managers, thereby reducing agency costs and ensuring managerial behavior aligns more closely with shareholder objectives.

Although the free cash flow hypothesis links dividend policy to investment decisions by suggesting that increasing dividends can mitigate overinvestment and enhance a firm's market value (Lang & Litzenberger, 1989), shareholders must weigh the associated risks. These risks include higher personal taxes on dividends and the potential for increased firm debt. In contrast, M&M proposed that dividend policy and investment decisions are independent, emphasizing the trade-off shareholders face in balancing the costs and benefits of elevated dividend payouts.

Leverage serves as a disciplinary mechanism, enforcing financial obligations that align management's interests with those of shareholders (Lee & Tulcanaza-Prieto, 2024; González, 2013; Nielsen, 2005; Harvey et al., 2004). However, increasing leverage raises financial and operating risks, as noted by Diedrich et al. (2022), who link it to the cost of capital.

Dividend policy complements leverage by signaling financial health and stability to shareholders (Brav et al., 2005; Bhattacharya, 1979). This approach suggests an ongoing commitment to shareholder returns, instills confidence and reduces perceived risks. While Modigliani and Miller (1963) assume deterministic debt levels and certain tax breaks, Miles and Ezzell (1980) and Harris and Pringle (1985) take into account dynamic adjustments to desired capital structures. However, empirical studies show that these models are not completely accurate. Graham and Harvey (2001) and Brounen et al. (2006) discovered that enterprises rarely adhere to exact debt ratios, instead shifting within goal zones. This suggests that integrated impact of debts and dividend policy results in an intriguing equilibrium. High leverage raises risk, yet continuous dividend payments might offset adverse perceptions and improve value Deviations from theoretical models, affected by factors such as volatility in the markets and sluggish adjustment to target capital structures, exacerbate the interaction (Fama & French, 2002; Baker & Wurgler, 2002; Chindengwike, 2024).

In a nutshell the combination of leverage and dividend payments, controlled by shareholder power, is crucial in determining business value. Firms that successfully manage

this trade-off can increase their market value by using debt to limit agency costs while also committing to dividend payments, which signal financial strength and attract investors. This emphasizes the importance of context-specific approaches that account for real-world economic challenges.

A number of gaps remain in the literature. First, the dynamic nature of optimal capital structure and its interaction with dividend policy need additional investigation. The sluggish adjustment of leverage to target ratios (Fama & French, 2002) and variations owing to market timing (Welch, 2004) indicate that static models do not reflect real-world complexities. Second, assuming that dividends and debt always operate as complements may simplify how they interact. To further understand these patterns, future research must take into account firm—and market-level heterogeneity. Finally, the empirical discrepancies found in dividend effect studies (dividend puzzle) highlight the importance of conducting longitudinal assessments across several contexts.

The interaction of debt capital and dividend policy in influencing firm value is shaped by a delicate balance of financial discipline, risk management, and market signaling. While theoretical frameworks provide fundamental perspectives, empirical evidence demonstrates considerable contextual dependencies. To bridge the gap between theory and practice, a customized strategy is required, taking into consideration firm-specific, market, and structural variables.

3. Hypothesis Development

Debt capital is an important determinant of corporate value, acting as both a signaling mechanism and a financial discipline instrument. According to Ross et al. (2018), optimal leverage levels balance tax benefits against financial distress costs, allowing successful enterprises to lower taxes while also signaling confidence in future profitability, which frequently leads to stock price increases. Similarly, Tulcanaza-Prieto and Lee (2019) highlight leverage disciplines management (Jensen, 1986), which promotes value-maximizing decisions while lowering free cash flow agency costs (Tulcanaza-Prieto et al., 2024). Studies by Abor (2005) and Modigliani and Miller (1963) confirm a positive association between leverage and business value, particularly for profitable enterprises that use debt to improve performance. Not all of the time is this link linear or positive. In the end, excessive debt lowers business value by increasing agency costs and financial distress. High-profit companies may favor retained earnings above debt, according to the pecking-order theory, which would result in lower levels of leverage (González, 2013). According to the management-entrenchment theory, entrenched managers may increase leverage in order to solidify their position, which could lead to risks and inefficiencies that reduce the value of the company (Aggarwal & Kyaw, 2010; Harris & Raviv, 1990). Research from emerging economies, such as Chen's (2004) and Ibhagui and Olokoyo's (2018) findings in Nigeria, indicates that high leverage has a negative and significant effect on business value. These dynamics are supported in the Korean context by Tulcanaza-Prieto et al. (2024), who observe that highly indebted enterprises have operational difficulties and dwindling market share, which is consistent with Opler and Titman's (1994) results for the U.S. market.

Empirical research, such as Graham and Harvey (2001), demonstrates that firms frequently vary from optimal leverage, resulting in over-leverage and lower firm value. Over-leverage in the Korean environment, where enterprises face distinctive market structures and possible Chaebol dominance, can increase these risks and reduce firm value.

H1. *Debt capital negatively impacts firm value in Korean firms.*

Dividend policy significantly impacts firm value, influencing both market and accounting performance. The interest alignment hypothesis proposes that in corporations

with concentrated managerial ownership, such as Chaebols, dividend policies align managerial and shareholder interests, increasing firm value (Jensen & Meckling, 1976; Chen & Chuang, 2009). Founding CEOs frequently prioritize sustainable growth and shareholder wealth, which contributes to this alignment (Fahlenbrach, 2009; Wasserman, 2003). Njoku and Lee (2024) show that cash dividend payments have a positive effect on market indicators such as Tobin's Q and market-to-book ratios, implying that dividend-paying companies are more favored by investors. The entrenchment hypothesis, on the other hand, contends that excessive managerial power can lead to self-serving behaviors like as cash hoarding, lowering shareholder value (Stulz, 1990; Wang, 2006; Faulkender & Wang, 2006). According to Njoku & Lee, a negative association between dividend yield and firm value over their entire dataset of Korean companies suggests that higher dividend yields may reduce prices, presumably due to unfavorable investor sentiments. When Chaebol and non-Chaebol enterprises are examined independently, unique patterns occur, indicating the importance of ownership structure in creating these results. Njoku and Lee (2024) emphasize that these twin dynamics necessitate specialized payout schemes to address agency concerns while optimizing firm value across different ownership arrangements.

Although paying out dividends can signal financial soundness (John & Williams, 1985) and lower agency costs (Rozeff, 1982; Jensen, 1986; La Porta et al., 2000; Njoku & Lee, 2024), it can also reduce the amount of retained earnings available for reinvestment, especially in growing markets. Hussainey et al. (2011) discovered a negative association between dividend payouts and stock price movements, lending weight to the theory that high dividend yields may indicate lower future growth potential. This may be especially important for Korean enterprises, given their primary focus on growth and reinvestment in Chaebol-dominated sectors.

H2. *Dividend yield negatively impacts firm value.*

Empirical evidence underscores the complementary roles of debt and dividend policies in mitigating agency conflicts and enhancing firm value. Debt imposes financial discipline on management by creating fixed obligations, aligning managerial interests with those of shareholders (Fama & French, 2002; Harvey et al., 2004), while dividends signal financial stability and reduce information asymmetry, fostering investor trust (Brav et al., 2005; Lintner, 1962; Nielsen, 2005). The dynamic interplay between these mechanisms suggests that firms benefit from leveraging both strategies simultaneously, as each addresses distinct aspects of governance and financial stability (Diedrich et al., 2022; Seth & Mahenthiran, 2022). Majid and Abu Samrah (2015) find that while dividend payouts positively impact stock prices and firm leverage has a negative effect, the combined influence of capital structure and dividend policy significantly affects stock prices, with varying effects at different levels.

In the context of Korean Chaebol firms, characterized by high ownership concentration and unique governance structures, this synergy becomes particularly salient. Chaebols often rely on high leverage, which, while enabling resource sharing and strategic investments, exposes firms to financial risks (Li & Roberts, 2023). Strategic dividend policies can offset these risks by signaling stability and enhancing investor confidence, a factor critical in markets with weak investor protections. Recent studies (Ducret & Isakov, 2024; Oh & Park, 2021) have shown that Chaebol-affiliated firms exhibit unique financial behaviors, with dividends playing a stabilizing role in the presence of high leverage. Building on this, we hypothesize.

H3. *The interaction of debt and dividend policies has a complementary effect on firm value.*

Chaebol affiliation is projected to reduce corporate value due to inherent governance inefficiencies and conflicts of interest. Baek et al. (2004) show how concentrated family ownership in Chaebols causes inequalities between voting and cash flow rights, compromising governance and lowering investor confidence. Bae et al. (2002) demonstrate tunneling, in which Chaebol-affiliated acquisitions frequently benefit controlling shareholders at the expense of minority owners, resulting in wealth expropriation and inefficient resource allocation. These structural weaknesses reduce corporate value by favoring family interests over shareholder wealth maximization. While Chaebols may benefit from economies of scale and group synergies, these advantages are frequently offset by governance issues, inefficient decision-making, and decreased investor confidence.

As a result, the Chaebol dummy is expected to have a negative impact on company value, underlining the need to resolve governance issues in chaebol-dominated ownership arrangements.

H4. *The Chaebol dummy negatively impacts firm value.*

In Chaebol corporations, debt can operate as an external check on entrenched management practices, lowering agency costs (Harvey et al., 2004). Given their proclivity to over-leverage, creditor monitoring may result in greater governance and increased business value. This relationship is consistent with agency theory, which holds that external financial restrictions can regulate managerial behavior.

H5. *The interaction of debt ratio with the Chaebol dummy positively impacts firm value.*

Chaebol corporations are always under extreme scrutiny by minority stockholders over governance shortcomings. Dividend payments might suggest financial strength and lower the perceived danger of management expropriation (Lintner, 1962; John & Williams, 1985). In the Korean environment (Tulcanaza-Prieto et al., 2024), where Chaebol enterprises are dominant, this signaling effect could rebuild investor confidence and increase firm value, offsetting some of the negative effects of Chaebol structures.

H6. *The interaction of the Chaebol dummy with dividend yield positively impacts firm value.*

4. Sample and Methodology

4.1. Sample Selection

This study examines a panel dataset comprising 1514 Korean enterprises listed on the Korean Stock Exchange, with data sourced from KisValue, a database provided by the Korea Investor Service (KIS). The dataset spans the years 2011 to 2021 and includes comprehensive financial information, such as statements of financial position, income statements, cash flow statements, and changes in equity. Additionally, annual data on capital structure, dividend policies, ownership structures, and other firm-specific characteristics were integrated.

However, corporate governance variables—central to our study's objectives—were only available for the period 2011 to 2019. To ensure consistency and completeness, the sample was restricted to these years. Firms with missing data or distinguishing traits, such as financial institutions, were excluded during the cleaning and filtering processes. The final dataset, transformed into a panel structure using Python, includes 558 firms and totals 5022 firm-year observations. This selection provides a robust foundation for longitudinal analysis of governance, financial mechanisms, and firm value in the Korean context.

4.2. Model Specification

This study aims to (1) evaluate the effect of debt ratio on firm value, (2) gauge the impact of dividend policy on firm value, (3) explore the interaction effect of debt ratio and dividend policy on the market performance of Korean firms, (4) investigate the effect of Chaebol-group affiliation on firm value, (5) examine the interaction effect of Chaebol ownership structure and debt capital on firm value, and finally (6) gauge the interaction effect of Chaebol ownership structure and dividend policy on firm value; all while controlling for specific firm variables.

In addition to the lagged regressors, exogenous variables are incorporated as instruments, including the firm's total corporate governance score (TSG), return on equity (ROE), and economic growth (Growth) in the robustness analysis. Firm control variables such as free cash flow and size are incorporated in the regression models.

The introduction of a "ChaebolDummy" variable is crucial for separating the effects of Chaebol membership on the relationship being studied. This dummy variable represents the distinct governance and structural aspects of Chaebol-affiliated companies. According to the Korea Fair Trade Commission (KFTC) criteria, a corporation is categorized as a Chaebol (Chaebol Dummy = 1) if its controlling ownership position exceeds 30% and its total assets surpass KRW 5 trillion. Non-Chaebol firms (Chaebol Dummy = 0) typically have more distributed ownership structures. This technique distinguishes between Chaebol and Non-Chaebol enterprises, allowing for a more refined investigation of ownership structure effects (Njoku et al., 2024; Njoku & Lee, 2024).

Ownership concentration (OWN), defined as the proportion of shares held by the largest shareholder or group of major shareholders, serves as a key metric for measuring control within firms. It reflects the extent of concentrated ownership and its potential influence on managerial decisions and governance processes. This indicator has been widely used in empirical research to explore corporate governance issues and agency problems (Hwang et al., 2013). In this study, the Chaebol Dummy and OWN variables are used in tandem to provide reliable proxies for ownership structure, facilitating a deeper analysis of its relationship with capital structure, dividend policies, and firm value.

Accordingly, this research develops the following regression models to examine both the independent and interactive effects of debt ratio, dividend policy, and Chaebol affiliation on firm value in the context of Korean firms. To examine whether debt alone significantly affects firm value, controlling for size and free cash flow, Equation (1) is specified as follows:

$$\text{Tobin's } Q_{it} = \beta_0 + \beta_1 \text{Debt}_{it} + \beta_2 \text{Size}_{it} + \beta_3 \text{FCF}_{it} + \epsilon_{it} \quad (1)$$

To test whether dividend policy alone significantly impacts firm value, Equation (2) is specified thus:

$$\text{Tobin's } Q_{it} = \beta_0 + \beta_1 \text{DYD}_{it} + \beta_2 \text{Size}_{it} + \beta_3 \text{FCF}_{it} + \epsilon_{it} \quad (2)$$

To test ownership structure and Chaebol-affiliated governance augmentation, Equation (3) is captured as:

$$\text{Tobin's } Q_{it} = \beta_0 + \beta_1 \text{DEBT}_{it} + \beta_2 \text{DYD}_{i} + \beta_3 \text{CHAEBOLDUMMY}_{i} + \beta_4 \text{SIZE}_{i} + \beta_5 \text{FCF}_{i} + \varepsilon_{it} \quad (3)$$

To examine how debt and dividend policy interact with each other and how ownership structure moderates their effects on firm value, Equation (4) is specified below:

$$\begin{aligned}\text{Tobin's } Q_{it} = {} & \beta_0 + \beta_1 \text{Debt}_{it} + \beta_2 \text{DYD}_{it} + \beta_3 (\text{Debt}_{it} \times \text{DYD}_{it}) + \beta_4 \text{ChaebolDummy}_{it} + \\ & \beta_5 (\text{ChaebolDummy}_{it} \times \text{Debt}_{it}) + \beta_6 (\text{ChaebolDummy}_{it} \times \text{DYD}_{it}) + \beta_7 \text{Size}_{it} + \beta_8 \text{FCF}_{it} + \epsilon_{it}\end{aligned} \quad (4)$$

where

Tobin's Q (Tob.Qit) is the dependent variable representing the market value of the firm. It is calculated as the total market value of the firm divided by the total asset value of firm i in year t (Njoku & Lee, 2024).

The debt ratio (Debt), computed as (total debt/total assets) × 100, indicates the percentage of a company's assets financed by debt. In this study, it is used as an independent variable to assess how a firm's capital structure influences its market value, giving light on capital allocation efficiency and the role of leverage in firm performance (Njoku & Lee, 2024).

Dividend yield (DYDi,t), calculated as the ratio of cash dividends paid to market value of equity, is a reliable indicator of dividend policy (Njoku & Lee, 2024; Atanassov & Mandell, 2018). It reflects shareholder returns and is less susceptible to accounting manipulation than other proxies such as earnings (La Porta et al., 2000). Using market value rather than book value removes accounting distortions, providing a more accurate picture of a company's financial status.

ChaebolDummy is an indicator variable for ownership structure affiliation (1 = Chaebol firm, 0 = non-Chaebol firm).

Debti,t × DYDi,t is the interaction term capturing the synergistic effect of leverage and dividend policy on firm value.

ChaebolDummy × Debti,t is the interaction term examining how Chaebol affiliation moderates the effect of debt capital on firm value.

ChaebolDummy × DYDi,t is the interaction term to assess how Chaebol ownership structure influences the impact of dividend policy on firm value.

Firm size (SIZEi,t) is calculated using the natural logarithm of a firm's sales revenue at time t. It indicates the size of a company's operations and money generated from core activities. Firm size is often included in empirical models as a control because it is strongly associated with firm performance and value. Larger firms tend to have greater market power, more diversified operations, and better access to capital, which can influence their Tobin's Q. However, size might also have a negative effect due to inefficiencies in managing large firms (e.g., agency issues or bureaucratic inertia).

Free cash flow (FCFi,t) is calculated as operating cash flow minus dividends (common and preferred), scaled by total assets, serving as a control for liquidity and operational efficiency.

In the 2SLS and GMM estimation models, lagged regressors are included to account for dynamic relationships. Exogenous instruments such as total corporate governance score (TSG), return on assets (ROE), and economic growth (Growth) are used to address potential endogeneity issues.

Total corporate governance score (TSGi,t) represents a composite measure of governance quality, encompassing board structure, shareholder rights, and disclosures, as evaluated annually by the Korea Corporate Governance Service (KCGS) to promote improved governance practices. Return on equity (ROEi,t) serves as an instrumental variable, representing a firm's profitability relative to its shareholders' equity. It is calculated by dividing the firm's net income by its total shareholders' equity. This measure reflects how effectively a company uses shareholder investments to generate returns, making it a valuable indicator of internal performance that impacts firm value.

Growth (Growthi,t) is employed as an instrumental variable to represent the economic growth rate. It is quantified using the gross national product (GNP) of Korea, providing an external macroeconomic indicator that influences firm performance and value. This variable is instrumental in isolating the broader economic context's impact on the relationship

between debt capital, dividend policy, and firm value. εi,t is the error term, capturing the unobserved factors influencing firm value (Njoku & Lee, 2024).

These variables enable a thorough examination of the individual and combined impacts of debt ratio, dividend policy, and Chaebol affiliation (ownership structure) on firm value in the Korean conglomerates.

5. Empirical Analysis and Results

5.1. Descriptive Statistics

The descriptive statistics in Table 1 highlight the most significant variables for the total sample of 5022 observations, which are weighted at the 5th and 95th percentile. Tobin's Q (TOB.Q), an indicator for firm value, with a mean of 0.689 and SD of 0.538, suggests that firms in the sample, on average, have a market value below their book value of assets. This result indicates that, for many firms, the market may perceive a significant discount on their asset base, possibly due to lower growth expectations, market mispricing, or concerns about the future performance of these firms.

Table 1. Descriptive statistics.

Variable	Count	Mean	Median	Std. Dev.
TOB.Q	5022	0.689	0.515	0.538
DEBT	5022	0.406	0.408	0.203
DYD	5022	0.012	0.010	0.013
SIZE	5022	26.242	26.165	1.402
FCF	5022	0.043	0.039	0.056
ROE	5022	0.024	0.031	0.101
GROWTH	5022	0.030	0.029	0.004
TSG	5022	29.073	28.670	8.378
OWN	5022	28.095	24.890	13.736

Note: This table presents firm's market value, debt, dividend policy, ownership structure, and other control and instrumental variables of the total testing sample of 5022 observations. They are winsorized at 5% and 95%, respectively.

The debt ratio (DEBT) averages 40.6%, with a median of 40.8% and a small range (SD = 0.203). The average dividend yield (DYD) is 1.25%, with a median of 0.96% (SD = 0.0125). The median 0.96% < 1.25% suggests a right-skewed distribution where most firms offer lower dividend yields, with a few higher-yielding firms pulling the average up. This aligns with the observation that Korean firms, such as the Chaebol groups, often reinvest profits rather than distribute them as dividends.

Firm size (SIZE), calculated as the natural log of sales revenue, with a mean of 26.242, median of 26.16, and standard deviation of 1.402, indicates a mix of firm sizes, with larger, possibly Chaebol-affiliated firms, likely influencing capital structure, dividend policies, and governance practices, potentially skewing results. Free cash flow (FCF) averages 4.26%, with some fluctuations (SD = 0.056). Return on equity (ROE) is low, with a mean of 2.44% and a median of 3.08%, although there is significant variation (SD = 0.0101). Gross national product (GNP), which represents economic growth, is consistent across enterprises, averaging 3.03% with low variability (SD = 0.0043).

The TSG (total corporate governance score) has a mean of 29.073 and a standard deviation of 8.378. While this indicates a moderate to high average governance score, the large standard deviation suggests considerable variation in governance practices across firms. Ownership concentration (OWN) varies significantly, with a mean of 28.10%, a median of 24.89%, and a standard deviation of 13.73.

These statistics provide an overview of the sample's financial, governance, and structural characteristics, laying the groundwork for assessing the relationship between debt, payout policy, and firm value.

5.2. Test of Equality of Means Between Chaebol and Non-Chaebol Firms

According to Table 2, the equality of means evaluation demonstrates significant disparities in ownership concentration (OWN) between Chaebol and non-Chaebol enterprises, with a 23.93-point mean difference. This is corroborated by a highly significant *t*-value (101.85), which indicates that Chaebol enterprises have a much more concentrated ownership structure than non-Chaebol firms. This finding is consistent with the governance characteristics of Chaebols, which are often family-controlled conglomerates. Furthermore, dividend yield (DYD) has a very high *t*-value (8.18), implying a statistically significant difference in dividend payout choices between Chaebol and non-Chaebol companies. SIZE, FCF, and ROE likewise have substantial *t*-values (greater than 4.4), indicating important differences in total assets, liquidity or cash reserves and profitability.

Table 2. Test of equality of means between Chaebol and non-Chaebol firms.

Variable	Total Sample [N = 5022]		Chaebol Sample [N = 1918]		Non-Chaebol Sample [N = 3101]		Firm Type Difference		*t*-Value
	Mean	Std. Dev	Mean	Std. Dev	Mean	Std. Dev	Mean Difference	Standard Error	
TOB.Q	0.689	0.538	0.692	0.527	0.686	0.545	0.005	0.016	0.322
DEBT	0.406	0.203	0.409	0.208	0.405	0.201	0.004	0.006	0.671
DYD	0.012	0.013	0.014	0.013	0.012	0.012	0.003	0	8.179 ***
SIZE	26.242	1.402	26.353	1.42	26.173	1.387	0.18	0.041	4.402 ***
FCF	0.043	0.056	0.047	0.057	0.04	0.055	0.008	0.002	4.896 ***
ROE	0.024	0.101	0.033	0.098	0.019	0.103	0.013	0.003	4.478 ***
GROWTH	0.03	0.004	0.03	0.004	0.03	0.004	0.000	0.000	0.000
TSG	29.073	8.378	29.333	8.306	28.909	8.422	0.423	0.243	1.744 *
OWN	28.095	13.736	42.88	9.209	18.95	5.838	23.93	0.235	101.847 ***

Note: ***, and * indicate statistical significance at the 1%, and 10% levels, respectively.

In contrast, the variations in market value (TOB.Q) and debt financing (DEBT) between the two business types are minor and statistically insignificant, as indicated by the modest mean differences and low *t*-values. This shows that, despite their dissimilar ownership structures, the two business types have similar capital structure policies and market performance.

5.3. Correlation Analysis

Table 3 shows the correlation analysis results. It investigates the linear correlations among the important variables in this study. It provides first glimpses into their relationships and guides later multivariate analyses. Correlation does not imply causation, but it does assist in detecting trends. Multicollinearity is usually a problem when the absolute value of the correlation coefficient between two independent variables surpasses 0.8 or 0.9. The study found a substantial negative correlation between Tobin's Q (TOBQ) and debt (DEBT) ($r = -0.3700$, $p < 0.01$), indicating an inverse relationship between firm value and debt financing.

Dividend yield (DYD) has a negative association with TOBQ ($r = -0.1172$, $p < 0.01$). There is no significant link between firm size (SIZE) and TOBQ ($r = -0.0076$, $p = 0.5920$). However, free cash flow (FCF) is positively correlated with TOBQ ($r = 0.1957$, $p < 0.01$). Ownership concentration (OWN) has a weak negative connection with TOBQ ($r = -0.0269$. $p < 0.10$). Debt (DEBT) is adversely correlated with DYD ($r = -0.2515$, $p < 0.01$) and FCF ($r = -0.1378$, $p < 0.01$), but favorably correlated with SIZE ($r = 0.1364$, $p < 0.01$). DYD shows a positive connection with FCF ($r = 0.2274$, $p < 0.01$) and OWN ($r = 0.0980$, $p < 0.01$).

Table 3. Cross-Correlation Matrix of Variables.

Variable	TOBQ	DEBT	DYD	SIZE	FCF	OWN
TOBQ	1.0000					
DEBT	−0.3700 ***	1.0000				
	0.0000					
DYD	−0.1172 ***	−0.2515 ***	1.0000			
	0.0000	0.0000				
SIZE	−0.0076	0.1364 ***	0.0335 **	1.0000		
	0.5920	0.0000	0.0176			
FCF	0.1957 ***	−0.1378 ***	0.2274 ***	0.1272 ***	1.0000	
	0.0000	0.0000	0.0000	0.0000		
OWN	−0.0269 *	0.0166	0.0980 ***	0.0372 ***	0.0454 ***	1.0000
	0.0563	0.2389	0.0000	0.0083	0.0013	

Note: ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels, respectively.

SIZE shows a small positive association with FCF (r = 0.1272, $p < 0.01$) and OWN (r = 0.0372, $p < 0.01$). Finally, FCF and OWN have a weak positive connection (r = 0.0454, $p < 0.01$). The presented correlation table shows no strong indication of multicollinearity among the variables. This study verifies that the dataset is suitable for further regression modeling.

While Table 3 shows that multicollinearity is not a major concern, we acknowledge the importance of providing a comprehensive assessment of multicollinearity diagnostics. To address this, we have included the results of our variance inflation factor (VIF) analysis in Appendix A (Table A1). The VIF values for all independent variables, such as DEBT (1.106), DYD (1.125), SIZE (1.045), FCF (1.083), and OWN (1.013), which are well below the commonly accepted threshold of 10, indicating no significant multicollinearity issues. Additionally, the low coefficient variance for each variable supports the robustness of the model specifications. It implies that the independent variables (DEBT, DYD, SIZE, and FCF) are not strongly correlated with each other. It suggests that the regression model's coefficient estimates are likely stable and not unduly influenced by multicollinearity. This detailed diagnostic test strengthens the validity of our regression results and provides reassurance regarding the reliability of the estimated coefficients.

5.4. Regression Analysis

Table 4 presents the results of four regression models estimating the relationship between Tobin's Q (as a proxy for firm value) and various financial and governance factors, focusing on debt capital (DEBT), dividend yield (DYD), and their interaction effects in Korean-listed firms.

The first model examines the direct effects of debt, firm size, and free cash flow (FCF) on Tobin's Q. Debt exhibits a highly significant negative relationship with firm value ($\beta = -0.570$, $t = -10.753$), consistent with agency cost theory, where excessive leverage increases financial distress risks. FCF positively impacts Tobin's Q ($\beta = 0.428$, $t = 4.654$), aligning with free cash flow theory, indicating firms with greater liquidity are better positioned to enhance shareholder value.

In the second model, the inclusion of DYD introduces a strong negative coefficient ($\beta = -4.839$, $t = -9.536$). In the context of this study, a highly negative beta for DYD suggests that a higher dividend yield (relative to the market) is being interpreted negatively by investors. This could happen in Korea if dividend increases are perceived as opportunistic signaling by controlling shareholders (common in Chaebols) or if they signal a lack of profitable reinvestment opportunities, thereby reducing firm value.

Table 4. OLS Fixed Effects Results.

Dependent Variable	**Tobin's Q**							
Estimated Specification	**Tobin's Q = f(debt, Size, fcf)**		**Tobin's Q = f (dyd, Size, fcf)**		**Tobin's Q = f (debt, dyd, Chaeboldummy, Size, fcf)**		**Tobin's Q = f (debt, dyd, debt × dyd, debt × Chaeboldummy, dyd × Chaeboldummy, Size, fcf)**	
Estimation Model	**1**		**2**		**3**		**4**	
Independent Variables	**Beta**	**t-Statistics**	**Beta**	**t-Statistics**	**Beta**	**t-Statistics**	**Beta**	**t-Statistics**
INTERCEPT	1.239 ***	8.860	1.073 ***	7.718	1.326 ***	9.578	1.411 ***	10.175
DEBT	−0.570 ***	−10.753			−0.649 ***	−12.272	−0.832 ***	−13.580
DYD			−4.839 ***	−9.536	−5.591 ***	−11.105	−12.582 ***	−11.153
DEBT × DYD							16.229 ***	7.245
CHAEBOLDUMMY					−0.025 *	−1.747	−0.101 ***	−2.603
DEBT × CHAEBOLDUMMY							0.154 **	2.135
DYD × CHAEBOLDUMMY							0.766 *	1.855
SIZE	−0.013 ***	−2.430	−0.013 ***	−2.499	−0.012 **	−2.315	−0.012 **	−2.285
FCF	0.428 ***	4.654	0.562 ***	6.088	0.506 ***	5.563	0.515 ***	5.691
Year Fixed Effect	Yes		Yes		Yes		Yes	
Firm Fixed Effect	Yes		Yes		Yes		Yes	
R^2	0.771		0.770		0.777		0.78	
Adj. R^2	0.742		0.741		0.749		0.752	
F-statistics	26.438 ***		26.253 ***		27.246 ***		27.547 ***	
Prob(F-stat.)	0.000		0.000		0.000		0.000	
Hausman_Chi^2	29.781 ***		60.685 ***		82.379 ***		86.766 ***	

Note: Beta corresponds to the coefficients. Numbers inside the parentheses are the t-statistics. ***, **, and * show the statistical significance at the 1%, 5% and 10% levels, respectively. D.W.~2.01.

Model 3 incorporates a Chaebol dummy variable, identifying governance structures within Korea's conglomerates. Chaebol-affiliated firms show a weakly significant negative association with firm value (β = −0.025, t = −1.747). DYD's impact remains strongly negative (β = −5.591, t = −11.105), while debt's negative effect intensifies (β = −0.649, t = −12.272).

Model 4 introduces interaction terms between debt, DYD, and the Chaebol dummy. Interestingly, the interaction between debt and DYD is strongly positive (β = 16.229, t = 7.245), suggesting that the combined effect of leverage and elevated dividend yields offsets the negative impacts of each variable individually. Moreover, the interaction of debt and Chaebol affiliation (β = 0.154, t = 2.135) and DYD with Chaebol (β = 0.766, t = 1.855) both indicate that Chaebol governance can moderate the adverse effects of DYD and leverage.

Across all models, size consistently shows a small but statistically significant negative beta (e.g., Model 1: β = −0.013, t = −2.430; Model 4: β = −0.012, t = −2.285). This suggests that holding other factors constant, larger firms in the sample are associated with slightly lower Tobin's Q. This could reflect inefficiencies or the diminished growth opportunities that often accompany large firm size.

In the model performance, the regressions show strong explanatory power, as evidenced by the R^2 values ranging from 0.771 (Model 1) to 0.78 (Model 4), indicating that the models explain approximately 77% to 78% of the variation in Tobin's Q. Adjusted R^2 values, which account for the number of predictors, remain robust across specifications, ranging from 0.742 to 0.752, stressing the models' reliability in controlling for potential overfitting.

The F-statistics for all models are statistically significant at the 1% level ($p < 0.01$), confirming the overall validity of the regressions. Additionally, the Durbin–Watson statistic (~2.01 across all models) suggests no significant autocorrelation in the residuals, enhancing the credibility of the findings.

Hausman test statistics further validate the use of fixed effects models, with Chi^2 values ranging from 29.781 (Model 1) to 86.766 (Model 4), all significant at the 1% level, indicating that fixed effects specifications are more appropriate than random effects. The inclusion of firm and year-fixed effects provides additional robustness, mitigating concerns about unobserved heterogeneity and temporal variations.

5.5. Discussion

The regression results presented in Table 4 reveal several critical insights into the relationship between debt capital, dividend policy, and firm value in the context of Korean-listed firms. These findings are significant but also raise key questions that warrant closer examination.

The beta coefficient for DEBT (−0.832 in Model 4) is both highly significant and notably large, supporting the first study hypothesis, H1. The high negative beta coefficient for DEBT reflects a significant decline in firm value with increased leverage. This aligns with Ross et al. (2018) and Harbula (2000), who note that while debt can curb free cash flow agency costs, excessive leverage heightens default risk and marginal borrowing costs (Al Amosh et al., 2024). Jensen and Meckling (1976) also underlines the role of debt as a governance tool to discipline managers, but when overused, it exacerbates financial fragility. The result shows that in Korea, where firms may face unique financial constraints and governance challenges, investor concerns about debt amplify its adverse impact on firm value. For firms, this result suggests that excessive reliance on debt financing can erode shareholder wealth, potentially due to increased financial distress costs or restrictive covenants imposed by creditors. For investors, this emphasizes the importance of monitoring firms' leverage ratios as a key determinant of value. In Korea's Chaebol-dominated

market, the unique governance structures and internal capital markets may exacerbate these effects, as Chaebols often have higher leverage compared to non-Chaebol firms.

The highly negative beta for DYD (−12.582 in Model 4) suggests that an increase in dividend yield is associated with a substantial decrease in firm value, an unexpected finding that deviates from the prevailing literature. Although it supports the second hypothesis (H2) of this study, it remains a major point of interest. Despite rigorous diagnostic tests, including winsorization to control for outliers and firm-clustered standard errors ensuring high accuracy and reliability, this extreme value persists. One potential explanation for the extreme value may result from the structural characteristics of Korean firms, where low dividend payouts are common due to reinvestment priorities, especially among Chaebols. This behavior reflects a preference for retaining earnings to fund growth initiatives rather than distributing them as dividends, a strategy that may negatively impact value metrics like Tobin's Q. While Mitton (2004) observes that dividends often act as a signaling tool in markets with weak investor protections to reduce agency conflicts, the extreme negativity here implies a potential overreaction from investors. This could occur in the Korean market due to concerns over excessive dividend payouts draining cash reserves, thereby limiting future growth opportunities.

Moreover, Jensen and Meckling (1976), Jensen (1986) and La Porta et al. (2000) highlight dividends as a mechanism to limit managerial expropriation, but when dividend policies are overly aggressive, they can signal a lack of profitable reinvestment opportunities, leading to diminished firm value. In Korea's unique context, where firms often operate under concentrated ownership and face scrutiny for capital allocation, this extreme sensitivity may reflect investor distrust of dividend policies perceived as opportunistic or unsustainable. The result underlines the importance of contextualizing dividend strategies within broader governance and market dynamics.

Additionally, the "Korean discount" phenomenon provides further context. Korean stocks are often undervalued relative to global peers due to historically low shareholder returns, stemming from insufficient dividends and sub-optimal corporate governance practices. The extreme DYD coefficient could be capturing this systemic market inefficiency, indicating that investors may penalize firms with unusual dividend yields more severely in Korea than in other markets.

The positive coefficient for DEBT × DYD (16.229 in Model 4) suggests a synergistic effect between leverage and dividend yield, particularly significant in the Chaebol-dominated Korean market. This finding explains the complementary role of these financial policies in shaping firm value, supporting the third hypothesis (H3). Chaebols, known for their entrenched ownership structures and reliance on debt, can use dividends to signal financial stability and mitigate investor concerns about excessive leverage. This aligns with agency theory (Jensen, 1986) as debt constrains free cash flow while dividends reduce managerial discretion, together acting as complementary mechanisms to address agency conflicts. The dual emphasis on reinvestment and shareholder appeasement creates a complex dynamic that likely amplifies the observed synergy (Diedrich et al., 2022; Seth & Mahenthiran, 2022). In the context of Korean investors' historical skepticism due to governance issues and the "Korean discount", this interaction reflects a dual commitment to financial discipline and shareholder value. By signaling alignment with global governance norms, Chaebols can counteract the negative perceptions tied to their ownership structures. These findings are consistent with Mitton (2004), who emphasizes that dividends in environments with weak investor protections enhance trust, while debt enforces operational discipline, making their combination particularly effective in the Korean market.

The negative coefficient for CHAEBOLDUMMY (−0.101 in Model 4) suggests that Chaebol affiliation slightly reduces firm value, supporting the fourth study hypothesis

(H4). It is important to clarify that the construction of CHAEBOLDUMMY in this study is intended to capture the ownership structure of Chaebols rather than to investigate their heterogeneity. This result reflects the systematic characteristics of Chaebol-affiliated firms, such as their complex ownership structures, cross-shareholding practices, and governance issues, which may contribute to a lower value. The aggregation of Chaebols into a single category is consistent with the study's objective of examining ownership effects at a broad level rather than exploring firm-specific differences within the Chaebol group. While future studies could consider disaggregating Chaebols for more granular insights, the current approach effectively aligns with the scope of this research.

The positive coefficients for DEBT × CHAEBOLDUMMY (0.154) and DYD × CHAEBOLDUMMY (0.766) indicate that Chaebol affiliation moderates the effects of both leverage and dividend policy. These results, consistent with the fifth (H5) and sixth (H6) hypotheses of the study, suggest that Chaebol firms' unique governance structures and access to internal capital markets influence the value effects of financial policies. For instance, Chaebols' preference for reinvestment over large payouts may partially offset the negative impact of low DYD, while their ability to leverage internal resources could mitigate the risks associated with high debt levels. These dynamics further suggest the need to consider institutional and organizational contexts when interpreting financial policy outcomes.

The control variables, SIZE and FCF, provide the critical context for the analysis. The negative and significant relationship between SIZE and Tobin's Q across all models (e.g., Model 4: $\beta = -0.012$, $t = -2.285$) suggests that larger firms may face value discounts, likely due to reduced growth opportunities or operational inefficiencies. In contrast, FCF shows a consistently positive and significant association with Tobin's Q (e.g., Model 4: $\beta = 0.515$, $t = 5.691$), indicating that firms with higher financial flexibility are better positioned to enhance value through investment or shareholder distributions. The inclusion of these controls ensures that the observed effects of leverage, dividend yield, and governance mechanisms are isolated and robust.

Coming to the broader theoretical and practical imports of these findings, Table 4 contributes to the literature on corporate governance and financial signaling by highlighting the interdependencies between debt and dividend policy in determining firm value. The values observed for dividend yield (DYD) and its interaction with debt ratio (DEBT) raise important questions about the traditional value models in markets with unique institutional characteristics, such as Korea. These results also emphasize the need for firms to strike a balance between reinvestment and shareholder returns to optimize firm value.

Improving dividend policies, enhancing transparency, and strengthening corporate governance practices could help align Korean firms more closely with global standards, thereby reducing value disparities. These results could guide policymakers and regulators in addressing the Korean discount.

5.6. Robustness Test

In our investigation, relying solely on an OLS fixed-effects model to control for unobserved heterogeneity across corporations and time does not adequately address the potential endogeneity concerns highlighted by Chen et al. (2005), Chen and Steiner (1999), and Cho (1998). Dividend policy, ownership structure, and capital structure are likely to be simultaneously determined, leading to interdependence that generates reverse causality and simultaneity bias. These issues render OLS estimates potentially biased and inconsistent, necessitating more robust econometric methods to ensure reliable interpretations.

To address these challenges, we adopt two-stage least squares (2SLS) and the generalized method of moments (GMM). The 2SLS leverages instrumental variables to isolate exogenous variation in potentially endogenous regressors, thus reducing simultaneity bias.

Meanwhile, the GMM approach exploits moment conditions to adjust for endogeneity while accounting for heteroskedasticity and the dynamic structure of panel data, making it particularly well-suited for our dataset.

For this analysis, the total corporate governance score, in addition to the lagged regressors, profitability (ROE), and economic growth (GNP), are chosen as instrumental variables for their theoretical and empirical relevance. Prior studies (Chen et al., 2005; Chen & Steiner, 1999; Cho, 1998) suggest that governance structures influence dividend policy and leverage decisions through managerial discipline and agency cost mitigation, but their direct effect on firm value is mediated through these financial strategies. This satisfies the exogeneity criterion, where the instrument is correlated with the endogenous variable (e.g., dividend policy) but not directly with the dependent variable (firm value). Additionally, governance scores provide sufficient variation across firms and time, ensuring their relevance for 2SLS estimation.

To validate the reliability of our chosen instruments, we conduct the relevant tests. F-statistics confirm that the instruments are strongly correlated with the endogenous variables. A rule of thumb is an F-statistic above 10 to avoid weak instrument bias. As for the exogeneity test, we perform Sargan tests (in 2SLS) to evaluate whether the instruments satisfy the exclusion restriction, i.e., they are uncorrelated with the error term in the structural equation and Hansen J-tests (in GMM). Dividend policy and firm value are prone to exhibit bidirectional causality. Dividend payouts can influence firm value via signaling effects or reduced agency costs, while higher firm value enhances the ability to pay dividends. These complexities necessitate advanced empirical models like 2SLS and dynamic GMM, which disentangle causality and ensure that the estimated effects reflect true relationships rather than reverse causality. By implementing these econometric strategies and rigorously validating the chosen instruments, this study ensures the robustness and reliability of the findings while addressing potential endogeneity concerns.

According to Table 5, the 2SLS estimations, addressing endogeneity concerns, generally confirm the OLS findings but with larger magnitudes. Debt ratio (DEBT) shows a stronger negative impact on Tobin's Q ($\beta = -1.386$, $t = -17.570$), reinforcing concerns about financial distress under high leverage. Dividend yield (DYD) also demonstrates a sharper negative effect ($\beta = -24.543$, $t = -10.601$), emphasizing the perceived trade-off with growth opportunities. However, the positive effect of the interaction DEBT $\times$ DYD ($\beta = 11.989$, $t = 2.399$) persists, albeit with reduced significance, supporting the argument of strategic synergy. CHAEBOLDUMMY has a more pronounced negative impact on firm value ($\beta = -0.178$, $t = -2.857$), while the interaction terms DEBT $\times$ CHAEBOLDUMMY ($\beta = 0.299$, $t = 2.743$) and DYD $\times$ CHAEBOLDUMMY ($\beta = 5.927$, $t = 2.663$) exhibit stronger positive effects, reflecting effective financial strategies in Chaebol firms. Control variables maintain consistent effects: firm size (SIZE) remains slightly negative ($\beta = -0.012$, $t = -1.757$), while free cash flow (FCF) shows a significantly positive impact ($\beta = 4.912$, $t = 12.322$).

Under the model diagnostics, the 2SLS model, addressing endogeneity concerns, has lower, predictive power compared to the OLS fixed effects model, with R^2 (0.127, Adj. $R^2 = 0.125$) due to its focus on exogenous variation. Durbin–Watson statistics indicate robustness against autocorrelation.

Table 5. 2SLS Results.

Dependent Variable	**TOBINS Q**	
TOB.Q = f (debt, dyd, debt × dyd, debt × Chaeboldummy, dyd × Chaeboldummy, Size, fcf)		
	2-SLS	
Independent Variables	Beta	t-statistics
INTERCEPT	1.620 ***	8.012
DEBT	−1.386 ***	−17.57
DYD	−24.543 ***	−10.601
DEBT × DYD	11.989 **	2.399
CHAEBOLDUMMY	−0.178 ***	−2.857
DEBT × CHAEBOLDUMMY	0.299 ***	2.743
DYD × CHAEBOLDUMMY	5.927 ***	2.663
SIZE	−0.012 *	−1.757
FCF	4.912 ***	12.322
Year Fixed Effect		
Firm Fixed Effect		
R^2	0.127	
Adj. R^2	0.125	
F-statistics	116.287 ***	
Prob(F-stat.)	0.000	
Hausman_Chi^2		

Note: Beta corresponds to the coefficients. Numbers inside the parentheses are the t-statistics. ***, **, and * show the statistical significance at the 1%, 5% and 10% levels, respectively. D.W.~2.01.

5.7. Additional Robustness Test

The Generalized Method of Moments (GMM) estimation results in Table 6 support the robustness of the results from earlier estimations using the OLS and 2SLS models. In addition, it reveals dynamic linkages in firm value. The positive and significant coefficient of the lagged Tobin's Q (0.4388, $p < 0.01$) emphasizes the persistence in firm valuation, demonstrating the dynamic nature of Tobin's Q and confirming that previous market performances of the firm significantly impact the present valuation patterns.

Table 6. Results of the GMM estimation.

Variable	**TOBINS Q**			
	Coefficient	**t-Statistic**	**Std. Error**	**Prob.**
TOBINS Q_(−1)	0.4838 ***	8.7108	0.0504	0.0000
DEBT	−1.9908 ***	−4.0370	0.4931	0.0001
DYD	−31.9900 ***	−4.2027	7.6118	0.0000
DEBT × DYD	31.7996 **	2.0640	15.4070	0.0391
CHAEBOLDUMMY	−0.3667 *	−1.7804	0.2059	0.0751
DEBT × CHAE-BOLDUMMY	0.7222 **	2.0312	0.3555	0.0423
DYD × CHAE-BOLDUMMY	6.3376 ***	2.4724	5.4058	0.0024
SIZE	−0.0021 *	−1.8220	0.0131	0.0826
FCF	0.1760 ***	2.8244	0.2135	0.0041
Cross-section fixed (first differences)	Yes			
S.E. of regression	0.3571			
J-statistic	87.0255			
Prob(J-statistic)	0.1078			
Test order	m-Statistic	rho	SE(rho)	Prob.
AR(1)	−8.6024	−181.6561	21.1170	0.0000
AR(2)	−0.4189	−4.1732	9.9614	0.6753

Note: Beta corresponds to the coefficients. Numbers inside the parentheses are the t-statistics. ***, **, and * show the statistical significance at the 1%, 5% and 10% levels, respectively.

In the main effects, the negative and highly significant coefficient of DEBT (−1.9908, $p < 0.01$) reinforces H1, supporting the hypothesis that higher debt levels lower firm value due to excessive financial distress and weakened operational flexibility.

Similarly, the strong negative impact of dividend yield (−31.9900, $p < 0.01$) confirms H2, reflecting market predisposition in Korea, where high dividend payouts are interpreted as signals of constrained growth opportunities.

Based on the interaction effects for DEBT × DYD, the positive and significant coefficient (31.7996, $p < 0.05$) provides robust support for H3, indicating that the adverse effects of debt and dividends are mitigated when these policies are combined. This interplay suggests that firms utilizing both strategies may better signal financial stability and governance efficacy, aligning with the complementary signaling hypothesis. For DEBT × CHAEBOLDUMMY, the positive coefficient (0.7222, $p < 0.05$) corroborates H5, suggesting that Chaebol-affiliated firms derive valuation benefits from utilizing debt, potentially due to enhanced monitoring mechanisms and implicit guarantees within the conglomerate structure. In terms of DYD × CHAEBOLDUMMY, the significant positive coefficient (6.3376, $p < 0.01$) supports H6, highlighting that dividend payouts in Chaebol firms are perceived as value-enhancing mechanisms, likely reflecting investor confidence in Chaebol governance practices.

As for the control variables, the marginally significant negative effect of firm size (−0.0021, $p = 0.08$) suggests that larger firms may face diminishing returns or heightened scrutiny from shareholders, consistent with scale inefficiencies. On the contrary, the positive and highly significant coefficient of free cash flow (0.1760, $p < 0.01$) strengthens its role as a critical determinant of firm value, supporting the hypothesis that liquidity enhances operational flexibility and investment potential.

In the model performance, the diagnostics show robustness in the GMM model estimations. The validity of the instrumental variables is confirmed by the J-statistic (87.0255, $p = 0.1078$). The AR(2) test confirms that there is no second-order serial correlation ($p = 0.6753$), guaranteeing the reliability of the dynamic panel data estimation.

The results confirm the hypothesized associations, especially the negative effects of debt and dividends on firm value (H1, H2), while underlining the moderating function of their interaction terms (H3). Additionally, Chaebol affiliation influences the dynamics of firm valuation significantly, with interactions in terms of Chaebol ownership, debt, and dividend policies positively influencing firm value (H5, H6). These trends amplify how effective governance practices and strategic financial policies might counteract the negative valuation implications of the Korean discount.

6. Conclusions

This study investigated the interdependent associations between debt capital, dividend policy, Chaebol affiliation, and firm value within the environment of Korean corporations. Grounded in agency theory and corporate governance frameworks, this research furnished empirical evidence on how these indicators individually and interactively impact firm value. This signifies an empirically evidence-based effort, aimed at tackling the haunting "Korean discount" phenomenon. The results reveal that while debt ratio and dividend policy negatively impact firm value independently, their interaction offsets these effects, signaling a synergistic role in mitigating agency problems. In addition, Chaebol affiliation magnifies the positive effects of these interactions, showcasing the unique governance mechanisms that characterize the affected conglomerate structures.

This research extends agency theory by highlighting how Chaebol ownership moderates agency conflicts tied to debt and dividend decisions, offering fresh insights into the interplay of corporate governance and capital structure. It emphasizes the complementary

roles of debt and dividends in reducing agency costs, with Chaebols balancing entrenchment risks against value-enhancing capacities like implicit guarantees and resource pooling. For Chaebols, leveraging governance strengths can mitigate the Korean discount, while non-chaebol firms should prioritize transparency to attract investors.

For policymakers, the study recommends promoting balanced debt strategies to signal governance quality, strengthening shareholder rights, and aligning dividend payouts with growth opportunities to address systemic inefficiencies and the valuation gap. Investors are encouraged to evaluate financial strategies and governance quality to make informed decisions and advocate for reforms.

Despite its contributions, this study has limitations: Tobin's Q may not fully capture firm value, the Chaebol focus limits generalizability to other ownership structures, and reliance on Korean data may obscure broader governance dynamics. Future research should explore alternative firm value metrics, diverse ownership models, and cross-country analyses to expand these findings.

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Appendix A

Table A1. Multicollinearity Test.

Variable	Coefficient Variance	Centered VIF
DEBT	1.201×10^{-3}	1.106
DYD	3.221×10^{-1}	1.125
SIZE	2.39×10^{-5}	1.045
FCF	1.556×10^{-2}	1.083
OWN	2.41×10^{-7}	1.013

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