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Business group heterogeneity and firm outcomes: Evidence from Korean chaebols

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Abstract

This paper examines the impact of business group affiliation on the performance and corporate policies of Korean listed firms over the period 2007–2019. This study proposes a novel approach to observe heterogeneity in the affiliation effects. Overall, we conclude that business group characteristics are reflected in firm outcomes. We find that investors perceive group membership positively as they pay a premium to hold affiliated firms. The premium is related to profitability and size of business groups, which is consistent with resource-based theories. This analysis also identifies significant group-specific effects on firm policies. These findings suggest that several business groups follow group-level strategies and apply homogeneous financial and investment policies to all their affiliates.

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1. Introduction

Business groups exist in many countries around the world, in both emerging and developed markets. They consist of legally independent firms linked by formal and informal ties. How affiliation with a business group affects firm outcomes remains to be an open question. Carney et al. (2011), among others, note that the literature offers ambiguous empirical results and does not find a universal effect of affiliation. In this paper, we develop a multi-level identification strategy that accounts for the heterogeneity of business groups and allows to have a better understanding of the effect of affiliation on firm outcomes. Our approach contrasts with the common practice considering business groups as homogeneous entities. We use this novel identification strategy to explore the effect of group membership on firm performance and decisions in Korea. This economy is characterized by the prevalence of well-identified and large business groups commonly called chaebols. These business groups contributed to the quick industrialization of Korea during the second half of the 20th century. Chaebols recently emerged as global players in different industries including consumer electronics, automotive, and electronic components. Based on a sample of listed firms covering the period from 2007 to 2019, our empirical results shed new light on the relation between business group affiliation and a large range of firm outcomes including performance, financial, and investment policies. The analysis further reveals substantial variations of affiliation effect across business groups and highlights that business group features are reflected in affiliate outcomes.

In the first stage, we consider the impact of affiliation on performance considering chaebols as homogeneous entities. We find contradictory results as business group membership appears to be associated with higher value and lower profitability. Our empirical approach allows the reconciliation of this apparent discrepancy by highlighting the association between the affiliation effect and group characteristics. Indeed, it appears that the level of the value premium is positively associated with group profitability. The valuation premium is almost four times larger for the most profitable groups than for the least performing ones. We also note a positive association between the valuation premium and the size of the business group. This result is consistent with investors valuing the better visibility and reputation associated with the largest chaebols. We observe a negative relation between the value premium and the group leverage, which reveals that investors integrate a possible financial vulnerability of affiliated

firms in their valuations. These results indicate that market participants are confident in the perspectives of affiliated firms since they pay a premium for chaebol membership. When we consider financial decisions, we find, at the market-level, that affiliation with a chaebol is associated with lower cash holdings and debt. Further investigations on group characteristics reveal that such financing policy is essentially followed by firms belonging to smaller and well-performing business groups with higher profitability and sales growth. Regarding the dividend policy, affiliated firms appear to have lower payouts than unaffiliated firms at the market-level. A finer analysis reveals that this is only the case for a limited number of chaebols. Other affiliated firms do not exhibit significant differences with unaffiliated firms. Regarding investments, we observe no significant differences with unaffiliated firms at the market-level. However, the group-level analysis also shows that the effect of affiliation on investment varies substantially from a group to another, explaining the absence of a significant average effect. We find that firms affiliated to larger and more diversified chaebols have higher investment levels.

Overall, our empirical approach reveals the limitations of a simple identification strategy ignoring the heterogeneity of business groups. First, the effect estimated by such model is not generalizable to all business groups. Indeed, our results show that the group-specific effects diverge qualitatively and quantitatively from the average effect. Second, a model considering business groups as homogeneous entities would fail at identifying any significant effect if the association between affiliation and firm outcomes varies substantially in terms of sign across groups. Consequently, the empirical evidence provided by this paper calls for a reconsideration of prior findings. Indeed, the heterogeneity between groups might explain the lack of consensus in the literature and differences observed in the cross-country studies.

In addition to methodological contributions, this study extends the business group literature and contributes to a better understanding of the impact of business group membership on firm outcomes. First, this paper documents the effect of business group affiliation on a large range of firm outcomes for a single sample. It addresses the lack of comparability between studies in the business group literature discussed by Yiu et al. (2007) and provides a comprehensive view of the impact of affiliation. It contrasts with most prior studies that focus only on one specific topic such as performance (e. g. Khanna and Palepu (2000)) or specific decisions such as dividend policies (e. g. Gopalan et al. (2014)). Second, the empirical results reveal a stronger heterogeneity of the effect of affiliation on firm decisions than firm performance. This observation is likely to be explained by the discretionary power of controlling shareholder on affiliate decisions. By contrast, market forces are likely to be the

first driver of the performance effect. The evidence of significant group fixed effects also indicates that several business groups follow group-level policies and tend to apply homogeneously these policies to their affiliates. Finally, this paper extends the literature on the Korean market and chaebols. Indeed, a substantial part of the existing literature focuses on the 1997 Asian financial crisis (AFC) period. Since this event, the Korean institutional framework and corporate sector have experienced substantial changes calling for a reconsideration of the effect of chaebol affiliation.

The remainder of the paper is organized as follows. Section 2 introduces business groups and implications of affiliation. Section 3 presents the identification strategy and different models used in the empirical analysis. The firms and business groups datasets are described in Section 4. Section 5 presents the empirical results and discusses the main outcomes and some limitations of the paper. Section 6 provides the conclusion of the paper.

2. The effects of business group affiliation on firm outcomes

2.1 Effect of business group affiliation on firm outcomes

Resource-based and agency theories are the dominant theoretical lenses used in the literature analyzing how affiliation with a business group affects firm performance and behavior. With resource-based theory, business groups are seen as pools of intangible and tangible resources. The access to these resources differentiates affiliated from unaffiliated firms. The agency theory focuses on conflicts between different shareholders arising from the complex governance structure of business groups.

Resource-based theories generally predict a beneficial effect of business group membership on firm performance. For instance, Holmes Jr et al. (2018) note that firms that belong to a business group have access to internal markets for capital, workforce, and inputs. Group internal markets and intra-group transactions provide competitive advantages to business group affiliates relative to stand-alone firms. Internal capital markets reduce risks, ease project funding, and lower financial constraints. Internal labor markets provide advantages in terms of flexibility and knowledge sharing between affiliates of a same business group. Finally, intra-group trades secure supply chains and lower transaction costs. In contrast with resource-based theories, agency theories highlight costs associated with business group membership. Young et al. (2008) put forward a substantial risk of minority shareholder expropriation arising from the presence of a controlling shareholder and from complex ownership structure. In addition to traditional principal-agent conflicts, some conflicts between the group controlling shareholder

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and affiliates minority shareholders might occur as group-level and affiliate-level interests might compete. For instance, Bae et al. (2002) find that some decisions create value at a group-level, but are value destroying at a firm-level.

The effect of affiliation on market valuation depends on the investors' perception and the anticipated benefits and costs associated with business group membership. On the one hand, investors expect a value-enhancing effect of affiliation based on the resource-based theories. In addition to the abovementioned arguments, affiliation with a business group is associated with some intangible assets such as reputation (Lee, 2022b) and the "too big to fail" belief (Gormley et al., 2015). Gopalan et al. (2007) also document that affiliation with a business group reduces the risk of bankruptcy as affiliated firms can benefit from group support in case of financial distress. On the other hand, investors might discount business group membership given the risk of expropriations or resource misallocation. The empirical literature finds that the value of chaebol affiliation changes over time. Lee et al. (2010) observe a valuation premium during the 1980s and the 2000s and a discount during the 1990s. The authors explain the discount during the period preceding the AFC by over-investments and cross-subsidizations of poor performing affiliates. Recent evidence on the value of affiliation remains scarce, but Lee (2022b) observes that official chaebol designation is associated with a premium over the period 2013–2019. He explains the affiliation premium by reputation and the stricter regulation of chaebols over that period.

The predictions of resource-based theories are less conclusive regarding the effect of business group membership on affiliate profitability. Lower transaction costs and synergies between affiliates can enhance their profitability relative to independent firms. However, Stein (1997) theorizes that the benefits of synergies depend on the level of group diversification. In addition, Lincoln et al. (1996) observe that the profitability of affiliates can be harmed by profit smoothing strategy that aims at reducing group-level risk. Agency theories also highlight the risk of rent seeking behavior and resource misallocation that alter the profitability of affiliated firms. During the early stage of the Korean industrialization in the mid-1970s, Chang and Choi (1988) find that affiliated firms were more profitable, but Choi and Cowing (1999) note that the benefits of affiliation disappeared during the late 1980s and 1990s. Joh (2003) and Kim (2006) also observe a negative effect of affiliation on firm profitability during the period preceding the 1997 AFC.

The literature relates the ability of business groups to create internal capital markets by their capacity to raise, pool, and allocate financial resources among their affiliates. Unlike stand-alone firms that rely on internal liquidity and external debt, affiliated firms benefit from

the access to group internal capital markets as a complementary funding source. Consequently, their financing and investment decisions are likely to differ from unaffiliated firms. For instance, Shin and Park (1999) show that business group affiliation and internal capital markets reduce financial constraints, while Lee (2022a) concludes that they reduce financial frictions of affiliated firms.

The empirical literature reports evidence of differences in terms of financial policy between business group affiliates and stand-alone firms. Hence, Choi and Min (2015) find that, on average, chaebol affiliates have lower cash reserves than unaffiliated firms. Pinkowitz and Williamson (2001) suggest that business group affiliates need less cash for precautionary purpose as internal capital markets play the role of risk reduction mechanism. However, Choi and Min (2015) find that accumulation of cash holding for precautionary motive increased among chaebol affiliates after the AFC. In terms of use of debt, Lee et al. (2010) find that chaebol affiliates are historically more indebted than unaffiliated firms. However, the difference tends to decrease after the AFC. Before this crisis, the expansion of chaebols was mostly fueled by debt. Indeed, chaebols benefited from preferential borrowing conditions, while debt financing allowed raising external funds without diluting the power of controlling families. In terms of dividend policy, it is important to consider the presence and impact of group controlling shareholders. They are likely to have a substantial influence on payout decisions. On the one hand, a short-term perspective could foster higher dividend payout to extract cash from the company and to increase personal wealth. On the other hand, Kwon and Han (2020) conclude that the controlling shareholder prefer conducting conservative payout policy in order to maintain resources within the firms and the group. Dividends can also serve other purposes. For instance, a higher dividend payout mitigates risk of expropriation by limiting available resources under the control of managers or controlling shareholders, while Gopalan et al. (2014) document that dividends are used to transfer funds between affiliates of a same business group. Gul and Kealey (1999) do not observe any relation between affiliation with a chaebol and dividend payout in the pre-AFC period. For the post-AFC period, Hwang et al. (2013) and Kwon and Han (2020) find that affiliation with a chaebol is associated with lower dividend payout.

Resource-based theories have contradictory predictions regarding the effect of affiliation on investments. On the one hand, Chang and Hong (2000) conclude that synergies and investment sharing might benefit affiliates and lower individual investments. The benefits of synergies depend on the level of group diversification and integration. On the other hand, Shin and Park (1999) argue that internal capital markets provide higher investment capacity to

business group affiliates in relaxing financial constraints. Hong et al. (2007) observe a positive effect of chaebol affiliation on investment before the AFC, but not after the crisis. On a more recent period, Lee (2022b) does not find any significant association between chaebol affiliation and investments.

2.2 Between-group heterogeneity and effect of affiliation

Since the resource-based view relates the effect of affiliation to the presence of shared resources within a group, the differences in business group resources should lead to different effects on affiliate outcomes. Predictions based on the agency theory are also likely to vary across business groups, as group structures and preferences of controlling shareholders are specific to each group. Therefore, the main hypothesis developed in this paper is that the effect of affiliation should differ across groups.

The size of business groups is a key element of resource-based theories as it defines the pool of available resources. Consequently, the advantages highlighted by those theories are likely to increase with the size of the business group. In their meta-analysis, Carney et al. (2011) observe a positive association between the group size and affiliate performance. In addition to tangible resources, Khanna and Yafeh (2007) note that group size is also associated with higher market power and political influence. Hence, Lee (2022b) explains the premium associated with the affiliation with large chaebols by a gain in visibility. Empirical literature also shows a positive link between the affiliation with largest chaebols and the access to external financing (e.g. Byun et al. (2013)). However, Stein (1997) argues that, to some extent, size can have adverse effect and reduces the efficiency of internal capital markets due to increasing monitoring costs. Consistent with this prediction, Chang and Hong (2000) find a negative effect of chaebol size on affiliates' profitability.

Group size is often associated with the level of business group diversification. However, group diversification has specific benefits and costs. On the one hand, Lewellen (1971) highlights the benefit of diversification as a risk reduction mechanism. In addition, diversified business groups are often able to provide more resources and inputs to their affiliates securing supply chains and lowering transaction costs. On the other hand, diversification increases the risk of resource misallocation and monitoring costs, which can have a potential negative effect on performance. During the period preceding the AFC, Chang and Hong (2000) find a positive effect of chaebol diversification on affiliate performance. Consistent with the risk reduction

effect, Byun et al. (2013) observe that chaebol diversification reduces the borrowing costs of affiliated firms.

Poor financial conditions of a business group are likely to affect its affiliates and to raise concerns among investors. As discussed by Gopalan et al. (2007), bankruptcy of one group member can trigger negative spillover within the business group. Second, poor financial conditions reduce the resources available for affiliated firms. Chang and Hong (2000) find that chaebol affiliate profitability is positively associated with group liquidity but negatively associated with group leverage. Kim (2016) shows that chaebol leverage alters affiliates' investment and sales growth.

The management style and preferences of the group controlling shareholder are also likely to differ between business groups, and to be reflected in affiliates' decisions. Cuervo-Cazurra (2006) suggests that the preference and education of the controlling shareholder might influence the strategy of family business groups. Empirical evidence is scarce, as subjective preferences are not observable per se. Kwon and Han (2020) find evidence in Korea of a group-level payout tendency affecting all affiliates belonging to the same family business group.

3. Identification strategy

This section presents and discusses the three models used to examine the variations in the affiliation effects associated with business group heterogeneity. The identification strategy is inspired by Cronqvist and Fahlenbrach (2008) and adapted to the specificities of the business group framework.

3.1 Baseline model

The baseline model of this paper estimates the market-level effect of business group affiliation and firm outcomes. The effect is averaged across all business groups. Consequently, business groups are supposed to be homogeneous; therefore, the effect of affiliation should be the same for all business groups. To capture the association between a given firm outcome and business group affiliation, the explained variable is regressed on a dummy variable for affiliation. The baseline model is given by Equation (1):

$$y_{it} = \alpha + \delta BG_{it} + \beta \boldsymbol{X_{it}} + Ind_i + Year_t + \varepsilon_{it} \tag{1}$$

where i and t index firms and years, respectively. The firm outcome y is regressed on the dummy variable BG, taking the value 1 for firms affiliated with a business group and 0 otherwise. To capture the effect of the affiliation on firm outcome net of other firm characteristics, the model includes a set of firm control variables denoted by the vector $\boldsymbol{X}$, and fixed effects for industries and years. The coefficient δ captures the average difference in the variable y between affiliated and unaffiliated firms after accounting for firm characteristics.

3.2 Model modified for categories

The assumption of business group homogeneity imposed by the baseline model (1) could be considered as too strong given the differences in business group characteristics observed in reality. To examine to which extent these differences cause heterogeneity in the affiliation effect, we propose a second approach in which business groups are pooled in homogeneous categories. The baseline model (1) is modified as follows:

$$y_{it} = \alpha + \boldsymbol{\gamma D_{it}} + \beta \boldsymbol{X_{it}} + Ind_i + Year_t + \varepsilon_{it} \tag{2}$$

where a $K \times 1$ vector $\boldsymbol{D}$ of business group category indicators replaces the dummy variable BG of model (1). $\boldsymbol{\gamma}$ is a vector of category coefficients. The coefficient γ_k captures the difference in the variable y between unaffiliated firms and firms affiliated with a business group belonging to category k. To capture the effect net of firm characteristics, model (2) includes the same controls and fixed effects as the baseline model (1). The model assumes the homogeneity of the affiliation effect only among business groups that share similar characteristics, but allows heterogeneity across business groups having different attributes.

3.3 Group fixed effect model

Model (2) allows only partially relaxing the assumption of business group homogeneity since it imposes homogeneity of affiliation effects among business groups with similar attributes. In addition, it captures only the effect related to observable group characteristics. To fully capture the variations in the affiliation effects due to both observable and unobservable group characteristics, the affiliation dummy variable of model (1) is replaced by a vector of individual business group indicators:

$$y_{it} = \alpha + \boldsymbol{\Gamma Z_{it}} + \beta \boldsymbol{X_{it}} + Ind_i + Year_t + \varepsilon_{it} \tag{3}$$

where $\mathbf{Z}$ is a vector of individual business group indicators of size $G \times 1$, G is the number of business groups, and $\boldsymbol{\Gamma}$ is a vector of business group fixed effects. The coefficient Γ_g captures the specific effect associated with the affiliation with the business group g. Equation (3) includes the same control variables as the baseline model (1) to estimate the business group fixed effects net of firm characteristics. The group fixed effect model (3) allows to fully relaxing the assumption of the between-group homogeneity imposed by models (1) and (2). Unlike model (2), the group fixed effect model (3) is able to observe the variations in the effect of affiliation due to group-specific and unobservable features such as the controlling shareholder preferences.

The estimation of the group fixed effect model (3) imposes some specific constraints. To ensure estimation based on both time and cross-sectional differences, each business group needs to be in the sample for at least two years with a minimum of two affiliated firms. If a business group is present during only a single year, the group fixed effect would be collinear with the year fixed effect. If a business group has only one affiliate in the sample, the group fixed effect would be captured by the firm fixed effect rather than the group effect.

3.4 Discussion of the identification strategy

All the three abovementioned models use unaffiliated firms as control group but differ in how they consider business groups. Model (1) assumes that business groups are homogenous entities. In model (2), business groups are pooled into homogeneous categories based on observable group characteristics, such as size or leverage, while the group fixed effect of model (3) considers each business group individually.

These differences have some implications in terms of identification. Hence, the baseline model (1) is set to identify the market-level average effect of business group affiliation on firm outcomes. However, the average effect potentially hides variations in the affiliation effect across groups. For instance, the model might identify a significant and positive market-level effect of affiliation on a given firm outcome, whereas this effect is actually negative for some specific business groups. It is also possible that the model may fail to identify a significant market-level effect if group effects of opposite sign cancel each other. In both cases, the baseline model could lead to a wrong conclusion. Hence, the baseline model (1) draws only a general and partial picture of the relation between firm outcomes and business group affiliation.

The model modified for categories (2) and the group fixed effect model (3) allow an analysis at a higher granularity level. Model (2) partially relaxes the assumption of homogeneity imposed by model (1) by averaging the effects of affiliation across business groups with similar attributes. Therefore, model (2) allows the effect of affiliation to differ between business groups with different characteristics. Such differences would be consistent with the resource based theories that relate the affiliation effect to specific features of business groups. However, one limitation of model (2) is its inability to capture the heterogeneity due to unobservable group features such as the controlling shareholder preferences or management styles. The group fixed effect model (3) allows addressing this issue by estimating the specific effect of each single business group. Moreover, conditionally on the significance of the group fixed effects, this model also indicates whether affiliates of a given business group follow homogeneous policies and strategies.

4. Sample and data

4.1 Firm sample

The initial sample includes all firms listed on the two main market divisions (KOSPI and KOSDAQ) of the Korean stock market from 2007 to 2019. We then exclude financial firms (ICB 3010-3030) and utilities firms (ICB 6510). Accounting and financial data are retrieved from Refinitiv Datastream and Worldscope. After deleting observations with missing variables, the final sample includes 14183 firm-year observations (1785 unique firms).

Our paper differs from the previous literature as we examine the impact of affiliation on a wide range of firm outcomes including firm performance as well as financial and investment policies. Return on assets (ROA) and Tobin's q are two proxies for firm performance. ROA reflects the operating performance and is based on past accounting data, whereas Tobin's q is a forward-looking proxy for firm value. ROA is EBITDA scaled by total assets. Tobin's q is measured as total assets minus total common equity plus market value of equity divided by total assets. Cash holding, leverage, and dividend payout are used as proxies for financial policy. Cash holding is cash and equivalent divided by total assets. Leverage is the sum of long-term debt, short-term debt, and current portion of long-term debt in current liabilities divided by total assets. Dividend payout is the total cash dividend divided by EBIT. Investment policy is proxied by capital investment and is measured as capital expenditure scaled by net property, plant, and equipment (PPE). Size, market-to-book ratio, sales growth, and firm age are additional control variables. Firm size is the natural logarithm of firm total assets, market-to-book ratio is market

value of equity divided by total common equity, sales growth is the one-year change in sales, and firm age is the number of years since firm incorporation. Except firm age, all variables are winsorized at the 1 percent level in each tail. The firm variables construction is detailed in Appendix A.

[Insert Table 1 here]

Table 1 reports the summary statistics for all sample firms and compares statistics of non-chaebol and chaebol firms. Overall, we observe that listed firms affiliated to business groups are, on average, larger, more profitable, and older than unaffiliated listed firms. They also hold less cash and invest less, but they have more leverage, lower firm values, and higher dividend payouts than unaffiliated firms.

4.2 Business group sample

Data on chaebols and affiliation status are based on the official Korea Fair Trade Commission (KFTC) disclosures. [1] The sample includes a total of 63 chaebols for 528 group-year observations and 1710 affiliate-year observations (257 unique firms).

All chaebol characteristics are computed including both listed and unlisted domestic affiliates based on the data disclosed by the KFTC. These characteristics are used to categorize chaebols in the implementation of model (2). Group size is defined as the sum of total assets of all affiliates. Group diversification is given by the number of industries in which chaebol affiliates operate. Group leverage is computed as the ratio of the sum of liabilities of all affiliates divided by group total assets. Group profitability is the sum of net income of all affiliates divided by group total assets. Growth sales is the one-year change in the sum of sales of all affiliates (set to zero if missing). Group summary statistics are reported in Table 2.

[Insert Table 2 here]

We observe that chaebols have on average 34.2 affiliated firms and are active in 14.8 industries. They also have a positive performance with an average profitability of 2.8% and annual sales growth of 6.7%. Their leverage is on average 55.1%. In Panel B, the correlation

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[1] In 2009, the total assets threshold for chaebol designation increased from 2 to 5 trillion KRW. In order to keep consistency in the chaebol definition across the full sample, business groups having less than 5 trillion KRW of total assets are not considered as chaebols. State owned business groups are not considered as chaebols.

matrix shows strong relation between the different measures of group size and diversification. Indeed, we observe significant positive correlations between the value of group assets, the number of industries, and the number of affiliated firms. Since the correlation between the number of affiliated firms and the number of industries is close to one, we drop the number of affiliates as a sorting criterion in model (2). The two measures of group performance, profitability and sales-growth have a significantly positive correlation, as expected. However, since the correlation is relatively low, we keep both attributes as sorting criteria for chaebols since they represent different features. In the implementation of model (2), chaebols are sorted on a yearly basis in tercile groups (low, middle, high) for each characteristic, namely, size, group diversification, group leverage, group profitability, and group sales growth.

5. Empirical results

5.1 Average affiliation effect

Table 3 reports the regression results of the baseline model (1). The variable of interest is the affiliation dummy variable *Chaebol.* Columns (1) and (2) display coefficients on affiliation dummy with opposite signs for our two performance proxies. Hence, chaebol affiliation is associated with a 2.4 percentage points lower ROA, but an 18.6 percent higher Tobin's q relative to unaffiliated firms. A lower profitability of affiliated firms is consistent with either profit smoothing by chaebols or a misallocation of resources within business groups, as put forward by agency theories. The presence of a significant affiliation premium confirms the results obtained by Lee (2022b) for the period 2013–2019. The dichotomy between these two performance metrics is surprising. However, higher valuations could be related to specificities of chaebols such as the fact that they are associated with some intangible assets including reputation, visibility, and the belief by investors that they are considered as "too big to fail." Moreover, the stricter regulation of chaebols that has been enforced since the AFC could also explain higher valuations.

[Insert Table 3 here]

Columns (3) to (5) report significant coefficients on affiliation dummy for all financial policy proxies. On average, chaebol affiliation is associated with a debt leverage lower by 3.2 percentage points. This result contrasts with the existing evidence reporting that leverage is higher for affiliated firms before the AFC. Our results show that chaebols rely more on internal

source of financing in recent times. We also report a 1.8 percentage point lower cash holding associated with chaebol affiliation. This is consistent with Pinkowitz and Williamson (2001) who argue that business group affiliates have lower liquidity needs. The results in column (5) indicate a 1.9 percentage point lower payout ratio associated with chaebol affiliation. The lower payout of affiliated firms is consistent with the findings of Hwang et al. (2013) and Kwon and Han (2020). Column (6) reports an insignificant coefficient for investment policy at a market-level, showing that there are no differences between affiliated and unaffiliated firms in terms of investment levels.

Despite the presence of control variables, the omitted variable bias and unobserved firm heterogeneity can affect the estimations presented in Table 3. To mitigate this concern, we use an alternative identification strategy. Since it is not possible to implement a firm fixed effect model because of the possible multicollinearity between the affiliation dummy and the firm fixed effect, we use a two-step approach. In the first step, we estimate a model in which firm fixed effects replace the affiliation dummy (and industry indicator). In the second step, the firm fixed effects are regressed on an affiliation dummy. Except for dividend payout and capital investment, the results of the second step, as shown in Appendix B, are qualitatively consistent with the results of the baseline model (1) and suggest that the omitted variable bias has a limited impact on the results.

5.2 Between-category heterogeneity

Table 4 reports the coefficients on category indicators based on the estimation of Equation (2). Chaebols are sorted in terciles by group size (Panel A), group diversification (Panel B), group leverage (Panel C), group profitability (Panel D), and group sales growth (Panel E). Table 4 also provides the results of F-tests for the differences between the coefficients of top and bottom terciles.

[Insert Table 4 here]

Columns (1) and (2) report the results for the firm performance proxies. The results are qualitatively similar and consistent with the baseline model. Hence, chaebol affiliation is associated with a significantly lower profitability and higher firm value relative to non-chaebol firms. These results are valid for all categories irrespective of the sorting characteristic. However, the magnitude of the association varies across categories and diverges from the

average association estimated by the model (1). In Panel A of Table 4, we note that the lower profitability associated with affiliation ranges between 1.5 percentage point for the smallest chaebols and 2.8 percentage points for the largest chaebols. However, the difference between these two coefficients is not statistically significant. Only the group leverage in Panel C significantly affects the magnitude of the association between affiliation and profitability. The affiliation with a highly indebted chaebol is associated with a 3.6 percentage points lower ROA relative to non-chaebol firms, while the profitability is only lower by 1.2 percent for firms affiliated to the least indebted chaebols. In terms of the value effect of chaebol membership, the results also show consistently positive coefficients but with more significant differences between high and low terciles groups. We notably observe in Panel A that investors value more affiliation with the largest chaebols. The premium is twice larger for the largest chaebols (28%) than for the smallest ones (14%). This result is consistent with the benefits associated with large business groups such as visibility and higher market and political power. In Panel C, we report that investors also value more chaebols with lower leverage. The negative effect of group leverage on affiliate value is likely to be attributed to the risks associated with group financial vulnerability. The results of Panels D and E show that the group-level performance is associated with higher firm value. Hence, investors are willing to pay a higher premium for the affiliates of highly profitable and growing chaebols. We notably report a premium that is almost four times larger for affiliation with more profitable chaebols (26.8% compared to 6.8% for affiliation with less profitable groups). This reconciles the apparently conflicting results obtained at the market level approach, which could be due to the averaging of performance across all groups of chaebols. This latter result also highlights the necessity to include group characteristics in the analysis.

Columns (3) to (5) report the estimation results for firm financial policies. The baseline model (1) identifies significant associations between affiliation and financial policies. However, the estimation results using model (2) indicate substantial variation of the significance, magnitude, and sign across different chaebol categories. In the case of firm leverage, we generally document lower leverage levels for affiliated firms. However, we report significant differences between coefficients for chaebols sorted on profitability and sales growth. In both cases, it appears that firms affiliated to better performing chaebols have less debt than those affiliated to less profitable groups. On the other hand, we report no significant differences in terms of debt associated to the size and diversification of chaebols. The level of cash holdings in column (4) presents significant differences across terciles for all chaebols features except for diversification. Affiliation with better performing, smaller, and less levered

chaebols appears to be associated with lower cash holdings. For dividend payout in column (5), there are no significant differences between the coefficients of high and low terciles. Dividend policy appears to be homogeneous across the five sorting criteria, although we find that some categories have insignificant coefficients, which indicates that the payout policies of these groups are either similar to those of unaffiliated firms or do not follow common payout policies.

The baseline model (1) does not identify a significant association between chaebol affiliation and investment decisions at the market-level. This non-result might be explained by either an absence of effect or a high heterogeneity in affiliation effects across groups. The results of the category analysis reported in columns (6) support the second explanation. Indeed, there are significant differences between coefficients for four out of the five sorting criteria. Moreover, we observe that some categories of chaebols have positive and significant coefficients for investments. They do not appear as such when all the chaebols are considered similarly.

The interpretation of the results obtained for model (2) requires some caution because categories are based on a one-way sorting. Therefore, inferring a direct and causal link between a specific group characteristic and its effect on firm outcome is not possible. However, this model brings evidence that the heterogeneity in business group characteristics reflects in the affiliation effect.

5.3 Between-group heterogeneity

Table 5 presents the results for model (3). As discussed in Section 3, the implementation of group fixed effect model imposes some constraints. Therefore, Table 5 reports the fixed effects of chaebols that have a minimum of two listed affiliates and that are in the sample during at least two years. [2] Among the 63 chaebols of the sample, 25 chaebols (for 1216 affiliate-year observations) fulfill these criteria. [3]

[Insert Table 5 here]

Panel A reports the statistics of the 25 chaebol fixed effects. The first rows show the total number, the number of positive and negative fixed effects. We observe more heterogeneity

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[2] Fixed effects of chaebols that do not meet requirements are ignored in Table 5.
[3] 13 chaebols are excluded because they have only one listed affiliate (without missing data) during the sample period. 21 chaebols are excluded because they appear during at least one year with a single listed affiliate. 4 chaebols are excluded because they appear in the sample during only one year.

in terms of signs of the coefficients for some firm outcomes than for others. For instance, we observe that affiliation with 15 chaebols is related to a lower profitability and a higher profitability for the 10 others. On the other hand, 23 of the 25 chaebol fixed effects are positive for firm value. To ensure the strength of the association between firm outcome and the affiliation with a specific chaebol, Panel B reports statistics only for the chaebol fixed effects that are significant at a 5% level. In the case of financial and investment policies, a significant chaebol fixed effect indicates a strong within-group homogeneity in the firm policy and suggests that the affiliates of a same group behave in a similar manner. On the other hand, a non-significant group fixed effect might reflect a high heterogeneity in policy across the group affiliates or that affiliated firms behave as unaffiliated firms. We note that the number of significant fixed effects varies between different firm outcomes. The results in Panel B indicate that 11 chaebols conduct specific and uniform policies in terms of use of debt and capital investment, whereas only seven chaebols over the 25 are associated with a specific payout policy. We also find that the significant fixed effects for firm valuation are all positive, while those of profitability are essentially negative except for one group.

Differences in signs of group fixed effects indicate heterogeneity in the effect of affiliation across business groups. In terms of valuation, the significant fixed effects are homogeneously positive. A similar homogeneity is observed for profitability with seven negative coefficients over eight significant fixed effects. The homogeneity of the performance effect is consistent with the results of the model (2). However, it is also important to note that profitability is not different from unaffiliated firms for 17 chaebols out of 25. This observation shows that negative effect of affiliation on profitability is limited to few chaebols and cannot be generalized. Also consistent with the results of the models (1) and (2), we observe that the associations between affiliation and both cash holding and dividend payout are mostly negative. By contrast, the results indicate heterogeneous group policies regarding leverage and investments. Hence, among the 11 chaebols associated with specific debt policy, eight lead their affiliates to maintain a low debt leverage, whereas three others foster more intensive use of debt relative to non-chaebol firms. The results for investment decisions contrast with the results of the baseline model (1) that does not identify any significant association between chaebol affiliation and investment. Consistent with the results of model (2), we find that such association exists but varies substantially across groups. Indeed, among the 10 significant fixed effect for capital investment, five are positive and five are negative.

The results of the group fixed effect model (3) support and complement the results obtained using the two other models. This model allows estimating the effect specific to each

business group. Overall, the results confirm that the affiliation with a chaebol is homogeneously associated with a higher value. The picture is more nuanced for all other firm outcomes. The results also indicate that a number of chaebols apply homogeneous financial and investment policies at a group-level.

5.4 Discussion and limitations

The different models provide complementary results and allow a comprehensive overview of the relation between business group membership and firm outcomes. Overall, our analysis reveals a higher heterogeneity of the affiliation effect on firm policies than performance. Indeed, all models provide qualitatively similar results in terms of the performance effect of affiliation. As a market-based measure, the effect of affiliation on Tobin's q reflects the perception and expectations of investors. The results indicate that investors perceive business group affiliation as a value-enhancing factor, while there is a negative association between affiliation and profitability. Unlike the firm value and accounting profitability, the firm policies rely on the discretionary decisions of the firm or group managers. Therefore, the effects of affiliation on firm policies are more likely to vary across groups depending on group features or controlling shareholder preferences. The results of models (2) and (3) support this prediction. The category-level and group-level analyses suggest that the differences in financial policy are driven by the heterogeneity in both observable and unobservable group characteristics, whereas the heterogeneity in unobservable characteristics explains differences in terms of investment policy. The identification of significant group fixed effects also reveals group-level strategies and indicates that some business groups apply similar strategy to all group affiliates. For instance, the results show that three chaebols are associated with a significant higher use of debt, whereas eight others are related to a lower use of debt relative to non-chaebol firms.

By providing results at a higher level of granularity, the models (2) and (3) improve some limitations of the baseline model (1). First, an identification strategy based on a single dummy variable for affiliation could fail to identify a significant affiliation effect in the presence of a wide heterogeneity in affiliation effects across groups. This is the case for investments of affiliated firms. Second, the effect estimated at market-level is not generalizable to all business groups. Indeed, the empirical analysis shows variations of the affiliation effects in terms of significance and magnitude across business groups. For instance, the baseline model identifies a significant and negative association between the affiliation and dividend payout.

However, the analysis at group-level reveals that such relation is significant only for a minority of chaebols. Third, supplementing the market-level analysis by considering group characteristics helps provide a better picture of the impacts of affiliation. For instance, the apparently conflicting results obtained for profitability and valuation at the market level are solved after considering group characteristics in the analysis. In summary, a possible heterogeneity in the effect of affiliation on firm outcomes might lead to wrong conclusions if this effect is only based on a single dummy variable for affiliation.

As one of the first attempts to document the heterogeneity in the affiliation effect across business groups, this analysis has some limitations. The sample size does not allow the implementation of methods used to address endogeneity issues. [4] As the causality cannot be clearly established, we prefer to interpret our results as association (between affiliation and firm outcome) rather than causal effect. Consequently, we prefer to interpret our results as association (between affiliation and firm outcome) rather than causal effect. Moreover, our analysis is only based on a sample of listed firms as the vast majority of studies in the area. Further research might consider including unlisted affiliates for a better understanding of group strategy.

6. Conclusion

This study sheds a new light on how business group membership affects several firm outcomes, such as their performance and corporate policies. Based on a sample of Korean listed firms, we find substantial variations of the effect of affiliation across business groups.

This paper exploits the specificities of the Korean framework to implement a novel empirical strategy that accounts for the business group heterogeneity. Consistent with resource-based theories, our empirical results reveal that business group characteristics affect the performance effect of affiliation. We find that investors generally value affiliation at a premium that is related to the size and performance of business groups. We also note a wide heterogeneity in affiliates financial and investment decisions. This observation suggests that some business groups follow group-level strategies and apply homogeneous policy across their affiliates.

Our paper contributes to the business group literature and more specifically the literature on Korean chaebols. In a single study, we estimate the effect of affiliation on a wide range of

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[4] During the sample period, we observe only a limited number of changes in affiliation status. As discussed by Khanna and Yafeh (2007), the group structure is mainly historically determined. Khanna (2000) also notes the difficulty to find a suitable instrument for business group affiliation.

corporate decisions and performance measures. In addition, our empirical strategy provides results at a higher level of granularity and allows a better understanding of the complex relation between business group membership and firm outcomes. By revealing the heterogeneity of the affiliation effect, our investigation highlights the limitations of models estimating the affiliation based on a single dummy variable. Such models do not provide representative estimation of the real effect of affiliation. Instead, we propose an empirical strategy that accounts for business group heterogeneity. In addition to scholars, this approach should also be useful for practitioners and policymakers by allowing them to improve their forecast accuracy and the monitoring of business groups.

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Tables

Table 1 Firm summary statistics

	All firms (Obs.=14183)			Non-chaebol firms (Obs.=12473)			Chaebol firms (Obs.=1710)			Non-chaebol vs chaebol firms
	Mean	Median	SD	Mean	Median	SD	Mean	Median	SD	t-stat
Tobin's q	1.318	1.037	0.854	1.33	1.044	0.869	1.23	0.997	0.728	4.534***
Market-to-book	1.608	1.08	1.598	1.629	1.095	1.617	1.456	0.992	1.439	4.205***
ROA	0.063	0.073	0.105	0.06	0.072	0.107	0.088	0.085	0.077	-10.275***
Leverage	0.229	0.219	0.172	0.226	0.212	0.173	0.254	0.264	0.164	-6.322***
Cash holding	0.171	0.124	0.148	0.177	0.132	0.151	0.124	0.09	0.115	14.099***
Dividend payout	0.092	0.03	0.237	0.09	0.012	0.239	0.109	0.076	0.218	-3.077***
Capital investment	0.178	0.121	0.179	0.181	0.121	0.184	0.158	0.124	0.134	4.790***
Tangibility	0.319	0.313	0.178	0.315	0.309	0.177	0.347	0.354	0.184	-7.004***
ln(Size)	19.177	18.86	1.523	18.848	18.695	1.123	21.573	21.758	1.873	-85.339***
Age	28.072	24	16.676	27.259	23	16.244	34.005	35	18.489	-15.827***
Sales growth	0.11	0.052	0.379	0.113	0.052	0.39	0.09	0.052	0.29	2.422**

The table presents summary statistics for the full sample and subsample of non-chaebol and chaebols firms. The last column reports t-stat for test of mean between non-chaebol and chaebol firms. Variables construction is described in Appendix A. Variables are winsorized at the 1 percent level in each tail (except Age). Data are retrieved from Refinitiv Datastream and Worldscope. The sample covers the period from 2007 to 2019. Financial and utility firms are excluded from the sample. Chaebol affiliation is based on KFTC disclosure.

Table 2 Group summary characteristics

	Size (tr KRW)	Nbr of affiliates	Nbr of industries	Leverage	Profitability	Sales growth
Panel A: Summary statistics (Obs. 528)						
Mean	45.992	34.2	14.8	0.551	0.028	0.067
p25	8.335	16.5	9.0	0.456	0.008	-0.019
Median	15.243	26.5	14.0	0.557	0.024	0.041
p75	39.881	48.0	20.0	0.667	0.048	0.136
SD	90.341	22.1	7.1	0.182	0.058	0.175
Panel B: Correlation matrix						
Size	1.00					
Nbr of affiliates	0.50***	1.00				
	(0.000)					
Nbr of industries	0.45***	0.88***	1.00			
	(0.000)	(0.000)				
Leverage	0.06	0.08*	0.03	1.00		
	(0.194)	(0.059)	(0.561)			
Profitability	0.05	-0.00	0.01	-0.50***	1.00	
	(0.238)	(0.975)	(0.896)	(0.0000)		
Sales growth	0.01	0.05	0.05	-0.04	0.16***	1.00
	(0.735)	(0.296)	(0.296)	(0.408)	(0.000)	

*The table presents summary statistics and correlations between group characteristics. Group size is the sum of total assets of all affiliates. Number of affiliates is the number of domestic listed and unlisted affiliated firms as designated by the KFTC. Number of industries is the number of industries in which chaebol affiliates operate. Group leverage is the ratio of the sum of liabilities of all affiliates divided by group total assets. Group profitability is the sum of net income of all affiliates divided by group total assets. Growth sales is the one-year change in the sum of sales of all affiliates (set to zero if missing). Group characteristics are computed based on affiliate data and include both listed and unlisted affiliates. The sample covers the period from 2007 to 2019 and 63 business groups. Data are retrieve from KTFC. P-value are in parentheses * < 10% ** < 5% *** < 1%*

Table 3 Baseline model

	(1) ROA	(2) ln(Q)	(3) Leverage	(4) Cash holding	(5) Dividend payout	(6) Capital investment
Constant	-0.261***	1.401***	-0.312***	0.371***	-0.120***	0.383***
	(0.026)	(0.123)	(0.051)	(0.040)	(0.046)	(0.035)
Chaebol	-0.024***	0.186***	-0.032***	-0.018**	-0.019**	0.008
	(0.005)	(0.030)	(0.011)	(0.009)	(0.010)	(0.008)
ln(Size)	0.022***	-0.059***	0.024***	-0.004*	0.011***	-0.004*
	(0.001)	(0.007)	(0.003)	(0.002)	(0.002)	(0.002)
Leverage	-0.177***	0.129***		-0.389***	-0.195***	-0.062***
	(0.008)	(0.044)		(0.014)	(0.017)	(0.014)
MtB	-0.007***		0.011***	0.012***	-0.006***	0.020***
	(0.001)		(0.002)	(0.001)	(0.001)	(0.002)
Sales growth	0.043***	0.135***	0.023***	-0.009***	-0.029***	0.012**
	(0.003)	(0.011)	(0.003)	(0.003)	(0.004)	(0.005)
ln(Age)	-0.008***	-0.082***	-0.007	-0.018***	0.008**	-0.028***
	(0.002)	(0.011)	(0.005)	(0.003)	(0.004)	(0.003)
Investment		0.460***	0.010	0.069***		
		(0.034)	(0.011)	(0.011)		
ROA		-0.069	-0.556***	-0.033	0.205***	0.100***
		(0.079)	(0.021)	(0.021)	(0.020)	(0.027)
Tangibility			0.370***			
			(0.017)			
Dividend				-0.002		
				(0.007)		
Observations	14183	14183	14183	14183	14183	14183
Adj. R-sq.	0.212	0.267	0.276	0.308	0.050	0.121

*The table presents results for the baseline model (1). In columns (1) and (2), dependent variables are performance measures. ROA is the EBITDA scaled by total assets. Tobin's q is measured as total assets minus total common equity plus market value of equity divided by total assets. In columns (3) to (5), dependent variables are proxies for financial policies. Cash holding is cash and equivalent divided by total assets. Leverage is the sum of long term debt, short term debt and current portion of long term debt in current liabilities divided by total assets. Dividend payout is total cash dividend divided by EBIT. In the column (6), the dependent variable is the capital expenditure scaled by net property, plant, and equipment. Chaebol is a dummy variable taking value 1 for firms affiliated to a business groups as defined by the KFTC and 0 otherwise. Other control variables are: firm size computed as the natural logarithm of total assets, leverage computed as the sum of long term debt, short term debt and current portion of long term debt in current liabilities divided by total assets, market-to-book ratio computed as market value of equity divided by total common equity, sales growth computed as the one-year change in sales, age is the natural logarithm of time since incorporation, capital investment computed as EBITDA scaled by total assets, tangibility computed as net property, plant, and equipment divided by total assets, and dividend payout computed as total cash dividend divided by EBIT. Computation of variables is described in Appendix A. All regressions include year and industry indicators. Variables are winsorized at the 1 percent level in each tail (except Age). Data are retrieved from Refinitiv Datastream, Worldscope, and KFTC. The sample covers the period from 2007 to 2019. Financial and utility firms are excluded from the sample. Robust standard errors are in parentheses and clustered at firm level. p-value * < 10% ** < 5% *** < 1%*

Table 4 Model modified for categories

	(1) ROA	(2) ln(Q)	(3) Leverage	(4) Cash holding	(5) Dividend payout	(6) Capital investment
Panel A: Group size						
Small	-0.015**	0.141***	-0.031**	-0.031***	-0.019	-0.009
	(0.006)	(0.039)	(0.015)	(0.010)	(0.016)	(0.009)
Middle	-0.027***	0.092***	-0.005	-0.025**	-0.009	0.001
	(0.007)	(0.035)	(0.015)	(0.010)	(0.015)	(0.009)
Large	-0.028***	0.279***	-0.050***	-0.006	-0.026**	0.023**
	(0.008)	(0.042)	(0.015)	(0.012)	(0.012)	(0.011)
F-test (small vs large)	2.18	6.96***	1.07	3.91**	0.16	6.29**
Observations	14183	14183	14183	14183	14183	14183
Adj. R-squared	0.212	0.270	0.278	0.309	0.050	0.122
Panel B: Group diversification						
Low	-0.021***	0.222***	-0.057***	-0.023*	-0.000	-0.008
	(0.008)	(0.053)	(0.017)	(0.013)	(0.019)	(0.010)
Middle	-0.026***	0.080***	-0.022	-0.020*	-0.027**	-0.006
	(0.007)	(0.031)	(0.015)	(0.011)	(0.013)	(0.009)
High	-0.024***	0.241***	-0.026*	-0.015	-0.023*	0.026**
	(0.008)	(0.039)	(0.014)	(0.011)	(0.012)	(0.010)
F-test (low vs high)	0.13	0.11	2.42	0.31	1.31	7.82***
Observations	14183	14183	14183	14183	14183	14183
Adj. R-squared	0.212	0.269	0.277	0.308	0.050	0.122

Table 4 *(ctd)*

	(1) ROA	(2) ln(Q)	(3) Leverage	(4) Cash holding	(5) Dividend payout	(6) Capital investment
Panel C: Group leverage						
Low	-0.012*	0.240***	-0.067***	-0.037***	-0.024**	0.014
	(0.007)	(0.040)	(0.014)	(0.011)	(0.012)	(0.010)
Middle	-0.028***	0.176***	-0.036***	-0.003	-0.007	0.006
	(0.006)	(0.038)	(0.013)	(0.010)	(0.014)	(0.009)
High	-0.036***	0.122***	0.028*	-0.014	-0.031**	0.001
	(0.009)	(0.036)	(0.016)	(0.010)	(0.015)	(0.011)
F-test (low vs high)	5.22**	6.49**	23.79***	2.87*	0.16	0.97
Observations	14183	14183	14183	14183	14183	14183
Adj. R-squared	0.213	0.268	0.281	0.309	0.050	0.121
Panel D: Group profitability						
Low	-0.035***	0.068**	0.021	-0.007	-0.010	-0.012
	(0.006)	(0.030)	(0.013)	(0.008)	(0.016)	(0.009)
Middle	-0.023***	0.193***	-0.029**	-0.018*	-0.018	0.014
	(0.006)	(0.034)	(0.012)	(0.010)	(0.012)	(0.009)
High	-0.017**	0.268***	-0.074***	-0.027**	-0.027**	0.017
	(0.007)	(0.037)	(0.013)	(0.011)	(0.012)	(0.010)
F-test (low vs high)	5.69**	30.40***	45.58***	4.34**	1.00	6.32**
Observations	14183	14183	14183	14183	14183	14183
Adj. R-squared	0.212	0.270	0.282	0.309	0.050	0.121

Table 4 *(ctd)*

	(1) ROA	(2) ln(Q)	(3) Leverage	(4) Cash holding	(5) Dividend payout	(6) Capital investment
Panel E: Sales growth						
Low	-0.022***	0.154***	-0.024*	-0.013	-0.021*	-0.005
	(0.006)	(0.033)	(0.012)	(0.009)	(0.012)	(0.008)
Middle	-0.026***	0.184***	-0.028**	-0.018**	-0.021*	0.017*
	(0.006)	(0.032)	(0.012)	(0.009)	(0.012)	(0.010)
High	-0.025***	0.224***	-0.045***	-0.025***	-0.015	0.009
	(0.007)	(0.034)	(0.013)	(0.010)	(0.011)	(0.009)
F-test (low vs high)	0.26	10.29***	5.26**	4.30**	0.24	3.65*
Observations	14183	14183	14183	14183	14183	14183
Adj. R-squared	0.212	0.267	0.276	0.308	0.050	0.121

*The table presents results for the model modified for categories (2). In columns (1) and (2), dependent variables are performance variables. In columns (3) to (5), dependent variables are proxies for financial policies. In the column (6), the dependent variable is the capital investment. In Panel A, chaebols are sorted by group value of assets. In Panel B, chaebols are sorted by group level of diversification proxied as the number of industries. In Panel C, chaebols are sorted by group debt level computed as the ratio of group debt to group assets. In Panel D, chaebols are sorted by group profitability computed as the ratio of group net income divided by group assets. In Panel E, chaebols are sorted by one-year group sales growth (zero if missing). Dependent variables and control variables are the same as in Table 3. Computation of variables is described in Appendix A. All regressions include year and industry indicators. Chaebol metrics include both listed and unlisted domestic affiliates. Firm variables are winsorized at the 1 percent level in each tail (except Age). Data are retrieved from Refinitiv Datastream, Worldscope, and KFTC. The sample covers the period from 2007 to 2019. Financial and utility firms are excluded from the sample. F-tests test the equality of coefficients between top and bottom chaebol categories. Robust standard errors are in parentheses and clustered at firm level. p-value * < 10% ** < 5% *** < 1%*

Table 5 Chaebol fixed effects

	(1) ROA	(2) ln(Q)	(3) Leverage	(4) Cash holding	(5) Dividend payout	(6) Capital investment
Panel A: All chaebol fixed effects						
Total	25	25	25	25	25	25
>0	10	23	10	6	7	15
<0	15	2	15	19	18	10
Mean	-0.016	0.264	-0.031	-0.029	-0.028	0.007
Max	0.054	1.060	0.098	0.107	0.041	0.076
Min	-0.117	-0.057	-0.294	-0.129	-0.147	-0.141
Panel B: Significant chaebol fixed effects (p-value<5%)						
Total	8	12	11	11	7	10
>0	1	12	3	2	0	5
<0	7	0	8	9	7	5
Mean	-0.052	0.485	-0.073	-0.052	-0.089	-0.001
Max	0.036	1.060	0.098	0.107	-0.047	0.076
Min	-0.117	0.212	-0.294	-0.129	-0.147	-0.141
Observations	14183	14183	14183	14183	14183	14183
Adj. R-squared	0.219	0.278	0.302	0.312	0.055	0.114

This table reports statistics for group fixed effects estimated with group fixed effect model (3). In columns (1) and (2), dependent variables are performance variables. In columns (3) to (5), dependent variables are proxies for financial policies. In the column (6), the dependent variable is the capital investment. First row reports the number of group fixed effects. Second and third rows report the number of positive and negative group fixed effects respectively. The fourth, fifth, and sixth rows report the mean, maximum, and minimum value of group fixed effects. Panel A reports statistics of all group fixed effects of chaebols that have a minimum of two listed affiliates and that are in the sample during at least two years. Panel B reports statistics only for significant fixed effects (p-value<5%). Group fixed effects are estimated based on Equation (3) and regressions include same control variables as in Table 3. Computation of variables is described in Appendix A. All regressions include year and industry indicators. Variables are winsorized at the 1 percent level in each tail (except Age). Data are retrieved from Refinitiv Datastream, Worldscope, and KFTC. The sample covers the period from 2007 to 2019. Financial and utility firms are excluded from the sample. Robust standard errors are in parentheses and clustered at firm level. p-value * < 10% ** < 5% *** < 1%

Appendices

Appendix A: Firm variables

Variable name	Definition
Return on assets (ROA)*	Earnings before interest, taxes, depreciation, and amortization (WC18198) divided by total assets (WC02999)
Tobin's q*	Total assets minus total common equity plus market value of equity (WC08001) divided by total assets.
Cash holding*	Cash and equivalent (WC02001) divided by total assets
Leverage*	Sum of LT debt (WC03251) and ST debt and current portion of LT in current liabilities (WC03051) divided by total assets
Dividend payout*	Cash dividend paid total (WC04551) divided by EBIT (WC18191)
Capital investment*	Capital expenditures divided by net property, plant, and equipment (WC02501).
Size*	Total assets (in thousands KRW)
Asset tangibility*	Net property, plant, and equipment divided by total assets
Market-to-book*	Market value of equity divided by total common equity (WC03501)
Age	Years since incorporation (WC18273)
Sales growth*	One year change in total sales (WC01001)
Industry indicators	Set of dummy variables for ICB super sectors
Chaebol affiliation	Dummy variable taking value 1 for firms affiliated to a business group in the KFTC list, 0 otherwise

This appendix contains the definitions of all firm variables. Data are retrieved from Refinitiv Datastream and Worldscope. Variables with (*) are winsorized at the 1 percent level in each tail. Chaebol affiliation is based on KFTC disclosure.

Appendix B: Firm fixed effect approach

	(1) ROA	(2) ln(Q)	(3) Leverage	(4) Cash holding	(5) Dividend payout	(6) Capital investment
Chaebol	-0.048***	0.134***	-0.112***	-0.053***	0.002	-0.073***
	(0.005)	(0.025)	(0.010)	(0.007)	(0.008)	(0.008)
Observations	1784	1784	1784	1784	1784	1784
Adj. R-squared	0.043	0.013	0.074	0.021	-0.001	0.037

The table presents results of cross-section regression of firm fixed effect on a constant and a dummy variable for affiliation as:

$$\hat{\gamma}_i = \alpha + \delta Chaebol_i + \varepsilon_i$$

where $\hat{\gamma}_i$ is estimated fixed effect for firm i, $Chaebol$ is a dummy variable taking value 1 if firm i is affiliated to a chaebol during at least one year. Firm fixed effects are estimated based on the following equation:

$$y_{it} = \alpha + \beta X_{it} + \gamma_i + Year_t + \varepsilon_{it}$$

*where y is the dependent variable (performance measures or proxy for firm policy), X is a vector of control variables, γ is firm fixed effect, $Year$ is time fixed effect. Control variables are the same as in Table 3. Computation of variables is described in Appendix A. Variables are winsorized at the 1 percent level in each tail (except Age). Data are retrieved from Refinitiv Datastream, Worldscope, and KFTC. The sample covers the period from 2007 to 2019. Financial and utility firms are excluded from the sample. Robust standard errors are in parentheses and clustered at firm level. p-value * < 10% ** < 5% *** < 1%*

Appendix C: Model modified for categories (detailed tables)

	(1) ROA	(2) ln(Q)	(3) Leverage	(4) Cash holding	(5) Dividend payout	(6) Capital investment
Panel A: Group size						
Constant	-0.265***	1.469***	-0.325***	0.381***	-0.125***	0.396***
	(0.026)	(0.128)	(0.052)	(0.041)	(0.046)	(0.036)
Small	-0.015**	0.141***	-0.031**	-0.031***	-0.019	-0.009
	(0.006)	(0.039)	(0.015)	(0.010)	(0.016)	(0.009)
Middle	-0.027***	0.092***	-0.005	-0.025**	-0.009	0.001
	(0.007)	(0.035)	(0.015)	(0.010)	(0.015)	(0.009)
Large	-0.028***	0.279***	-0.050***	-0.006	-0.026**	0.023**
	(0.008)	(0.042)	(0.015)	(0.012)	(0.012)	(0.011)
ln(Size)	0.022***	-0.063***	0.025***	-0.005**	0.012***	-0.004**
	(0.001)	(0.007)	(0.003)	(0.002)	(0.002)	(0.002)
Leverage	-0.178***	0.138***		-0.388***	-0.196***	-0.060***
	(0.008)	(0.044)		(0.014)	(0.017)	(0.014)
MtB	-0.007***		0.011***	0.012***	-0.006***	0.020***
	(0.001)		(0.002)	(0.001)	(0.001)	(0.002)
Sales growth	0.043***	0.135***	0.023***	-0.009***	-0.029***	0.012**
	(0.003)	(0.011)	(0.003)	(0.003)	(0.004)	(0.005)
ln(Age)	-0.008***	-0.083***	-0.007	-0.018***	0.008**	-0.028***
	(0.002)	(0.011)	(0.005)	(0.003)	(0.004)	(0.003)
Investment		0.455***	0.011	0.068***		
		(0.034)	(0.011)	(0.011)		
ROA		-0.065	-0.555***	-0.032	0.205***	0.101***
		(0.079)	(0.021)	(0.020)	(0.020)	(0.027)
Tangibility			0.369***			
			(0.017)			
Dividend				-0.001		
				(0.007)		
F-test (small vs large)	2.18	6.96***	1.07	3.91**	0.16	6.29**
Observations	14183	14183	14183	14183	14183	14183
Adj. R-sq.	0.212	0.270	0.278	0.309	0.050	0.122

Appendix C *(ctd)*

	(1) ROA	(2) ln(Q)	(3) Leverage	(4) Cash holding	(5) Dividend payout	(6) Capital investment
Panel B: Group diversification						
Constant	-0.261***	1.436***	-0.309***	0.373***	-0.122***	0.395***
	(0.026)	(0.125)	(0.052)	(0.041)	(0.046)	(0.035)
Low	-0.021***	0.222***	-0.057***	-0.023*	-0.000	-0.008
	(0.008)	(0.053)	(0.017)	(0.013)	(0.019)	(0.010)
Middle	-0.026***	0.080***	-0.022	-0.020*	-0.027**	-0.006
	(0.007)	(0.031)	(0.015)	(0.011)	(0.013)	(0.009)
High	-0.024***	0.241***	-0.026*	-0.015	-0.023*	0.026**
	(0.008)	(0.039)	(0.014)	(0.011)	(0.012)	(0.010)
ln(Size)	0.022***	-0.061***	0.024***	-0.004*	0.011***	-0.004**
	(0.001)	(0.007)	(0.003)	(0.002)	(0.002)	(0.002)
Leverage	-0.177***	0.130***		-0.389***	-0.194***	-0.062***
	(0.008)	(0.044)		(0.014)	(0.017)	(0.014)
MtB	-0.007***		0.011***	0.012***	-0.006***	0.020***
	(0.001)		(0.002)	(0.001)	(0.001)	(0.002)
Sales growth	0.043***	0.135***	0.023***	-0.009***	-0.029***	0.012**
	(0.003)	(0.011)	(0.003)	(0.003)	(0.004)	(0.005)
ln(Age)	-0.008***	-0.082***	-0.007	-0.018***	0.008**	-0.028***
	(0.002)	(0.011)	(0.005)	(0.003)	(0.004)	(0.003)
Investment		0.456***	0.010	0.068***		
		(0.034)	(0.011)	(0.011)		
ROA		-0.069	-0.556***	-0.033	0.205***	0.100***
		(0.079)	(0.021)	(0.021)	(0.020)	(0.027)
Tangibility			0.371***			
			(0.017)			
Dividend				-0.002		
				(0.007)		
F-test (low vs high)	0.13	0.11	2.42	0.31	1.31	7.82***
Observations	14183	14183	14183	14183	14183	14183
Adj. R-sq.	0.212	0.269	0.277	0.308	0.050	0.122

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	(1) ROA	(2) ln(Q)	(3) Leverage	(4) Cash holding	(5) Dividend payout	(6) Capital investment
Panel C: Group leverage						
Constant	-0.260***	1.404***	-0.317***	0.371***	-0.118***	0.384***
	(0.026)	(0.124)	(0.051)	(0.040)	(0.046)	(0.035)
Low	-0.012*	0.240***	-0.067***	-0.037***	-0.024**	0.014
	(0.007)	(0.040)	(0.014)	(0.011)	(0.012)	(0.010)
Middle	-0.028***	0.176***	-0.036***	-0.003	-0.007	0.006
	(0.006)	(0.038)	(0.013)	(0.010)	(0.014)	(0.009)
High	-0.036***	0.122***	0.028*	-0.014	-0.031**	0.001
	(0.009)	(0.036)	(0.016)	(0.010)	(0.015)	(0.011)
ln(Size)	0.022***	-0.059***	0.025***	-0.004*	0.011***	-0.004*
	(0.001)	(0.007)	(0.003)	(0.002)	(0.002)	(0.002)
Leverage	-0.176***	0.135***		-0.390***	-0.194***	-0.061***
	(0.008)	(0.044)		(0.014)	(0.017)	(0.014)
MtB	-0.007***		0.011***	0.012***	-0.006***	0.020***
	(0.001)		(0.002)	(0.001)	(0.001)	(0.002)
Sales growth	0.043***	0.135***	0.023***	-0.009***	-0.029***	0.012**
	(0.003)	(0.011)	(0.003)	(0.003)	(0.004)	(0.005)
ln(Age)	-0.008***	-0.082***	-0.007	-0.018***	0.008**	-0.028***
	(0.002)	(0.011)	(0.005)	(0.003)	(0.004)	(0.003)
Investment		0.459***	0.011	0.069***		
		(0.034)	(0.011)	(0.011)		
ROA		-0.074	-0.550***	-0.031	0.205***	0.099***
		(0.079)	(0.021)	(0.020)	(0.020)	(0.027)
Tangibility			0.373***			
			(0.017)			
Dividend				-0.002		
				(0.007)		
F-test (low vs high)	5.22**	6.49**	23.79***	2.87*	0.16	0.97
Observations	14183	14183	14183	14183	14183	14183
Adj. R-sq.	0.213	0.268	0.281	0.309	0.050	0.121

	(1) ROA	(2) ln(Q)	(3) Leverage	(4) Cash holding	(5) Dividend payout	(6) Capital investment
Panel D: Group profitability						
Constant	-0.258***	1.429***	-0.326***	0.367***	-0.123***	0.388***
	(0.026)	(0.123)	(0.050)	(0.040)	(0.046)	(0.035)
Low	-0.035***	0.068**	0.021	-0.007	-0.010	-0.012
	(0.006)	(0.030)	(0.013)	(0.008)	(0.016)	(0.009)
Middle	-0.023***	0.193***	-0.029**	-0.018*	-0.018	0.014
	(0.006)	(0.034)	(0.012)	(0.010)	(0.012)	(0.009)
High	-0.017**	0.268***	-0.074***	-0.027**	-0.027**	0.017
	(0.007)	(0.037)	(0.013)	(0.011)	(0.012)	(0.010)
ln(Size)	0.022***	-0.061***	0.025***	-0.004*	0.011***	-0.004**
	(0.001)	(0.007)	(0.003)	(0.002)	(0.002)	(0.002)
Leverage	-0.176***	0.143***		-0.390***	-0.196***	-0.060***
	(0.008)	(0.043)		(0.014)	(0.017)	(0.014)
MtB	-0.007***		0.011***	0.012***	-0.006***	0.020***
	(0.001)		(0.002)	(0.001)	(0.001)	(0.002)
Sales growth	0.043***	0.135***	0.023***	-0.009***	-0.029***	0.012**
	(0.003)	(0.011)	(0.003)	(0.003)	(0.004)	(0.005)
ln(Age)	-0.008***	-0.082***	-0.007	-0.018***	0.009**	-0.028***
	(0.002)	(0.011)	(0.005)	(0.003)	(0.004)	(0.003)
Investment		0.455***	0.012	0.069***		
		(0.034)	(0.011)	(0.011)		
ROA		-0.075	-0.549***	-0.032	0.206***	0.099***
		(0.079)	(0.021)	(0.020)	(0.020)	(0.027)
Tangibility			0.370***			
			(0.017)			
Dividend				-0.002		
				(0.007)		
F-test (low vs high)	5.69**	30.40***	45.58***	4.34**	1.00	6.32**
Observations	14183	14183	14183	14183	14183	14183
Adj. R-sq.	0.212	0.270	0.282	0.309	0.050	0.121

	(1) ROA	(2) ln(Q)	(3) Leverage	(4) Cash holding	(5) Dividend payout	(6) Capital investment
Panel E: Sales growth						
Constant	-0.261***	1.402***	-0.313***	0.371***	-0.120***	0.384***
	(0.026)	(0.123)	(0.051)	(0.040)	(0.046)	(0.035)
Low	-0.022***	0.154***	-0.024*	-0.013	-0.021*	-0.005
	(0.006)	(0.033)	(0.012)	(0.009)	(0.012)	(0.008)
Middle	-0.026***	0.184***	-0.028**	-0.018**	-0.021*	0.017*
	(0.006)	(0.032)	(0.012)	(0.009)	(0.012)	(0.010)
High	-0.025***	0.224***	-0.045***	-0.025***	-0.015	0.009
	(0.007)	(0.034)	(0.013)	(0.010)	(0.011)	(0.009)
ln(Size)	0.022***	-0.059***	0.024***	-0.004*	0.011***	-0.004*
	(0.001)	(0.007)	(0.003)	(0.002)	(0.002)	(0.002)
Leverage	-0.177***	0.130***		-0.389***	-0.195***	-0.062***
	(0.008)	(0.044)		(0.014)	(0.017)	(0.014)
MtB	-0.007***		0.011***	0.012***	-0.006***	0.020***
	(0.001)		(0.002)	(0.001)	(0.001)	(0.002)
Sales growth	0.043***	0.135***	0.023***	-0.009***	-0.029***	0.012**
	(0.003)	(0.011)	(0.003)	(0.003)	(0.004)	(0.005)
ln(Age)	-0.008***	-0.082***	-0.007	-0.018***	0.008**	-0.028***
	(0.002)	(0.011)	(0.005)	(0.003)	(0.004)	(0.003)
Investment		0.459***	0.010	0.069***		
		(0.034)	(0.011)	(0.011)		
ROA		-0.069	-0.556***	-0.033	0.205***	0.100***
		(0.079)	(0.021)	(0.021)	(0.020)	(0.027)
Tangibility			0.370***			
			(0.017)			
Dividend				-0.002		
				(0.007)		
F-test (low vs high)	0.26	10.29***	5.26**	4.30**	0.24	3.65*
Observations	14183	14183	14183	14183	14183	14183
Adj. R-sq.	0.212	0.267	0.276	0.308	0.050	0.121

*The table presents detailed results for the model modified for categories (2). In columns (1) and (2), dependent variables are performance variables. In columns (3) to (5), dependent variables are proxies for financial policies. In the column (6), the dependent variable is the capital expenditure scaled by net property, plant, and equipment. In Panel B, chaebols are sorted by group level of diversification proxied as the number of industries. In Panel C, chaebols are sorted by group debt level computed as the ratio of group debt to group assets. In Panel D, chaebols are sorted by group profitability computed as the ratio of group net income divided by group assets. In Panel E, chaebols are sorted by one-year group sales growth (zero if missing). Dependent variables and control variables are the same as in Table 3. Computation of variables is described in Appendix A. All regressions include year and industry indicators. Chaebol metrics include both listed and unlisted domestic affiliates. Variables are winsorized at the 1 percent level in each tail (except Age). Data are retrieved from Refinitiv Datastream, Worldscope, and KFTC. The sample covers the period from 2007 to 2019. Financial and utility firms are excluded from the sample. F-tests test the equality of coefficients between top and bottom chaebol categories. Robust standard errors are in parentheses and clustered at firm level. p-value * < 10% ** < 5% *** < 1%*

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Abstract

This paper examines the impact of business group affiliation on the performance and corporate policies of Korean listed firms over the period 2007-2019. This study proposes a novel approach allowing the observation of heterogeneity in the affiliation effects. Overall, we conclude that business group characteristics are reflected in firm outcomes. We find that investors perceive group membership positively as they pay a premium to hold affiliated firms. The premium is related to profitability and size of business groups, consistent with resource-based theories. The analysis also identifies significant group specific effects on firm policies. These findings suggest that several business groups follow group-level strategies and apply homogeneous financial and investment policies to all their affiliates.

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