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# The Ownership of the Largest Family Blockholders and Korean Firm Risk

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## Abstract

This paper investigates the relationship between the ownership of the largest family blockholders and corporate risk. We also examine whether firms that belong to 30 main Chaebol groups lower corporate risk. We use panel analysis for companies listed on the Korea Exchange from 2005 to 2017. We use beta, volatility, and idiosyncratic risk as a proxy for corporate risk. We employ both the ownership of the largest family blockholders and firms that belong to 30 main Chaebol groups as a major independent variable. The results show that the ownership of the largest family blockholders is associated with low beta. In terms of the effects of the ownership of the largest family blockholders on beta, we find that a firm that belongs to the 30 main Chaebol group reinforces the lower beta. These results suggest that the ownership of the largest family blockholders and firms that belongs to 30 main Chaebol groups may be associated with low systematic risk in the Korean stock market. Our findings can provide meaningful information to investors and field officers who are interested in the relationship between firm risk and both the largest family blockholders' ownership and firms that belong to 30 main Chaebol groups.

**Keyword:** Family Blockholder, Ownership, Beta, Volatility, Idiosyncratic Risk

**JEL Classification Code:** G30, G32, G35

## 1. Introduction

In the field of finance, the risk of stock price returns is a central theme in portfolio theory, asset pricing model, and option valuation. Therefore, this theme has been actively studied. In the fields of portfolio theory, asset pricing model, and option valuation, it is assumed that the risk of stock price returns is known and constant. However, the risk of the stock price return is variable. The risk of stock price returns is a very important issue for financial theory and investors (Campbell et al., 2001; Zhang, 2010).

Until now, many studies have been focused on the ownership structure as a factor that determines the volatility of stock price returns. First, previous studies use the investor base as a proxy for ownership structure. They use an investor base as the number and ownership of minority shareholders, ownership of institutional investors, and ownership of foreign investors (Chichemea et al., 2015; Li et al., 2011; Merton, 1987; Rubin & Smith, 2009; Wang, 2007). Second, previous studies also use portfolio concentration as a proxy for ownership. They employ portfolio concentration as the largest non-diversified (concentrated) shareholders, the degree of concentration or diversification (distribution) among large shareholders, and the presence and the number of large shareholders (Ekholm & Maury, 2014; Faccio et al., 2011; Rossetto & Stagliano, 2012). However, previous studies do not show consistent results in the effects of each ownership on corporate risk. Also, previous studies analyze the influence of other factors on corporate risk. Other factors are market value versus book value, profitability, stock liquidity, firm size, leverage, and dividend payments(Black, 1976; Cao et al., 2006; Dennis & Strickland, 2004; Faccio et al., 2011; Li et al., 2011; Pastor & Veronesi, 2003; Schwert, 2002; Wei & Zhang, 2006). However, prior studies also do not show consistent results in the impact of other factors on firm risk. Some research shows that the relationship between stockholders and earnings volatility(Faccio et al., 2011; John et al., 2008).

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There are some studies on the relationship between blockholder ownership and corporate risk. Blockholders are defined as shareholders who hold 5% or more of the total stake (Dlugosz et al., 2006). For example, the impact of founding families on the idiosyncratic risk and total risk (Anderson & Reeb, 2003b), the relationship between the largest blockholder ownership and total risk (Rossetto & Stagliano, 2012), the relationship between long-term shareholders and the risk that related to the ownership of large shareholders (Newton & Paeglis, 2019). In general, blockholders are classified into families, institutional investors, and foreign investors within a firm. Unlike the United States, the largest blockholder is a family in South Korea's ownership. However, previous studies overlooked the relationship between the ownership of the largest family blockholders and corporate risk. As far as we know, there is very little regarding the relationship between firm risk and the ownership of the largest family blockholders who include both affiliated persons and affiliates. Korea listing companies can provide good examples of the largest family blockholders who include both affiliated persons and affiliates.

Our analysis makes two contributions to the literature as to the relationship between ownership structure and corporate risk. First, the ownership of South Korean companies is different from that of US companies. Institutional investors are the largest shareholders of US companies (Volkova, 2018). However, families who include affiliated persons and affiliates are the largest blockholders of South Korean companies. Therefore, this study is differentiated in that we analyze the relationship between firm risk and the ownership of the largest family blockholders who include affiliated persons and affiliates. Second, this study also analyzes the relationship between firm risk and the interaction between the ownership of the largest family blockholders and the 30 main Chaebol groups. This has not been addressed by earlier studies. This extends the existing literature on the association between ownership structure and corporate risk.

## 2. Literature Review and Hypotheses

### 2.1. The Relationship between Ownership and Firm Risk

Previous studies analyze the relationship between ownership structure and corporate risk from two perspectives: investment base and portfolio concentration. Previous studies use the proxy for investment base as the number and ownership of minority shareholders, institutional investor ownership, and foreign investor ownership.

Concerning the relationship between the number and ownership of minority shareholders and the firm risk, Merton (1987) argues that the number of investors has a positive influence on the stock price under incomplete information. Wang (2007) finds that the size of the investor base has a negative impact on firm risk. However, Jankensgard and Vilhelmsson (2015) report a positive relationship between firm risk and the number and ownership of minority shareholders. Regarding the association between volatility and institutional investor's ownership, Dennis and Strickland (2004) report that there is a positive relationship between volatility and the ownership of financial institutions and mutual funds. Chichernea et al. (2015) report that institutional investors with a short-term investment are associated with high volatility. Campbell et al. (2001) and Zhang (2010) examine that there is a positive relationship between volatility and the ownership of institutional investors. However, Rubin and Smith (2009) argue that dividend payments are the determining factor that the ownership of institutional investors affects the volatility. They find that there is a negative (positive) relationship between volatility and institutional investor's ownership when paying (not) dividends. Jankensgard and Vilhelmsson (2015) report that there is a negative relationship between volatility and the ownership of institutional investors. Regarding the association between volatility and foreign investor's ownership, Li et al. (2011) argue that foreign investors not only decrease volatility through monitoring activities but also improved governance in emerging markets.

Previous studies report that there is a relationship between portfolio concentration and firm risk. Investors who have different investment orientations have different characteristics in terms of governance and risk-taking. Faccio et al. (2011) show that companies that are controlled by the largest diversified (decentralized) shareholders opt for more risker investment options than those that controlled by the largest non-diversified (concentrated) shareholders. Ekholm and Maury (2014) argue that whether a firm that prefers a stable policy with low risk is related to not only the degree of concentration but also diversification among the largest shareholders. However, we know very little as to the association between the ownership of the largest family blockholder and firm risk.

As far as we know, only three prior studies have explicitly investigated the effects of blockholders on firm risk. For example, Anderson and Reeb (2003b) examine the seriousness of these moral hazard problems by analyzing whether founding families – as undiversified, large blockholders – seek to decrease firm-specific risk by impacting the firm's diversification and leverage decisions. They find that the effects of founding families on firm-specific risk and the total depend critically on the founding family's generation responsible for the company. Rossetto and Stagliano (2012) investigate empirically

the relationship between firm risk and medium-sized blockholders. They show that the existence of multiple blockholders has a positive impact on corporate risk. They also show that the ownership of the largest blockholder decrease company risk only when the corporation has no other blockholders. Newton and Paeglis (2019) show that the ownership of individual blockholders is related to the lower systematic risk while firm blocks were associated with the systemic risk. Recently, Lee et al. (2018) examine the relationship between a controlling family's ownership and South Korea company's risk-taking behavior. They show that a non-linear U-shaped relationship exists between family ownership and a firm's risk-taking. They argue that a family with small ownership takes a small risk for pursuing their private interests, while a family with more ownership modify their interest with their company's by taking more value-enhancing risky projects. Rajverma et al. (2019) find that firms owned by the family are dominant with concentrated ownership. Management pays low dividends leading to decrease valuation and increase idiosyncratic risk. They illustrate that family control and family ownership concentration affect both firm performance and risk.

We assume that the largest family blocks will use their control to reduce the risk because of their risk-aversion. Based on these preceding studies the relationship between family blockholders' ownership and firm risk, this study formulates the following hypothesis.

***H1:*** *There is a negative relationship between the ownership of the largest family blockholders and firm risk.*

### 2.2. Interaction of 30 Major Chaebol Groups

A Chaebol is a big industrial conglomerate that is controlled and run by a family or an owner in South Korea. A Chaebol is often made up of many diversified affiliates, managed by an owner whose control over the group often surpass legal authority. Some Chaebol is one large firm while others have dispersed loosely connected groups of divided companies sharing a common name. Campbell II and Keys (2002) examines the influence of corporate governance dominated by some large Korea's business groups. They show that firms affiliated with the top five groups exhibit higher sales growth and lower performance relative to other firms. Lee et al. (2005) focus on the determining factors of conditional skewness of stock return. They find that risk-sharing has effects on affiliated firm heterogeneity. Previous studies have analyzed 30 major Chaebol groups in Korea (Cho & Park, 2002; Lee et al., 2005). The Fair Trade Commission selects the 30 major Chaebol groups. Whether or not the 30 main Chaebol group belongs to the group is based on the total assets of each company.

In terms of the effects of the ownership of the largest family blockholders on firm risk, we expect that the interaction between firms that belongs to the 30 major Chaebol groups and the largest family blockholders reinforces the lowering of corporate risk. Therefore, the following hypothesis is established.

***H2:*** *The interaction between the largest family blockholders and companies that belongs to the 30 main Chaebol groups strengthens the lowering of corporate risk.*

## 3. Method

### 3.1. Sample and Data

Our data is composed of firm-level information, not only from TS-2000 (similar to COMPUSTAT of U.S.), which is provided by the Korea Listed Companies Association, but also KIS VALUE Library (similar to CRSP of U.S.), which is provided by Korea Investors Service Corporation. Our final sample is composed of 7,275 firm-year observations from 646 non-financial firms from Korea exchange between 2005 and 2017. Samples are selected based on the following criteria. First, we exclude companies for which financial statements are not available from both TS-2000 and KIS VALUE Library. Second, we also do not include the financial sectors such as banks, securities, and insurances because they differ from manufacturing in terms of capital structure and business methods. Third, to control the effect of outliers on the analysis results, the upper and lower 1% of each variable is removed.

### 3.2. Model and Variables Measures

To analyze the effect of the ownership of the largest family blockholders on corporate risk, we use an equation (1). To analyze the relationship between a firm that belongs to the 30 main Chaebol groups and corporate risk, we use an equation (2). We conduct empirical analysis through panel analysis based on panel data. Chamberlain and Griches (1984) argue that the fixed-effects model has the advantage that there is no bias in the estimation result even if there is a correlation between the missing variable and the independent variable. We confirm the existence of corporate characteristics and time (year) characteristic effects through the Lagrange multiplier test suggested by Breusch and Pagan (1980) and also confirmed that the fixed effect model is more suitable than the probability effect model through the Hausman test.

$$\mathrm{FR}_{it} = \alpha_0 + \beta_1 \mathrm{LFB}_{it-1} + \beta_2 \mathrm{NB}_{it-1} + \beta_3 \mathrm{X}_{t-1} + \mu_t + \lambda_t + \varepsilon_{it} \quad (1)$$

$$\mathrm{FR}_{it} = \alpha_0 + \beta_1 \mathrm{LFB}_{it-1} \mathrm{XD\_30Chaebol}_{it-1} + \beta_2 \mathrm{NB}_{it-1} + \beta_3 \mathrm{X}_{t-1} + \mu_t + \lambda_t + \varepsilon_{it} \quad (2)$$

Where,

FR = Firm risk (Beta, Volatility, Idiosyncratic Risk)

LFB = Ownership of the largest family blockholders

*D_30* Chaebol = Dummy (1: a firm that belongs to 30 main Chaebol group, 0: otherwise)

NB = Number of blockholders

*X* = Control variables (firm size, Tobin's Q, leverage, ROA)

$\mu$ = Firm characteristic effect

$\lambda$ = Time characteristic effect

$\varepsilon$ = Error

*i* = Firm 1, …, N

*t, t* – 1 = 2005 – 2017 Yr.

This study uses beta for firm risk according to Rossetto and Staglianò (2012). We measure beta as the regression coefficient from the market model in which the corporations' daily share returns are regressed on a market portfolio for the period included by the annual sample. We use the ownership of the largest family blockholder as a major independent variable. We also use a dummy variable to test the interaction effect. D_30 Chaebol are a binary variable that equals one when a firm belongs to 30 main Chaebol groups. In further analysis, we also use volatility and idiosyncratic risk for firm risk. We calculate volatility as the standard deviation of corporations' daily stock returns since the year in which the ownership information is located. We also measure idiosyncratic risk as to the standard error of the residuals from the market model in which the corporations' daily share returns are regressed on a market portfolio for the relative year. To estimate the size of the idiosyncratic risk, this study measures the idiosyncratic risk according to the method of Ang et al. (2006) using the residuals obtained through the market model.

We use the number of blockholders and firm characteristic factors as control variables. We employ four firm characteristics that used in previous studies: firm size, Tobin Q, leverage, and ROA (Alqirem et al., 2020; Kim & Cho, 2019, 2020a, 2020b). Firm size is measured by the natural log of total assets (1million won). Tobin Q is measured by the ratio of equity market value plus debt book value to total assets. Leverage is the ratio of debt to equity. ROA is measured by the ratio bottom line to total assets.

## 4. Results

### 4.1. Descriptive

Table 1 shows the descriptive statistics for risks, ownership, and firm characteristics. This sample covers 7,275 firm-years for all variables. The average (median) of beta is 0.746 (0.385). This is similar to the average (median) of 0.812 (0.571) for US firms reported by Rossetto and Staglianò (2012). The average (median) of volatility is 47.5% (44.6%). This is much larger than both the 3.36% (2.93%) of US companies reported by Rossetto and Staglianò (2012) and the 7.9% reported by Anderson and Reeb (2003b). The average (median) of idiosyncratic risk is 2.8% (1.1%). This is similar to those of 3.1% (1.7%) of US firms reported by Rossetto and Staglianò (2012). However, this is less than the average of 7.0% of US firms studied by Anderson and Reeb (2003b). Although there is a difference in the analysis year and number of samples, the volatility of South Korean companies is greater than that of US companies, while the beta and idiosyncratic risks are similar or smaller than those of US companies. The average (median) of the ownership of the largest family blockholders is 41.6% (15.5%). This is greater than 6.08% of the family ownership of Newton and Paeglis (2019). The proportion of 30 main Chaebol groups in the sample is 12.9%. The table shows that only for corporations with at least one blockholder. The mean (median) of the number of blockholder is 1.663 (0.928). This is less than the average (median) of 2.79 (1.43) for US companies surveyed by Rossetto and Staglianò (2012). The average firm size is 12.226, which is greater than the median of 11.939. The average of Tobin's *Q* is 1.097, which is greater than the median 0.935. The leverage average is 98.2%, which is greater than the median of 69.2%. The average ROA is 2.9%, which is less than the median of 3.1%. In summary, we find that there is no significant difference between the mean and median for the firm characteristic variables, and each variable was not significantly affected by outliers. Since the outliers that deviate from the upper and lower 1% were removed for each variable, the distribution of the variables was slightly more stable.

### 4.2. Correlation Matrix

Table 2 shows the correlations between variables measured by the Pearson correlation coefficient. There is a significantly positive correlation among the firm risks at the 1% level. There is a significant negative correlation at the 1% level between the largest family blockholders (LFB) and beta. There is a positive correlation at the 1% level between D_30 and beta. There is also a significant negative correlation at the 1% level between the number of blockholders and beta. There is a mixed correlation between corporate characteristic factors and corporate risk. And we measure the variance inflation factor (VIF) individually for the regression coefficient. As a result of the analysis, the VIF value of D_30 is the largest at 2.50. However, it is smaller than 10, which is used as a criterion for multicollinearity (Kneedy, 1992). Therefore, there is no concern about the problem of multicollinearity in the regression outputs.

**Table 1:** Descriptive Statistics

| Variable | Obs. | Mean | Std. Dev. | *p*25 | *p*50 | *p*75 |
|---|---|---|---|---|---|---|
| Beta(BT) | 7275 | 0.746 | 0.385 | 0.461 | 0.723 | 1.004 |
| Volatility(VO) | 7275 | 0.475 | 0.183 | 0.341 | 0.446 | 0.586 |
| Idiosyncratic Risk(IR) | 7275 | 0.028 | 0.011 | 0.020 | 0.026 | 0.034 |
| Largest Family Block(LFB) | 7275 | 0.416 | 0.155 | 0.304 | 0.411 | 0.514 |
| D_30Chaebol(D_30) | 7275 | 0.129 | 0.336 | 0.000 | 0.000 | 0.000 |
| Number of Block(NB) | 7275 | 1.663 | 0.928 | 1.000 | 1.000 | 2.000 |
| Firm Size(FS) | 7275 | 12.226 | 1.391 | 11.270 | 11.939 | 12.903 |
| Tobin's Q(TQ) | 7275 | 1.097 | 0.585 | 0.755 | 0.935 | 1.225 |
| Leverage(LV) | 7275 | 0.982 | 1.016 | 0.338 | 0.692 | 1.262 |
| Return on Asset(ROA) | 7275 | 0.029 | 0.073 | 0.006 | 0.031 | 0.066 |

Note: All variables are winsorized at the top and bottom 1 percentile to mitigate the impact of outliers.

**Table 2:** Correlation Matrix

| | BT | VO | IR | LFB | D_30 | NB | FS | TQ | LV | ROA | VIF |
|---|---|---|---|---|---|---|---|---|---|---|---|
| BT | 1 | | | | | | | | | | |
| VO | 0.40* | 1 | | | | | | | | | |
| IR | 0.24* | 0.80* | 1 | | | | | | | | |
| LFB | –0.22* | –0.13* | –0.06* | 1 | | | | | | | 1.19 |
| D_30 | 0.15* | –0.13* | –0.10* | –0.05* | 1 | | | | | | 2.50 |
| NB | –0.09* | –0.18* | –0.16* | –0.21* | 0.11* | 1 | | | | | 1.21 |
| FS | 0.17* | –0.33* | –0.29* | –0.04* | 0.57* | 0.29* | 1 | | | | 1.92 |
| TQ | 0.21* | 0.15* | 0.10* | –0.20* | 0.04* | 0.02* | –0.02* | 1 | | | 1.11 |
| LV | 0.09* | 0.20* | 0.13* | –0.07* | 0.10* | –0.01 | 0.17* | 0.00 | 1 | | 1.23 |
| ROA | 0.01 | –0.23* | –0.21* | 0.13* | 0.04* | 0.11* | 0.10* | 0.11* | –0.35* | 1 | 1.27 |

Note: This table presents the Pearson correlation matrix for all variables. All variables are defined in Table 1. * indicate significance at the 1% level.

### 4.3. The Ownership of the Largest Family Blockholders and Firm Risk

To test the effects of the largest family blockholders' ownership on firm risk, this study attempt to consider one dimensions of risk. To that end, this study uses beta as a proxy of risk. We also use volatility and the idiosyncratic risk as a proxy of risk in additional analysis. This study uses the two independent variables: the ownership of the largest family blockholders, the interaction between the ownership of the largest family blockholders and a firm that belongs to the 30 main Chaebol group. In so doing, this study controlled for firm size, firm size, Tobin's Q, leverage, ROA, as well as period time. In this study, the panel regression model is applied through statistical testing procedures such as the Lagrange multiplier test and the Hausman test. Through the Lagrangian multiplier test, the firm characteristic effect and the time characteristic effect exist significantly at the 1% level. Through the Hausman test, we confirm that the fixed effect model is more valid than the probability effect model. And the fit of the model is significant at the 1% level. We analyze the relationship between beta and the control variables in Model (1). We examine the relationship between beta and the ownership of the largest family blockholders in Model (2). In Model (3), this study also analyzes the relationship between beta and the interaction between the ownership of the largest family blockholders and a firm that belongs to 30 main Chaebol groups.

**Table 3:** The Ownership of the Largest Family Blockholders and Beta

| Variables | Panel (Fixed Effect Model) *Beta* | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| Largest Family Blockholder$_{t-1}$ | | –0.239*** | |
| | | (–4.31) | |
| Largest Family Blockholder$_{t-1}$ × D_30Chaebol$_{t-1}$ | | | –0.098* |
| | | | (–1.78) |
| Number of Blockholder$_{t-1}$ | –0.036*** | –0.040*** | –0.036*** |
| | (–6.61) | (–7.26) | (–6.62) |
| Firm Size$_{t-1}$ | 0.081*** | 0.077*** | 0.082*** |
| | (6.35) | (5.95) | (6.40) |
| Tobin's Q$_{t-1}$ | 0.127*** | 0.124*** | 0.126*** |
| | (14.33) | (14.09) | (14.30) |
| Leverage$_{t-1}$ | –0.019*** | –0.020*** | –0.019*** |
| | (–3.15) | (–3.30) | (–3.19) |
| ROA$_{t-1}$ | 0.297*** | 0.306*** | 0.295*** |
| | (4.85) | (5.01) | (4.82) |
| Constant | –0.173 | –0.006 | –0.152 |
| | (–1.14) | (–0.04) | (–1.15) |
| Year effect | Yes | Yes | Yes |
| Observations | 7,275 | 7,275 | 7,275 |
| *R*–squared | 0.220 | 0.222 | 0.221 |
| Number of *i* | 622 | 622 | 622 |
| *F*–value | 117.11*** | 111.61*** | 110.45*** |
| Lagrange multiplier test | 3940.33*** | 2974.66*** | 3939.49*** |
| Hausman test | 81.39*** | 106.70*** | 82.28*** |

Note: *t*-value is shown in parenthesis. ***, * indicate significance at the 1%, 10% levels, respectively.

Our findings can be summarized as follows. First, this study uses firm size, Tobin's Q, leverage, and ROA as control variables in Model (1). We find that there is a significant relationship between all control variables and beta at the level of 1%. Therefore, we use four control variables to control the impact of the ownership of the largest family blockholders on beta.

Second, as reported in Model (2) of Table 3, we find that there is a significant negative relationship between beta and the ownership of the largest family blockholder (H1: accept). This suggests that the CAPM betas decreased with the level of the largest family blockholder's ownership. These results are economically and statistically significant in the following mean: an increase from 0% to 25% ownership was, on average, related to a reduction in the CAPM beta of about 6%. This finding implies that companies with the largest family blocks were less sensitive to both broad market shocks and to the relative output of small corporations over large firms, which could impact their cost of capital. This result could be consistent with both the company having less debt and with effective risk management that makes the firm less vulnerable to macroeconomic shocks and economic swings. This result is similar to the study of Newton and Paeglis (2019) who analyze the relationship between individual blockholder and systematic risk.

Third, we examine the relationship between beta and the interaction of the ownership of the largest family blockholders with a firm that belongs to the 30 main Chaebol groups. A Chaebol is a big industrial conglomerate that is controlled and run by an owner or family in South Korea. In Model (3) of Table 3, we find that there is a negative relationship between beta and the interaction of the ownership of the

largest family blockholders with a firm that belongs to the 30 main chaebol groups (H2: accept). This means that companies that belong to the 30 main Chaebol groups have more strengthened in reducing corporate risk.

Fourth, this study shows that there is a negative relationship between the number of blockholders and beta. This is different from that of Rossetto and Staglianò' (2012). They show that there is a positive relationship between the number of blockholders and corporate risk. We attribute these differences to differences in ownership structure, analysis period, and samples.

Fifth, this study shows that there is a positive relationship between firm size and beta in all models. This means that the larger the firm size, the higher the systematic risk. The factor used as a proxy variable for growth options in the previous study is Tobin's Q. The analysis results show that Tobin's Q is associated with high corporate risk. These can be seen as the higher the growth opportunity, the higher the corporate risk. These results are similar to previous studies (Pastor & Veronesi, 2003; Cao et al., 2005; Jankensgard & Vilhelmsson, 2015). Black (1976) argue that the volatility of stock price returns is determined by leverage. This study shows that there is a negative relationship between leverage and beta. These results are consistent with studies showing a negative relationship between leverage and volatility (Paster & Veronesi, 2003; Cao et al., 2006). We show that profitability is related to high beta. This is consistent with previous studies that show a positive relationship between profitability and volatility (Faccio et al., 2011; Jankensgard & Vilhelmsson, 2015).

**Table 4:** The Ownership of the Largest Family Blockholders and Volatility/Idiosyncratic Risk

| Variables | Volatility | | Idiosyncratic Risk | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Largest Family Blockholder$_{t-1}$ | 0.020 | | 0.003 | |
| | (0.78) | | (1.62) | |
| Largest Family Blockholder$_{t-1}$ × D_30Chaebol$_{t-1}$ | | –0.063** | | –0.002 |
| | | (–2.51) | | (–1.08) |
| Number of Blockholder$_{t-1}$ | –0.007*** | –0.007*** | –0.000 | –0.000 |
| | (–2.67) | (–2.86) | (–0.59) | (–0.88) |
| Firm Size$_{t-1}$ | –0.044*** | –0.044*** | –0.003*** | –0.003*** |
| | (–7.44) | (–7.47) | (–8.10) | (–8.24) |
| Tobin's $Q_{t-1}$ | 0.027*** | 0.027*** | 0.001* | 0.000* |
| | (6.65) | (6.57) | (1.81) | (1.70) |
| Leverage$_{t-1}$ | 0.020*** | 0.019*** | 0.001*** | 0.001*** |
| | (7.26) | (7.17) | (7.23) | (7.14) |
| ROA$_{t-1}$ | –0.151*** | –0.151*** | –0.009*** | –0.009*** |
| | (–5.37) | (–5.39) | (–5.07) | (–5.04) |
| Constant | 0.966*** | 0.979*** | 0.061*** | 0.063 |
| | (13.39) | (14.00) | (13.74) | (14.58) |
| Year effect | Yes | Yes | Yes | Yes |
| Observations | 7,275 | 7,275 | 7,275 | 7,275 |
| *R*-squared | 0.284 | 0.285 | 0.177 | 0.177 |
| Number of *i* | 622 | 622 | 622 | 622 |
| *F*-value | 154.73*** | 155.20*** | 83.87*** | 83.76*** |
| Lagrange multiplier test | 1246.59*** | 1415.83*** | 3025.50*** | 3007.93*** |
| Hausman test | 219.69*** | 236.41*** | 119.23*** | 121.06*** |

Note: *t*-value is shown in parenthesis. ***, **, * indicate significance at the 1%, 5%, 10% levels, respectively.

### 4.4. Robustness Tests

We analyze four robustness tests. First, we use beta only as a proxy variable for corporate risk in Table 3. We additionally use volatility and the idiosyncratic risk as a proxy for corporate risk in Table 4. In Models 1 and 2, we use volatility as a proxy for corporate risk. In Models 3 and 4, we use the idiosyncratic risk as a proxy for corporate risk. We use the fixed-effect model as analyzed in Table 3. In Models (1) and (3), there is no evidence of relationship between the ownership of the largest family blockholder and volatility / the idiosyncratic risk. In Model (2), we find that the interaction of the ownership of the largest family blockholders with firms that belong to the 30 main chaebol group have a negative effect on volatility at the 5% level. This means that the belongings to the 30 main Chaebol groups strengthen more the reduction of volatility. However, there is no evidence of relationship between the interaction variables and the idiosyncratic risk in a model (4). Contrary to expectations, the results in Table 3 and Table 4 show conflicting results in the relationship between control variables and corporate risk. There is a negative relationship between firm size, ROA and volatility, idiosyncratic risk, while both Tobin's Q and leverage are positively related to the volatility and idiosyncratic risk.

Second, we additionally examine the effect of the largest non-family blockholders on firm risk in Table 5. This is to see how the largest family blockholder and the largest non-family blockholder affect corporate risk. The non-family blockholders refer to the blockholders who are not affiliated persons and affiliates: foreigners, institutional investors, and governments. We use a probability effect model in panel analysis. This is because the results of the Housman test were not statistically significant. We find that there is no significant relationship between the ownership of the largest non-family blockholders and firm risk.

**Table 5:** The Ownership of the Largest Non-Family Blockholder and Firm Risk

| Variables | Panel(Random effect) | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| | $Beta_t$ | $Volatility_t$ | $Idiosyncratic\ Risk_t$ |
| $Largest\ Non\text{-}Family\ Blockholder_{t-1}$ | –0.147 | –0.002 | 0.004 |
| | (–0.09) | (–0.03) | (0.93) |
| $Number\ of\ Blockholder_{t-1}$ | –0.043** | –0.006 | 0.000 |
| | (–2.09) | (–0.75) | (0.19) |
| $Firm\ Size_{t-1}$ | 0.027 | –0.036*** | –0.002*** |
| | (1.37) | (–4.46) | (–4.70) |
| $Tobin's\ Q_{t-1}$ | 0.105*** | 0.037** | –0.000 |
| | (3.16) | (2.67) | (–0.15) |
| $Leverage_{t-1}$ | 0.009 | 0.037*** | 0.001*** |
| | (0.63) | (6.06) | (3.96) |
| $ROA_{t-1}$ | –0.163 | –0.512*** | –0.023*** |
| | (–0.76) | (–5.69) | (–4.14) |
| Constant | 0.540* | 0.874*** | 0.056*** |
| | (1.89) | (7.50) | (7.73) |
| Year Effect | Yes | Yes | Yes |
| Observations | 453 | 453 | 453 |
| *R*-squared | 0.201 | 0.353 | 0.246 |
| Number of *i* | 70 | 70 | 70 |
| Wald $chi^2(17)$ | 99.28*** | 260.59*** | 148.60*** |
| Lagrange multiplier test | 320.40*** | 142.44*** | 113.55*** |
| Hausman test | 24.19 | 18.65 | 14.98 |

Note: *z*-value is shown in parenthesis. ***, **, * indicate significance at the 1%, 5%, 10% levels, respectively.

Third, we divide the Korea Exchange into KOSPI (similar to NYSE) and KOSDAQ (similar to NASDAQ). The reason for distinguishing the market is that the two markets differ in terms of listing conditions, ownership structure, and corporate characteristics. We analyze by fixed effect model as shown in Table 3. Although not shown here, we find that there is a negative relationship between beta and the ownership of the largest family blockholders. In KOSPI, the regression coefficient of ownership of the largest family blockholders was (–) 0.171, and the *t*–value was (–) 2.57. In KOSDAQ, the regression coefficient of ownership of the largest family blockholders was (–) 0.356 and the *t*–value was –3.58. However, there is no significant association between volatility / idiosyncratic risk and the ownership of the largest family blockholders.

Fourth, we employ other control variables that are introduced in prior research. Other control variables are cash flow, growth, tangible assets, and R&D expense. Although not shown here, we find that there is no evidence the relationship between other control variables and firm risk.

## 6. Conclusions

This study examined the relationship between the ownership of the largest family blockholders and firm risk using a cross-section of Korea stock exchange-listed firms. This study also analyzed the impact of firms that belong to 30 main Chaebol groups on corporate risks.

We found that the ownership of the largest family blockholders was related to lower the systematic risk and volatility, while they were unrelated to the idiosyncratic risk. We also found that the interaction of the ownership of the largest family blockholders with a firm that belongs to the 30 main chaebol group had reinforced to lower firm risk.

This study contributes to the literature on firm ownership and control with those on family portfolio allocation and asset pricing. Much of the intersection between asset pricing and firm control has focused on the relationship between ownership and stock returns. We extend prior literature by showing that the ownership of the largest family blockholders influences firm risk. While there are many prior studies yet to be done, the first finding is suggestive that risk loadings may be strictly determined not only by the ownership of family blockholder, but also by belongings to 30 main Chaebol groups. While the assumption in the prior study is that the identity of a corporation's owners is mostly irrelevant, we report that is not the case. This study brings up the very real possibility that ownership needs to be considered in future studies involving risk.

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