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Global Finance Journal

journal homepage: www.elsevier.com/locate/gfj

Business group heterogeneity and firm outcomes: Evidence from Korean chaebols[☆]

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ARTICLE INFO

JEL classification:

G30
G32
G35
L22

Keywords:

Business groups
Performance
Corporate policies

ABSTRACT

This study examines how business group heterogeneity affects firm outcomes using data from Korean chaebols (2007–2019). We employ a three-level empirical strategy considering: 1) market-level average effects, 2) effects across categories of business groups, and 3) group-specific effects capturing unobservable attributes. Our analysis reveals substantial variations in affiliation effects between business groups, often diverging from average market-level effects. We find that group resources significantly impact affiliate performance - investors assign higher valuations to firms affiliated with large, financially sound, and well-performing business groups. While performance effects are primarily market-driven, we document considerable heterogeneity in financial and investment policies across groups, likely influenced by unobservable characteristics such as controlling shareholders' preferences. Our findings highlight the importance of considering business group heterogeneity when analyzing affiliate performance

1. Introduction

Business groups (BG) consist of legally independent firms linked together by formal and informal ties under the control of the same controlling shareholder. These ties can range from equity ownership and interlocking directorates to family relationships and social networks, often manifesting in pyramidal structures or cross-shareholding arrangements. Firms belonging to a group can act in a coordinated way and share resources. This coordination is facilitated through centralized strategic planning and shared services, enabling member firms to leverage not only financial resources but also human capital, technology, and market access across the group. Consequently, the question of whether the performance and behavior of firms affiliated with BGs differ from those of standalone firms is important from an academic point of view and has economic policy implications. The existing literature documents significant effects of affiliation on performance (Carney et al., 2011), financial constraints (Shin & Park, 1999), and dividend policy (Kwon & Han, 2020). However, the literature remains inconclusive, as the results differ across studies (Carney et al., 2011).

Most of the existing studies estimate an average effect of affiliation. This approach assumes that all firms affiliated to any BG behave similarly, regardless of the characteristics of the specific BG they belong such as the size of the BG, its diversification level or its performance. However, theoretical explanations provided in the academic literature to explain the impact of affiliation are usually

[☆] We thank two anonymous referees, Ettore Croci, Aastha Gupta, Prateek Jain, Hojong Shin, Martin Wallmeier, and participants at the IESEG Finance Research Seminar, the 2022 Paris Financial Management Conference, the FMA Europe Conference 2023, and the Asian Finance Association Annual Meeting 2023 for their helpful comments and suggestions. We are responsible for all remaining errors.

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<https://doi.org/10.1016/j.gfj.2024.101056>

Received 11 June 2024; Received in revised form 15 October 2024; Accepted 13 November 2024

Available online 16 November 2024

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based on BG characteristics. For instance, the resource-based view (e.g. [Chang & Hong, 2000](#)) typically assumes that BG with more resources (financial, knowledge or social resources) will have competitive advantages, leading to better performance for their affiliated firms.

This article proposes an empirical strategy that explicitly considers the heterogeneity of BGs to document its impact on affiliated firms. We use a multilevel analysis inspired by [Cronqvist and Fahlenbrach \(2008\)](#) and proceed in three steps. First, we follow the literature and estimate the average effect of BG affiliation. In the second approach, we categorize BGs based on observable characteristics such as their size, performance, or financial robustness. This second approach assumes that the impact of affiliation in a certain category of BG (e.g. firms affiliated to large BGs) is uniform for all member firms, while it can differ across categories of BGs (e.g. between firms affiliated to large BGs and firms affiliated to small BGs). This allows us to observe whether the effect of affiliation varies across different types of BGs. The third approach assumes that affiliated firms behave similarly only within their specific BG. In this context, we estimate the effect of affiliation for each single BG to capture whether unobservable group characteristics, such as controlling shareholder preferences, impact affiliates' behavior.

BGs exist in many countries around the world, in both emerging and developed markets. This research focuses on South Korea, a market characterized by the dominance of BGs, also known as chaebols, such as the Samsung Group, Hyundai Motors Group, and LG Group. Chaebols have contributed significantly to the country's economic development. Korea presents several advantages for our study. Due to their importance to the economy, chaebols are regulated and closely monitored by a governmental agency, the Korean Fair Trade Commission (KFTC). This agency publishes an official list of chaebols and their affiliated firms. This is an advantage as the identification of BGs and their member firms in a country is complex and can lead to misclassifications regarding affiliation ([Khanna & Palepu, 2000](#)). Hence, academic studies on Korea are comparable and replicable, which is not always the case in other countries. Another advantage is that the KFTC publishes aggregate-level data on BGs, such as their size or debt levels. This information is obtained by summing the values of listed and unlisted affiliates, allowing us to directly observe the characteristics of the entire BG for our second approach. The empirical analysis is conducted on a final sample of 1785 listed Korean firms covering the period from 2007 to 2019, including 257 listed firms affiliated with one of the 63 chaebols in the sample.

Our empirical study is conducted on a set of firm outcomes that represent either firm performance or firm policies. Our goal is to provide a comprehensive analysis of the impact of affiliation to Korean chaebols. Firm performance is measured with two variables: the operating profitability of affiliate firms (measured by their ROA) and their valuation (measured by their Tobin's q). These two variables offer a complementary view of performance as profitability reflects historical (accounting) performance while valuation is a forward-looking (market-based) measures representing the perception of the future firm performance by outside investors. We consider four different variables to evaluate the impact of affiliation on firm policies, representing either financing decisions (levels of leverage, cash holdings and dividend payout ratio) or investment decisions (measured by capital investment). In terms of BG characteristics, we use five different sorting criteria to detect eventual differences on affiliation effects. We use the size and diversification-level of BGs to investigate whether BG resources play an important role for affiliation. We then consider the leverage of the BG to investigate if financial vulnerability of the entire BG is related to some firm outcomes. Finally, profitability and sales growth are used to reflect the performance of a BG performance as global entity.

The results of the analysis of the performance of affiliated firms are relatively homogeneous. We find that firms affiliated to chaebols have lower ROAs but higher Tobin's qs relative to unaffiliated firms. This result is true for all three levels of analysis. We find that, assuming a unique effect affiliation, chaebols affiliation is, on average, associated with a 2.4 percentage points lower ROA but an 18.6 % higher Tobin's q relative to unaffiliated firms. The lower profitability of affiliated firms is consistent with either profit smoothing by chaebols ([Kim & Yi, 2006](#)) or misallocation of resources within BGs, as proposed by agency theories. The dichotomy between these two performance metrics is surprising. However, high valuations could be related to the specificities of chaebols, such as the fact that they are associated with some intangible assets, including reputation ([Lee, 2022b](#)), visibility, and investors' belief that they are "too big to fail" ([Gormley et al., 2015](#)). Moreover, the strict regulation of chaebols that has been enforced since the 1997 Asian Financial Crisis (AFC) could also explain higher valuations. The results of our approach explicitly distinguishing affiliation effects according to BG characteristics show a similar picture irrespective of the sorting characteristic. However, the magnitude of the category-level effect diverges from the average effect as we find an association between group-level observable characteristics and the intensity of performance effects. For profitability, the results are similar across characteristics except for BG leverage and BG profitability. Highly leveraged BG have significantly less profitable affiliate while the firms affiliated to the more profitable BG are significantly more profitable than those belonging to least profitable BG. Valuation displays more significant differences between BG categories suggesting that investors tend to include group-level attributes in the valuation of affiliated firms. The valuation premium is significantly higher for the largest chaebols (28 %) than for the smallest ones (14 %), consistent with the benefits associated with large BGs, including visibility and high market and political power. We also find that investors also highly value chaebols with low leverage. The negative effect of BG leverage on affiliate value can be attributed to the risks associated with group financial vulnerability. In addition, we observe a premium that is almost four times larger for affiliation with more profitable BGs (26.8 % compared to 6.8 % for affiliation with less profitable groups). These observations indicate that investors are considering the characteristics of the BG when they value their affiliated firms and that they are willing to pay a higher premium for affiliates belonging to larger, financially robust and well-performing chaebols. When we assume that affiliated firms have a similar behavior within their specific BG only, we find a certain homogeneity of the performance effect of affiliation, as there are mostly significantly negative effects for profitability while those of valuation are only positive. It is however interesting to note that we observe significant BG-level effects only for a minority of BGs. This means that the impact on affiliated firms is not homogeneous in most BGs and that their performance is not different from those of independent firms.

Our results on the financial and investment policies of affiliated firms demonstrate more heterogeneity. At the aggregate level, we

find that, on average, chaebol affiliation is associated with a debt leverage lower by 3.2 percentage points. This result contrasts with existing evidence reporting that leverage is higher for affiliated firms before the AFC. Our results show that chaebols rely highly on internal sources of financing in recent times as they affiliated firms have a 1.8 percentage point lower cash holding associated with chaebol affiliation. We find a 1.9 percentage point lower payout ratio associated with chaebol affiliation. We do not find significant differences between affiliated and independent firms in terms of investment policy. When we consider BG characteristics, our results reveal substantial variation in significance, magnitude, and sign across different BG categories. The association between BG resources and firm decisions is less salient than for firm performance. Indeed, unlike performance driven by market forces, financial and investment decisions also depend on the group-controlling shareholder preferences and management style. Nevertheless, we observe a link between group-level performance and cash holding and leverage of affiliated firms. Hence, the results show that affiliation with a well-performing chaebol is associated with lower firm cash holding and leverage. We also note that affiliation with less leveraged BGs is associated with lower cash holdings. Affiliates of well-performing and financially healthy groups are likely to rely on group support and consequently need a low cash buffer to face potential financial distress. Dividend payout and investment policies are discretionary decisions. Consistent with findings, we observe that most categories of chaebols are associated with a low payout, although this relation is not always significant. We also do not observe significant differences across various BG categories. This observation may indicate a wide between-group heterogeneity that is not related to BG characteristics but rather to unobservable characteristics such as controlling shareholder preference. We do not identify a significant association between BG affiliation and investment decisions at the market level. This result may be explained by either an absence of effect or high heterogeneity in affiliation effects across groups. The analysis with BG characteristics supports the second explanation. Indeed, only a few categories of chaebols are associated with a significant association between BG affiliation and investment intensity. Overall, affiliation with the largest, highly diversified, and well-performing chaebols is associated with higher investment intensity than affiliation with small, focused, and poor-performing groups. The association between investment and group size and group diversification is consistent with resource-based theories as affiliates of such groups have access to more tangible and intangible resources to develop their activities (Khanna & Yafeh, 2007). When we assume a similar behavior of affiliated firms within their specific BG only, we find a higher heterogeneity for firm policies than for firm performance. This is consistent with firm policies being more sensitive to group unobservable characteristics, such as group-controlling shareholder preferences. For firm policies, a significant BG fixed effect suggests that affiliates of the same group behave similarly. Hence, we observe that 11 chaebols conduct specific and uniform policies in terms of use of debt and capital investment, whereas only seven chaebols of the 25 are associated with a specific payout policy. Consistent with the results of the first two approaches, we observe that the associations between affiliation and both cash holding and dividend payout are mostly negative. In contrast, the results indicate heterogeneous group policies regarding leverage and investments. Hence, eight BG lead their affiliates to maintain low debt leverage, whereas three others foster an intensive use of debt relative to non-chaebol firms. The results for investment decisions contrast with the average results, which do not show any significant association between chaebol affiliation and investment. We find that such an association exists but varies substantially across groups. Among the 10 significant BG fixed effects of capital investment, five are positive, and five are negative.

Our study reveals that the performance effect of affiliation varies across BGs depending on the BG resources. Hence, BG financial vulnerability alters the operating performance of affiliates. In addition, investors are willing to pay a higher premium for firms affiliated with a large, well-performing, and robust BG. We also observe substantial variations in the effect of affiliation on firm financial and investment policies. While market forces appear as the main drivers of the performance effect of affiliation, corporate policies seem to be linked with unobservable group characteristics, such as controlling shareholder preferences. For instance, we find that some groups apply an investment-intensive strategy, whereas others tend to invest less than other firms.

Our paper makes several contributions to the literature. First, it proposes an empirical strategy to explicitly consider the heterogeneity of BGs when addressing the question of whether the performance and behavior of firms affiliated to BGs differ from those of standalone firms. Our approach provides a more nuanced answer to this question than the previous literature. This is important from an academic point of view, as our approach is better suited to investigate theories relating firm outcomes to BG characteristics, and for economic policy as a one-size-fits all answer could lead to the wrong conclusions and regulatory decisions. Overall, our results highlight the relevance of considering the effect of BG affiliation as heterogeneous. They show that BG-specific effects tend to diverge from the average effect of affiliation. In addition, assuming a unique impact of affiliation may fail to identify any significant effect if the association between affiliation and firm outcomes varies substantially in terms of signs across BGs as in the case of investments in our study.

A second contribution of our study is to extend the BG literature by documenting the association between BG affiliation and a comprehensive set of affiliate outcomes at a high level of granularity. This contrasts with the standard approach of the literature documenting the market-level impact of affiliation focusing on a specific firm outcome (Lee et al., 2010 or Hwang et al., 2013). Finally, our study also complements the literature on Korean chaebols by providing contemporaneous empirical results for the Korean market, whereas most of the existing literature focused on the AFC period. Since this event, the Korean institutional framework and corporate sector have experienced substantial changes that call for a reconsideration of the effect of chaebol affiliation. In addition, the emergence of Korea as a global player in key industries such as semiconductors and batteries has attracted interest and investments from foreign investors.

The remainder of the paper is organized as follows. Section 2 reviews the literature. Section 3 presents the empirical strategy, and the different models used in the empirical analysis. Section 4 describes the firms and BG datasets. Section 5 presents the empirical results and discusses the main outcomes and limitations of the study. Section 6 concludes the paper.

2. Literature review

2.1. Effect of business group affiliation on firm outcomes

Resource-based and agency theories are the dominant theoretical lenses used in the literature to analyze how affiliation with a BG affects firm performance and behavior. Considering that most affiliated firms are not fully owned by the controlling shareholder of the BG (Almeida et al., 2011), conflicts of interest may occur with minority shareholders. Hence, agency theories highlight the costs associated with BG membership. A substantial risk of minority shareholder expropriation arises from the presence of a controlling shareholder and the complex ownership structure (Young et al., 2008). In addition to traditional principal-agent and principal-principal conflicts, some conflicts between the BG-controlling shareholder and affiliate minority shareholders may occur as BG- and affiliate-level interests may compete. For instance, the literature shows that some decisions create value at the BG level but destroy value at the firm level (Bae et al., 2002). With resource-based theory, BGs are seen as pools of tangible and intangible resources. Access to these resources differentiates firms affiliated to a BG from independent ones. In this paper, we mostly focus on resource-based theory.

Resource-based theories generally predict a beneficial effect of BG membership on firm performance. For instance, Holmes Jr et al. (2018) note that firms that belong to a BG have access to internal markets for capital, workforce, and inputs. BG internal markets and intragroup transactions provide competitive advantages to BG affiliates relative to stand-alone firms. Internal capital markets reduce risks, ease project funding, and decrease financial constraints. Internal labor markets provide advantages in terms of flexibility and knowledge sharing among affiliates of the same BG. Finally, internal trades in BG secure supply chains and decrease transaction costs.

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

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

The literature relates the ability of BGs to create internal capital markets through their capacity to raise, pool, and allocate financial resources among their affiliates. Unlike stand-alone firms that rely on internal liquidity and external debt, affiliated firms benefit from access to group internal capital markets as complementary funding sources. Consequently, their financing and investment decisions are likely to differ from those of unaffiliated firms. For instance, Shin and Park (1999) show that BG affiliation and internal capital markets reduce financial constraints, whereas Lee (2022a) concludes that they reduce the financial frictions of affiliated firms.

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

Resource-based theories have contradictory predictions regarding the effect of affiliation on investments. On the one hand, Chang and Hong (2000) conclude that synergies and investment sharing may benefit affiliates and decrease individual investments. The

benefits of synergies depend on the level of group diversification and integration. On the other hand, [Shin and Park \(1999\)](#) argue that internal capital markets provide high investment capacity to BG affiliates in relaxing financial constraints. [Hong et al. \(2007\)](#) observe a positive effect of chaebol affiliation on investment before the AFC, but not after the crisis. In a more recent period, [Lee \(2022b\)](#) does not find any significant association between chaebol affiliation and investments.

2.2. Business groups characteristics and the effect of affiliation

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

BG size is often associated with the level of BG diversification. However, BG diversification has specific benefits and costs. [Lewellen \(1971\)](#) highlights the benefits of diversification as a risk reduction mechanism. In addition, diversified BGs can often provide additional resources and inputs to their affiliates, thereby securing supply chains and lowering transaction costs. However, diversification increases the risk of resource misallocation and monitoring costs, which can have a potentially negative effect on performance. During the period preceding the AFC, [Chang and Hong \(2000\)](#) find a positive effect of chaebol diversification on affiliate performance. Consistent with the risk reduction effect, [Byun et al. \(2013\)](#) observe that chaebol diversification reduces the borrowing costs of affiliated firms.

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

The management style and preferences of the group-controlling shareholder are also likely to differ between BGs and to be reflected in affiliates' decisions. [Cuervo-Cazurra \(2006\)](#) suggests that the preference and education of the controlling shareholder may influence the strategy of family BGs. Empirical evidence is scarce because subjective preferences are unobservable per se. [Kwon and Han \(2020\)](#) find evidence in Korea of a group-level payout tendency affecting all affiliates belonging to the same family BG.

3. Empirical strategy

This section presents and discusses the three levels of analysis used to examine variations in affiliation effects associated with BG heterogeneity. We begin our analysis by estimating the average effect of BG affiliation. This widespread approach assumes that the effect of affiliation is identical across all BGs. To examine the variations in the affiliation effect across groups, we need a high level of granularity. Therefore, we further estimate the effect of affiliation for different categories of BGs and each BG.

The identification strategy is inspired by [Cronqvist and Fahlenbrach \(2008\)](#). However, given the differences in our respective empirical frameworks, we cannot use a firm fixed effect model. In contrast to the frequent changes in blockholder ownership shown in the abovementioned article, the composition of BGs tends to be constant over time ([Khanna & Rivkin, 2001](#)). Therefore, the indicator for BG affiliation would be perfectly collinear with a firm fixed effect, and it would be impossible to estimate simultaneously the coefficients for firm fixed effects and BG affiliation. To limit the risk of omitted variable bias, we add a comprehensive set of control variables that are generally used in the different studies in the BG literature. The use of these control variables is also recommended more generally in the corporate finance literature ([Mitton, 2022](#)).

3.1. Market-level analysis

We first estimate the effect of affiliation at the market level, considering all BGs as similar. In this first approach, we estimate the effect of affiliation using a unique dummy variable for affiliation as follows:

$$y_{it} = \alpha + \delta \text{Group}_{it} + \beta \mathbf{X}_{it} + \text{Ind}_i + \text{Year}_t + \varepsilon_{it} \quad (1)$$

where i and t index firms and years, respectively. The firm outcome y is regressed on the dummy variable Group , taking the value 1 for firms affiliated with a BG and 0 otherwise. Because Eq. (1) uses a unique dummy variable for affiliation, the estimated effect, δ , is averaged and assumed to be homogeneous across all BGs. The model includes a set of firm control variables denoted by vector \mathbf{X} and fixed effects for industries and years to capture the effect of affiliation on firm outcome net of other firm characteristics.

3.2. Business group category-level analysis

We propose a second approach in which BGs are pooled into homogeneous categories to relax partially the assumption of BG homogeneity imposed by model (1). In this model, we assume the effects to be homogeneous across similar groups (e.g., largest BGs) but heterogeneous between groups exhibiting substantial differences (e.g., largest vs smallest BGs). Model (1) is modified as follows:

$$y_{it} = \alpha + \gamma D_{it} + \beta X_{it} + Ind_i + Year_t + \varepsilon_{it} \quad (2)$$

where a $K \times 1$ vector D of BG category indicators replaces the dummy variable *Group* of model (1). γ 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 BG belonging to the category k . Model (2) includes the same controls and fixed effects as model (1) to capture the net effect of firm characteristics.

3.3. Business group-level analysis

Model (2) allows only partially relaxing the assumption of BG homogeneity because it assumes common affiliation effects among BGs with similar attributes. In addition, categorization is only possible for observable group characteristics. In our model (3), the affiliation dummy variable of model (1) is replaced by a vector of individual BG indicators to fully capture the variations in affiliation effects owing to observable and unobservable group characteristics:

$$y_{it} = \alpha + \Gamma Z_{it} + \beta X_{it} + Ind_i + Year_t + \varepsilon_{it} \quad (3)$$

where Z is a vector of individual BG indicators of size $G \times 1$, G is the number of BGs, and Γ is a vector of BG fixed effects. The coefficient of group fixed effects, Γ_g , provides the specific effect associated with affiliation with the BG g . Eq. (3) includes the same control variables as model (1) to estimate individual BG effect net of firm characteristics. Model (3) allows us to fully relax the assumption of between-group homogeneity imposed by models (1) and (2). Unlike model (2), model (3) can observe variations in the effect of affiliation owing to BG-specific and unobservable features, such as controlling shareholder preferences.

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

3.4. Discussion of the empirical strategy

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

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

Models (2) and (3) allow analysis at a high granularity level. Model (2) partially relaxes the assumption of homogeneity imposed by model (1) by averaging affiliation effects across BGs with similar attributes. Such differences are consistent with resource-based theories that relate the affiliation effect to specific features of BGs. Model (2) testing whether the variation of the affiliation effect is related to BG observable characteristics. Model (3) captures the heterogeneity in the affiliation effect owing to unobservable group features as it estimates the effect specific to each single BG. Moreover, conditionally on the significance of the BG fixed effects, this model indicates whether affiliates of a given BG follow homogeneous policies and strategies. The parameters of all models are estimated using pooled least squares with robust standard errors clustered at the firm level.

4. Sample and data

4.1. Firm sample

Korea offers an ideal framework for studying BGs. First, the Korean economy is characterized by the dominance of BGs, also called chaebols, such as the Samsung Group, Hyundai Motors Group, and LG Group. After the Korean War, chaebols contributed to the rapid industrialization of Korea. Since the beginning of the 21st century, Korean BGs emerged as global players in different industries, including consumer electronics, automotive, and electronic components. Data availability presents a second unique feature of the Korean setting. Since the end of the 1980s, chaebols are closely monitored by the competition authorities called the Korea Fair Trade Commission (KFTC). The KFTC publishes a list of the largest BGs and their affiliates every year. Although the identification of BG scope is a challenging task in BG literature (Khanna & Palepu, 2000), this official classification provides an objective and homogeneous classification to all researchers. Additionally, the KFTC classification is particularly comprehensive as it is based on qualitative and

quantitative criteria.

The initial sample includes all firms listed on the two main market divisions (i.e., KOSPI and KOSDAQ) of the Korean stock market from 2007 to 2019. We then exclude financial firms and utility firms. Accounting and financial data are retrieved from Refinitiv Datastream and Worldscope. After deleting observations with missing variables, the final sample consists of 14,183 firm-year observations (1785 unique firms) including 1710 observations of BG affiliates (257 unique affiliated firms).

Our study investigates the effect of affiliation with a BG on a wide range of firm outcomes. First, we examine the effect of affiliation on firm operating performance and valuation measured by the return on assets (ROA) and Tobin's q respectively. ROA is EBITDA scaled by total assets. Tobin's q is measured as total assets minus total common equity plus the market value of equity divided by total assets. We also examine the effect of affiliation on financial decisions, including cash holding, leverage, and dividend payout. Cash holding is cash and equivalent divided by total assets. Leverage is the sum of long-term debt, short-term debt, and the current portion of long-term debt in current liabilities divided by total assets. Dividend payout is the total cash dividend divided by EBIT. Finally, investment policy is proxied by capital investment and is measured as capital expenditure scaled by net property, plant, and equipment (PPE). Size, market-to-book ratio, sales growth, and firm age are additional control variables. Firm size is the natural logarithm of firm total assets, and market-to-book ratio is the 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 % level in each tail. The firm variable construction is detailed in [Appendix A](#).

[Table 1](#) reports the summary statistics for all sample firms and compares the statistics of non-chaebol and chaebol firms. Overall, listed firms affiliated with BGs are, on average, larger, more profitable, and older than unaffiliated listed firms. They also hold less cash and invest less, but they have more leverage, lower firm values, and higher dividend payouts than unaffiliated firms.

4.2. Business group sample

Data on chaebols and affiliation status are based on KFTC disclosures.¹ The sample includes a total of 63 chaebols for 528 group-year observations. A unique feature of KFTC data is that it includes listed and unlisted affiliates, allowing a precise overview of the scope of each BG. All chaebol characteristics are computed, including both listed and unlisted domestic affiliates.²

We analyze different BG characteristics corresponding to arguments given in the theoretical literature. Resource-based theories highlight the relevance of BG scope and diversification. We measure the group size as the sum of the total assets of all affiliates (listed and unlisted). BG diversification is given by the number of industries in which listed and unlisted affiliates operate. To measure the financial robustness of a BG, we compute the BG-level leverage as the ratio of the sum of liabilities of all affiliates divided by the BG total assets. BG leverage is particularly relevant in Korea because high debt levels caused the collapse of several chaebols during the AFC. Finally, we also include two measures of group-level performance. BG profitability is used as a proxy for BG operating performance and is measured as the sum of the net income of listed and unlisted affiliates divided by the total assets of the group. BG sales growth measures the growth of the BG. It is the one-year change in the sum of sales of all listed and unlisted affiliates (set to zero if missing). [Table 2](#) presents the BG summary statistics.

The average chaebol is composed of 34.2 affiliates (listed and unlisted) active in 14.8 industries for a total assets value of 45.992 trillion KRW. The sum of the debt of all affiliates represents, on average, 55.1 % of the value of total assets. The average chaebol generates a 2.8 % ROA and grows by 6.7 %. These figures describe the average chaebol, but we observe substantial variations across the groups. Hence, the value of assets of the first quartile chaebols is 8.335 trillion KRW against almost 39.881 trillion KRW for the third quartile. Similar heterogeneity can be observed in terms of diversification, and we note a high correlation between the size and the two diversification measures. Note, however, that as this correlation is not perfect, diversification and size reflect different aspects of BGs. The BG-level debt-to-asset ratio varies between 45.6 and 66.7 % for the first and third quartiles, respectively. Group-level profitability also varies substantially between quartiles and ranges between 0.8 and 4.8 %. Finally, we observe that some chaebols experience fast-growing sales, whereas others face a decline in sales. Both BG profitability and growth are positively correlated at a significant level. We note a strong negative correlation between BG profitability and debt.

5. Empirical results

5.1. Average affiliation effect

We begin our investigation with model (1), which estimates the effect of affiliation with a single dummy variable for chaebol affiliation. Consequently, the effect of affiliation is assumed to be homogeneous across BGs. [Table 3](#) reports the regression results of model (1). The variable of interest is the dummy variable for BG affiliation denoted by *Group*. Columns (1) and (2) display coefficients on the affiliation dummy with opposite signs for our two performance proxies. Hence, chaebol affiliation is associated with a 2.4 percentage points lower ROA but an 18.6 % higher Tobin's q relative to unaffiliated firms. The lower profitability of affiliated firms is

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

² Note that since the KFTC data also contain information on unlisted firms, the characteristics of chaebols are different from the simple addition of characteristics of affiliated listed firms presented in [Section 4.1](#).

Table 1
Summary characteristics of individual firms.

	All firms (Obs. = 14,183)			Non-chaebol firms (Obs. = 12,473)			Chaebol firms (Obs. = 1,710)			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***
Asset 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 % 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
Summary characteristics of BG.

	Group size (tr KRW)	Nbr of affiliates	Nbr of industries	BG leverage	BG profitability	BG 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						
BG 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			
BG leverage	0.06 (0.194)	0.08* (0.059)	0.03 (0.561)	1.00		
BG profitability	0.05 (0.238)	-0.00 (0.975)	0.01 (0.896)	-0.50*** (0.000)	1.00	
BG 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 BG characteristics. BG 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. BG leverage is the ratio of the sum of liabilities of all affiliates divided by group total assets. BG 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). BG 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 BGs. Data are retrieved from KFTC. P-value are in parentheses * < 10 % ** < 5 % *** < 1 %.

consistent with either profit smoothing by chaebols or misallocation of resources within BGs, as proposed by agency theories (Ferris et al., 2003). The presence of a significant affiliation premium confirms the results obtained by Lee (2022b) for 2013–2019. The dichotomy between these two performance metrics is surprising. However, high valuations could be related to the specificities of chaebols, such as the fact that they are associated with some intangible assets, including reputation, visibility, and investors' belief that they are "too big to fail." Moreover, the strict regulation of chaebols that has been enforced since the AFC could also explain higher valuations.

Columns (3) to (5) report significant coefficients on the affiliation dummy for all financial policy proxies. On average, chaebol affiliation is associated with a debt leverage lower by 3.2 %age points. This result contrasts with existing evidence reporting that leverage is higher for affiliated firms before the AFC. Our results show that chaebols rely highly on internal sources of financing in recent times. We also report a 1.8 percentage point lower cash holding associated with chaebol affiliation. This finding is consistent with Pinkowitz and Williamson (2001), who argue that BG affiliates have low liquidity needs. The results in column (5) indicate a 1.9 percentage point lower payout ratio associated with chaebol affiliation. The lower payout of affiliated firms is consistent with the findings of Hwang et al. (2013) and Kwon and Han (2020). Column (6) reports an insignificant coefficient for investment policy at the market level, showing that no differences exist between affiliated and unaffiliated firms in terms of investment levels.

Table 3
Baseline model.

	Firm performance		Firm financial policies			
	(1)	(2)	(3)	(4)	(5)	(6)
	ROA	ln(Q)	Leverage	Cash holding	Dividend payout	Capital 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)
Group	-0.024*** (0.005)	0.186*** (0.030)	-0.032*** (0.011)	-0.018** (0.009)	-0.019** (0.010)	0.008 (0.008)
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)
Leverage	-0.177*** (0.008)	0.129*** (0.044)		-0.389*** (0.014)	-0.195*** (0.017)	-0.062*** (0.014)
MtB	-0.007*** (0.001)		0.011*** (0.002)	0.012*** (0.001)	-0.006*** (0.001)	0.020*** (0.002)
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)
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)
Capital 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)
Asset tangibility			0.370*** (0.017)			
Dividend payout				-0.002 (0.007)		
Observations	14,183	14,183	14,183	14,183	14,183	14,183
Adj. R-sq.	0.212	0.267	0.276	0.308	0.050	0.121

The table presents results for the baseline model (1). In columns (1) and (2), dependent variables are firm-level 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 firm-level financial policies. Cash holding is cash and equivalent divided by total assets. Leverage is the sum of long term debt, short term debt and current portion of long term debt in current liabilities divided by total assets. Dividend payout is total cash dividend divided by EBIT. In the column (6), the dependent variable is the capital expenditure scaled by net property, plant, and equipment. Group is a dummy variable taking value 1 for firms affiliated to a BG as defined by the KFTC and 0 otherwise. Other firm-level 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 % 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. The parameters are estimated using pooled least squares with robust standard errors clustered at the firm level (in parentheses). p-value * < 10 % ** < 5 % *** < 1 %.

5.2. Affiliation effects between different categories of business groups

In our second approach, we examine whether observable characteristics such as size or level of diversification are reflected in the effect of affiliation. To implement model (2), we sort chaebols into terciles based on the key group-level observable characteristics described in Section 4.2. All these BG-level characteristics are computed, including both listed and unlisted affiliates.

Table 4 reports the coefficients on category indicators and the F-tests for the differences between the coefficients of the top and bottom terciles. In Panels A and B, chaebols are classified by size and diversification, respectively. We sort chaebols based on their BG-level leverage (Panel D) to assess the effect of group financial resilience. Finally, we use group-level profitability and group-level sales growth (Panel E) as proxies for group performance.

Columns (1) and (2) report the results for firm performance. The results are qualitatively similar and consistent with model (1). Hence, chaebol affiliation is associated with significantly lower profitability and higher firm value than non-chaebol firms. These results are valid for all categories, irrespective of the sorting characteristic. However, the magnitude of the category-level effect diverges from the average effect estimated by model (1). We note an association between BG-level observable characteristics and the intensity of performance effects. For instance, the lower profitability associated with affiliation ranges between 1.5 percentage points for the smallest and 2.8 percentage points for the largest chaebols. However, the difference between these two coefficients is not statistically significant. Only BG leverage in Panel C significantly affects the magnitude of the association between affiliation and profitability. The association between group performance and group leverage is consistent with Kim (2016) findings. The affiliation with a highly leveraged chaebol is associated with a 3.6 percentage points lower ROA relative to non-chaebol firms, whereas the profitability is only lower by 1.2 percent for firms affiliated with the least indebted chaebols.

Column (2) shows the association between BG-level characteristics and the intensity of the affiliation premium. Such a relationship suggests that investors tend to include group-level attributes in the valuation of affiliated firms. We observe in Panel A that investors

Table 4
Model modified for categories.

	Firm performance		Firm financial policies			
	(1)	(2)	(3)	(4)	(5)	(6)
	ROA	ln(Q)	Leverage	Cash holding	Dividend payout	Capital investment
Panel A: BG 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)
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)
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)
F-test (small vs large)	2.18	6.96***	1.07	3.91**	0.16	6.29**
Observations	14,183	14,183	14,183	14,183	14,183	14,183
Adj. R-squared	0.212	0.270	0.278	0.309	0.050	0.122
Panel B: BG 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)
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)
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)
F-test (low vs high)	0.13	0.11	2.42	0.31	1.31	7.82***
Observations	14,183	14,183	14,183	14,183	14,183	14,183
Adj. R-squared	0.212	0.269	0.277	0.308	0.050	0.122
Panel C: BG 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)
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)
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)
F-test (low vs high)	5.22**	6.49**	23.79***	2.87*	0.16	0.97
Observations	14,183	14,183	14,183	14,183	14,183	14,183
Adj. R-squared	0.213	0.268	0.281	0.309	0.050	0.121
Panel D: BG 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)
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)
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)
F-test (low vs high)	5.69**	30.40***	45.58***	4.34**	1.00	6.32**
Observations	14,183	14,183	14,183	14,183	14,183	14,183
Adj. R-squared	0.212	0.270	0.282	0.309	0.050	0.121
Panel E: BG 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)
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)
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)
F-test (low vs high)	0.26	10.29***	5.26**	4.30**	0.24	3.65*
Observations	14,183	14,183	14,183	14,183	14,183	14,183
Adj. R-squared	0.212	0.267	0.276	0.308	0.050	0.121

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

value more affiliation with the largest chaebols. The premium is twice as large for the largest chaebols (28 %) than for the smallest ones (14 %). This result is consistent with the benefits associated with large BGs discussed in Section 2.2, including visibility and high market and political power. Panel C reports that investors also highly value chaebols with low leverage. The negative effect of group

leverage on affiliate value can be attributed to the risks associated with group financial vulnerability. Korean investors are likely to pay attention to this aspect given the experience of the AFC. During this crisis, high debt levels were a key factor explaining the collapse of some chaebols. The results of Panels D and E suggest that investors are willing to pay a higher premium for affiliates of highly profitable and growing chaebols. We notably report a premium that is almost four times larger for affiliation with highly profitable chaebols (26.8 % compared to 6.8 % for affiliation with less profitable groups). This observation reconciles the conflicting results obtained using the market-level approach, which could be due to the averaging of performance across all groups of chaebols.

Columns (3) to (6) report the estimation results for firm policies. Model (1) identifies significant associations between affiliation and financial policies but none in the case of investment intensity. The estimation of model (2) reveals substantial variation in significance, magnitude, and sign across different chaebol categories. As expected, the association between group resources and firm decisions is less salient than for firm performance. Indeed, unlike performance driven by market forces, financial and investment decisions also depend on the group-controlling shareholder preferences and management style. Nevertheless, in columns (3) and (4), we observe a link between group-level performance and cash holding and leverage of affiliated firms. Hence, the results in Panels D and E show that affiliation with a well-performing chaebol is associated with lower firm cash holding and leverage. We also note that affiliation with less leveraged chaebols is associated with lower cash holdings. Affiliates of well-performing and financially healthy BGs are likely to rely on BG support and consequently need a low cash buffer to face potential financial distress.

Dividend payout and investment policies are discretionary decisions. Consistent with model (1) findings, we observe that most categories of chaebol are associated with a low payout, although this relation is not always significant. We also do not observe significant differences across different categories. This observation may indicate a wide between-group heterogeneity that is not related to group characteristics. Model (1) does not identify a significant association between chaebol affiliation and investment decisions at the market level. This may be explained by either an absence of effect or high heterogeneity in affiliation effects across groups. The results in column (6) support the second explanation. Indeed, only a few categories of chaebols are associated with a significant association between BG affiliation and investment intensity. Overall, affiliation with the largest, highly diversified, and well-performing chaebols is associated with higher investment intensity than affiliation with small, focused, and poor-performing groups. The association between investment and BG size and BG diversification is consistent with resource-based theories. Affiliates of such groups have access to more tangible and intangible resources to develop their activities (Lewellen, 1971).

The interpretation of the results obtained for model (2) requires some caution because the categories are based on one-way sorting. Therefore, inferring a direct and causal link between a specific group characteristic and its effect on firm outcome is not possible. In addition, categorization is only possible for observable group characteristics that are mostly related to resource-based theories. However, this model provides evidence that heterogeneity in BG characteristics is reflected in the affiliation effect.

5.3. Affiliation effects between different business groups

Model (2) estimates the general association between group features and the effect of affiliation, whereas model (3) estimates the effect associated with each BG and their unobservable attributes. As discussed in Section 3, the implementation of model (3) imposes some constraints. Therefore, Table 5 reports the fixed effects of chaebols that have a minimum of two listed affiliates and are in the sample during at least two years.³ Among the 63 chaebols of the sample, 25 chaebols (for 1216 affiliate-year observations) fulfill these criteria.⁴ Table 5 presents the results of model (3).

Panel A reports the statistics of the 25 chaebol fixed effects. The first rows show the total number and the number of positive and negative fixed effects. We observe substantial heterogeneity in terms of coefficient signs for some firm outcomes. For instance, we observe that affiliation with 15 chaebols is related to a lower leverage and a higher leverage for the 10 others. By contrast, 23 of the 25 chaebol fixed effects are positive for firm value. To ensure the strength of the association between firm outcome and affiliation with a specific chaebol, Panel B reports statistics only for the chaebol fixed effects that are significant at a 5 % level. A significant chaebol fixed effect indicates strong within-group homogeneity of the affiliation effect. We note that the number of significant fixed effects varies among firm outcomes.

Columns (1) and (2) of Panel B support the qualitative homogeneity of the performance effect of affiliation observed in model (2). We find that the significant fixed effects for firm valuation are all positive, whereas those of profitability are essentially negative except for one BG. Notably, profitability is not different from unaffiliated firms for 17 out of the 25 chaebols. This observation shows that the negative effect of affiliation on profitability is limited to a few chaebols and cannot be generalized. Columns (3) to (6) reveal higher heterogeneity for firm policies than for firm performance. This observation is consistent with the assumption of a high sensitivity of firm policies to group unobservable characteristics, such as group-controlling shareholder preferences. For firm policies, a significant chaebol fixed effect suggests that affiliates of the same group behave similarly. Hence, we observe that 11 chaebols conduct specific and uniform policies in terms of use of debt and capital investment, whereas only seven chaebols of the 25 are associated with a specific payout policy. Consistent with the results of models (1) and (2), we observe that the associations between affiliation and both cash holding and dividend payout are mostly negative. In contrast, the results indicate heterogeneous group policies regarding leverage and investments. Hence, eight chaebols lead their affiliates to maintain low debt leverage, whereas three others foster an intensive use of

³ Fixed effects of chaebols that do not meet the requirements are ignored in Table 5.

⁴ 13 chaebols are excluded because they have only one listed affiliate (without missing data) during the sample period. 21 chaebols are excluded because they appear during at least one year with a single listed affiliate. 4 chaebols are excluded because they appear in the sample during only one year.

Table 5
Chaebol fixed effects.

	Firm performance		Firm financial policies			
	(1)	(2)	(3)	(4)	(5)	(6)
	ROA	ln(Q)	Leverage	Cash holding	Dividend payout	Capital investment
Panel A: All chaebol fixed effects						
Total	25	25	25	25	25	25
>0	10	23	10	6	7	15
<0	15	2	15	19	18	10
Mean	-0.016	0.264	-0.031	-0.029	-0.028	0.007
Max	0.054	1.060	0.098	0.107	0.041	0.076
Min	-0.117	-0.057	-0.294	-0.129	-0.147	-0.141
Panel B: Significant chaebol fixed effects (p-value < 5 %)						
Total	8	12	11	11	7	10
>0	1	12	3	2	0	5
<0	7	0	8	9	7	5
Mean	-0.052	0.485	-0.073	-0.052	-0.089	-0.001
Max	0.036	1.060	0.098	0.107	-0.047	0.076
Min	-0.117	0.212	-0.294	-0.129	-0.147	-0.141
Observations	14,183	14,183	14,183	14,183	14,183	14,183
Adj. R-squared	0.219	0.278	0.302	0.312	0.055	0.114

This table reports statistics for group fixed effects estimated with BG fixed effect model (3). In columns (1) and (2), dependent variables are performance variables. In columns (3) to (5), dependent variables are proxies for financial policies. In the column (6), the dependent variable is the capital investment. First row reports the number of BG 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 BG fixed effects of chaebols that have a minimum of two listed affiliates and that are in the sample during at least two years. Panel B reports statistics only for significant fixed effects (p-value < 5 %). BG fixed effects are estimated based on Eq. (3) and regressions include same control variables as in Table 3. Computation of variables is described in Appendix A. All regressions include year and industry indicators. Variables are winsorized at the 1 % 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. The parameters are estimated using pooled least squares with robust standard errors clustered at the firm level (in parentheses). p-value * < 10 % ** < 5 % *** < 1 %.

debt relative to non-chaebol firms. The results for investment decisions contrast with the results of the baseline model (1), which does not identify any significant association between chaebol affiliation and investment. Consistent with the results of model (2), we find that such an association exists but varies substantially across groups. Among the 10 significant fixed effects of capital investment, five are positive, and five are negative.

The results of model (3) support and complement the results obtained using the other two approaches. This model allows estimation of the effect specific to each BG. Overall, the results confirm that affiliation with a chaebol is homogeneously associated with a higher value. The picture is more nuanced for all other firm outcomes. The results also indicate that several chaebols apply homogeneous financial and investment policies at the group level.

5.4. Discussion and limitations

The different models provide complementary results and allow a better understanding of the relation between BG membership and firm outcomes. By providing results at a higher level of granularity, models (2) and (3) improve some limitations of model (1). Indeed, the BG category- and BG-level analysis show that the actual effect of affiliation differs from the average effect estimated at a market-level. Overall, our analysis reveals a higher heterogeneity of the affiliation effect on firm policies than performance. This observation suggests that the performance effects are mostly driven by market forces, while the effects of affiliation on firm policies are more likely to vary across groups depending on group features or controlling shareholder preferences.

As one of the first attempts to document the heterogeneity in the affiliation effect across BGs, this analysis has some limitations. First, the analysis focuses on the between-group heterogeneity and assumes the homogeneity of the effect within each group. Prior literature shows that the effect of affiliation might differ across affiliates given their own characteristics (Almeida et al., 2015). However, examining simultaneously between-affiliate and between-BG heterogeneity is not possible given that each firm corresponds to a unique combination of firm and group characteristics. Second, the sample size does not allow the implementation of methods used to address endogeneity issues.⁵ As the causality cannot be clearly established, we prefer to interpret our results as association (between affiliation and firm outcome) rather than causal effect. Finally, like most articles in the finance literature, we examine the effect of affiliation only on listed affiliates.

⁵ During the sample period, we observe only a limited number of changes in affiliation status. As discussed by Khanna and Yafeh (2007), the group structure is mainly historically determined. Khanna (2000) also notes the difficulty to find a suitable instrument for BG affiliation.

6. Conclusion

This study advances our understanding of how BG heterogeneity shapes firm outcomes by moving beyond the traditional focus on average effects of BG affiliation. Through a novel three-level analysis of Korean chaebols from 2007 to 2019, we demonstrate that the impact of BG membership varies significantly across groups, often diverging from market-level averages. This heterogeneity underscores the limitations of treating BGs as homogeneous entities and highlights the importance of considering both observable and unobservable group characteristics when analyzing affiliate performance and behavior.

Our findings are consistent with resource-based theories of BGs. The performance effects of affiliation are closely tied to group resources and capabilities - investors assign higher valuations to firms affiliated with large, financially sound, and well-performing BGs. However, our analysis also reveals considerable heterogeneity in financial and investment policies across groups, driven not just by observable characteristics but also by unobservable factors such as controlling shareholders' preferences. This distinction between market-driven performance effects and discretionary policy decisions enriches our theoretical understanding of BGs.

The practical implications of our findings are significant for investors, managers, and policymakers. Investors should consider specific BG characteristics when valuing affiliated firms, as the affiliation premium varies substantially across groups. For managers, our results suggest that the constraints and opportunities created by affiliation depend heavily on the specific characteristics of their BG. Policymakers should recognize that one-size-fits-all approaches to regulating BGs may be ineffective given the heterogeneity in group characteristics and their effects on affiliates.

Our study has several limitations that suggest directions for future research. First, our analysis assumes homogeneity of affiliation effects within each group, potentially overlooking important variations across affiliates based on their individual characteristics. Second, while our methodology provides robust correlations, establishing clear causal relationships remains challenging due to potential endogeneity issues. Finally, our focus on listed affiliates, while necessary due to data availability, may not capture the full spectrum of BG effects.

Despite these limitations, our study makes significant contributions to both the academic literature and practical understanding of BGs. By revealing the heterogeneous effects of group affiliation, we provide a more nuanced and accurate picture of how BGs shape firm outcomes. As BGs continue to play a crucial role in many economies, understanding this heterogeneity becomes increasingly important for researchers, practitioners, and policymakers alike.

CRedit authorship contribution statement

Romain Ducret: Writing – review & editing, Writing – original draft, Validation, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Dušan Isakov:** Writing – review & editing, Writing – original draft, Validation, Project administration, Methodology, Formal analysis, Conceptualization.

Declaration of competing interest

The authors of this article have no conflicts of interest to declare.

Appendix A. Firm-level variables

Variable name	Definition
Panel A: Firm-level variables	
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 (WC03501) plus market value of equity (WC08001) divided by total assets.
Cash holding*	Cash and equivalent (WC02001) divided by total assets
Leverage*	Sum of LT debt (WC03251) and ST debt and current portion of LT in current liabilities (WC03051) divided by total assets
Dividend payout*	Cash dividend paid total (WC04551) divided by EBIT (WC18191)
Capital investment*	Capital expenditures divided by net property, plant, and equipment (WC02501).
Size*	Total assets (in thousands KRW)
Asset tangibility*	Net property, plant, and equipment divided by total assets
Market-to-book*	Market value of equity divided by total common equity
Age	Years since incorporation (WC18273)
Sales growth*	One year change in total sales (WC01001)
Industry indicators	Set of dummy variables for ICB super sectors
Group	Dummy variable taking value 1 for firms affiliated to a business group in the KFTC list, 0 otherwise
Panel B: BG-level variables	
BG size	Sum of the total asset of listed and unlisted affiliates of a given business group
BG diversification	Number of industries in which listed and unlisted affiliates operate
BG leverage	Sum of liabilities of listed and unlisted affiliates divided by the group size
BG profitability	Sum of the net income of listed and unlisted affiliates divided by the group size
BG sales growth	One-year change in the sum of sales of listed and unlisted affiliates (set to zero if missing)

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

Appendix B. Model modified for categories (detailed tables)

	Firm performance		Firm financial policies			
	(1)	(2)	(3)	(4)	(5)	(6)
	ROA	ln(Q)	Leverage	Cash holding	Dividend payout	Capital investment
Panel A: BG 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)
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)
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)
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)
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)
Leverage	-0.178*** (0.008)	0.138*** (0.044)		-0.388*** (0.014)	-0.196*** (0.017)	-0.060*** (0.014)
MtB	-0.007*** (0.001)		0.011*** (0.002)	0.012*** (0.001)	-0.006*** (0.001)	0.020*** (0.002)
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)
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)
Capital 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)
Asset tangibility			0.369*** (0.017)			
Dividend payout				-0.001 (0.007)		
F-test (small vs large)	2.18	6.96***	1.07	3.91**	0.16	6.29**
Observations	14,183	14,183	14,183	14,183	14,183	14,183
Adj. R-sq.	0.212	0.270	0.278	0.309	0.050	0.122

	Firm performance		Firm financial policies			
	(1)	(2)	(3)	(4)	(5)	(6)
	ROA	ln(Q)	Leverage	Cash holding	Dividend payout	Capital investment
Panel B: BG 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)
Small	-0.021*** (0.008)	0.222*** (0.053)	-0.057*** (0.017)	-0.023* (0.013)	-0.000 (0.019)	-0.008 (0.010)
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)
Large	-0.024*** (0.008)	0.241*** (0.039)	-0.026* (0.014)	-0.015 (0.011)	-0.023* (0.012)	0.026** (0.010)
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)
Leverage	-0.177*** (0.008)	0.130*** (0.044)		-0.389*** (0.014)	-0.194*** (0.017)	-0.062*** (0.014)
MtB	-0.007*** (0.001)		0.011*** (0.002)	0.012*** (0.001)	-0.006*** (0.001)	0.020*** (0.002)
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)
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)
Capital Investment		0.456*** (0.034)	0.010 (0.011)	0.068*** (0.011)		

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	Firm performance		Firm financial policies			
	(1)	(2)	(3)	(4)	(5)	(6)
	ROA	ln(Q)	Leverage	Cash holding	Dividend payout	Capital investment
ROA		-0.069 (0.079)	-0.556*** (0.021)	-0.033 (0.021)	0.205*** (0.020)	0.100*** (0.027)
Asset tangibility			0.371*** (0.017)			
Dividend payout				-0.002 (0.007)		
F-test (low vs high)	0.13	0.11	2.42	0.31	1.31	7.82***
Observations	14,183	14,183	14,183	14,183	14,183	14,183
Adj. R-sq.	0.212	0.269	0.277	0.308	0.050	0.122

	Firm performance		Firm financial policies			
	(1)	(2)	(3)	(4)	(5)	(6)
	ROA	ln(Q)	Leverage	Cash holding	Dividend payout	Capital investment
Panel C: BG 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)
Small	-0.012* (0.007)	0.240*** (0.040)	-0.067*** (0.014)	-0.037*** (0.011)	-0.024** (0.012)	0.014 (0.010)
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)
Large	-0.036*** (0.009)	0.122*** (0.036)	0.028* (0.016)	-0.014 (0.010)	-0.031** (0.015)	0.001 (0.011)
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)
Leverage	-0.176*** (0.008)	0.135*** (0.044)		-0.390*** (0.014)	-0.194*** (0.017)	-0.061*** (0.014)
MtB	-0.007*** (0.001)		0.011*** (0.002)	0.012*** (0.001)	-0.006*** (0.001)	0.020*** (0.002)
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)
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)
Capital 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)
Asset tangibility			0.373*** (0.017)			
Dividend payout				-0.002 (0.007)		
F-test (low vs high)	5.22**	6.49**	23.79***	2.87*	0.16	0.97
Observations	14,183	14,183	14,183	14,183	14,183	14,183
Adj. R-sq.	0.213	0.268	0.281	0.309	0.050	0.121

	Firm performance		Firm financial policies			
	(1)	(2)	(3)	(4)	(5)	(6)
	ROA	ln(Q)	Leverage	Cash holding	Dividend payout	Capital investment
Panel D: BG 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)
Small	-0.035*** (0.006)	0.068** (0.030)	0.021 (0.013)	-0.007 (0.008)	-0.010 (0.016)	-0.012 (0.009)
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)
Large	-0.017** (0.007)	0.268*** (0.037)	-0.074*** (0.013)	-0.027** (0.011)	-0.027** (0.012)	0.017 (0.010)
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)

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	Firm performance		Firm financial policies			
	(1)	(2)	(3)	(4)	(5)	(6)
	ROA	ln(Q)	Leverage	Cash holding	Dividend payout	Capital investment
Leverage	-0.176*** (0.008)	0.143*** (0.043)		-0.390*** (0.014)	-0.196*** (0.017)	-0.060*** (0.014)
MtB	-0.007*** (0.001)		0.011*** (0.002)	0.012*** (0.001)	-0.006*** (0.001)	0.020*** (0.002)
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)
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)
Capital 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)
Asset tangibility			0.370*** (0.017)			
Dividend payout				-0.002 (0.007)		
F-test (low vs high)	5.69**	30.40***	45.58***	4.34**	1.00	6.32**
Observations	14,183	14,183	14,183	14,183	14,183	14,183
Adj. R-sq.	0.212	0.270	0.282	0.309	0.050	0.121

	Firm performance		Firm financial policies			
	(1)	(2)	(3)	(4)	(5)	(6)
	ROA	ln(Q)	Leverage	Cash holding	Dividend payout	Capital investment
Panel E: BG 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)
Small	-0.022*** (0.006)	0.154*** (0.033)	-0.024* (0.012)	-0.013 (0.009)	-0.021* (0.012)	-0.005 (0.008)
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)
Large	-0.025*** (0.007)	0.224*** (0.034)	-0.045*** (0.013)	-0.025*** (0.010)	-0.015 (0.011)	0.009 (0.009)
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)
Leverage	-0.177*** (0.008)	0.130*** (0.044)		-0.389*** (0.014)	-0.195*** (0.017)	-0.062*** (0.014)
MtB	-0.007*** (0.001)		0.011*** (0.002)	0.012*** (0.001)	-0.006*** (0.001)	0.020*** (0.002)
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)
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)
Capital 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)
Asset tangibility			0.370*** (0.017)			
Dividend payout				-0.002 (0.007)		
F-test (low vs high)	0.26	10.29***	5.26**	4.30**	0.24	3.65*
Observations	14,183	14,183	14,183	14,183	14,183	14,183
Adj. R-sq.	0.212	0.267	0.276	0.308	0.050	0.121

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

top and bottom chaebol categories. The parameters are estimated using pooled least squares with robust standard errors clustered at the firm level (in parentheses). p -value * < 10 % ** < 5 % *** < 1 %.

Data availability

The authors do not have permission to share data.

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