

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 financial decisions of Korean listed firms over the period 2007-2019. This study proposes a novel approach allowing heterogeneity in the affiliation effects. The analysis shows that the behavior of affiliated firms is related to business group characteristics. The intensity of the affiliation effects on valuation and profitability is associated to the size, diversification, or leverage of business groups. The analysis also identifies significant group specific effects on firm policies. These findings suggest that a number of business groups follow group-level strategies and apply homogeneous financial and investment policies to their affiliates.

Keywords: Business groups, performance, corporate policies

JEL Classification: G30, G32, G35, L22

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1. Introduction

This paper examines the effect of business group affiliation on firm outcomes and the variation of this effect across groups. Numerous scholars investigate whether the affiliation with a business group affects the performance and the decisions of firms. The results of this literature remain mixed and do not identify a universal effect. Hence, some studies highlight the bright sides, whereas others document the dark sides of business groups. Finally, some other studies do not identify any impact of business group affiliation on firm outcomes. The cross-country and longitudinal studies also show that the results differ between countries and evolve over time. In this paper, we examine to which extent the effect of affiliation on firm outcomes varies across business groups. The heterogeneity of the affiliation effect might potentially explain the variability of results observed in the literature.

South Korea (Korea hereafter) offers an ideal field for business group research. The local business groups, commonly called chaebols, play the role of the spearhead of the Korean economy. Chaebols emerged after the Korean War and contributed to the rapid industrialization of the country during the second half of the twentieth century (Eichengreen et al., 2015). Prevalent in many Asian, European and Latin American countries, the literature often questions the ambivalent role of business groups hesitating between “parasites or paragons” (Khanna and Yafeh, 2007). A similar ambivalence is observed in Korea. On the one hand, chaebols play a key role in the economy in terms of international visibility, innovation, and value creation. On the other hand, chaebols are often criticized for their economic power that harms market competition at the expense of SMEs (OECD, 2018). The recent bribery or misbehavior scandals involving owner families increase public criticisms.

Based on a sample of Korean listed firms covering the period from 2007 to 2019, this paper examines the association between business group affiliation and a large range of firm outcomes including performance, financial, and investment policies.¹ First, the effect of affiliation is estimated at a market-level with a simple model assuming that business groups are homogeneous entities. To complement this market-level analysis and account for the heterogeneity in chaebol attributes, we use an identification strategy inspired by Cronqvist and

¹ The firm performance measures are ROA and Tobin’s q. Cash holding, debt leverage, and dividend payout are the proxies for financial policies, and the investment measures are capital investments and R&D expenditure.

Fahlenbrach (2008).² First, chaebols are pooled in categories of groups sharing similar observable characteristics including group size, diversification, indebtedness, profitability, and sales growth. Second, a group fixed effect model is used to estimate the effect associated with each single chaebol.

The empirical results show that business group affiliation is associated with a valuation premium and a lower profitability. The category-level and group-level analyses confirm these market-level average effects, but show variations in their intensity across categories and groups. The valuation premium suggests that investors perceive business group membership as a value-enhancing factor. The lower profitability is consistent with the profit smoothing behavior described by Lincoln et al. (1996). The homogeneity of the performance effect of affiliation contrasts with the heterogeneous results observed in terms of firm policies. Unlike the operating and market performance, the financial and investment policies are subject to discretionary decisions of the firm or group managers. In terms of financial policies, the market-level analysis shows that the affiliation with a business group is associated with a lower cash holding, lower debt, and lower dividend payout relative to unaffiliated firms. No significant association between affiliation and investment policy is observed. However, the analyses at a higher level of granularity show that these results are not generalizable to all chaebols. Indeed, the group specific effects tend to diverge substantially from the market-level effect. For instance, a number of business groups are associated with a higher use of debt contrasting with the negative average effect. Investment policy offers a more salient example. Indeed, the market-level results does not identify significant effect of affiliation on investments, but the group-level analysis reveals that a substantial part of business groups are associated with a significant effect on affiliate investments.

Overall, the analysis reveals that the differences in business group characteristics reflect in the affiliation effect. This evidence highlights the importance to account for the business group heterogeneity in the estimation of the affiliation effect. These results also put in light the limitations of an identification strategy based on a single dummy variable for affiliation. First, the effect estimated by such model is not generalizable to all business groups. Indeed, the empirical results shows that the group specific effects diverge qualitatively and quantitatively from the market-level average effect. Second, when the association between affiliation and firm outcomes varies substantially in terms of sign across groups, group effects of opposite sign tend to cancel each other. Consequently, a model using a single dummy variable would not identify

² In their paper, Cronqvist and Fahlenbrach (2008) examine the effect of heterogeneity across blockholders and its impact on firm performance and policies.

any significant effect at a market-level. Based on this result, one could conclude to the absence of affiliation effect on a given firm outcome, even though such association exists in reality but varies across business groups. In this paper, the case of the investment policy illustrates empirically this limitation. Indeed, no significant association between business group affiliation and capital investment is observed at a market-level. However, the group-level analysis reveals that most groups in the sample are associated with significant group fixed effect in terms of investment. This association is positive for a number of chaebols and negative for others. The empirical evidence provided by this paper also call for the reinterpretation of some prior works that ignore the potential effect of the heterogeneity. Indeed, the heterogeneity between groups might explain the lack of consensus in the literature and differences observed in the cross-country studies (e. g. Khanna and Rivkin (2001) and Carney et al. (2011)).

In addition to this methodological contribution, the paper also extends the business group literature and contributes to a better understanding of the impact of business group membership on firm outcomes. First, this paper addresses the lack of comparability between studies in the business group literature (Yiu et al., 2007) by documenting the effect of business group affiliation on a large range of firm outcomes for a single sample. It contrasts with most prior studies that focus only on one specific topic such as performance (e. g. Khanna and Palepu (2000b)) or financing (e. g. Byun et al. (2013)). Second, the empirical results also indicate that the differences in business group features impact more the estimation of the effect of affiliation on firm policies than the performance effect. The discretionary power of controlling shareholder on affiliate investment and financial decisions might explain this observation. The evidence of significant group fixed effects also indicates that a number of 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 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 limitations of the paper. Section 6 provides the conclusion of the paper.

2. Business groups and affiliation effect

2.1 Business groups and Korean chaebols

Defining business groups is not a trivial task given their considerable diversity. However, we usually define business groups as clusters of legally independent firms under the control of an individual, family, or corporation, that exercises control through formal and informal mechanisms (Kandel et al., 2019). The ties and coordination between affiliates appear as two key characteristics shared by business groups (Khanna and Rivkin, 2001). Khanna and Rivkin (2001) insist on the multiplicity and combination of ties binding affiliates together. The economists often focus on the equity links and ownership structure (e. g. cross-ownership and pyramidal structure), whereas the scholars from other social sciences emphasize the importance of social and interpersonal ties (e. g. family, school or interlocking directorates) (Khanna and Palepu, 2000a). This combination of formal and informal ties is used by the controlling shareholder to control affiliated firms with a minimum of equity investment (Yiu et al., 2007). Prior works document how such mechanisms are used to conduct group-level strategies aiming at sharing resources (Chang and Hong, 2000), reducing risk (Lincoln et al., 1996), supporting weak affiliates (Gopalan et al., 2007) or conducting political lobbying (Fisman, 2001). The diversification is another characteristic of business groups documented in the literature. The group diversification plays different roles such as risk reduction through diversification of cashflow sources and ensuring supply in inputs when external markets are deficient (Leff, 1978).

The dominance of business groups is a characteristic of the Korean economy. Chaebols emerged in the aftermath of the Korean War and contributed to the industrialization by collaborating with the government to implement development policies. The support and protection from the government allowed chaebols to grow and diversify their activities. The 1997 Asian financial crisis strongly hit Korea and led to the collapse of several chaebols. After this crisis, the Korean government undertook substantial reforms that aimed at curbing the chaebol power, and improving the transparency and financial resilience of chaebols. Despite these reforms, chaebols are still prevalent and play a key role in the Korean economy (Eichengreen et al., 2015).

Chaebols are similar on some aspects, but differ on others. Hence, chaebols of different size co-exist. During decades, Hyundai Group was the largest business group in Korea but, Samsung Group became the largest one after the split off of Hyundai Group in the early 2000s, (Kim et al., 2004). During the industrialization of the country, many chaebols diversified their

activities to either follow the government incentives or remediate to the lack of suppliers. However, a number of chaebols refocused on their core business more recently. Hence, some chaebols are still highly diversified (e. g. Samsung Group), whereas others are more focused (e. g. Hyundai Motors) (Kim et al., 2004). Chaebols also differ in terms of ownership. Even though some widely held business groups exist in Korea (e. g. POSCO), the majority of chaebols are family controlled. For instance, Samsung Group is still controlled by the founder Lee Byung-chul's descendants. The ownership structure of chaebols evolves over time. In 1987, the authorities forbade holding structure to avoid the development of pyramidal structure. However, holding structure prohibition was removed and this type of ownership structure was promoted in order to improve transparency after the 1997 Asian financial crisis (KFTC, 2017). Consequently, LG Group and a number of chaebols operated restructuring into holding structure, but others as Samsung Group still exhibit complex ownership scheme (Kim et al., 2004).

2.2 Effect of business group affiliation on firm outcomes

The resource-based and agency theories are commonly used in the finance literature to describe and predict the effect of business group affiliation on firm performance and decisions. The resource-based theories focus on whether and how group-level resources influence affiliated firms. The ability of business groups to pool and reallocate resources among the affiliates is often cited as a competitive advantage of business group membership. Indeed, internal factor markets can substitute to external markets by providing the access to scarce resources and reducing transaction costs (Chang and Choi, 1988). Larger benefits are expected in emerging countries where external markets are less efficient and underdeveloped. Internal markets for factors can be used to share workforce (internal labor markets), input (intragroup trades) or capital (internal capital markets) (Khanna and Rivkin, 2001).

Internal capital markets raise a special interest among finance scholars. According to the literature, internal capital markets affect directly or indirectly financial and investment policies of business group affiliates. Hence, several studies provide the empirical evidence that business group affiliation and access to internal capital markets lower financial constraints. This effect is documented for different countries such as Japan (Hoshi et al., 1991), Korea (Shin and Park, 1999), Russia (Perotti and Gelfer, 2001), India (Lensink et al., 2003), and China (He et al., 2013). Consequently, Pinkowitz and Williamson (2001) and Locorotondo et al. (2014) observe that business group affiliation is associated with a lower cash holding in Japan and

Belgium respectively. The better access to external financing (e.g. Byun et al. (2013) and Gormley et al. (2015)) contributes to explain the lower financial constraints. The reallocation of funds between affiliates serves different purposes namely propping and tunneling. The former refers to the transfer of resources to affiliates in need of financing, whereas the latter is associated with minority shareholder expropriations (Bae et al., 2008). Empirical evidences show that intragroup loans (Gopalan et al., 2007) and dividends (Gopalan et al., 2014) are used to transfer capitals within business groups. The lower financial constraints and the access to internal capital markets might also reflect in investment policy. For instance, Hoshi et al. (1991) observe a lower cashflow sensitivity of investments for affiliated firms in Japan. Similar results are observed in Korea by Shin and Park (1999). Almeida et al. (2015) find that during crisis periods the access to internal capital markets allows business group affiliates with high growth opportunities to maintain their investments.

Whereas the resource-based theories describe business group affiliation as mostly beneficial, the agency theories argue that business group affiliation is associated with some costs. The presence of a controlling shareholder prevents against principal-agent conflicts. Nevertheless, it increases the risk of principal-principal conflicts. The controlling shareholders might take advantage of their control over affiliates to extract private benefits at the expense of non-controlling shareholders (Young et al., 2008). This risk is even higher in the case of business groups since the controlling shareholder might prioritize group-level interests rather than firm-level interests (Bae et al., 2002). Intragroup subsidizations (propping) might also benefit to some affiliates at the expense of others (Chang and Hong, 2000). A number of scholars provide evidence of minority shareholder expropriations by chaebol controlling shareholders. For instance, Bae et al. (2002) find that the acquisitions conducted by chaebol affiliates benefit to controlling shareholders at the expense of minority shareholders and Baek et al. (2006) document tunneling activities through private security offerings. Some authors also observe minority shareholder expropriations during the family succession. Hence, Hwang and Kim (2016) find that controlling shareholders use related party transactions to ease family successions and Shin (2020) shows that inheritance tax avoidance is a motive for intragroup mergers at the expense of minority shareholders.

Overall, the effect of affiliation on firm performance results in the sum of the benefits and costs associated with business group membership. The empirical literature provides mixed results regarding the association between business group affiliation and firm performance. Carney et al. (2011) conduct a meta-analysis based on 141 studies covering 28 countries. The authors find a negative effect of affiliation on firm performance. However, they observe that

results differ substantially from a study to another depending on the methodology or country. The cross-country analysis covering 14 emerging countries during the early 1990s conducted by Khanna and Rivkin (2001) also highlights the variability of the performance effect of business group affiliation across countries. The authors identify a significant association between affiliation and accounting profitability in nine countries. The effect is positive in six countries and negative in three others. Holmes Jr et al. (2018) observe the difficulty to assess the benefits of group membership on performance given the different group strategies and roles of affiliates. For instance, Lincoln et al. (1996) find a negative effect of business group affiliation on firm profitability in Japan. The authors explain this negative relation by the reallocation aiming at smoothing profitability across affiliates and ensuring group viability rather than maximizing profit. The results in terms of performance effect for Korean chaebols are also mixed. For instance, Lee et al. (2010) use a 21-years long sample and observe variations in value of chaebol affiliation over time. During the both 1980s and 2000s, chaebol affiliation is associated with a higher firm value but, chaebol affiliates are traded at a discount during the period preceding the 1997 crisis. The underperformance of chaebol affiliates in the years prior to this crisis are supported by other studies as Ferris et al. (2003) and Lee et al. (2008).

2.3 Between-group heterogeneity and effect of affiliation

Most studies estimate the impact of affiliation on firm outcomes at a market-level. The market-level estimation of the affiliation effect assumes implicitly that business groups are homogeneous entities and the effect of affiliation is the same for all business groups. In this paper, we argue that the heterogeneity in business group features might reflect in the affiliate outcomes. Indeed, both resource-based and agency theories associate the effect of business group membership with business group features and we observe substantial differences in business group characteristics. Therefore, we can expect to see the effect of affiliation varies across business groups.

The firms belonging to a business group access the same resources such as the capital, workforce, knowhow or brands through internal factor markets (Khanna and Rivkin, 2001). Consequently, the affiliates of a same business group are likely to share similar benefits and costs, whereas the affiliates of another business group benefit from other advantages and face other costs. A number of studies examine the association between group size and firm outcomes. Overall, the meta-analysis conducted by Carney et al. (2011) highlights a positive association between the group size and affiliate performance. Some authors document other

benefits associated with the large business group affiliation such as the access to government (Khanna and Palepu, 2000b), reputation (Morck et al., 2005) and lower entry barriers (Pattnaik et al., 2018). Those benefits are likely to translate into firm performance. Gormley et al. (2015) and Minetti and Yun (2015) observe that the advantage of business group affiliation in terms of debt financing is even higher for the affiliates of the five largest chaebols. The investigations on the interaction between the group diversification and affiliate outcomes yield mixed results. Hence, a U-shaped relationship between the group diversification and firm profitability is observed in Chile (Khanna and Palepu, 2000a) and India (Khanna and Palepu (2000b) and Elango et al. (2016)), while the reverse is found in South American countries (Borda et al., 2017). However, Khanna and Rivkin (2001) do not find evidence of a diversification discount in their cross-country analysis contrasting with the results for US conglomerates. During the period prior the 1997 Asian finance crisis, Chang and Hong (2000) investigate the relation between shared resources and chaebol affiliate profitability. The authors observe a significant effect of group resources on affiliate performance. The group size and leverage have a negative effect, whereas the diversification has a positive effect.

The management style and preferences of the group controlling shareholder are also likely to differ between business groups and reflect in affiliates outcomes and decisions. Cuervo-Cazurra (2006) suggests that the preference and education of controlling shareholder might influence the strategy of family business groups. Such association is especially likely to be observed in highly centralized business groups as Korean chaebols in which strategic decisions are taken at a group-level (Shin and Park, 1999). For instance, Kwon and Han (2020) find evidence of a group-level payout tendency affecting all affiliates belonging to a same family business group. Outside the business group literature, Bertrand and Schoar (2003) and Cronqvist and Fahlenbrach (2008) document how firm policies are impacted by the preferences of managers and blockholders respectively.

Finally, a number of empirical works show how the ties between affiliates reflect in firm performance or decisions. For instance, Khanna and Rivkin (2001) observe a significant higher correlation in the profitability between firms belonging to a same business group. Some works show that between affiliate ties reflect in stock prices. For instance, Kim et al. (2015) document stock return comovements within Korean business groups and other authors find a group-level spillover effect at credit rating announcement (Kwon et al. (2016), Joe and Oh (2018)), earnings announcement (Bae et al., 2008) or stock price crash risk (Kwon et al., 2019).

3. Identification strategy

This section presents and discusses the models used to examine the variations in the affiliation effects associated with the heterogeneity in group characteristics. The identification strategy is inspired by Cronqvist and Fahlenbrach (2008) and adapted to the specificities of the business group framework. The section starts with a simple model using a single dummy variable to capture the average association between the business group membership and the firm outcome. Then, this model is developed to account for the business group heterogeneity and the variations in the effect of affiliation across groups.

3.1 Baseline model

The baseline model of this paper estimates the market-level average association between affiliation with a business group and firm outcomes. Therefore, the effect of affiliation is supposed to be the same for all business groups that are considered as homogenous entities. 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).

$$y_{it} = \alpha + \delta BG_{it} + \beta X_{it} + Ind_i + Year_t + \varepsilon_{it} \quad (1)$$

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, Equation (1) includes a set of firm control variables denoted by the vector 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. Consequently, the affiliation effect estimated by Equation (1) is the same for all business groups.

3.2 Model modified for categories

The assumption of the business group homogeneity imposed by the baseline model (1) is unrealistic given the differences in business group characteristics observed in the reality. As discussed in Section 2.3, we can expect that the effect of affiliation varies depending on group

characteristics. To examine to which extent the differences in group characteristics causes heterogeneity in the affiliation effect, business groups are pooled in homogeneous categories and the baseline model (1) is modified as follows

$$y_{it} = \alpha + \boldsymbol{\gamma}\mathbf{D}_{it} + \beta\mathbf{X}_{it} + Ind_i + Year_t + \varepsilon_{it} \quad (2)$$

where, a $K \times 1$ vector \mathbf{D} of business group category indicators replaces the dummy variable BG of the 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 . In order to capture the effect net of firm characteristics, the model (2) includes the same controls and fixed effects as the baseline model (1). The model modified for categories (2) differs from the baseline model (1) by averaging the effect of affiliation on firm outcomes across categories of homogeneous business groups instead of averaging the effects across all (and heterogeneous) business groups. Hence, the model assumes the homogeneity of the affiliation effect only across business groups sharing similar characteristics, but accounts for the variations induced by the heterogeneity in group characteristics.

3.3 Group fixed effect model

The assumption of the between-group homogeneity is only partially relaxed by the model (2). Indeed, this model assumes that the association between group affiliation and firm outcomes is homogenous between similar business groups. In addition, the model modified for categories (2) captures only the effect related to observable group characteristics. To fully capture the variations in the effect of affiliation due to both observable and unobservable group characteristics, the single affiliation dummy variable of the baseline model (1) is replaced by a vector of individual business group indicators as depicted in Equation (3).

$$y_{it} = \alpha + \boldsymbol{\Gamma}\mathbf{Z}_{it} + \beta\mathbf{X}_{it} + Ind_i + Year_t + \varepsilon_{it} \quad (3)$$

where, \mathbf{Z} is a vector of individual business group indicators of size $G \times 1$, where G is the number of business groups. $\boldsymbol{\Gamma}$ 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 and fixed effects 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 relax the assumption of the between-group homogeneity imposed by models (1) and (2). Unlike the model modified for categories (2) that captures only the variation associated with the differences in observable characteristics such as the group size or diversification, the group fixed effect model (3) is able to capture the variations in the effect of affiliation due to group-specific and unobservable features such as the controlling shareholder preference.

The estimation of the group fixed effect model (3) imposes some specific constraints. To ensure an estimation based on the both time and cross-section 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

The three above-mentioned models use unaffiliated firms as control group but differ in how they consider business groups. The baseline model (1) assumes that business groups are homogenous entities. In the model modified for categories (2), business groups are pooled into homogeneous categories based on observable characteristics and the group fixed effect 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. Estimating the market-level average effect raises some concerns if we consider the differences in business group characteristics. Indeed, the average effect might hide variations in the affiliation effect across groups. For instance, the model might identify a significant and positive average effect of affiliation on a given firm outcome at a market-level, whereas this effect is actually negative for some specific business groups. It is also possible that the model fails to identify any systematic and significant relation if group effects of opposite sign cancel each other. In both cases, the baseline model leads to a wrong conclusion. In the first example, one can conclude that the business group affiliation is associated with a positive effect on the firm outcome, whereas it is true only for some specific business groups. In the second case, one can infer that the firm outcome is not significantly affected by the business group membership, whereas the affiliation has a significant but heterogeneous effect across business groups. 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 to observe the variations in the affiliation effect across business groups. The model modified for categories (2) relaxes partially the assumption of homogeneity imposed by the baseline model (1). Instead of averaging affiliation effects across all (and potentially heterogeneous) business groups, the effects of affiliation are averaged across similar business groups. Therefore, this model assumes that the effect of affiliation on firm outcomes is homogenous between similar business groups, but heterogeneous between groups with different characteristics. Such differences are consistent with the resource-based and agency theories discussed earlier. One limitation of this model is to be unable to capture the heterogeneity due to unobservable group features such as the controlling shareholder preference or management style. The group fixed effect model (3) allows addressing this issue by estimating the effect specific to each single business group. Depending on the significance of the group fixed effects, this model also indicates to which extent affiliates of a given business group follows homogeneous policy and strategy.

4. Sample and data

The empirical analysis is based on a single country sample as it provides more reliable results than a multi-country analysis (Khanna, 2000). Indeed, results of multi-country analyses might be affected by the differences in legal framework or macroeconomic factors. In addition, a single country analysis also ensures a consistency in the definition of business group and the identification of affiliated firms. Korea offers an ideal framework for business group analysis. First, business groups play a prominent role in the Korean economy. A second advantage is the data provided by the Korea Fair Trade Commission (KFTC) that eases the identification of business groups and their affiliates (Kim et al., 2022). Additionally, it provides a common definition of business groups to researchers ensuring the result comparability.

4.1 Firm sample

The sample consists of firms listed on the two main market divisions (KOSPI and KOSDAQ) of the Korean stock market (KRX) from 2007 to 2019. Consistent with a common practice in the literature, financial firms (ICB 3010-3030) and utilities firms are excluded (ICB 6510) from the sample. 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).

Whereas the majority of research works usually focus only on firm performance (e.g. Khanna and Palepu (2000b)) or specific decisions (e. g. Gopalan et al. (2014)), this paper examines the effect of affiliation on a wide range of firm outcomes including firm performance, financial, and investment policies. Return on assets (ROA) and Tobin's q are two proxies for firm performance. ROA reflects operating performance and is based on past accounting data, whereas Tobin's q is a forward-looking proxy for firm value (Isakov and Weisskopf, 2014). 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 are proxied by capital investment and R&D investment. Capital investment is capital expenditure scaled by net property, plant, and equipment (PPE). R&D investment is R&D expense divided by total assets. 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 some summary statistics for all sample firms and compares statistics of non-chaebol and chaebol firms.³ Overall, we observe that business group affiliates differ significantly from other Korean listed firms. This observation raises concerns regarding the choice of unaffiliated firms as control group and endogeneity issues. These concerns are discussed in Section 5.4.

4.2 Business group sample

Data about chaebols and affiliation status are based on the KFTC disclosures. Following a common practice in the literature dedicated to Korean chaebols, state owned business groups

³ The detailed summary statistics are showed in Appendix B.

are not considered as chaebols.⁴ In order to keep consistency in the chaebol definition across the full sample, business groups whose the value of total assets is below 5 trillion KRW are not considered as chaebols.⁵ The sample includes a total of 63 chaebols for 528 group-year observations and 1710 affiliate-year observations (257 unique firms).⁶

All chaebol characteristics are computed including both listed and unlisted domestic affiliates based on data disclosed by the KFTC. 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 size, number of industries and affiliates are attributes directly linked with the resources available at a group-level and associated with the resource-based theories. As discussed earlier, the size and diversification play a significant role in internal factor markets. Group leverage is computed as the ratio of the sum of liabilities of all affiliates divided by group total assets. Different interpretations are possible for group leverage. As the above-mentioned characteristics, it might be linked with a resource-based perspective. However, the group leverage can be also associated with the controlling shareholder preference who might have preference for debt financing or avoid control dilution (Chang and Hong, 2000). Finally, it can be interpreted as an indicator for financial vulnerability. Indeed, the excessive indebtedness was a cause of chaebols collapse during the 1997 Asian financial crisis (Eichengreen et al., 2015). 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). Both group profitability and group sales growth are two proxies for group-level performance. Group summary statistics are reported in Table 2.

[Insert Table 2 here]

In Panel B, the correlation matrix shows strong relation between the different measures of group size and diversification. Indeed, we observe a significant correlation between the value of group assets and the number of industries. These two variables are also significantly correlated with the number of affiliated firms that can be interpreted as a measure of both diversification and size. The two measures of group performance, profitability and sales-growth, are also significantly correlated, whereas correlation between leverage and profitability

⁴ Only 18 firm-year observations are due to affiliates of state owned chaebols. Appendix C presents the estimation of the baseline model excluding those observations. Results are not affected.

⁵ In 2009, the total assets threshold for chaebol designation increased from 2 to 5 trillion KRW.

⁶ A limitation of the KFTC classification is to be restricted to largest business groups and does not consider business groups below the threshold. This limitation is discussed in Section 5.4.

is negative and significant. We also observe that the correlation between leverage and number of affiliates is slightly significant.

In Section 5, the group size, group diversification, group leverage, group profitability, and group sales growth are used to categorize business groups in the model modified for categories (2). The number of affiliated firms is not used given its mixed interpretation. Chaebols are sorted on yearly basis in tercile groups (low, middle, high) for each above-mentioned characteristics. Table 3 reports average characteristics for each category.

[Insert Table 3 here]

The largest chaebols are more diversified and have more affiliated firms than smaller ones. The smallest chaebols have lower debt and are slightly more profitable than larger groups. The highly diversified chaebols are larger in terms of asset value and number of affiliates. They also exhibit higher sales growth than less diversified chaebols. The chaebols with a low level of debt exhibit higher sales growth and profitability than heavily indebted chaebols. Chaebols of different indebtedness categories appear as homogenous in terms of size and diversification. The highly profitable chaebols have also higher sales growth than poor performing chaebols. On average, they are also larger and have lower debt. Finally, in comparison with sorting based on profitability, the categorization according to one-year change in sales results into homogeneous categories in terms of size and debt.

5. Empirical results

5.1 Average affiliation effect

The empirical analysis starts by examining the average association between affiliation with a business group and firm outcomes using the baseline model (1). To control for firm differences, the regression model includes a set of firm control variables commonly used in the literature (Mitton, 2022), and fixed effects for year and industry.

[Insert Table 4 here]

Table 4 reports the regression results using the baseline model (1). The variable of interest is the affiliation dummy variable *Chaebol* taking value 1 for firms affiliated with a chaebol and 0 otherwise. A positive (negative) coefficient means that the affiliation with a

chaebol is associated with a higher (lower) dependent variable than non-chaebol firms after controlling for effects of other firm characteristics, industry, and year. In columns (1) and (2), we observe that the coefficients on affiliation have opposite signs for performance proxies. Hence, chaebol affiliation is associated with a 2.4 percentage points lower ROA, but a 18.6 percent higher Tobin's q relative to unaffiliated firms. The negative effect on profitability is consistent with the priority put on profit smoothing rather than profit maximization described by Lincoln et al. (1996). 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. Consistent with Pinkowitz and Williamson (2001) who argue that business group affiliates have lower liquidity needs, we observe a 1.8 percentage point lower cash holding associated with chaebol affiliation. The results in column (5) indicate a 1.9 percentage point lower payout ratio associated with chaebol affiliation. The lower payout is consistent with the findings of Hwang et al. (2013) and Kwon and Han (2020). The results in the last set of columns do not indicate a systematic and significant association between business group membership and investment policy at a market-level.

Despite the presence of control variables in the specification above, the omitted variable bias and unobserved firm heterogeneity can affect the estimations presented in Table 4. To mitigate this risk, we test an alternative model. Since the firm fixed effect model is not applicable due to the risk of multicollinearity between the affiliation dummy and the firm fixed effect, we apply a two steps approach. The first step consists in estimating a model in which firm fixed effects replace the affiliation dummy (and industry indicator).⁷ 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 showed in Appendix D 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.

The baseline model (1) assumes that the association between affiliation and firm outcomes is the same for all business groups. Consequently, it ignores potential differences between groups. This model allows drawing only a general picture of the relation between firm outcomes and business group membership at a market-level. For instance, the results show a positive value effect of affiliation. However, this result might not apply to all chaebols or its intensity might vary across chaebols. It is also possible that the affiliation with some chaebols

⁷ The firm fixed effect model is

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

where, γ_i is firm fixed effect for firm i .

is associated with a significant effect on investment, even though a general association is not identified at the market-level. Hence, the results obtained with the baseline model (1) might not to be generalizable to all chaebols.

5.2 Between-category heterogeneity

As discussed in Section 4, Korean chaebols exhibit a wide diversity in terms of size, diversification and financing. According to the resource-based and agency theories, we can expect that the effect of affiliation on firm outcomes varies depending on group features. To account for the heterogeneity in group characteristics and implement the model modified for categories (2), chaebols are categorized (one-way sorting) according to group characteristics (see Section 4.2). The model (2) assumes that the affiliation effect is homogeneous across chaebols belonging to a same category (e. g. the largest chaebol), but heterogeneous between different categories (e. g. between the largest and the smallest chaebols).

[Insert Table 5 here]

Table 5 reports the coefficients on category indicators based on the estimation of Equation (2).⁸ The regression model includes the same firm control variables as in Table 4. Chaebols are sorted in terciles by group size (Panel A), group diversification (Panel B), group leverage (Panel C), group profitability (Panel D), and group growth (Panel E).

Columns (1) and (2) report the results for the performance proxies. The results of the model modified for categories (2) are qualitatively similar and consistent with the baseline model (1). 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 with the sorting characteristic. However, the magnitude of the association varies across categories and diverges from the average association estimated by the baseline model (1). For instance, the baseline model (1) identifies that chaebol affiliation is associated with a 2.4 percentage point lower ROA relative to non-chaebol firms. In Panel A of Table 5, 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. The results of Panel C indicate that the group leverage alters affiliate profitability. This observation is consistent with Kim (2016) who find a negative association between chaebol leverage and firm sales growth.

⁸ Full tables are available in Appendix E.

The affiliation with a highly indebted chaebol is associated with a 3.6 percentage points lower ROA relative to non-chaebol firms, while the decrease in profitability associated with the affiliation with a low indebted chaebol is only 1.2 point of percentage. It is also interesting to note that the association is only marginally significant. Panel D shows a positive relation between the group and affiliate profitability. This observation suggests that in highly (poorly) performing chaebols both listed and unlisted affiliates tend to exhibit a higher (lower) profitability.⁹ In terms of the value effect of chaebol membership, the results show that investors value more affiliation with the largest chaebols. This result is consistent with the benefits associated with large business groups such as visibility (Morck et al., 2005) and higher market and political power (Khanna and Yafeh, 2007). 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. However, in Panel C, we observe that the group leverage alters the valuation premium associated with chaebol affiliation. The negative effect of group leverage on affiliate value is likely to be explained by the risks associated with group financial vulnerability and lower product market performance (Kim, 2016). Consistent with Khanna and Palepu (2000b), the results based on the diversification sorting (Panel B) indicate a U-shaped relation between group diversification and both measures of firm performance.

Columns (3) to (5) report the estimation results for firm financial policies. The baseline model (1) identifies significant associations between affiliation and financial policy. However, the estimation results using the model (2) indicate substantial variation of the significance, magnitude, and sign across different chaebol categories. Hence, we observe that the association is significant only for some categories of chaebols. For instance, the association between a lower cash reserve and chaebol membership is significant for the small and medium size chaebols, but not for the largest chaebols. In the case of firm leverage and sorting by group leverage, we also note that the sign of the association varies between categories. Hence, the results show that affiliation with a highly indebted chaebol is associated with a higher use of debt relative to non-chaebol firms. This result contrasts with the overall effect estimated by the baseline model (1). Indeed, chaebol affiliation is associated with a firm leverage lower by 3.2 percentage points at a market-level, but the affiliation with a highly indebted chaebol is associated with a firm leverage higher by 2.8 percentage points relative to non-chaebol firms. The positive relation between the group-level and firm-level indebtedness suggests that some

⁹ The group-level profitability is computed included both listed and unlisted affiliates (sorting characteristic), whereas the firm-level profitability (dependent variable) includes only listed affiliates.

chaebols apply homogeneous group-level strategy regarding the use of debt.¹⁰ The results of Panels D and E indicate that the affiliation with a well performing chaebol is associated with a lower use of debt. In terms of cash holding, the results of Panels C to E indicate that the association with a lower cash reserve is significant only for the affiliation with chaebols characterized by a low debt, high profitability and high sales growth. These results are consistent with Pinkowitz and Williamson (2001) who argue that business group affiliates are less liquidity constrained. Interpreting the results for dividend payout is more difficult given the heterogeneity of the coefficients across categories. Unobservable characteristics such as the controlling shareholder preference might explain these results as documented by Kwon and Han (2020).

The baseline model (1) does not identify a significant association between chaebol affiliation and investment decisions at a 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) and (7) support the second explanation. Indeed, the association between affiliation and investment is significant only for some categories of chaebols. We also observe differences in terms of sign for some outcomes and sortings (e. g. effect on R&D investment and sorting by group diversification).

The interpretation of the model modified for categories (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, the model modified for categories (2) brings evidence that the heterogeneity in business group characteristics reflects in the affiliation effect. Consistent with the resource-based and agency theories, Table 5 shows that the association between firm outcomes and business group affiliation varies in magnitude and significance depending on group characteristics. This observation is especially salient for the financial and investment decisions. The differences between the market-level and the category-level effects also highlight the limitation of the baseline model (1) assuming the homogeneity in affiliation effect across groups.

5.3 Between-group heterogeneity

The model modified for categories (2) relaxes only partially the assumption of the between-group homogeneity. First, the effect of affiliation on firm outcomes is assumed to be

¹⁰ The group-level leverage is computed including both listed and unlisted affiliates (sorting characteristic), whereas the firm-level leverage (dependent variable) includes only listed affiliates.

the same across chaebols sharing similar characteristics. Second, the sorting based on characteristics does not allow to capture effect associated with unobservable features such as the controlling shareholder preference. By estimating the effect of affiliation associated with each single chaebol, the group fixed effect model (3) remedies to these limitations.

[Insert Table 6 here]

Table 6 presents statistics of the chaebol fixed effects. The chaebol fixed effects are estimated based on Equation (3). The regression model includes the same firm control variables as in Table 4 and Table 5. As discussed in Section 3.3, to ensure that the fixed effect estimation comes from cross-section and time-series, Table 6 reports only the fixed effects of chaebols that have a minimum of two listed affiliates and that are in the sample during at least two years.¹¹ Among the 63 chaebols of the sample, 25 chaebols (for 1,216 affiliate-year observations) fulfill these criteria.¹² A positive (negative) fixed effect means that the affiliation with a specific chaebol is associated with a higher (lower) dependent variable than non-chaebol firms after controlling for the effects of firm characteristics, industry, and year.

Panel A reports statistics of the 25 chaebol fixed effects. The first rows show the total number, the number of positive and negative fixed effects. We observe a higher heterogeneity in terms of coefficient sign 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 over the 25 chaebol fixed effects are positive for firm value. The leverage and investment policies are other firm outcomes for which signs of group fixed effect vary substantially between chaebols. 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 10% level. We note that the number of significant fixed effects varies between different firm outcomes. The number of significant fixed effects is especially meaningful in the case of proxies for financial and investment policies. Indeed, a significant chaebol fixed effect indicates a strong within-group homogeneity in the firm policy. In other words, it suggests that the affiliates of a same group behave in a similar manner. On the other side, a non-significant group fixed effect might reflect a high heterogeneity in policy

¹¹ Fixed effects of chaebols that do not meet requirements are ignored in Table 6.

¹² 13 chaebols are excluded because they have only one listed affiliates (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.

across the group affiliates. The results in Panel B indicate that a majority of chaebols conduct specific and uniform policies in terms of use of debt and capital investment, whereas only nine chaebols over the 25 are associated with a specific payout policy.

The sign of group fixed effects inform on the heterogeneity in the effect of affiliation across groups. In terms of valuation, the significant fixed effects are homogeneously positive. A similar homogeneity is observed for profitability with seven over eight negative significant fixed effects. The homogeneity of the performance effect is consistent with the results of the model (2). Also consistent with the results of the models (1) and (2), we observe that the association 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 13 chaebols associated with specific debt policy, nine lead their affiliates to maintain a low debt leverage, whereas four others foster an intensive use of debt relative to non-chaebol firms. The evidence of group-level debt policies supports the results of Panel C of Table 5 that show a positive association between the group-level and firm-level indebtedness. The results for investment decisions tend to support results of the model modified for categories (2). Indeed, whereas the baseline model (1) does not identify any significant association between chaebol affiliation and investment, the group fixed effect model (3) reveals that such association exists but varies substantially in terms of sign across groups. Indeed, among the 15 (10) significant fixed effect for capital investment (R&D investment), nine (three) are positive and six (seven) are negative.

The results of the group fixed effect model (3) support and complement the results obtained with the two other models. This model allows to estimate the effect specific to each group. Overall, the results confirm that the affiliation with a chaebol is homogeneously associated with a lower profitability and higher value. The model also identifies significant group fixed effects in firm policies indicating that a number of chaebols apply homogeneous financial and investment policies at a group-level.

5.4 Discussion and limitations

The baseline model (1) identifies the average association between chaebol membership and firm outcomes at a market-level with the implicit assumption that the effect of affiliation is the same for all business groups. The results reveal significant associations for firm performance and financial policy, but no significant relation is observed in terms of investment policy. The model modified for categories (2) solves some limitations of the baseline model by

accounting for the heterogeneity in chaebol characteristics. In this model, the chaebols are categorized according to observable characteristics. Consistent with the resource-based theories, the magnitude and significance of the association between chaebol affiliation and firm outcomes varies depending on group characteristics. Finally, the group fixed effect model (3) accounts for the between-group differences in observable and unobservable characteristics. This model estimates the relation between firm outcomes and the affiliation with each single chaebol. The results put in light some substantial differences across chaebols.

Overall, the results reveal that the heterogeneity in chaebol characteristics has a stronger impact on affiliate 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 and value some group attributes such as the size, financial resilience, and performance. The negative association between affiliation and profitability is consistent with the profit smoothing observed by Lincoln et al. (1996) in Japan and Ferris et al. (2003) in Korea. Unlike the firm value and accounting profitability, the firm policies rely on 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 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 four chaebols are associated with a significant higher use of debt, whereas nine 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) highlight some limitations of the baseline model (1). First, an identification strategy based on a single dummy variable for affiliation fails to identify significant affiliation effect in the presence of a wide heterogeneity in affiliation effects across groups. Indeed, the effects of opposite sign tend to cancel each other and result in a non-significant average effect. Therefore, the baseline model results conclude in the absence of relation between business group affiliation and investment policy. However, both model modified for categories and group fixed effect model provide the evidence that such association exists but varies substantially across business groups. Second,

the effect estimated at a 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 a group-level reveals that such relation is significant only for a minority of groups. In conclusion, the heterogeneity in the effect of affiliation on firm outcome might lead to wrong conclusions if the effect estimation is based on a single dummy variable for affiliation.

As one of the first attempt to document the heterogeneity in the affiliation effect across business groups, this analysis has some limitations. The low number of business groups in the sample limits the analysis potential. For this reason, the category analysis is limited to a one-way sorting to obtain categories with a sufficient number of chaebols and affiliated firms. In the group fixed effect analysis, the low number of chaebols fulfilling requirements does not allow deeper investigations such as the identification of the source of group fixed effects.¹³ Commonly used in the literature dedicated to chaebols, the KFTC classification has the advantage to provide a uniform business group definition and scope to all researchers. However, the KFTC reporting is limited to the largest business groups. Therefore, the data and composition of the business groups below the total assets threshold of 5 trillion KRW are not available. This scope of implementation is consistent with the competition supervision purpose of the KFTC but imposes to interpret results as the effect of affiliation with a *large* business group. Indeed, among unaffiliated firms some are possibly affiliated with a small business group.¹⁴ To mitigate the limitations due to the low number of chaebols, one might including smaller business groups. However, such extension is difficult to implement. Indeed, the data required to extend the KFTC classification are not available. The KFTC considers the both equity ties and *de facto* control to identify the boundaries of business groups. The detailed ownership is not available for firms that are not constrained to strict disclosure as chaebol affiliates. In addition, the notion of *de facto* control is based on the KFTC assessment. Consequently, extending the list of chaebols might affect the analysis reliability by generating a distortion in the definition and identification between the “KFTC classified” and “additional” chaebols. Holmes Jr et al. (2018) highlight the importance of using a homogeneous definition to obtain reliable results. In addition, it would go against the literature common practice.

¹³ For instance, Bertrand and Schoar (2003) and Cronqvist and Fahlenbrach (2008) analyze sources of manager and blockholder fixed effects.

¹⁴ For this reason, I use the term of “unaffiliated” or “non-chaebol” firms rather than “independent firm” to designated firms that are not affiliated with a chaebol.

Finally, the low number of business groups is also associated with a limited number of changes in the affiliation status during the sample period. Several authors report this phenomenon. For example, Byun et al. (2013) note that changes in the chaebol composition are rarely observed in the short-term. Khanna and Rivkin (2001) explain that the social ties and competition between groups contribute to maintain stable the composition of groups. Consequently, the implementation of different methods aiming at establishing causality or remedy endogeneity issues is not possible (e. g. firm fixed effect model, difference-in-difference, etc).

Reverse causality and endogeneity are common issues in the empirical corporate finance. In this paper, some concerns about the endogeneity might emerge from the significant differences observed between chaebol and non-chaebol firms (see Table 1). Using a matching sample is usually a suitable method to tackle such issue. However, in this specific framework, a matching sample would alter the estimation of group effects by deleting affiliated firms without matching firms.¹⁵ In addition, it would reduce the number of chaebols available for the analysis based on the group fixed effect model (3). Khanna (2000) also notes the difficulty to find a suitable instrument for business group affiliation. As discussed, the implementation of other methods commonly used in the corporate finance literature are difficult or even impossible given the sample specificities. However, Khanna and Yafeh (2007) argue that the issue of group formation endogeneity is mitigated by the fact that the group structure is mainly historically determined. Since the causality is not empirically established, we discuss the results in terms of association between affiliation and firm outcomes rather than affiliation effect. The sample restricted to listed firms only is another limitation of the empirical framework. Such practice is common in research estimating the affiliation effect by comparing affiliated with unaffiliated firms. The data availability and selection of relevant control group are two obstacles to include unlisted firms in the sample. However, ignoring unlisted firms might bias the results as many chaebols have unlisted affiliates (Khanna, 2000).

Future research might remedy some of these limitations by focusing on the comparison between affiliated firms rather than using unaffiliated firms as control group. This empirical framework alleviates the concern regarding the endogeneity of affiliation status and allows the inclusion of unlisted affiliates. However, such analysis would not allow to identify the effect of business group affiliation relative to unaffiliated firms. Another possible extension is to include the between-affiliate differences in the analysis. Indeed, this paper focuses exclusively on the

¹⁵ Among the 30 largest listed firms in 2019 (2007), 29 (24) are affiliated with a chaebol. Therefore, exact matching between chaebol and non-chaebol firms would lead to the deletion of important chaebol firms. Non-chaebol nearest neighbors are also likely to differ substantially from those chaebol firms in case of nearest neighbor matching.

differences in affiliation effects across groups with the assumption that the effect is homogeneous within each group.

6. Conclusion

This paper examines the impact of business group affiliation on the performance and on the financial and investment policies. Based on a sample of Korean listed firms covering the period 2007-2019, the empirical analysis shows that the heterogeneity in business group features results in variations in the effect of affiliation across groups. The performance effect of affiliation appears qualitatively homogenous with a reduction in firm profitability and a gain in firm valuation. However, the intensity of the profitability reduction and valuation premium varies and is related to group characteristics. The effect of affiliation on the financial and investment policies exhibits a large heterogeneity across groups. Indeed, the analysis reveals that the group-level effects tend to differ qualitatively and quantitatively from the effect estimated at a market-level.

Identifying the variation in the association between affiliation and firm outcomes has both methodological and empirical implications. This evidence shows that considering business groups as homogeneous entities might lead to wrong conclusions. The empirical analysis reveals the limitations of an identification strategy based on a single dummy variable to estimate the effect of business group affiliation. Indeed, the results show that such model fails to identify the effect of affiliation in the presence of heterogeneous business groups. This paper also contributes to the business group literature by providing a better understanding of the impact of business group affiliation on firm behavior. The group-level analysis identifies significant group specific effects in terms of firm policies. This observation indicates that some chaebols tend to conduct homogenous group-level financial and investment policies.

Overall, this paper highlights the complexity of business groups and the importance to account for their heterogeneity for a better understanding of their effect on firm policies and performance.

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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***
R&D investment	0.021	0.011	0.028	0.022	0.012	0.029	0.013	0.005	0.023	12.669***
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*** (0.000)	1.00				
Nbr of industries	0.45*** (0.000)	0.88*** (0.000)	1.00			
Leverage	0.06 (0.194)	0.08* (0.059)	0.03 (0.561)	1.00		
Profitability	0.05 (0.238)	-0.00 (0.975)	0.01 (0.896)	-0.50*** (0.0000)	1.00	
Sales growth	0.01 (0.735)	0.05 (0.296)	0.05 (0.296)	-0.04 (0.408)	0.16*** (0.000)	1.00

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 KTFK. P-value are in parentheses * < 10% ** < 5% *** < 1%

Table 3 Group category summary statistics

		Observations	Size (tr. KRW)	Nbr of affiliates	Nbr of industries	Leverage	Profitability	Sales growth
All groups		528	45.992	34.2	14.8	0.551	0.028	0.067
Group size	Small	180	7.308	23.4	11.3	0.481	0.033	0.067
	Middle	175	17.109	28.9	13.0	0.587	0.021	0.062
	Large	173	115.458	51.0	20.3	0.586	0.029	0.072
Diversification	Low	197	17.968	16.7	8.0	0.523	0.033	0.054
	Middle	168	21.511	29.5	14.3	0.578	0.019	0.07
	High	163	105.092	60.4	23.7	0.555	0.031	0.079
Leverage	Low	180	35.061	34.7	14.2	0.36	0.058	0.077
	Middle	175	58.173	36.6	15.6	0.558	0.024	0.07
	High	173	45.043	31.4	14.7	0.74	0	0.053
Profitability	Low	180	28.045	30.8	13.8	0.665	-0.014	0.025
	Middle	175	44.841	37.8	15.8	0.563	0.026	0.08
	High	173	65.829	34.2	14.9	0.419	0.073	0.097
Sales growth	Low	180	37.939	29.1	13.2	0.553	0.018	-0.068
	Middle	175	52.830	38.3	16.5	0.564	0.026	0.057
	High	173	47.454	35.4	14.8	0.534	0.04	0.217

The table presents summary statistics for group categories. First row provides the mean characteristics for all groups. Further rows provide statistics for different group categories. Categories are based on yearly tercile sorting. Categories are based on size (group total assets), diversification (number of industries), leverage (group total liabilities divided by total assets), profitability (group total net income divided by total assets), and sales growth (one-year change in group total sales, zero if missing). First column provides the number of group-year observations. Next columns provide mean group size, number of affiliated firms (listed and unlisted), number of industries, group leverage, group profitability, and group sales growth. All measures include listed and unlisted affiliates. The sample covers the period from 2007 to 2019 and 63 business groups. Data are retrieved from KTFIC.

Table 4 Baseline model

	(1) ROA	(2) ln(Q)	(3) Leverage	(4) Cash holding	(5) Dividend payout	(6) Capital investment	(7) R&D investment
Constant	-0.261*** (0.026)	1.401*** (0.123)	-0.312*** (0.051)	0.371*** (0.040)	-0.120*** (0.046)	0.383*** (0.035)	0.060*** (0.009)
Chaebol	-0.024*** (0.005)	0.186*** (0.030)	-0.032*** (0.011)	-0.018** (0.009)	-0.019** (0.010)	0.008 (0.008)	0.001 (0.002)
ln(Size)	0.022*** (0.001)	-0.059*** (0.007)	0.024*** (0.003)	-0.004* (0.002)	0.011*** (0.002)	-0.004* (0.002)	-0.001** (0.000)
Leverage	-0.177*** (0.008)	0.129*** (0.044)		-0.389*** (0.014)	-0.195*** (0.017)	-0.062*** (0.014)	-0.020*** (0.003)
MtB	-0.007*** (0.001)		0.011*** (0.002)	0.012*** (0.001)	-0.006*** (0.001)	0.020*** (0.002)	0.003*** (0.000)
Sales growth	0.043*** (0.003)	0.135*** (0.011)	0.023*** (0.003)	-0.009*** (0.003)	-0.029*** (0.004)	0.012** (0.005)	-0.002** (0.001)
ln(Age)	-0.008*** (0.002)	-0.082*** (0.011)	-0.007 (0.005)	-0.018*** (0.003)	0.008** (0.004)	-0.028*** (0.003)	-0.005*** (0.001)
Investment		0.460*** (0.034)	0.010 (0.011)	0.069*** (0.011)			
ROA		-0.069 (0.079)	-0.556*** (0.021)	-0.033 (0.021)	0.205*** (0.020)	0.100*** (0.027)	-0.014*** (0.005)
Tangibility			0.370*** (0.017)				
Dividend				-0.002 (0.007)			
Observations	14183	14183	14183	14183	14183	14183	14183
Adj. R-sq.	0.212	0.267	0.276	0.308	0.050	0.121	0.232

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 column (6) and (7), dependent variables are proxies for investment policies. Investment is capital expenditure scaled by net property, plant, and equipment. R&D investment is R&D expenditures divided by total assets. Chaebol is an 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 5 Model modified for categories

	(1) ROA	(2) ln(Q)	(3) Leverage	(4) Cash holding	(5) Dividend payout	(6) Capital investment	(7) R&D investment
Panel A: Group size							
Small	-0.015** (0.006)	0.141*** (0.039)	-0.031** (0.015)	-0.031*** (0.010)	-0.019 (0.016)	-0.009 (0.009)	-0.000 (0.002)
Middle	-0.027*** (0.007)	0.092*** (0.035)	-0.005 (0.015)	-0.025** (0.010)	-0.009 (0.015)	0.001 (0.009)	-0.003* (0.002)
Large	-0.028*** (0.008)	0.279*** (0.042)	-0.050*** (0.015)	-0.006 (0.012)	-0.026** (0.012)	0.023** (0.011)	0.004 (0.002)
Observations	14183	14183	14183	14183	14183	14183	14183
Adj. R-squared	0.212	0.270	0.278	0.309	0.050	0.122	0.234
Panel B: Group diversification							
Low	-0.021*** (0.008)	0.222*** (0.053)	-0.057*** (0.017)	-0.023* (0.013)	-0.000 (0.019)	-0.008 (0.010)	0.000 (0.002)
Middle	-0.026*** (0.007)	0.080*** (0.031)	-0.022 (0.015)	-0.020* (0.011)	-0.027** (0.013)	-0.006 (0.009)	-0.004* (0.002)
High	-0.024*** (0.008)	0.241*** (0.039)	-0.026* (0.014)	-0.015 (0.011)	-0.023* (0.012)	0.026** (0.010)	0.004* (0.002)
Observations	14183	14183	14183	14183	14183	14183	14183
Adj. R-squared	0.212	0.269	0.277	0.308	0.050	0.122	0.234
Panel C: Group leverage							
Low	-0.012* (0.007)	0.240*** (0.040)	-0.067*** (0.014)	-0.037*** (0.011)	-0.024** (0.012)	0.014 (0.010)	-0.001 (0.002)
Middle	-0.028*** (0.006)	0.176*** (0.038)	-0.036*** (0.013)	-0.003 (0.010)	-0.007 (0.014)	0.006 (0.009)	0.000 (0.002)
High	-0.036*** (0.009)	0.122*** (0.036)	0.028* (0.016)	-0.014 (0.010)	-0.031** (0.015)	0.001 (0.011)	0.004 (0.003)
Observations	14183	14183	14183	14183	14183	14183	14183
Adj. R-squared	0.213	0.268	0.281	0.309	0.050	0.121	0.233

Table 5 (ctd)

	(1) ROA	(2) ln(Q)	(3) Leverage	(4) Cash holding	(5) Dividend payout	(6) Capital investment	(7) R&D investment
Panel D: Group profitability							
Low	-0.035*** (0.006)	0.068** (0.030)	0.021 (0.013)	-0.007 (0.008)	-0.010 (0.016)	-0.012 (0.009)	0.001 (0.002)
Middle	-0.023*** (0.006)	0.193*** (0.034)	-0.029** (0.012)	-0.018* (0.010)	-0.018 (0.012)	0.014 (0.009)	-0.001 (0.002)
High	-0.017** (0.007)	0.268*** (0.037)	-0.074*** (0.013)	-0.027** (0.011)	-0.027** (0.012)	0.017 (0.010)	0.002 (0.002)
Observations	14183	14183	14183	14183	14183	14183	14183
Adj. R-squared	0.212	0.270	0.282	0.309	0.050	0.121	0.232
Panel E: Sales growth							
Low	-0.022*** (0.006)	0.154*** (0.033)	-0.024* (0.012)	-0.013 (0.009)	-0.021* (0.012)	-0.005 (0.008)	-0.000 (0.002)
Middle	-0.026*** (0.006)	0.184*** (0.032)	-0.028** (0.012)	-0.018** (0.009)	-0.021* (0.012)	0.017* (0.010)	0.003 (0.002)
High	-0.025*** (0.007)	0.224*** (0.034)	-0.045*** (0.013)	-0.025*** (0.010)	-0.015 (0.011)	0.009 (0.009)	-0.001 (0.002)
Observations	14183	14183	14183	14183	14183	14183	14183
Adj. R-squared	0.212	0.267	0.276	0.308	0.050	0.121	0.233

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 column (6) and (7), dependent variables are proxies for investment policies. 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 4. 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. Robust standard errors are in parentheses and clustered at firm level. p-value * < 10% ** < 5% *** < 1%

Table 6 Chaebol fixed effects

	(1) ROA	(2) ln(Q)	(3) Leverage	(4) Cash holding	(5) Dividend payout	(6) Capital investment	(7) R&D investment
Panel A: All chaebol fixed effects							
Total	25	25	25	25	25	25	25
>0	10	23	10	6	7	15	11
<0	15	2	15	19	18	10	14
Mean	-0.016	0.264	-0.031	-0.029	-0.028	0.007	-0.001
Max	0.054	1.060	0.098	0.107	0.041	0.076	0.021
Min	-0.117	-0.057	-0.294	-0.129	-0.147	-0.141	-0.018
Panel B: Significant chaebol fixed effects (p-value<10%)							
Total	8	14	13	11	9	15	10
>0	1	14	4	2	1	9	3
<0	7	0	9	9	8	6	7
Mean	-0.052	0.436	-0.061	-0.052	-0.071	0.008	-0.003
Max	0.036	1.060	0.098	0.107	0.015	0.076	0.021
Min	-0.117	0.126	-0.294	-0.129	-0.147	-0.141	-0.018
Observations	14183	14183	14183	14183	14183	14183	14183
Adj. R-squared	0.219	0.278	0.302	0.312	0.055	0.114	0.235

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 column (6) and (7), dependent variables are proxies for investment policies. 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<10%). Group fixed effects are estimated based on Equation (3) and regressions include same control variables as in Table 4. 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).
R&D investment*	Research and development expenses (WC01201) divided by total assets. (R&D is set to zero if missing)
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: Detailed firm summary statistics

	Mean	p25	Median	p75	SD
Panel A: All firms (Obs.=14183)					
Tobin's q	1.318	0.847	1.037	1.451	0.854
Market-to-book	1.608	0.674	1.08	1.891	1.598
ROA	0.063	0.03	0.073	0.119	0.105
Leverage	0.229	0.074	0.219	0.357	0.172
Cash holding	0.171	0.06	0.124	0.239	0.148
Dividend payout	0.092	0	0.03	0.14	0.237
Capital investment	0.178	0.056	0.121	0.234	0.179
R&D investment	0.021	0.003	0.011	0.028	0.028
Tangibility	0.319	0.184	0.313	0.444	0.178
ln(Size)	19.177	18.139	18.86	19.905	1.523
Age	28.072	15	24	39	16.676
Sales growth	0.11	-0.057	0.052	0.184	0.379
Panel B: Non-chaebol firms (Obs.=12473)					
Tobin's q	1.33	0.843	1.044	1.475	0.869
Market-to-book	1.629	0.68	1.095	1.928	1.617
ROA	0.06	0.027	0.072	0.118	0.107
Leverage	0.226	0.068	0.212	0.354	0.173
Cash holding	0.177	0.062	0.132	0.251	0.151
Dividend payout	0.09	0	0.012	0.136	0.239
Capital investment	0.181	0.055	0.121	0.239	0.184
R&D investment	0.022	0.003	0.012	0.03	0.029
Tangibility	0.315	0.182	0.309	0.44	0.177
ln(Size)	18.848	18.048	18.695	19.531	1.123
Age	27.259	15	23	38	16.244
Sales growth	0.113	-0.062	0.052	0.188	0.39
Panel C: Chaebol firms (Obs.=1710)					
Tobin's q	1.23	0.869	0.997	1.294	0.728
Market-to-book	1.456	0.639	0.992	1.68	1.439
ROA	0.088	0.048	0.085	0.128	0.077
Leverage	0.254	0.118	0.264	0.378	0.164
Cash holding	0.124	0.046	0.09	0.161	0.115
Dividend payout	0.109	0	0.076	0.163	0.218
Capital investment	0.158	0.066	0.124	0.21	0.134
R&D investment	0.013	0.001	0.005	0.013	0.023
Tangibility	0.347	0.202	0.354	0.474	0.184
ln(Size)	21.573	20.093	21.758	22.955	1.873
Age	34.005	18	35	48	18.489
Sales growth	0.09	-0.033	0.052	0.153	0.29

The table presents summary statistics for the full sample (Panel A) and subsample of non-chaebol firms (Panel B) and chaebols firms (Panel C). 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 period from 2007 to 2019. 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.

Appendix C: Baseline model without state owned group affiliates

	(1) ROA	(2) ln(Q)	(3) Leverage	(4) Cash holding	(5) Dividend payout	(6) Capital investment	(7) R&D investment
Constant	-0.260*** (0.026)	1.398*** (0.124)	-0.312*** (0.051)	0.372*** (0.040)	-0.121*** (0.046)	0.384*** (0.035)	0.060*** (0.009)
Chaebol	-0.024*** (0.005)	0.183*** (0.030)	-0.031*** (0.011)	-0.018** (0.009)	-0.021** (0.010)	0.008 (0.008)	0.000 (0.002)
ln(Size)	0.022*** (0.001)	-0.059*** (0.007)	0.024*** (0.003)	-0.004* (0.002)	0.011*** (0.002)	-0.004* (0.002)	-0.001** (0.000)
Leverage	-0.177*** (0.008)	0.135*** (0.044)		-0.389*** (0.014)	-0.193*** (0.017)	-0.062*** (0.014)	-0.019*** (0.003)
MtB	-0.007*** (0.001)		0.011*** (0.002)	0.012*** (0.001)	-0.007*** (0.001)	0.020*** (0.002)	0.003*** (0.000)
Sales growth	0.043*** (0.003)	0.136*** (0.011)	0.023*** (0.003)	-0.009*** (0.003)	-0.029*** (0.004)	0.012** (0.005)	-0.001** (0.001)
ln(Age)	-0.008*** (0.002)	-0.082*** (0.011)	-0.007 (0.005)	-0.018*** (0.003)	0.008** (0.004)	-0.028*** (0.003)	-0.005*** (0.001)
Investment		0.456*** (0.034)	0.010 (0.011)	0.069*** (0.011)			
ROA		-0.080 (0.079)	-0.554*** (0.021)	-0.034* (0.021)	0.203*** (0.020)	0.100*** (0.027)	-0.014*** (0.005)
Tangibility			0.370*** (0.017)				
Dividend				-0.002 (0.007)			
Observations	14165	14165	14165	14165	14165	14165	14165
Adj. R-sq.	0.212	0.269	0.276	0.308	0.050	0.121	0.233

The table presents results for the baseline model (1) without firms affiliated with a state owned group. 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 column (6) and (7), dependent variables are proxies for investment policies. Investment is capital expenditure scaled by net property, plant, and equipment. R&D investment is R&D expenditures divided by total assets. Chaebol is an 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%

Appendix D: Firm fixed effect approach

	(1) ROA	(2) ln(Q)	(3) Leverage	(4) Cash holding	(5) Dividend payout	(6) Capital investment	(7) R&D investment
Chaebol	-0.048*** (0.005)	0.134*** (0.025)	-0.112*** (0.010)	-0.053*** (0.007)	0.002 (0.008)	-0.073*** (0.008)	0.002 (0.001)
Observations	1784	1784	1784	1784	1784	1784	1784
Adj. R-squared	0.043	0.013	0.074	0.021	-0.001	0.037	-0.000

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

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

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:

$$y_{it} = \alpha + \beta \mathbf{X}_{it} + \gamma_i + \text{Year}_t + \varepsilon_{it}$$

*where y is the dependent variable (performance measures or proxy for firm policy), \mathbf{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 4. 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 E: Model modified for categories (detailed tables)

	(1) ROA	(2) ln(Q)	(3) Leverage	(4) Cash holding	(5) Dividend payout	(6) Capital investment	(7) R&D investment
Panel A: Group size							
Constant	-0.265*** (0.026)	1.469*** (0.128)	-0.325*** (0.052)	0.381*** (0.041)	-0.125*** (0.046)	0.396*** (0.036)	0.062*** (0.009)
Small	-0.015** (0.006)	0.141*** (0.039)	-0.031** (0.015)	-0.031*** (0.010)	-0.019 (0.016)	-0.009 (0.009)	-0.000 (0.002)
Middle	-0.027*** (0.007)	0.092*** (0.035)	-0.005 (0.015)	-0.025** (0.010)	-0.009 (0.015)	0.001 (0.009)	-0.003* (0.002)
Large	-0.028*** (0.008)	0.279*** (0.042)	-0.050*** (0.015)	-0.006 (0.012)	-0.026** (0.012)	0.023** (0.011)	0.004 (0.002)
ln(Size)	0.022*** (0.001)	-0.063*** (0.007)	0.025*** (0.003)	-0.005** (0.002)	0.012*** (0.002)	-0.004** (0.002)	-0.001*** (0.000)
Leverage	-0.178*** (0.008)	0.138*** (0.044)		-0.388*** (0.014)	-0.196*** (0.017)	-0.060*** (0.014)	-0.019*** (0.003)
MtB	-0.007*** (0.001)		0.011*** (0.002)	0.012*** (0.001)	-0.006*** (0.001)	0.020*** (0.002)	0.003*** (0.000)
Sales growth	0.043*** (0.003)	0.135*** (0.011)	0.023*** (0.003)	-0.009*** (0.003)	-0.029*** (0.004)	0.012** (0.005)	-0.002** (0.001)
ln(Age)	-0.008*** (0.002)	-0.083*** (0.011)	-0.007 (0.005)	-0.018*** (0.003)	0.008** (0.004)	-0.028*** (0.003)	-0.005*** (0.001)
Investment		0.455*** (0.034)	0.011 (0.011)	0.068*** (0.011)			
ROA		-0.065 (0.079)	-0.555*** (0.021)	-0.032 (0.020)	0.205*** (0.020)	0.101*** (0.027)	-0.014*** (0.005)
Tangibility			0.369*** (0.017)				
Dividend				-0.001 (0.007)			
Observations	14183	14183	14183	14183	14183	14183	14183
Adj. R-sq.	0.212	0.270	0.278	0.309	0.050	0.122	0.234

Appendix E (ctd)

	(1) ROA	(2) ln(Q)	(3) Leverage	(4) Cash holding	(5) Dividend payout	(6) Capital investment	(7) R&D investment
Panel B: Group diversification							
Constant	-0.261*** (0.026)	1.436*** (0.125)	-0.309*** (0.052)	0.373*** (0.041)	-0.122*** (0.046)	0.395*** (0.035)	0.062*** (0.008)
Low	-0.021*** (0.008)	0.222*** (0.053)	-0.057*** (0.017)	-0.023* (0.013)	-0.000 (0.019)	-0.008 (0.010)	0.000 (0.002)
Middle	-0.026*** (0.007)	0.080*** (0.031)	-0.022 (0.015)	-0.020* (0.011)	-0.027** (0.013)	-0.006 (0.009)	-0.004* (0.002)
High	-0.024*** (0.008)	0.241*** (0.039)	-0.026* (0.014)	-0.015 (0.011)	-0.023* (0.012)	0.026** (0.010)	0.004* (0.002)
ln(Size)	0.022*** (0.001)	-0.061*** (0.007)	0.024*** (0.003)	-0.004* (0.002)	0.011*** (0.002)	-0.004** (0.002)	-0.001*** (0.000)
Leverage	-0.177*** (0.008)	0.130*** (0.044)		-0.389*** (0.014)	-0.194*** (0.017)	-0.062*** (0.014)	-0.020*** (0.003)
MtB	-0.007*** (0.001)		0.011*** (0.002)	0.012*** (0.001)	-0.006*** (0.001)	0.020*** (0.002)	0.003*** (0.000)
Sales growth	0.043*** (0.003)	0.135*** (0.011)	0.023*** (0.003)	-0.009*** (0.003)	-0.029*** (0.004)	0.012** (0.005)	-0.002** (0.001)
ln(Age)	-0.008*** (0.002)	-0.082*** (0.011)	-0.007 (0.005)	-0.018*** (0.003)	0.008** (0.004)	-0.028*** (0.003)	-0.005*** (0.001)
Investment		0.456*** (0.034)	0.010 (0.011)	0.068*** (0.011)			
ROA		-0.069 (0.079)	-0.556*** (0.021)	-0.033 (0.021)	0.205*** (0.020)	0.100*** (0.027)	-0.014*** (0.005)
Tangibility			0.371*** (0.017)				
Dividend				-0.002 (0.007)			
Observations	14183	14183	14183	14183	14183	14183	14183
Adj. R-sq.	0.212	0.269	0.277	0.308	0.050	0.122	0.234

Appendix E (ctd)

	(1) ROA	(2) ln(Q)	(3) Leverage	(4) Cash holding	(5) Dividend payout	(6) Capital investment	(7) R&D investment
Panel C: Group leverage							
Constant	-0.260*** (0.026)	1.404*** (0.124)	-0.317*** (0.051)	0.371*** (0.040)	-0.118*** (0.046)	0.384*** (0.035)	0.059*** (0.009)
Low	-0.012* (0.007)	0.240*** (0.040)	-0.067*** (0.014)	-0.037*** (0.011)	-0.024** (0.012)	0.014 (0.010)	-0.001 (0.002)
Middle	-0.028*** (0.006)	0.176*** (0.038)	-0.036*** (0.013)	-0.003 (0.010)	-0.007 (0.014)	0.006 (0.009)	0.000 (0.002)
High	-0.036*** (0.009)	0.122*** (0.036)	0.028* (0.016)	-0.014 (0.010)	-0.031** (0.015)	0.001 (0.011)	0.004 (0.003)
ln(Size)	0.022*** (0.001)	-0.059*** (0.007)	0.025*** (0.003)	-0.004* (0.002)	0.011*** (0.002)	-0.004* (0.002)	-0.001** (0.000)
Leverage	-0.176*** (0.008)	0.135*** (0.044)		-0.390*** (0.014)	-0.194*** (0.017)	-0.061*** (0.014)	-0.020*** (0.003)
MtB	-0.007*** (0.001)		0.011*** (0.002)	0.012*** (0.001)	-0.006*** (0.001)	0.020*** (0.002)	0.003*** (0.000)
Sales growth	0.043*** (0.003)	0.135*** (0.011)	0.023*** (0.003)	-0.009*** (0.003)	-0.029*** (0.004)	0.012** (0.005)	-0.002** (0.001)
ln(Age)	-0.008*** (0.002)	-0.082*** (0.011)	-0.007 (0.005)	-0.018*** (0.003)	0.008** (0.004)	-0.028*** (0.003)	-0.005*** (0.001)
Investment		0.459*** (0.034)	0.011 (0.011)	0.069*** (0.011)			
ROA		-0.074 (0.079)	-0.550*** (0.021)	-0.031 (0.020)	0.205*** (0.020)	0.099*** (0.027)	-0.014*** (0.005)
Tangibility			0.373*** (0.017)				
Dividend				-0.002 (0.007)			
Observations	14183	14183	14183	14183	14183	14183	14183
Adj. R-sq.	0.213	0.268	0.281	0.309	0.050	0.121	0.233

Appendix E (ctd)

	(1) ROA	(2) ln(Q)	(3) Leverage	(4) Cash holding	(5) Dividend payout	(6) Capital investment	(7) R&D investment
Panel D: Group profitability							
Constant	-0.258*** (0.026)	1.429*** (0.123)	-0.326*** (0.050)	0.367*** (0.040)	-0.123*** (0.046)	0.388*** (0.035)	0.060*** (0.009)
Low	-0.035*** (0.006)	0.068** (0.030)	0.021 (0.013)	-0.007 (0.008)	-0.010 (0.016)	-0.012 (0.009)	0.001 (0.002)
Middle	-0.023*** (0.006)	0.193*** (0.034)	-0.029** (0.012)	-0.018* (0.010)	-0.018 (0.012)	0.014 (0.009)	-0.001 (0.002)
High	-0.017** (0.007)	0.268*** (0.037)	-0.074*** (0.013)	-0.027** (0.011)	-0.027** (0.012)	0.017 (0.010)	0.002 (0.002)
ln(Size)	0.022*** (0.001)	-0.061*** (0.007)	0.025*** (0.003)	-0.004* (0.002)	0.011*** (0.002)	-0.004** (0.002)	-0.001** (0.000)
Leverage	-0.176*** (0.008)	0.143*** (0.043)		-0.390*** (0.014)	-0.196*** (0.017)	-0.060*** (0.014)	-0.020*** (0.003)
MtB	-0.007*** (0.001)		0.011*** (0.002)	0.012*** (0.001)	-0.006*** (0.001)	0.020*** (0.002)	0.003*** (0.000)
Sales growth	0.043*** (0.003)	0.135*** (0.011)	0.023*** (0.003)	-0.009*** (0.003)	-0.029*** (0.004)	0.012** (0.005)	-0.002** (0.001)
ln(Age)	-0.008*** (0.002)	-0.082*** (0.011)	-0.007 (0.005)	-0.018*** (0.003)	0.009** (0.004)	-0.028*** (0.003)	-0.005*** (0.001)
Investment		0.455*** (0.034)	0.012 (0.011)	0.069*** (0.011)			
ROA		-0.075 (0.079)	-0.549*** (0.021)	-0.032 (0.020)	0.206*** (0.020)	0.099*** (0.027)	-0.014*** (0.005)
Tangibility			0.370*** (0.017)				
Dividend				-0.002 (0.007)			
Observations	14183	14183	14183	14183	14183	14183	14183
Adj. R-sq.	0.212	0.270	0.282	0.309	0.050	0.121	0.232

Appendix E (ctd)

	(1) ROA	(2) ln(Q)	(3) Leverage	(4) Cash holding	(5) Dividend payout	(6) Capital investment	(7) R&D investment
Panel E: Sales growth							
Constant	-0.261*** (0.026)	1.402*** (0.123)	-0.313*** (0.051)	0.371*** (0.040)	-0.120*** (0.046)	0.384*** (0.035)	0.060*** (0.009)
Low	-0.022*** (0.006)	0.154*** (0.033)	-0.024* (0.012)	-0.013 (0.009)	-0.021* (0.012)	-0.005 (0.008)	-0.000 (0.002)
Middle	-0.026*** (0.006)	0.184*** (0.032)	-0.028** (0.012)	-0.018** (0.009)	-0.021* (0.012)	0.017* (0.010)	0.003 (0.002)
High	-0.025*** (0.007)	0.224*** (0.034)	-0.045*** (0.013)	-0.025*** (0.010)	-0.015 (0.011)	0.009 (0.009)	-0.001 (0.002)
ln(Size)	0.022*** (0.001)	-0.059*** (0.007)	0.024*** (0.003)	-0.004* (0.002)	0.011*** (0.002)	-0.004* (0.002)	-0.001** (0.000)
Leverage	-0.177*** (0.008)	0.130*** (0.044)		-0.389*** (0.014)	-0.195*** (0.017)	-0.062*** (0.014)	-0.020*** (0.003)
MtB	-0.007*** (0.001)		0.011*** (0.002)	0.012*** (0.001)	-0.006*** (0.001)	0.020*** (0.002)	0.003*** (0.000)
Sales growth	0.043*** (0.003)	0.135*** (0.011)	0.023*** (0.003)	-0.009*** (0.003)	-0.029*** (0.004)	0.012** (0.005)	-0.002** (0.001)
ln(Age)	-0.008*** (0.002)	-0.082*** (0.011)	-0.007 (0.005)	-0.018*** (0.003)	0.008** (0.004)	-0.028*** (0.003)	-0.005*** (0.001)
Investment		0.459*** (0.034)	0.010 (0.011)	0.069*** (0.011)			
ROA		-0.069 (0.079)	-0.556*** (0.021)	-0.033 (0.021)	0.205*** (0.020)	0.100*** (0.027)	-0.014*** (0.005)
Tangibility			0.370*** (0.017)				
Dividend				-0.002 (0.007)			
Observations	14183	14183	14183	14183	14183	14183	14183
Adj. R-sq.	0.212	0.267	0.276	0.308	0.050	0.121	0.233

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 column (6) and (7), dependent variables are proxies for investment policies. 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 4. 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. Robust standard errors are in parentheses and clustered at firm level. p -value * < 10% ** < 5% *** < 1%