Pension fund monitoring and corporate debt policy: Evidence from the Korean market

Abstract: We investigate whether the Korean National Pension Service, a corporate watchdog and major long-term investor in South Korea, positively affects corporate financial policy. The Korean National Pension Service is less likely to influence corporate financial policy even among firms with high uncertainty and information opacity, which increases the importance of large shareholders' monitoring role. Additionally, ownership by the Korean National Pension Service has statistically insignificant effects on firms' performance and financial soundness.

Keywords: Blockholding, Institutional monitoring, Korean market, Korean National Pension Service, Target capital structure

JEL codes: G32; G34

1. Introduction

Institutional investors and corporate financial policy have long been studied. Institutional ownership negatively affects firms' debt financing through institutional investors' monitoring role (e.g., Bathala, Moon, and Rao, 1994). Institutional investors exercise their voting rights, maximize shareholders' value, and mitigate managers' opportunistic behaviors (Brickley, Lease, and Smith, 1988; Weisbach, 1988; Hartzell and Starks, 2003; Yermack, 2004). However, institutional investors' monitoring effect may depend on their investment horizons (Bushee, 1998). Bushee (1998) suggests that investors with partial or temporary holdings have lower monitoring effects than long-term investors or investors with significant shares do. Chen, Harford, and Li (2007) and Chung, Liu, Wang, and Zykaj (2015) find that institutional blockholders with at least 5% stakes in their investee firms positively affect corporate investment decisions and overall financial soundness.

A few recent studies shed light on institutional investors' monitoring activity in different countries. For example, Hayat, Yu, Wang, and Jebran (2018) investigate the effects of institutional ownership on firms' capital structures based on a sample of public firms in the U.S. and China. They find that institutional ownership affects debt use positively in the U.S. but negatively in China. They suggest that the development economy and institutional investors both play strong roles. Building on this literature, this study aims to provide insights into the role of institutional investors' monitoring in optimizing corporate financial policy using the shareholdings of the Korean National Pension Service (KNPS).

The shareholdings of institutional investors, including pension funds, in Northeast Asian financial markets, such as those in South Korea and China, have steadily grown along with the economy, and increasing indirect investments by institutional investors are expected to further increase institutional ownership. In immature Asian financial markets, where information asymmetry among stakeholders and opportunistic behavior by managers are more common than in advanced financial markets, the monitoring function that institutional investors provide as their shareholdings increase, along with improvements in corporate governance structures and firm value, is considered an important steppingstone in becoming an advanced financial market. Moreover, in South Korea, institutional investors have been required to actively exercise their voting rights to protect shareholders' rights. Specifically, as the concept of responsible investment, which values shareholder activities, has developed, a draft of the stewardship code, a standard that urges institutional investors to take responsibility as trustees,

was finalized and went into effect at the end of 2016.

Although many studies report that institutional investors, including pension funds and long-term institutional investors, have positive effects on optimal leverage, only a few studies have examined the KNPS's direct and indirect influences on its investee firms. Thus, this study empirically tests whether the KNPS, as a major shareholder and corporate watchdog, affects firms' unique financial characteristics that may have continuing effects on firm value. In particular, we focus on the impact of KNPS blockholdings on its investee firms' capital structures, which are important characteristics related to firms' financial policies. Based on previous studies of institutional investors' monitoring role and firms' optimal leverage, we expect that a capital structure that deviates from the optimal structure reduces firm value and that, under KNPS monitoring, the extent to which a firm's capital structure diverges from the optimal one is small. Specifically, we estimate the degree of suboptimal leverage relative to the optimal capital structure and examine the effect of the KNPS's monitoring role granted by shareholdings of at least 5% on the degree of suboptimal leverage.

This study's main findings are as follows. First, we analyze 2,201 firms in which the KNPS has at least a 5% stake from 2009 to 2017 and find that KNPS ownership has no effect on its investee firms' abilities to maintain optimal capital structures. We find no effect even though KNPS blockholdings and the number of investee firms steadily increase over the period. Furthermore, we consider firm-specific characteristics, such as the dominance of the founding family, information opacity, and high uncertainty. Although these firms require stronger monitoring to mitigate insiders' value-decreasing activities, the KNPS does not significantly reduce suboptimal leverage. Additionally, we measure the impact of the relationship between KNPS blockholdings of 5% or more and firms' capital structures on firms' performance and financial soundness. We mostly find statistically insignificant results. The KNPS does have a partially positive effect on financial efficiency, but it does not significantly affect overall financial soundness or any other sub-categories of performance. To check whether a few firms dominate the overall empirical results, we further examine the effect of KNPS blockholdings on suboptimal leverage. However, we find that firms that highly deviate from their optimal capital structures do not drive the main results of the study, nor do firms in which the KNPS has a 5% or greater stake. Collectively, the KNPS does not play a monitoring role in corporate financial policy.

This study contributes to the literature in several ways. First, it sheds light on previous

studies of capital structures and agency issues regarding the development of economies and financial markets. It provides empirical evidence that the KNPS does not have a positive effect on corporate capital policy even though its shareholdings in the Korean capital market have increased. The KNPS is supposed to act as a long-term investor that maximizes shareholder values by taking strong actions, as the California Public Employees' Retirement System does. This role is especially important in Korea because a major reason for Korea's financial crisis in 1998 was the lack of corporate governance and transparency. Second, this study utilizes a unique setting to study the relationship between institutional investors and corporate debt policy. We empirically test whether the largest institutional investor in the Korean capital market plays a monitoring role in the chaebol-dominant economy. With this specification, many studies using Korean data report mixed evidence. Some find results that are consistent with the theories and empirical results based on U.S. data, whereas others find results that are not consistent. This study provides further evidence that general theories and results from other settings are not relevant in the Korean market. Lastly, our findings generally contribute to the literature providing evidence of ineffective and inactive institutional monitoring. For example, Smith (1996) and Del Guercio and Hawkins (1999) show that active institutional monitoring may not affect a firm's performance. Additionally, Coffee (1991) and Bhide (1994) find that the costs of active monitoring may be larger than the benefits. Because increased market liquidity allows institutional investors to trade their shares at low cost, it is often easier for investors to sell shares when they are dissatisfied with a firm's management. Parrino, Sias, and Starks (2003) observe that institutional ownership declines more significantly in the year before a forced CEO turnover than in the year before a voluntary CEO turnover. This finding also suggests that institutional investors may simply sell their shares when they are dissatisfied with management if the cost of monitoring is higher than the benefits.

2. Previous studies

2.1 Institutional investors' external monitoring effect

As institutional investors' presence in financial markets has grown significantly, their monitoring role has been frequently studied. Institutional investors are well-informed, large, and strongly motivated by performance. Brickley et al. (1988) and Barclay and Holderness (1989) report that institutional investors exercise their voting rights on boardroom agendas to

actively maximize shareholder value. A large body of literature provides evidence that institutional investors improve firm performance, risk-taking behavior, payouts, compensation, and accounting transparency (Grossman and Hart, 1980; Chung, Firth, and Kim, 2002; Hartzell and Starks, 2003; Grinstein and Michaely, 2005; Ferreira, Massa, and Matos, 2010; Chan, Lin, Chang, and Liao, 2013). In addition, a few studies investigate the relationship between ownership by institutional investors and corporate debt ratios. Bathala et al. (1994) find that institutional ownership has a negative marginal effect on debt financing and concludes that institutional investors serve as effective monitoring agents and help in mitigating agency problems. In a recent study, Chung, Liu, and Wang (2018) suggest that aggregated institutional investors' ownership negatively impacts the deviation from the optimal leverage target through these investors' monitoring activity. They also show that these reductions in the leverage deviation lead to better firm performance in the future.

In contrast, other studies report that institutional investors may not be able to effectively monitor and surveil managers. For example, Agrawal and Knoeber (1996) report that firm value, measured by Tobin's Q, is not significantly high even when institutional ownership is high. Black (1998) also argues that institutional investors do not effectively enhance their investee firms' performance by actively exercising their voting rights. Graves and Waddock (1990), who analyze the association between institutional investors and R&D expenses, claim that managers are incentivized to manipulate earnings reports by reducing R&D expenses to avoid earnings disappointments, which can cause temporary corporate stock mispricing or massive stock sales by institutional investors. In a study of U.S. firms, Matsumoto (2002) reports that institutional investors do not effectively control managers' accounting earnings management. Moreover, Hayat et al. (2018) show that the effect of institutional investors on firms' capital structures may differ depending on the economy's development level. They compare the effects of institutional ownership using data from the U.S. and China. They find a positive relationship between institutional ownership and debt in the U.S. and a negative relationship in China.

Previous studies report that monitoring effects may differ across institutional investors. We argue that these differing results mainly arise because previous studies use overall institutional ownership data. Recent studies are starting to focus on the percentage of shares required for institutional investors to truly influence a firm to better measure institutional ownership's monitoring effect. Chen et al. (2007) and Chung et al. (2015) find that institutional blockholders with at least 5% stakes in investee firms positively affect corporate investment decisions and

overall financial soundness. Specifically, Liu, Chung, Sul, and Wang (2018) and Chung, Cho, Ryu, and Ryu (2019) show that South Korean institutional blockholders faithfully monitor their investee firms in the domestic market. Park and Lee (2006) argue that foreign investors with at least 5% stakes improve governance structures. Eom (2012) finds positive excess returns for all individuals, firms, and institutional investors who report large equity investments under the 5% rule, suggesting that large investors in South Korea provide efficient monitoring and supervision. Kim and Lee (2016) show that larger KNPS blockholdings are associated with greater accounting transparency owing to limited excessive earnings management. Thus, our empirical analysis focuses on firms in which the KNPS owns at least a 5% stake.

2.2 Capital structure

Following Modigliani and Miller's (1958) study proposing the foundations of capital structure, many studies have suggested that an optimal capital structure that maximizes net utility may exist (Modigliani and Miller, 1963; Jensen and Meckling, 1976; Myers, 1977; Stulz, 1990). In practice, about 81% of firms have a target debt ratio and consider that target ratio when they raise debt (Graham and Harvey, 2001). Additionally, firms change their capital structures when a temporary event causes suboptimal leverage (Harford, Klasa, and Walcott, 2009; Uysal, 2011; Denis and McKeon, 2012). However, capital structure adjustments may depend on various other corporate decisions, such as future investment opportunities, realized cash flows, capital market conditions, financial flexibility, and adjustment costs (Leary and Roberts, 2005; Strebulaev, 2007; DeAngelo, DeAngelo, and Whited, 2011).

Another strand of literature sheds light on information asymmetry between insiders and outsiders. Owing to the cost of asymmetric information, firms have a selection order for funding (Myers and Majluf, 1984; Shyam-Sunder and Myers, 1999). According to pecking order theory, firms' optimal capital structures do not exist separately but rather are the cumulative result of selected capital procurement policies that depend on the amount of internal funds and the characteristics of the primary market when investment opportunities arise. This strand of the literature is important for understanding corporate capital structures. However, this study focuses on institutional investors using their monitoring role to ensure optimal leverage.

Many studies investigate capital structures using Korean data and provide supportive evidence for both the trade-off and pecking order theories. Gwak (2004) analyzes the periods

before and after the financial crisis and shows that Korean firms usually determine their capital structures according to pecking order theory. However, Ku, Eom, and Jeon (2008) report that although the explanatory variables representing both theories are statistically significant, trade-off theory is generally more supported. Kim and Park (2005) empirically analyze pecking order theory using firms' degrees of fund shortage and suggest that pecking order theory is not sufficiently supported to deny the influence of variables that explain trade-off theory. Yoon (2005) concludes that it is difficult to determine which theory is more prominent because both theories are partially valid. Kim (2011) examines the validity of trade-off theory, pecking order theory, and the market timing hypothesis, focusing on manufacturing firms listed on the Korea Exchange from 2000 to 2010. He concludes that the market timing hypothesis has high explanatory power because cumulative factors, such as the market-to-book ratio and stock returns, significantly impact capital structures.

Although many prior empirical studies investigate corporate capital structures in Korea, they offer mixed evidence. A few recent studies reveal that the KNPS and foreign institutional investors have significant monitoring effects on firms' performance, governance structures, and accounting transparency (Park and Lee, 2006; Eom, 2012; Kim and Lee, 2016; Liu et al., 2018; Chung et al., 2019). However, we believe that no previous studies have considered the KNPS's shareholdings and its monitoring effect on optimal corporate leverage. Thus, we hypothesize that shareholders' influence on corporate debt policies can provide evidence of target capital structures. This study not only provides additional empirical evidence on institutional investors' monitoring role but also sheds light on the effectiveness of Korea's largest institutional investor.

3. Sample and methodology

The sample for this study covers all Korean public firms listed on the Korea Composite Stock Price Index and the KOSDAQ between 2009 and 2017, after the most recent financial crisis. Following Chen et al. (2007), we identify KNPS blockholdings as domestic firms for which the KNPS holds 5% or more of shares. We use the FnOwnership database, which contains data on Korean public firms' ownership provided by FnGuide. We acquire financial data from Data Guide Pro and TS 2000, which are provided by FnGuide and the Korea Listed Companies Association, respectively. We exclude observations with missing data and

winsorize all variables at the 1% level to mitigate the potential effect of extreme values. The final sample for this study contains 2,201 firm-year observations.

Following Uysal (2011) and Denis and McKeon (2012), we estimate the optimal debt ratio in two ways to examine whether institutional ownership affects firms' corporate financial policies. We define KNPS blockholdings as firms in which the KNPS holds at least a 5% stake. Blockholdings serve as a proxy for institutional investors' significant shareholdings in the Korean market. Like prior studies that estimate the optimal capital ratio and conduct empirical tests, such as those of Frank and Goyal (2009), Harford et al. (2009), Uysal (2011), and Denis and McKeon (2012), we start by estimating the following model:

$$Leverage_{i,t} = \alpha + \beta_1 M/B_{i,t-1} + \beta_2 EBITD_{i,t-1} + \beta_3 R\&D_{i,t-1} + \beta_4 R\&D\ D_{i,t-1} + \beta_5 PPE_{i,t-1} + \beta_6 SE_{i,t-1} + \beta_7 SIZE\ S_{i,t-1} + \beta_8 Stock\ Return_{i,t-1} + \beta_9 Leverage_{i,t-1} + \beta_{10} Industry\ D_i + \varepsilon_{i,t} \quad (1)$$

In this model, *M/B* denotes the market value of firm *i* relative to its book value at time *t*. *EBITD* is earnings before interest, taxes, and depreciation, and represents profitability. *R&D* is the ratio of R&D expenses to sales. *R&D D* is a dummy variable equal to one if a company has no R&D expenses and zero otherwise. *PPE* is net property, plant, and equipment scaled by total assets. *SE* is the ratio of selling expenses to sales. *SIZE S* is the natural log of sales. *Stock Return* is the annual stock price return. *Leverage* is the book value of debt divided by the market value of assets. We use *Industry_D* to control for the industrial characteristics of the debt ratio. Following previous studies, we estimate the optimal capital ratio using these variables. We conduct a cross-sectional analysis by year using the Tobit model, which can explain censored dependent variables, because the debt ratio is necessarily between zero and one.

Our second model for estimating the optimal capital ratio is that of Frank and Goyal (2009) and Denis and McKeon (2012). Frank and Goyal (2009) propose six of the most consistent, reliable variables for determining the debt ratio on a market value basis, and Denis and McKeon (2012) use the same variables in their analysis. Following Denis and McKeon (2012), we exclude inflation, which is the same for all of the companies in our dataset, but we use the other five variables. We estimate the optimal debt ratio again using the second model with a Tobit regression:

$$Leverage_{i,t} = \alpha + \beta_1 [Med\ Ind\ ML]_{i,t-1} + \beta_2 [M/B]_{i,t-1} + \beta_3 [FA/TA]_{i,t-1} + \beta_4 [OI/TA]_{i,t-1} + \beta_5 [In(TA)]_{i,t-1} + \varepsilon_{i,t} \quad (2)$$

In this model, *Med Ind ML* is the median industry leverage for firm *i* at time *t*. *M/B* is the market-to-book ratio. *FA/TA* is the ratio of fixed assets to total assets. *OI/TA* is the ratio of operating income to total assets, and *TA* is total assets.

Median industry leverage (*Med Ind ML*) measures the different characteristics across industries. Firms in industries with high standard deviations and median values of the debt ratio are expected to have high debt ratios. The market-to-book ratio (*M/B*) is a growth measure. Trade-off theory hypothesizes that growth lowers the debt ratio by increasing financial distress costs, reducing free cash flow problems, and exacerbating the agency costs of debt. However, pecking order theory predicts that growth opportunities for companies with no profitability changes may increase their debt ratios by raising borrowing. For the ratio of fixed assets to total assets (*FA/TA*), under trade-off theory, tangible assets increase the debt ratio by reducing financial distress costs and the agency costs of debt. Under pecking order theory, reduced information asymmetry and lower costs of raising capital reduce the debt ratio, but adverse selection problems may increase the debt ratio. We can identify the collateral value through the tangible asset ratio. For the ratio of operating income to total assets (*OI/TA*), trade-off theory suggests that high profitability increases the debt ratio when taxes and bankruptcy costs are considered. However, dynamic studies that analyze pecking order theory or various financial frictions provide results with many interpretations because profitability and the debt ratio are negatively correlated. Profitability can be measured as operating income relative to total assets. The log of total assets (*In(TA))* measures a company's likelihood of bankruptcy. Trade-off theory predicts that major companies' debt ratios are high because they are large and diversified, making them less likely to go bankrupt. However, pecking order theory hypothesizes that major companies' debt ratios are generally low because they are more likely to outlive other companies and retain their surpluses.

The leverage estimated by the above equation is the optimal debt ratio, that is, the ratio of total debt (*TD*) to the market value of assets (*MA*). *Med Ind ML* represents the median debt ratios of sixteen industries, excluding the financial sector, based on the Korea Exchange's industry classification. *M/B* is the market value of assets (i.e., *TA+MC+PS-DT-BE*) divided by total assets (*TA*). Here, *MC* is computed by multiplying the number of common stock shares outstanding by the stock price at the end of the year. *TA* is the book value of total assets, *BE* is the book value of total equity, *PS* is the market capitalization of preferred stocks, and *DT* is the deferred tax. *FA/TA* is the ratio of property, plant, and equipment to total assets. *OI/TA* is the

ratio of operating profit to total assets, and *ln(TA)* is the natural log of total assets. *TD* is total debt, reflecting all interest-bearing debts, including current liabilities, short-term borrowing, the current portion of long-term debt, corporate bonds, capital lease liabilities, and long-term borrowing. *MA* is the market value of assets, defined as the sum of *MC*, that is, the market capitalization of common stock, and *TD*.

We define the leverages estimated from equations (1) and (2) as optimal leverage 1 and 2 (*O_LEV1* and *O_LEV2*), respectively, and we subtract them from each company's annual leverage to obtain leverage deviation 1 and 2 (*LD1* and *LD2*). The absolute values of *LD1* and *LD2* are defined as degree of leverage deviation 1 and 2 (*D_LD1* and *D_LD2*). We focus on the relationship between KNPS blockholdings of 5% or more (*KNPS_BIO*) and *D_LD1* and *D_LD2*.

Following previous corporate governance studies (Weisbach, 1988; Rosenstein and Wyatt, 1990; Agrawal and Knoeber, 1996; Yermack, 1996), we control for the characteristics of outside directors, who play an important role in mitigating agency issues, in our regression analyses to test whether KNPS blockholdings influence suboptimal leverage. Specifically, we use board size and the proportion of outside directors on the board to control for the board's potential effect on suboptimal leverage through its monitoring role. We also control for foreign investors' shareholdings following Park and Lee (2006), who suggest that foreign investors with at least 5% stakes improve firms' governance structures.

Table 1 presents descriptive statistics and sample distributions for the main variables. Among the companies in which the KNPS has at least a 5% stake, it holds 7.6% of shares on average during the sample period. In the top 75th percentile, KNPS blockholdings exceed 9%, indicating that the KNPS can exert significant direct or indirect influence on firms through its ownership percentage. The average leverage ratio (*LEV*) of the sample firms is around 45%, which is somewhat lower than the average optimal leverage ratios (*O_LEV1* and *O_LEV2*). The degrees of leverage deviation (*D_LD1* and *D_LD2*) indicate that firms' capital structures deviate from the optimal debt ratio by about 6.7% and 5.9%, respectively, on average and tend to remain above the optimal debt ratio. This result seems to reflect that domestic firms' debt financing is centered on the banking sector and that they have relatively poor capital market financing.

[Insert Table 1 about here]

Figure 1 shows trends in the number of investee firms in which the KNPS makes at least 5% of equity investments in each year and KNPS blockholdings. Since 2009, after the financial crisis, the number of investee firms in which the KNPS holds at least a 5% stake has increased steadily. Moreover, we find that KNPS blockholdings have increased consistently, averaging about 9% at the end of 2017. Thus, Figure 1 indicates that the KNPS's increased participation rate and blockholdings may increase its influence on firms. Figure 2 further shows the degree of leverage deviation (*D_LD1* and *D_LD2*) and the yearly average of KNPS blockholdings of 5% or more. As KNPS blockholdings continue to increase, suboptimal leverage remains relatively low. However, it is difficult to assert that the KNPS significantly influences optimal debt ratio maintenance at the corporate level based only on this figure.

[Insert Figures 1 & 2 about here]

Table 2 shows the correlations between KNPS blockholdings of 5% or more (*KNPS_BIO*) and several variables related to the debt ratio. *KNPS_BIO*, *O_LEV1*, and *O_LEV2* are positively correlated, indicating that the KNPS helps to raise the optimal debt ratio or prefers companies with high optimal debt ratios. *D_LD1* and *D_LD2*, which represent the degree of suboptimal leverage, are both negatively correlated with *KNPS_BIO*. This result may be due to the KNPS helping to keep suboptimal leverage low, but it may mean that the KNPS prefers to invest in firms with low suboptimal leverage.

[Insert Table 2 about here]

4. Empirical findings

This study focuses on the relationship between the degree of suboptimal leverage and KNPS blockholdings to test the effect of institutional investors' monitoring role on firms' financial policies. We first examine the relationship between concurrent *D_LD1* and *D_LD2* and lagged *KNPS_BIO* in a univariate analysis, as shown in Table 3. Specifically, we divide the sample into five subsamples of *KNPS_BIO* by year, and we report the average *D_LD1* and *D_LD2* in the following year for each group. We find that the fifth quintile has significantly lower average values of *D_LD1* and *D_LD2* than the first quintile group has. These results indicate that significant KNPS blockholdings are connected with a lower degree of suboptimal leverage, but the precise suboptimal leverage pattern is inconclusive. Thus, conducting multivariate analyses including control variables that may affect *D_LD1* and *D_LD2* seems necessary to identify the

causal relationship at the corporate level.

[Insert Table 3 about here]

Table 4 presents the estimation results for Fama–MacBeth cross-sectional regressions that include control variables for firm and board characteristics. Although *KNPS_BIO* tends to reduce suboptimal leverage, the relationship is not statistically significant when *D_LD1* and *D_LD2*, proxies for suboptimal leverage, are the dependent variables. In Models (3) and (4), we include governance variables that reflect characteristics of the board of directors, which could affect a company's financial policy, and foreign shareholdings, which are influential in the Korean market. Again, we find that KNPS blockholdings have an insignificant marginal effect on suboptimal leverage.[1] This result is in line with the lack of a clear pattern in the univariate analysis. Collectively, our empirical results suggest that the KNPS may not play a significant monitoring and advisory role in firms' efforts to achieve optimal financial policies.[2]

[Insert Table 4 about here]

The business groups known as chaebols are dominant in the Korean capital market, and pyramidal ownership structures are very common among chaebols. With a pyramidal ownership structure, controlling shareholders control an entire business through circular

[1] As a robustness test, we measure the ratio of exercised (dissenting) votes (*REV*) by the KNPS for investee firms. We utilize this ratio as an alternative measure of ownership by the KNPS to capture active monitoring. Specifically, we replace *KNPS_BIO* with this measure and re-estimate the model in Table 4. Consistent with the main findings, *REV* does not significantly affect corporate leverage deviations. Hence, the KNPS's large shareholdings and corresponding voting rights do not yet have a positive influence on corporate debt policy in the Korean market. Although they are not reported for brevity, the results validating the findings in Appendix Tables A through E are all available upon request.

[2] In additional analyses, we incorporate firm fixed effects to prevent endogeneity problems that may arise from uncaptured firm characteristics and estimate Petersen's (2009) panel regressions. The results of these analyses are not significantly different. In addition, to account for other stakeholders' ownership, we utilize variables for controlling shareholders' ownership (*Controlling_sh*), cash flow rights (*Cashflow_r*), and control rights (*Control_r*). Specifically, we include these additional governance variables and re-estimate the models in Table 4. The results show that controlling shareholders' ownership is negatively associated with leverage deviations. In particular, the part of controlling shareholders' ownership that is related to their control rights (i.e., not their cash flow rights) appears to negatively affect leverage deviations. Hence, the incentives of self-interested controlling shareholders may negatively influence corporate debt policy, which is broadly consistent with the existing literature (Joh, 2003; Baek, Kang, and Park, 2004; Kang, Lee, Lee, and Park, 2014). However, our main result regarding the relationship between KNPS blockholdings and leverage deviations does not change even if we consider these additional governance-related variables. Furthermore, to incorporate the recently increasing trend of firms exercising their voting rights on their investee firms, we decompose the sample period into two subperiods: the early sample period (i.e., 2009–2013) and the later sample period (i.e., 2014–2017). We re-estimate the main models for these subperiods and do not find significantly different results. These additional results are reported in Appendix Tables F through H.

shareholdings with disproportionately small stakes in a few strategically important firms. Chaebol families directly own about 20% of the firms in their business groups. Prior studies examine the controlling shareholders' incentives to engage in tunneling activities in the firms in which their direct ownership is heavily concentrated to increase the private benefits of the controlling family. Chaebols are characterized by the predominance of family owner-managers, who participate in management and strongly influence most management decisions. Thus, it is reasonable to doubt that institutional investors can play a monitoring and advising role for chaebol firms with strong controlling power. In particular, doubt may arise because our empirical results indicate that KNPS blockholdings do not significantly affect firms' financial policies, which contradicts the results of studies in more general settings.

In Table 5, we show that the negative relationship between KNPS blockholdings and leverage deviations is more pronounced for non-chaebol firms, but this relationship is not significant. Specifically, Panel A shows that *KNPS_BIO* has different effects for the samples of chaebol and non-chaebol firms, although both effects are not significant. In Panel B, we show that the interaction between chaebols and KNPS blockholdings has a positive but insignificant effect. This result is consistent with our previous empirical results that KNPS blockholdings do not have a significant marginal effect on suboptimal leverage. Table 5 shows that the Korean setting does not change our empirical results even though chaebols often generate deviations from more typical results in many empirical studies using Korean data.

[Insert Table 5 about here]

Next, we test whether firm-specific monitoring costs mitigate the effect of KNPS blockholdings on suboptimal leverage via the monitoring role. Major shareholders' motivations for influencing corporate debt policy may differ depending on firm characteristics. It is important for shareholders to monitor managers' discretionary decisions when a firm faces severe information asymmetry. Following prior studies that identify greater monitoring benefits relative to costs, we generate two sets of subsamples (Chung et al., 2018; Liu et al., 2018). Specifically, we classify firms with higher and lower illiquidity ratios and idiosyncratic volatilities, following Amihud (2002) and Ang, Hodrick, Xing, and Zhang (2006), respectively, based on their median values in each year.

Table 6 presents the results of applying the previous cross-sectional analyses to these subsamples. For simplicity, we report only the regression coefficients of key independent

variables in the table. The results show that *KNPS_BIO* is significantly negatively associated with *D_LD1* at the 10% level in the group with high idiosyncratic volatility. However, the Wald test finds no difference in the regression coefficients in the lower group, and we obtain no significant results when other groups or dependent variables are applied. Overall, we find that the monitoring role of institutional investors as major shareholders is not particularly strong or significant even for companies with a greater need to monitor managers and corporate policies in our sample. Possible interpretations are that the KNPS does not play a monitoring role in firms with a greater need for monitoring when it is a major shareholder or that the cost of monitoring debt policy in the Korean market may be higher than its utility.

[Insert Table 6 about here]

Next, we examine whether institutional investors positively influence firm value when we consider their interaction with debt policy. If corporate debt policy, especially maintaining an optimal debt ratio, is important and the KNPS influences on this policy as a major institutional investor, the interaction between KNPS blockholdings and a dummy for being underleveraged should be positively associated with firm performance and value. To test this prediction, we include the interactions between *KNPS_BIO* and *D_LD1_D* and *D_LD2_D* in the previous multivariate regressions, and we use variables reflecting firm performance and market value as dependent variables. The dummy variable for being underleveraged, *D_LD1_D*, equals one if *D_LD1* is negative in the year in which *KNPS_BIO* is measured and in the following year and zero otherwise; *D_LD2_D* is defined similarly. Following Chung et al. (2018), we consider four dependent variables: the return on equity, Tobin's Q, post one-year cumulative returns, and post two-year cumulative returns. Table 7 shows the regression coefficients of the interaction of KNPS blockholdings and the dummy for being underleveraged. These coefficients are not significant when we control for various corporate governance variables. These results show that although the KNPS keeps a low degree of suboptimal leverage regardless of its underlying intentions, this association is not particularly related to investee firms' market value and performance. Thus, debt policies influenced by the KNPS may not be effective, or a policy of maintaining suboptimal leverage may not be useful.

In addition, we use the overall quality of a firm's financial position as an outcome that may be influenced by institutional investors. We test the marginal effect of KNPS blockholdings on suboptimal leverage and find mostly insignificant results, as shown in Table 7. However, although firm-level financial policies are likely to significantly impact financial health, it is

possible that other factors may determine a firm's market valuation. Following Piotroski (2000), we use F-scores to test whether fundamental financial indicators reflect the KNPS's use of its shareholder's rights even if market variables do not immediately reflect the KNPS's actions. The F-score is constructed as a combination of nine accounting variables and is divided into three variables that indicate different financial characteristics of a firm: profitability, liquidity, and operating efficiency. The F-score, which is seen as a better indicator of a firm's overall state than market variables are, is found to better represent a firm's underlying financial health in recent studies (Piotroski and So, 2012).

Table 8 presents the estimation results for regressions of F-scores on the interactions between KNPS blockholdings, *KNPS_BIO*, and dummy variables for being underleveraged, *D_LD1_D* and *D_LD2_D*. We measure firm performance using an accounting-based measure: Piotroski's (2000) F-score.Thus, it is a more comprehensive measure of a firm's financial health than market-based performance measures are. Recent studies confirm that the F-score contains valuable information regarding firms' fundamentals. For example, Piotroski and So (2012) use the book-to-market ratio (BM) to measure a firm's expected market performance, and they use the F-score to proxy for a firm's financial strength. They show that firms with high BMs (i.e., low values in market terms) and high F-scores (i.e., high values in financial terms) are more prone to mispricing. Thus, these firms can realize higher returns after the mispricing is corrected. Given the empirical success of the F-score as a measure of a firm's financial strength, it may serve as a better performance measure for gauging the effectiveness of institutional monitoring relative to the market-based performance measures in Table 7. The results for *D_LD1_D* show that the efficiency of the F-score is significantly associated with the interaction term, suggesting that financial efficiency increases in companies with reduced suboptimal leverage owing to KNPS blockholdings of 5% or more. Moreover, the results for *D_LD2_D* show that both profitability and efficiency increase, indicating that when measuring a firm's overall financial status through the F-score, the KNPS's choice to exercise its shareholder's rights to control the degree of suboptimal leverage, can impact firms positively.

[Insert Tables 7 & 8 about here]

Owing to possible friction costs when implementing a debt policy or market timing strategy, a company's debt ratio can deviate from the optimal debt ratio. Thus, the variable for suboptimal leverage used in this study may exhibit volatility irrespective of the KNPS's monitoring role, which may impact the results of the previous empirical analyses. Thus, in this

section, we first divide companies into quartiles according to *D_LD1* and *D_LD2*, the key dependent variables of this study. We repeat the multivariate analysis using a dummy variable for firms in the top 25th percentile of suboptimal leverage as the dependent variable because it is difficult to explain suboptimal leverage with friction costs or a market timing strategy when a firm's suboptimal leverage is high. Table 9 shows the results of this robustness test. We use a logistic regression model because the dependent variable is a dummy variable, and we find that *KNPS_BIO* does not significantly affect the degree of suboptimal leverage, as shown in previous multivariate analyses.

Second, we can only acquire ownership data for institutional investors with shareholdings of 5% or more, in accordance with the domestic shareholding disclosure policy. Thus, we cannot analyze the relationship between KNPS blockholdings and firms' degrees of suboptimal leverage when KNPS blockholdings are below 5%. To address this issue to some extent, we conduct a multivariate analysis during the sample period by defining a dummy variable (*KNPS_BIO_D*) that takes a value of one if KNPS blockholdings are 5% or more and a value of zero otherwise. According to the results in Table 10, it is difficult to confirm that the degree of suboptimal leverage ratio is low, especially among firms with KNPS blockholdings above 5%, even though the total sample is classified into firms with KNPS blockholdings above 5% and those with blockholdings below 5%. These findings reaffirm that, as with the previous empirical results, large KNPS blockholdings have no significant average impact on corporate debt policy.

[Insert Tables 9 & 10 about here]

5. Conclusion

This study investigates whether significant institutional ownership affects corporate financial policy using data on KNPS blockholdings for Korean public firms. Prior studies of corporate governance and capital structures suggest that institutional investors optimize firms' suboptimal debt ratios and limit agency issues through monitoring (Bathala et al., 1994; Chung et al., 2018). However, this study's empirical results do not support those of prior studies. We do not find evidence that KNPS blockholdings significantly reduce suboptimal leverage at the firm level. We also consider a specific Korean ownership structure, chaebols, in examining the role of KNPS blockholdings, but the results do not support prior findings in the literature.

Moreover, we do not find evidence that the KNPS plays a monitoring role as a major shareholder even among firms with high uncertainty and opacity, for which the importance of monitoring by major institutional investors is higher. This study's empirical results are not consistent with previous studies in this field that use firm performance and market valuation measures. They are consistent with our previous results when we examine firms with high suboptimal debt ratios and those with KNPS holdings below 5% as a robustness test. Hence, the findings are consistent with studies that find evidence of ineffective and inactive institutional monitoring (Smith, 1996; Del Guercio and Hawkins, 1999). However, we find that institutional investors can improve corporate financial policy. Empirically, we report that KNPS blockholdings are positively related to financial soundness when a firm is underleveraged using F-scores (Piotroski, 2000). This relationship particularly holds for the efficiency measure. This result is consistent under both measures of optimal leverage.

Collectively, we can interpret these results as follows. First, it may be natural that even the KNPS, the largest institutional investor in Korea, has no significant monitoring effect on corporate debt policy considering the history of the domestic market and the neutrality of the KNPS, which plays a limited role in monitoring relative to overseas institutional investors centered on the U.S. market. Conversely, domestic institutional investors, including the KNPS, may play a direct or indirect role in corporate monitoring, as the importance of corporate governance has gained more emphasis following the Asian financial crisis and the recent global financial crisis. However, because the cost of monitoring debt policy tends to be higher than its utility, it may be subject to corporate decision-making on which the KNPS does not focus. Nevertheless, the results using the F-score can be interpreted as the KNPS monitoring some firms for which the utility of monitoring is greater than its cost because its influence as a major shareholder improves corporate debt policy and increases firms' overall financial soundness.

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Appendix I. Definitions of key variables

Variable	Definition
KNPS_BIO	Fraction of shares outstanding owned by the KNPS when the KNPS owns more than 5% of firm *i*'s total shares at the end of year *t*
Chaebol_dummy	Dummy variable equal to one for firms categorized as chaebols and zero otherwise
ROA	Earnings before interest and tax divided by total assets for firm *i* in year *t*
SIZE	Natural logarithm of firm *i*'s total assets in year *t*
MB	Sum of the market value of equity, long-term debt, and short-term debt divided by total assets for firm *i* in year *t*
MKT_D	Dummy variable equal to one for firms listed on the KOSPI and zero otherwise
Foreign_shrown	Fraction of shares outstanding owned by foreign investors for firm *i* at the end of year *t*
Board_size	Natural logarithm of the number of directors of firm *i* in year *t*
Ind_pct	Number of outside directors as a proportion of all directors

Online Appendix

Table A. Influence of the KNPS on leverage deviation using an alternative measure of KNPS blockholdings

	Models without governance variables		Models with governance variables	
	D_LD1	*D_LD2*	*D_LD1*	*D_LD2*
REV_{t-1}	-0.0031	0.0025	-0.0008	-0.0017
	(-1.92)	(1.09)	(-0.83)	(-0.98)
ROA_{t-1}	-0.0048	-0.0083	0.0122	0.0107
	(-0.23)	(-0.27)	(1.31)	(1.25)
$SIZE_{t-1}$	0.0012	0.0008	0.0012	0.0011
	(0.09)	(0.16)	(1.34)	(1.31)
MB_{t-1}	0.0008	-0.0043	-0.0021	-0.0018
	(0.11)	(-1.17)	(-1.41)	(-1.21)
MKT_D_{t-1}	0.0014	-0.0041	-0.0042	-0.0039
	(0.09)	(-0.49)	(-0.33)	(-0.13)
$Foreign\_shrown_{t-1}$			0.0001	0.0001
			(0.98)	(1.01)
$Board\_size_{t-1}$			0.0003	0.0005
			(0.57)	(0.77)
Ind_pct_{t-1}			-0.0017	-0.0016
			(-1.98)	(-1.72)
Intercept	0.0892***	0.0861***	0.0576***	0.0535***
	(2.79)	(3.56)	(3.71)	(3.87)
Industry D	Yes	Yes	Yes	Yes
N	1,947	1,947	1,466	1,466
Adj. R^2	0.0351	0.0398	0.0498	0.0478

Notes: This table reports coefficient estimates for Fama–MacBeth (1973) regressions investigating the effect of institutional monitoring on leverage deviation after controlling for board-related variables. *t*-statistics are adjusted for Newey–West autocorrelations with three lags and are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table B. Influence of an alternative measure of KNPS blockholdings on leverage deviation for chaebol and non-chaebol firms

Panel A	Chaebol firms	Non-chaebol firms	Panel B	Chaebol dummy
REV_{t-1}	0.0009	0.0013	REV_{t-1}	0.0016
	(0.78)	(0.53)		(0.98)
			Chaebol Dummy	0.0014
				(1.13)
			$REV_{t-1} \times$ *Chaebol Dummy*	0.0011
				(0.89)
ROA_{t-1}	0.0031	0.0056	ROA_{t-1}	0.0087
	(0.27)	(0.78)		(1.15)
$SIZE_{t-1}$	0.0008	0.0009	$SIZE_{t-1}$	0.0012
	(0.11)	(0.14)		(1.09)
MB_{t-1}	0.0078	0.0056	MB_{t-1}	0.0033
	(1.12)	(0.21)		(1.24)
MKT_D_{t-1}	-0.0025	-0.0031	MKT_D_{t-1}	-0.0056
	(-0.78)	(-0.56)		(-0.78)
$Foreign\_shrown_{t-1}$	-0.0004	-0.0003	$Foreign\_shrown_{t-1}$	-0.0005
	(-1.01)	(-1.21)		(-0.31)
$Board\_size_{t-1}$	0.0003	0.0004	$Board\_size_{t-1}$	0.0003
	(1.27)	(1.15)		(1.14)
Ind_pct_{t-1}	-0.0003	-0.0006	Ind_pct_{t-1}	-0.0015
	(-1.07)	(-1.31)		(-1.21)
Intercept	0.2142***	0.2531***	*Intercept*	0.3012***
	(4.51)	(4.87)		(4.59)
Industry D	Yes	Yes	*Industry D*	Yes
N	865	601	*N*	1,466
Adj. R^2	0.0156	0.0172	*Adj.* R^2	0.0298

Notes: This table reports coefficient estimates for Fama–MacBeth (1973) regressions investigating the effect of institutional monitoring on leverage deviation for chaebol and non-chaebol firms. *t*-statistics are adjusted for Newey–West autocorrelations with three lags and are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table C. Influence of an alternative measure of KNPS blockholdings on leverage deviation depending on the degree of information uncertainty

Coefficients of *REV*	Illiquidity			Idiosyncratic Volatility		
	Low	High	Diff	Low	High	Diff
D_LD1	-0.0004	-0.0008	–0.0004	-0.0014	-0.0028	–0.0014
	(-1.23)	(-1.21)	(-1.15)	(-1.23)	(-1.41)	(-1.25)
D_LD2	-0.0003	-0.0006	–0.0003	-0.0049	-0.0081	–0.0032
	(-1.15)	(-1.54)	(-1.14)	(-1.27)	(-1.46)	(-1.13)

Notes: This table reports coefficient estimates for Fama–MacBeth (1973) regressions investigating the effect of institutional monitoring on leverage deviation depending on the degree of information uncertainty after controlling for board-related variables. *t*-statistics are adjusted for Newey–West autocorrelations with three lags and are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table D. Firm value and performance depending on the interaction between an alternative measure of KNPS blockholdings and the degree of leverage deviation

	ROE	Q	1-Year Return	2-Year Return		ROE	Q	1-Year Return	2-Year Return
REV_{t-1}	0.0044	0.0054*	0.0092	0.0124*	REV_{t-1}	0.0124*	0.0134**	0.0073	0.0231
	(1.54)	(1.87)	(1.34)	(1.91)		(1.83)	(2.85)	(0.71)	(1.21)
$D\_LD1\_D_{t-1}$	0.0031	0.0124*	0.0031	0.0342**	$D\_LD2\_D_{t-1}$	0.0098*	0.0982*	0.0123*	0.0032
	(1.23)	(1.85)	(0.93)	(2.71)		(2.01)	(1.98)	(1.88)	(0.36)
$REV_{t-1} \times D\_LD1\_D_{t-1}$	0.0078	0.0835	0.0178	0.0312	$REV_{t-1} \times D\_LD2\_D_{t-1}$	0.0132	0.0447	0.0193	0.0321
	(0.80)	(1.26)	(1.35)	(0.98)		(0.89)	(1.13)	(0.78)	(1.04)
$SIZE_{t-1}$	–0.0077	–0.0068	–0.0081	–0.0084	$SIZE_{t-1}$	0.0018	0.0035	0.0017	–0.0008
	(–1.11)	(–0.92)	(–1.12)	(–1.09)		(0.30)	(0.70)	(0.32)	(–0.16)
MB_{t-1}	0.0249	0.0319	0.0267	0.0222	MB_{t-1}	0.0088	0.0246	0.0161	0.0095
	(0.53)	(0.76)	(0.57)	(0.52)		(0.31)	(0.93)	(0.56)	(0.34)
MKT_D_{t-1}	–0.0030	–0.0025	–0.0022	–0.0028	MKT_D_{t-1}	–0.0027	–0.0014	–0.0012	–0.0020
	(–1.50)	(–1.23)	(–1.16)	(–1.60)		(–1.27)	(–0.73)	(–0.64)	(–1.11)
Intercept	0.1155***	0.1112***	0.1135***	0.1191***	*Intercept*	0.0988***	0.0919***	0.0950***	0.0991***
	(10.50)	(9.78)	(10.07)	(11.30)		(16.21)	(17.74)	(15.60)	(17.81)
Other Governance Variables	Yes	Yes	Yes	Yes	*Other Governance Variables*	Yes	Yes	Yes	Yes
Industry D	Yes	Yes	Yes	Yes	*Industry D*	Yes	Yes	Yes	Yes
Year D	Yes	Yes	Yes	Yes	*Year D*	Yes	Yes	Yes	Yes
N	1,466	1,466	1,466	1,466	*N*	1,466	1,466	1,466	1,466
Adj. R^2	0.0684	0.1723	0.0244	0.0213	*Adj.* R^2	0.0643	0.1623	0.0172	0.0135

Notes: This table presents estimation results for panel regression models examining whether the reduced leverage deviation due to institutional monitoring improves market-based firm performance after controlling for board-related variables. *t*-statistics are reported in parentheses and are adjusted for two-way clustered standard errors at the firm level to allow for heteroskedasticity and arbitrary within-firm correlations based on Petersen's (2009) methodology. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table E. Financial soundness depending on the interaction between an alternative measure of KNPS blockholdings and the degree of leverage deviation

	F-Score (Overall)	F-Score (Profitability)	F-Score (Liquidity)	F-Score (Efficiency)		F-Score (Overall)	F-Score (Profitability)	F-Score (Liquidity)	F-Score (Efficiency)
REV_{t-1}	0.0187	0.0234	0.0097	0.1217*	REV_{t-1}	0.0235	0.0234	0.0045	0.0245*
	(0.98)	(1.27)	(1.14)	(1.95)		(1.64)	(1.67)	(1.26)	(1.95)
$D\_LD1\_D_{t-1}$	0.0351*	0.0124	0.0187	0.0087*	$D\_LD2\_D_{t-1}$	0.0102	0.0198*	–0.0045	0.0621**
	(1.88)	(0.98)	(1.64)	(1.95)		(0.82)	(1.89)	(–1.51)	(2.65)
$REV_{t-1} \times D\_LD1\_D_{t-1}$	0.0202	0.0182	0.0082	0.0381**	$REV_{t-1} \times D\_LD2\_D_{t-1}$	0.0242	0.0132	0.0231	0.0483***
	(1.56)	(0.93)	(0.84)	(2.21)		(0.54)	(0.84)	(1.54)	(3.64)
$SIZE_{t-1}$	–0.0668***	–0.0668***	–0.0662***	–0.0685***	$SIZE_{t-1}$	–0.0334***	–0.0328***	–0.0321***	–0.0355***
	(–8.48)	(–8.56)	(–8.67)	(–8.88)		(–4.14)	(–4.20)	(–4.29)	(–4.18)
MB_{t-1}	–0.0024	–0.0030**	–0.0029*	–0.0018***	MB_{t-1}	–0.0020*	–0.0027**	–0.0026**	–0.0032***
	(–1.60)	(–2.08)	(–1.95)	(–4.36)		(–1.90)	(–2.67)	(–2.56)	(–8.84)
MKT_D_{t-1}	–0.0022***	–0.0021***	–0.0016***	–0.0034**	MKT_D_{t-1}	–0.0036***	–0.0033***	–0.0027***	–0.0029***
	(–6.21)	(–5.11)	(–3.56)	(–2.56)		(–16.67)	(–11.53)	(–7.68)	(–2.97)
Intercept	0.1048***	0.1037***	0.1034***	0.1054***	*Intercept*	0.1035***	0.1018***	0.1016***	0.1048***
	(42.17)	(45.48)	(43.52)	(36.43)		(52.89)	(64.43)	(60.27)	(62.60)
Board-related Variables	Yes	Yes	Yes	Yes	*Board-related Variables*	Yes	Yes	Yes	Yes
Industry D	Yes	Yes	Yes	Yes	*Industry D*	Yes	Yes	Yes	Yes
Year D	Yes	Yes	Yes	Yes	*Year D*	Yes	Yes	Yes	Yes
N	1,132	1,132	1,132	1,132	*N*	1,132	1,132	1,132	1,132
Adj. R^2	0.0544	0.0564	0.0582	0.0595	*Adj.* R^2	0.0840	0.1112	0.1156	0.1142

Notes: This table presents estimation results for panel regression models examining whether the reduced leverage deviation due to institutional monitoring improves accounting-based firm performance after controlling for board-related variables. *t*-statistics are reported in parentheses and are adjusted for two-way clustered standard errors at the firm level to allow for heteroskedasticity and arbitrary within-firm correlations based on Petersen's (2009) methodology. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table F. Influence of the KNPS on leverage deviation after controlling for other types of stakeholder ownership

	D_LD1	*D_LD2*
KNPS_BIO_D $_{t-1}$	-0.0005	-0.0008
	(-1.34)	(-1.27)
ROA $_{t-1}$	-0.0489***	-0.0476***
	(-4.83)	(-5.97)
SIZE $_{t-1}$	-0.0025***	-0.0027***
	(-4.21)	(-4.31)
MB $_{t-1}$	-0.0039***	-0.0037***
	(-7.31)	(-7.28)
MKT_D $_{t-1}$	-0.0037	-0.0036
	(-1.25)	(-0.98)
Controlling_sh $_{t-1}$	-0.0021*	-0.0015*
	(-1.91)	(-1.89)
Cashflow_r $_{t-1}$	0.0001	-0.0004
	(0.10)	(-0.85)
Control_r $_{t-1}$	-0.0008*	-0.0009**
	(-1.93)	(-2.21)
Foreign_shrown $_{t-1}$	-0.0005	-0.0004
	(-1.37)	(-1.51)
Board_size $_{t-1}$	0.0001	-0.0003
	(0.15)	(-0.23)
Ind_pct $_{t-1}$	-0.0003*	-0.0002***
	(-1.81)	(-3.53)
Intercept	0.0978***	0.0998***
	(7.32)	(7.92)
Industry D	Yes	Yes
N	1,466	1,466
Adj. R^2	0.0598	0.0587

Notes: This table reports coefficient estimates for Fama–MacBeth (1973) regressions investigating the effect of institutional monitoring on leverage after controlling for variables reflecting ownership by additional stakeholders. *t*-statistics are adjusted for Newey–West autocorrelations with three lags and are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table G. Influence of KNPS blockholdings on leverage deviation: Panel regressions based on Petersen (2009)

	Models without governance variables		Models with governance variables	
	D_LD1	*D_LD2*	*D_LD1*	*D_LD2*
KNPS_BIO $_{t-1}$	–0.0017	–0.0016	–0.0014	-0.0012
	(–0.96)	(–0.22)	(–1.20)	(-1.04)
ROA $_{t-1}$	–0.0026	–0.0067	–0.0053	-0.0198
	(–0.36)	(–1.11)	(–0.90)	(-1.28)
SIZE $_{t-1}$	–0.0116	–0.0110	–0.0105	0.0009
	(–1.54)	(–1.53)	(–1.51)	(0.68)
MB $_{t-1}$	0.0144	0.0228	0.0160	-0.0037**
	(0.28)	(0.49)	(0.36)	(-2.28)
MKT_D $_{t-1}$	–0.0046	–0.0056*	–0.0037	-0.0032
	(–1.63)	(–1.83)	(–1.65)	(-0.55)
Foreign_shrown $_{t-1}$			0.0548	0.0846
			(1.12)	(1.52)
Board_size $_{t-1}$			–0.0006	0.0001
			(–0.60)	(0.03)
Ind_pct $_{t-1}$			–0.0042*	–0.0039**
			(–2.13)	(–2.16)
Intercept	0.1152***	0.1117***	0.1048***	0.0820***
	(11.54)	(11.07)	(10.91)	(12.83)
Firm-fixed effects	Yes	Yes	Yes	Yes
N	1,947	1,947	1,466	1,466
Adj. R^2	0.0364	0.0504	0.0529	0.0837

Notes: This table reports coefficient estimates of panel regressions using Petersen's (2009) methodology to investigate the effect of institutional monitoring on leverage deviation after controlling for board-related variables. *t*-statistics are adjusted for Newey–West autocorrelations with three lags and are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Appendix H. Influence of the KNPS on leverage deviation: Subperiod analysis

	Sample Period (2009–2013)		Sample Period (2014–2017)	
	D_LD1	*D_LD2*	*D_LD1*	*D_LD2*
KNPS_BIO $_{t-1}$	-0.0015	-0.0016	-0.0013	-0.0009
	(-1.12)	(-0.98)	(-0.78)	(-1.13)
ROA $_{t-1}$	-0.0027	-0.0031	-0.0024	0.0087
	(-0.13)	(-0.25)	(-0.29)	(1.41)
SIZE $_{t-1}$	0.0012	0.0009	0.0007	0.0006
	(0.12)	(0.17)	(0.89)	(0.73)
MB $_{t-1}$	-0.0012	-0.0023	-0.0035	-0.0027
	(-0.21)	(-0.57)	(-0.67)	(-0.83)
MKT_D $_{t-1}$	-0.0023	-0.0028	-0.0033	-0.0041
	(-0.31)	(-0.21)	(-0.35)	(-0.47)
Foreign_shrown $_{t-1}$	0.0002	0.0001	0.0001	0.0001
	(0.31)	(0.21)	(0.51)	(0.29)
Board_size $_{t-1}$	0.0002	0.0004	0.0001	0.0003
	(0.29)	(0.51)	(0.18)	(0.58)
Ind_pct $_{t-1}$	-0.0004	-0.0005	-0.0008	-0.0009
	(-0.24)	(-0.56)	(-0.31)	(-0.29)
Intercept	0.0231***	0.0298***	0.0313***	0.0386***
	(3.43)	(3.88)	(3.97)	(3.61)
Industry D	Yes	Yes	Yes	Yes
N	679	787	679	787
Adj. R^2	0.0141	0.0165	0.0143	0.0169

Notes: This table reports coefficient estimates for Fama–MacBeth (1973) regressions investigating the effect of institutional monitoring on leverage deviation after controlling for board-related variables. *t*-statistics are adjusted for Newey–West autocorrelations with three lags and are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Figure 1. Yearly averages of KNPS blockholdings and the number of investee firms

Figure 2. Yearly average of KNPS blockholdings and trends in leverage deviations

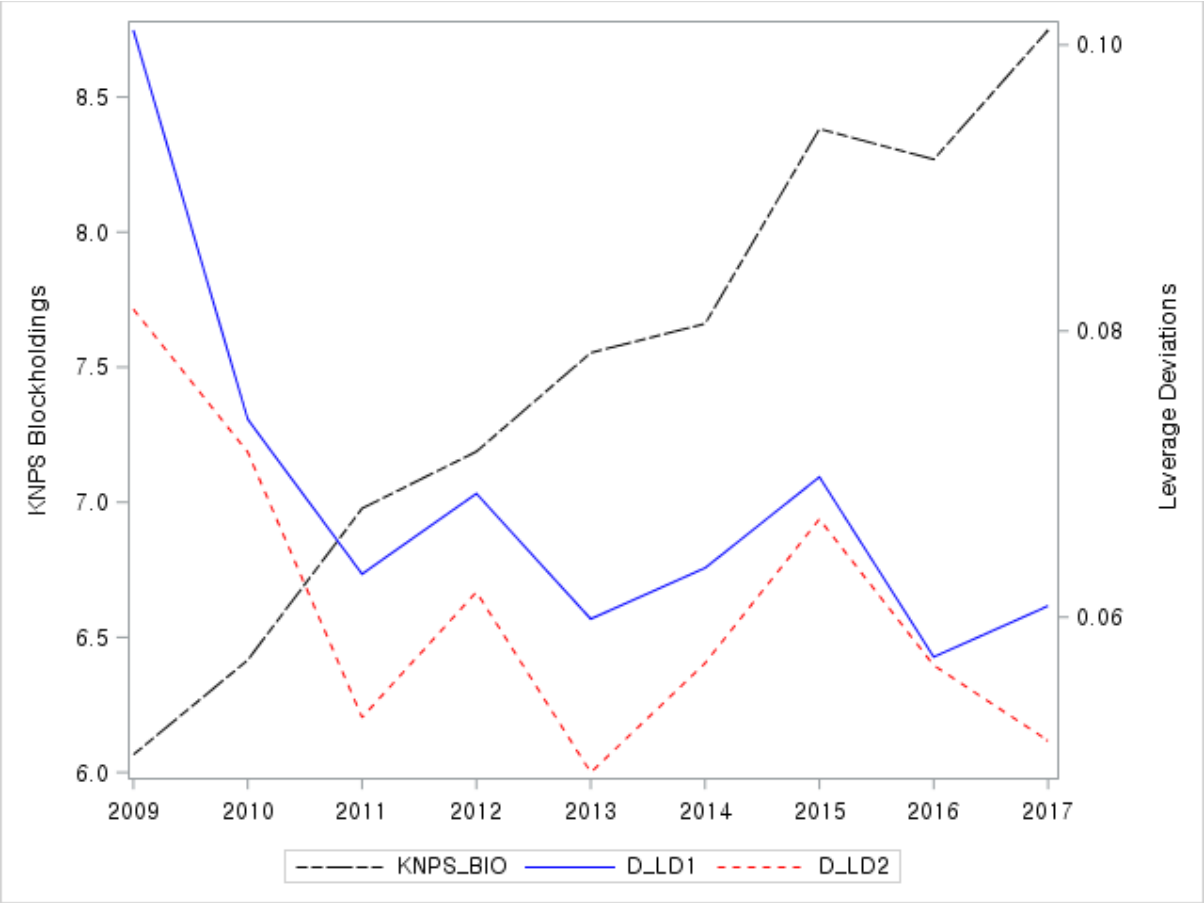

Table 1. Descriptive statistics

Variable	N	Mean	Std. Dev.	Lower Quartile	Median	Upper Quartile
KNPS_BIO	2,201	7.6329	2.3282	5.8015	7.1108	9.0857
O_LEV1	2,201	0.4658	0.2196	0.2774	0.4500	0.6442
O_LEV2	2,201	0.4573	0.2303	0.2619	0.4405	0.6476
LD1	2,201	0.0202	0.0838	-0.0337	0.0207	0.0729
LD2	2,201	0.0116	0.0780	-0.0330	0.0094	0.0574
D_LD1	2,201	0.0665	0.0548	0.0278	0.0547	0.0924
D_LD2	2,201	0.0593	0.0520	0.0214	0.0461	0.0844
MB	2,201	1.3489	0.9685	0.8866	1.0521	1.4786
SIZE	2,201	20.8718	1.7285	19.5854	20.6910	21.9554
ROA	2,201	0.0510	0.1189	0.0160	0.0433	0.0770
MKT_D	2,201	0.8074	0.3944	1.0000	1.0000	1.0000
Foreign_shrown	2,201	17.5436	15.3078	5.7494	13.6237	24.6826
Board_size	1,777	6.9078	2.6247	5.0000	7.0000	8.0000
Ind_pct	1,777	3.3517	1.7759	2.0000	3.0000	4.0000

Notes: This table reports the time-series mean, standard deviation, 25th percentile, median, and 75th percentile values of the cross-sectional means over the sample period from 2009 to 2017.

Table 2. Pearson's correlation coefficients between the characteristic debt ratio and KNPS blockholding variables

	KNPS_BIO	*O_LEV1*	*O_LEV2*	*LD1*	*LD2*	*D_LD1*	*D_LD2*
KNPS_BIO	1						
O_LEV1	0.0555***	1					
	[0.0091]						
O_LEV2	0.0680***	0.9932***	1				
	[0.0014]	[<.0001]					
LD1	-0.0347	-0.2410***	-0.2748***	1			
	[0.1029]	[<.0001]	[<.0001]				
LD2	0.0071	-0.1416***	-0.1390***	0.9416***	1		
	[0.7367]	[<.0001]	[<.0001]	[<.0001]			
D_LD1	-0.0738***	-0.0164	-0.0316	0.3171***	0.2934***	1	
	[0.0005]	[0.4413]	[0.1376]	[<.0001]	[<.0001]		
D_LD2	-0.0528**	0.0405*	0.0331	0.1977***	0.1962***	0.8793***	1
	[0.0132]	[0.0572]	[0.1200]	[<.0001]	[<.0001]	[<.0001]	

Notes: This table presents Pearson's (contemporaneous) correlation coefficients among the key variables used in the empirical analysis. *p*-values are reported in brackets. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 3. Univariate analysis of the degree of leverage deviation by KNPS blockholding quintile

	KNPS blockholding quintile					
Mean	1	2	3	4	5	Diff.
Portfolios formed on $KNPS\_BIO_t$						
D_LD1_{t+1}	0.0684	0.0694	0.0651	0.0684	0.0591	–0.0093** (–2.21)
D_LD2_{t+1}	0.0612	0.0570	0.0618	0.0568	0.0540	–0.0072** (–2.31)

Notes: This table presents the univariate relationship between institutional investment horizons and leverage deviation. *t*-statistics are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 4. Influence of KNPS blockholdings on leverage deviation: Fama–MacBeth regressions

	Models without governance variables		Models with governance variables	
	D_LD1	*D_LD2*	*D_LD1*	*D_LD2*
$KNPS\_BIO_{t-1}$	-0.0021	-0.0019	-0.0023	-0.0018
	(-1.70)	(-1.75)	(-1.42)	(-1.59)
ROA_{t-1}	-0.0132	-0.0145	-0.0585	-0.0268**
	(-0.54)	(-0.59)	(-1.59)	(-3.26)
$SIZE_{t-1}$	0.0001	0.0003	0.0005	0.0007
	(0.07)	(0.21)	(0.25)	(0.75)
MB_{t-1}	-0.0003	-0.0053	0.0048**	-0.0004
	(-0.10)	(-1.14)	(2.58)	(-0.28)
MKT_D_{t-1}	0.0007	-0.0068	-0.0057	-0.0014
	(0.13)	(-0.51)	(-0.52)	(-0.16)
$Foreign\_shrown_{t-1}$			0.0001	-0.0001
			(1.02)	(-0.69)
$Board\_size_{t-1}$			0.0006	0.0006
			(0.84)	(0.88)
Ind_pct_{t-1}			-0.0035*	-0.0031
			(-2.21)	(-1.81)
Intercept	0.0780***	0.0786***	0.0779***	0.0657***
	(3.85)	(7.41)	(3.86)	(5.52)
Industry D	Yes	Yes	Yes	Yes
N	1,947	1,947	1,466	1,466
Adj. R^2	0.0450	0.0538	0.0582	0.0595

Notes: This table reports coefficient estimates for Fama–MacBeth (1973) regressions investigating the effect of institutional monitoring on leverage deviation after controlling for board-related variables. *t*-statistics are adjusted for Newey–West autocorrelations with three lags and are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 5. Influence of KNPS blockholdings on leverage deviation for chaebol and non-chaebol firms

Panel A	Chaebol firms	Non-chaebol firms	Panel B	Chaebol dummy
$KNPS\_BIO_{t-1}$	0.0017	-0.0027	$KNPS\_BIO_{t-1}$	-0.0015
	(0.98)	(-1.76)		(-0.78)
			Chaebol Dummy	0.0027
				(1.01)
			$KNPS\_BIO_{t-1} \times$ *Chaebol Dummy*	0.0031
				(1.21)
ROA_{t-1}	-0.0079	-0.0087	ROA_{t-1}	0.0121
	(-0.31)	(-0.91)		(1.23)
$SIZE_{t-1}$	0.0012	0.0014	$SIZE_{t-1}$	0.0009
	(0.17)	(0.09)		(1.13)
MB_{t-1}	0.0058	0.0067	MB_{t-1}	-0.0021
	(1.02)	(0.11)		(-1.35)
MKT_D_{t-1}	-0.0039	-0.0082	MKT_D_{t-1}	-0.0043
	(-0.38)	(-0.14)		(-0.83)
$Foreign\_shrown_{t-1}$	-0.0003	-0.0002	$Foreign\_shrown_{t-1}$	0.0002
	(-1.11)	(-1.09)		(0.87)
$Board\_size_{t-1}$	0.0001	0.0002	$Board\_size_{t-1}$	0.0005
	(1.31)	(1.31)		(0.58)
Ind_pct_{t-1}	0.0004	-0.0002***	Ind_pct_{t-1}	-0.0024
	(1.14)	(-3.71)		(-1.09)
Intercept	0.1142***	0.1208***	*Intercept*	0.0922***
	(2.98)	(2.78)		(3.62)
Industry D	Yes	Yes	*Industry D*	Yes
N	865	601	*N*	1,466
Adj. R^2	0.0281	0.213	*Adj.* R^2	0.0497

Notes: This table reports coefficient estimates for Fama–MacBeth (1973) regressions investigating the effect of institutional monitoring on leverage deviation for chaebol and non-chaebol firms. *t*-statistics are adjusted for Newey–West autocorrelations with three lags and are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 6. Influence of KNPS blockholdings on leverage deviation by information uncertainty

Coefficients of *KNPS_BIO*	Illiquidity			Idiosyncratic Volatility		
	Low	High	Diff	Low	High	Diff
D_LD1	-0.0005	-0.0009	–0.0004	-0.0024	-0.0035*	–0.0011
	(-1.64)	(-0.81)	(-1.50)	(-1.57)	(-1.88)	(-1.23)
D_LD2	-0.0004	-0.0005	–0.0001	-0.0055	-0.0071	–0.0016
	(-1.58)	(-1.34)	(-0.72)	(-1.33)	(-1.51)	(-1.02)

Notes: This table reports coefficient estimates for Fama–MacBeth (1973) regressions investigating the effect of institutional monitoring on leverage deviation depending on the degree of information uncertainty after controlling for board-related variables. *t*-statistics are adjusted for Newey–West autocorrelations with three lags and are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 7. Firm value and performance depending on the interaction between KNPS blockholdings and the degree of leverage deviation

	ROE	Q	1-Year Return	2-Year Return		ROE	Q	1-Year Return	2-Year Return
KNPS_BIO $_{t-1}$	0.0031	0.0061*	0.0082	0.0134*	*KNPS_BIO* $_{t-1}$	0.0024*	0.0051**	0.0076	0.0142
	(1.54)	(1.87)	(1.34)	(1.91)		(1.83)	(2.85)	(0.71)	(1.21)
D_LD1_D $_{t-1}$	0.0024	0.0151*	0.0027	0.0124	*D_LD2_D* $_{t-1}$	0.0081	0.0532*	0.0087*	0.0071
	(1.23)	(1.85)	(0.93)	(0.71)		(1.01)	(1.91)	(1.88)	(0.36)
KNPS_BIO $_{t-1}$ × *D_LD1_D* $_{t-1}$	0.0067	0.0082	-0.0028	0.0153	*KNPS_BIO* $_{t-1}$ × *D_LD2_D* $_{t-1}$	0.0088	0.0115	0.0323	0.0127
	(1.50)	(1.26)	(-0.91)	(0.98)		(1.19)	(1.13)	(0.78)	(1.04)
SIZE $_{t-1}$	0.0225***	0.0150	–0.0041	–0.0086	*SIZE* $_{t-1}$	0.0226***	0.0444**	-0.0049	-0.0088
	(7.36)	(0.53)	(–0.79)	(–0.77)		(7.02)	(2.83)	(-1.24)	(-0.98)
MB $_{t-1}$	–0.0370***	1.4718***	–0.0205	–0.0428**	*MB* $_{t-1}$	-0.0375***	1.4588***	-0.0212	-0.0405*
	(–9.66)	(6.95)	(–1.42)	(–2.31)		(-9.19)	(6.89)	(-1.43)	(-2.13)
MKT_D $_{t-1}$	0.0050	-0.0009	0.0100	0.0082	*MKT_D* $_{t-1}$	0.0034	0.0009	0.0033	0.0034
	(1.45)	(-0.14)	(1.68)	(1.52)		(1.04)	(0.20)	(1.09)	(1.12)
Intercept	0.0559***	–1.0820***	0.2333**	0.4533**	*Intercept*	0.0572***	-1.2471***	0.2207**	0.4134**
	(3.27)	(–5.80)	(2.50)	(2.98)		(3.41)	(-9.28)	(2.36)	(2.60)
Other Governance Variables	Yes	Yes	Yes	Yes	*Other Governance Variables*	Yes	Yes	Yes	Yes
Industry D	Yes	Yes	Yes	Yes	*Industry D*	Yes	Yes	Yes	Yes
Year D	Yes	Yes	Yes	Yes	*Year D*	Yes	Yes	Yes	Yes
N	1,466	1,466	1,466	1,466	*N*	1,466	1,466	1,466	1,466
Adj. R^2	0.0341	0.0723	0.0301	0.0312	*Adj.* R^2	0.0831	0.0921	0.0283	0.0261

Notes: This table presents estimation results for panel regression models examining whether the reduced leverage deviation due to institutional monitoring improves market-based firm performance after controlling for board-related variables. *t*-statistics are reported in parentheses and are adjusted for two-way clustered standard errors at the firm level to allow for heteroskedasticity and arbitrary within-firm correlations based on Petersen's (2009) methodology. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 8. Financial soundness depending on the interaction between KNPS blockholdings and the degree of leverage deviation

	F-Score (Overall)	F-Score (Profitability)	F-Score (Liquidity)	F-Score (Efficiency)		F-Score (Overall)	F-Score (Profitability)	F-Score (Liquidity)	F-Score (Efficiency)
$KNPS\_BIO_{t-1}$	0.0181	0.0266	0.0054	0.0217	$KNPS\_BIO_{t-1}$	0.0145	0.0124	0.0053	0.0214*
	(1.17)	(1.27)	(1.14)	(1.42)		(1.64)	(1.67)	(1.26)	(1.89)
$D\_LD1\_D_{t-1}$	0.0031	0.0135*	0.0187	0.0051*	$D\_LD2\_D_{t-1}$	0.0231	0.0187*	0.0043	0.0432**
	(1.55)	(1.88)	(1.64)	(1.95)		(0.82)	(1.89)	(1.51)	(2.65)
$KNPS\_BIO_{t-1} \times D\_LD1\_D_{t-1}$	0.0124	0.0098	0.0079	0.0154**	$KNPS\_BIO_{t-1} \times D\_LD2\_D_{t-1}$	0.0343	0.0127*	0.0254	0.0313**
	(1.56)	(1.13)	(1.24)	(2.21)		(1.54)	(1.84)	(1.54)	(2.24)
$SIZE_{t-1}$	–0.0133	0.0363**	–0.0203**	–0.0293***	$SIZE_{t-1}$	-0.0131	0.0328*	-0.0163**	-0.0296***
	(–0.66)	(2.27)	(–2.79)	(–12.22)		(-0.67)	(2.00)	(-2.61)	(-10.83)
MB_{t-1}	0.2139***	0.2414***	–0.0200***	–0.0076	MB_{t-1}	0.2351***	0.2468***	-0.0207***	-0.0068
	(12.15)	(9.45)	(–3.48)	(–1.21)		(8.15)	(9.49)	(-3.47)	(-1.06)
MKT_D_{t-1}	0.1345	0.1476	0.1324	0.1310	MKT_D_{t-1}	0.0113	0.0108	0.0124	0.0132
	(1.46)	(1.40)	(1.44)	(1.44)		(0.87)	(0.81)	(0.92)	(0.96)
Intercept	2.3554***	1.1991***	0.5943***	0.5620***	*Intercept*	2.3391***	1.2054***	0.5916***	0.5420***
	(12.62)	(8.32)	(9.90)	(10.46)		(14.28)	(8.62)	(10.97)	(9.54)
Board-related Variables	Yes	Yes	Yes	Yes	*Board-related Variables*	Yes	Yes	Yes	Yes
Industry D	Yes	Yes	Yes	Yes	*Industry D*	Yes	Yes	Yes	Yes
Year D	Yes	Yes	Yes	Yes	*Year D*	Yes	Yes	Yes	Yes
N	1,132	1,132	1,132	1,132	*N*	1,132	1,132	1,132	1,132
Adj. R^2	0.0684	0.0723	0.0244	0.0213	*Adj.* R^2	0.0643	0.0623	0.0172	0.0135

Notes: This table presents estimation results for panel regression models examining whether the reduced leverage deviation due to institutional monitoring improves accounting-based firm performance after controlling for board-related variables. *t*-statistics are reported in parentheses and are adjusted for two-way clustered standard errors at the firm level to allow for heteroskedasticity and arbitrary within-firm correlations based on Petersen's (2009) methodology. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 9. Robustness test of the influence of KNPS blockholdings on leverage deviation: Logit regressions

	(highest quartile = 1, otherwise = 0)	
	Dummy_D_LD1	*Dummy_D_LD2*
KNPS_BIO $_{t-1}$	-0.0566	-0.0518
	(–1.14)	(–1.65)
ROA $_{t-1}$	0.4584***	0.1630***
	(2.80)	(2.99)
SIZE $_{t-1}$	–0.0240***	–0.0038**
	(–4.68)	(–2.12)
MB $_{t-1}$	–0.0957***	–0.1494***
	(–3.18)	(–3.14)
MKT_D $_{t-1}$	–0.0077	–0.0068
	(–1.11)	(–0.92)
Intercept	-0.4421	–0.5532
	(–0.69)	(–0.51)
Industry D	Yes	Yes
Year D	Yes	Yes
N	1,947	1,947
Pseudo R^2	0.0571	0.0617

Notes: This table reports time-series averages for the coefficient estimates of cross-sectional logit regression models for the relationship between institutional monitoring and leverage deviation. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 10. Robustness test of the influence of KNPS blockholdings on leverage deviation: Full sample

	Models without governance variables		Models with governance variables	
	D_LD1	*D_LD2*	*D_LD1*	*D_LD2*
KNPS_BIO_D $_{t-1}$	-0.0006	-0.0008	-0.0004	-0.0004
	(-1.17)	(-1.14)	(-1.40)	(-1.45)
ROA $_{t-1}$	-0.0483***	-0.0550***	-0.0473***	-0.0535***
	(-9.75)	(-11.78)	(-7.82)	(-11.87)
SIZE $_{t-1}$	-0.0041***	-0.0037***	-0.0040***	-0.0038***
	(-5.55)	(-8.69)	(-5.76)	(-5.20)
MB $_{t-1}$	-0.0033**	-0.0047***	-0.0044***	-0.0043***
	(-3.15)	(-5.46)	(-11.57)	(-4.28)
MKT_D $_{t-1}$	0.0023	0.0125	0.0027	-0.0398
	(1.33)	(1.76)	(1.37)	(-0.95)
Foreign_shrown $_{t-1}$			-0.0003	-0.0002
			(-1.48)	(-0.53)
Board_size $_{t-1}$			0.0000	-0.0004
			(0.10)	(-0.85)
Ind_pct $_{t-1}$			-0.0001*	-0.0002***
			(-1.90)	(-3.95)
Intercept	0.1626***	0.1503***	0.1618***	0.1531***
	(12.27)	(19.69)	(13.18)	(11.35)
Industry D	Yes	Yes	Yes	Yes
N	13,043	13,043	10,878	10,878
Adj. R^2	0.0305	0.0340	0.0358	0.0451

Notes: This table reports coefficient estimates for Fama–MacBeth (1973) regressions investigating the effect of institutional monitoring on leverage deviation based on the full sample after controlling for board-related variables. *t*-statistics are adjusted for Newey–West autocorrelations with three lags and are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.