Governance Transparency and Firm Value:
Evidence from Korean Chaebols

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Abstract

This study examines the impact of governance transparency on business group firms' valuations by analyzing Korean chaebols' transition from circular-shareholding to pyramidal-shareholding structures between 2011 and 2018. Greater transparency about controllers' incentives can impact business group firms' value through two channels: by increasing earnings informativeness and by enabling investors to update their priors about the severity of agency issues across group firms. These channels can lead to value increases and declines, depending on the relative strengths of the positive value effects of the earnings informativeness channel and the ambiguous value effects of the expected incentives channel. Our findings highlight the nuanced effects of governance transparency on firm value and have important implications for policymakers, investors, and managers.

Keywords: Business group; Cross shareholding; Circular shareholding; Pyramidal ownership; Governance transparency; Ownership transparency; Valuation; Earnings response coefficient

JEL: G18, G34, G38, G41, L51, M14, M52

1. Introduction

Understanding managerial incentives is critical to investors' analyses of corporate financial performance and their capital allocation decisions (Fischer and Verrecchia, 2000). However, these incentives are not always readily observable depending on the opacity of the information environment (Ferri, Zheng, and Zou, 2018).

A source of opacity about the conflicts of interests vis-á-vis minority investors in public companies around the world arises from the complexity of their ownership structures. This is especially true for firms belonging to business groups, which account for a large percentage of companies around the world (Burkart, Panunzi, and Shleifer, 2003).[1] To enhance the dominant investors' control, ownership of group firms is typically structured as stock pyramids and cross (or circular) shareholdings (Masulis et al., 2011). Voting trusts and share classes with differential voting rights are common alternative mechanisms. Notably, the ease with which shareholders can observe or infer the controllers' incentive conflicts vis-á-vis minority investors varies significantly across these different structures.

This paper sheds light on the valuation consequences of "governance transparency," or the ease with which investors can observe agency problems. We show that greater transparency about incentive conflicts vis-á-vis minority investors could lead to both value improvements and declines. In theory, transparency may increase valuations by intensifying earnings responsiveness (ERC) or the multiple that the market applies to a firm's long-term earnings (Fischer and Verrecchia, 2000; Ferri et al., 2018). On the other hand, transparency may depress valuations by revealing to investors that agency issues are more severe than previously anticipated. Thus, the valuation effects of governance transparency are ex-ante ambiguous and remain an open empirical question.

We study this question by examining the Korean setting, which contains the relevant variation of interest. Our empirical analysis exploits a unique policy-induced variation in the governance

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[1]Using a sample of public firms in 45 countries, Masulis, Pham, and Zein (2011) estimate that 19% belong to family-controlled business groups; in emerging-market economies, they estimate the corresponding number to be 40%.

transparency of public firms: the South Korean regulatory push to simplify the ownership structures of the country's business groups (*chaebols*). Historically, *chaebol* families have relied upon circular shareholding structures as a means for facilitating growth in the conglomerate while maintaining control over group firms with little ownership. A circular shareholding structure results from cross-ownership of group firms that creates ownership "loops." In its simplest form, firms can create an ownership loop of a reciprocal nature: firm A owns shares in firm B and vice-versa. Ownership loops can also embody more complex arrangements, such as when firm A has an ownership interest in B, B in C, and C in A.[2]

Compared to pyramidal holding structures, circular shareholdings are a less restrictive way to maintain control with little direct ownership, but they also make *effective* ownership (and controllers' incentives) substantially more opaque (Bebchuk, Kraakman, and Triantis, 2000).[3] The presence of ownership loops, therefore, obscures the family's ultimate voting and cash-flow rights in each firm (Kim, Kim, and Park, 2012). Unlike pyramidal structures, where capital flows through the business group linearly, capital flows through a complex circular web of inter-corporate linkages in a circular-shareholding structure. Thus, it is substantially more difficult for minority shareholders to distinguish the relative intensity of agency issues (e.g., the wedge between the controller's cash-flow and voting rights) *across* business-group firms when they are part of circular shareholding structures than when are in pyramidal structures.

Indeed, the opacity associated with circular shareholding structures—and the governance of South Korean corporations generally—became a matter of significant policy priority in the aftermath of the 1997 Asian Financial Crisis (Lee, 2017). The Korean Fair Trade Commission (KFTC), which governed the *chaebols*, determined that circular-shareholding structure led to "excessive con-

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[2]Masulis et al. (2011) estimates that 10% of business groups around the world employ reciprocal ownership structures. Claessens, Djankov, and Lang (2000) obtains a similar estimate by analyzing business groups in East Asian countries. Because circular shareholdings tend to embody a greater variety of ownership structures than reciprocal ownership, they are likely to encompass significantly more firms than the 10% estimate. For example, at the beginning of our study, nearly 30% of listed Korean business-group firms were parts of circular ownership loops, but only 2% of listed group firms were in reciprocal ownership arrangements.

[3]A comparison between Figure 2, a circular shareholding, and Figure 4, a pyramidal shareholding, demonstrates the point.

trol of the controlling shareholder and lowering the transparency of the governance structure."[4] Subsequently, a series of amendments to South Korean law incentivized chaebols' transitions from opaque circular-shareholding structures to relatively simple and transparent pyramidal holding-company structures. Improving the transparency in the ownership structure (thus chaebol families' conflicts of interest) became one of KFTC's main policy goals.

To understand the value implications of governance transparency, our study leverages the *chaebols'* transition from circular shareholding to pyramidal holding structures. We focus on two primary features of business group structures that capture incentive opacity and its reduction over time: the prevalence of circular shareholdings (i.e., the percentage of group firms that are part of ownership loops) and the extent of group simplification in a given year (i.e., the fraction of group firms removed from ownership loops). Our empirical analyses of these features are made possible by the availability of business-group shareholding data published by the KFTC. As Almeida, Park, Subrahmanyam, and Wolfenzon (2011) notes, such detailed and comprehensive data about business groups' ownership structures are rare in other countries, another reason the Korean setting is particularly attractive for our study. Not only do these data enable us to compute an array of metrics that characterize business group structures, but they also allow us to approximate controlling families' incentive conflicts vis-à-vis minority shareholders (e.g., via the wedge between controllers' voting and cash-flow rights in each group firm).

Our analyses are based on a comprehensive sample of chaebol public firms obtained by combining the group structure and incentive metrics with publicly available financial-statement and stock-price data from Worldscope and Datastream. We focus on the 2011-2018 period to ensure the comparability and consistency of accounting information, as the adoption of the International Financial Reporting Standards (IFRS) in Korea was completed in 2011. This sample period is also appropriate as most group structure simplifications occurred after the 2008-2009 financial crisis.

These data show the regulatory push for ownership structure simplification was largely successful

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[4]See, e.g., https://www.ftc.go.kr/www/selectReportUserView.do?key=11&rpttype=2&report_data_no=7852.

and suggest the possibility of a transparency effect in valuation. Whereas about 30% of public chaebol firms had been part of a circular shareholding structure in 2011, only 5% remained part of ownership loops in 2018 (a decline in excess of 80%). However, chaebol families' degree of control, direct ownership, and incentive conflicts in group firms remained stable throughout our sample period. In both 2011 and 2018, the families controlled about 60% of group firms, had 15% of direct ownership in group firms on average, and obtained an average separation between their voting and cash-flow rights in group firms of 9%. These empirical patterns are consistent with improvements in the transparency with which outside investors can observe chaebol families' ownership and incentive conflicts, while families' actual incentive conflicts vis-à-vis minority shareholders and degree of control over group firms had not changed. These summary statistics suggest the possibility of a transparency effect at play in this setting.

To identify the effects of governance transparency on value, our study's main analysis focuses on those group firms that were never part of ownership loops ("non-loop" firms) but whose values could be impacted by the ownership structure simplification. Three primary reasons motivate our empirical strategy. First, because the transition to holding company structures often required loop firms to engage in complicated M&A or other equity transactions (e.g., Figure 3), loop firms' values could change through this process for reasons unrelated to transparency, such as potential value transfers between group firms involved in the M&A or equity swaps (Lee, 2017). Second, compared to other group firms, firms that are part of ownership loops tend to differ substantially in characteristics (Almeida et al., 2011). Finally, the transparency hypothesis predicts that non-loop firms' values could be impacted because investors' evaluation of the consequences of controllers' incentives in one group firm depends on how their incentive conflicts in that firm compare against those in other firms. For example, knowing the existence of an incentive wedge between a controller's voting and cash-flow rights *per se* is not enough to infer the potential consequences (e.g., the likelihood of expropriation) of these incentive conflicts; an investor would need to compare the severity the controller's incentive conflicts in a firm relative to her incentive conflicts in other group

firms. Circular ownership structures obscure the controller's incentive conflicts across group firms, leading investors to form inaccurate expectations about the severity and consequences of agency issues. The simplification of a group's ownership structure results in a revelation of controlling family incentives across group firms, allowing investors to update their priors about the likelihood that a particular firm will benefit or lose from controllers' incentive conflicts.

We document two main results associated with the effects of governance transparency on value. First, we show that improvements in group-level transparency led to higher earnings response coefficients (ERC) in non-loop firms. This result is consistent with the hypothesis that, when the severity of agency conflicts across group firms becomes more transparent, reported earnings become more informative to market participants, who apply a higher earnings multiple. We call this the "earnings informativeness" channel, through which governance transparency can increase valuations. Consistent with theory (Fischer and Verrecchia, 2000), these ERC effects concentrate in firms where outside investors likely had the greatest degree of ex-ante uncertainty about controlling families' incentives.

Second, we show that governance transparency impacts valuations through a second "expected incentives" channel, which can either reinforce or counteract the value-increasing effects of the ERC channel. The resolution of uncertainty about conflicts of interest could also lead investors to revise their priors about the severity of agency issues, resulting in revisions in investors' long-term earnings expectations. This second channel could reinforce the value-increasing effects of the ERC channel if investors discovered that agency issues were less severe than originally anticipated. However, this channel could lower firm value if investors discovered controllers' incentive conflicts to be more severe than originally anticipated. Depending on the relative importance of the ERC and expected incentive effects, valuations of business-group firms could increase, decrease, or remain the same due to an improvement in governance transparency.

Consistent with the expected incentives channel playing a role, we find that improvements in group-level governance transparency led to *both* positive and negative value effects in non-loop firms.

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Specifically, among high-incentive uncertainty non-loop firms with less severe agency issues, we find a value improvement. This is consistent with the ERC effect and with investors realizing that the agency conflicts are less severe than previously expected (e.g., raising their long-term earnings estimates). Among high-incentive uncertainty non-loop firms with more severe agency issues, we find evidence of a value decline. This is consistent with investors realizing that agency conflicts are more severe than previously expected, leading them to lower long-term earnings estimates. These results are also robust to using Almeida et al. (2011)'s measure of "*stand-alone Q*," which removes the influence of affiliates when measuring a firm's Q, suggesting that a mechanical relation between loop removal and the market or book value of assets does not drive our valuation results. Our robustness tests also suggest that these value changes are unlikely driven by value transfers occurring during or after the group simplification process. Finally, our examination of analysts' long-term earnings forecasts responses to group-level transparency improvements yields modest evidence corroborating the idea that investors revising their earnings estimates contributed to these non-loop firms' value changes.

In general, we find larger effects for positive value effects of governance transparency. One possibility is that revisions in firm value and long-term earnings could embed expected positive *real* effects of governance transparency. For example, increased transparency may be expected to improve the external monitoring of firms. Nevertheless, we do not find significant evidence of such real effects during our sample period. For example, we do not find improvements in group-level governance transparency to be associated with changes in controlling families' incentive conflicts or the degree of control in group firms. Nor do we find improvements in group-level governance transparency to be associated with changes in related party transactions or profitability, irrespective of families' degree of incentive conflict.

Our work contributes to the extensive literature interested in the effect of information transparency. Specifically, we contribute to the understanding of the role of uncertainty about managerial incentives on market prices (Fischer and Verrecchia, 2000). Like Ferri et al. (2018), we show that

reducing the uncertainty about managerial objectives increases ERCs, providing empirical evidence for the theory of Fischer and Verrecchia (2000). We add to this literature by providing new insights that transparency can impact firm value through a second, "expected incentives," channel. We explain why these two channels can operate to reinforce or oppose each other, and we show empirically that their combined forces explain why governance transparency can result in both value improvements and declines. These insights are relevant not only to researchers but also to investors and policymakers in countries where cross-shareholdings and circular ownership are more prevalent (Claessens, Djankov, Fan, and Lang, 2002).

We also contribute to the literature on business groups and ownership structures. Our work builds on Almeida et al. (2011) by studying the implications of the evolution of business-group structures. Using the innovative group structure metrics introduced by Almeida et al. (2011) and leveraging the South Korean regulatory push to eliminate circular shareholdings, we are, to the best of our knowledge, the first to empirically analyze the consequences of ownership loops and their elimination. Our evidence showing that the removal of circular shareholding structures can impact valuation through ownership transparency, even when significant changes in control, agency conflicts, observed expropriation, or access to internal capital markets do not accompany it, also contributes novel evidence to the literature on the relation between controlling families' ownership, firm performance, and valuation (e.g., Bertrand, Mehta, and Mullainathan, 2002; Baek, Kang, and Suh Park, 2004; Claessens et al., 2002; Joh, 2003; Lins, 2003).

Finally, we add to the literature on earnings informativeness. Fan and Wong (2002) show that greater conflicts of interest between controllers and minority shareholders lower earnings informativeness. We build on this work by showing that if the family owners' degree of control over group firms and their conflicts of interest are held constant, earnings informativeness can improve through more transparent ownership structures.

2. Background

This section describes the history of circular shareholdings, their importance in Korean chaebols, and regulatory reforms to eliminate such structures.

2.1 Origins of Circular Shareholdings in Korean Chaebols

Controllers of business groups worldwide have traditionally sought to enhance control over group firms with little direct capital commitments via particular ownership or voting structures. The stock pyramid—in which the controller owns a stake in a holding company that in turn owns stakes in other group firms—is the predominant control-enhancing structure. Another common structure entails circular ownership of group firms. For example, two group firms can own stakes in each other, creating circularity of ownership (that is, each firm owns a piece of itself via its ownership of another group firm). The literature (e.g., Claessens et al., 2002; Faccio and Lang, 2002; Masulis et al., 2011) has documented that around 10% of business-group firms worldwide participate in such reciprocal ownership. However, this figure is likely to underestimate the prevalence of circular shareholding, which also encompasses more complex arrangements. A simple example is a circular ownership loop involving three firms, A, B, and C, in which A has ownership in B, B in C, and C in A. This kind of circular ownership was prevalent in Korea, particularly among large business groups or chaebols. Circular cross-shareholdings are also found in other parts of the world, including Russia, Japan, Germany, Thailand, and India.

During the post-war reconstruction era, Korean conglomerates grew under government sponsorship. To facilitate Korean businesses' abilities to grow and compete against foreign enterprises, the government instituted import barriers and laws that allowed for circular corporate contributions. With circular contributions, controlling families can expand while maintaining control over group firms without having to build commensurate ownership (Lee, 2017).[5] The reliance on circu-

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[5]To see why, consider the following example (see Figure 1 for a graphical illustration). Here, we assume that the family has control over a firm's decision rights when it has more than 30% stake in its equity. Suppose a *chaebol* family's initial business is in textiles, *KTex*, and has 50% stake in the company's $20 million of equity. The family

lar ownership structures in Korea amplified in the 1980s, when the holding company or pyramidal structure was outlawed. By the early 2000s, around 25% of chaebol group firms in Korea belonged to ownership loops (Almeida et al., 2011). And, in 2011, when our sample begins, around 27% of public business-group firms in Korea belonged to loops.

As a result of their reliance on circular contributions, chaebols' ownership structures could be highly complex, involving intricate webs of ownership patterns. Figure 2 depicts a portion of the organizational structure of Lotte in April 2016. The figure shows only 6 of the more than 70 firms in the group; the directed edges (arrows) indicate the direction of ownership. Even this partial illustration reveals the difficulty of assessing the controller's incentive conflicts (that is, the wedge or discrepancy between the controller's voting rights and cash-flow rights in each group firm) vis-à-vis minority shareholders. This difficulty arises because understanding controllers' voting and cash-flow rights in a given company require investors to understand controllers' rights in other group firms, an aim that is complicated by the presence of ownership loops. For example, Figure 2 illustrates an ownership loop in which Lotte Confectionery owns 7.9% of Lotte Shopping, which owns 34% of Daehong Communications, which in turn owns 3.3% of Lotte Confectionery. In such a circular loop, a firm can possess an ownership stake in itself. To accurately compute cash-flow and voting rights, and to estimate the value of a group firm, an investor must understand the ownership structure of the entire business group and solve a complex system of simultaneous equations (Elliott, Golub, and Jackson, 2014). Clearly, circular ownership structures impose substantial information-processing

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expands into the chemicals industry by creating *KChem*, whose equity comes from $3 million of *KTex*'s capital and $7 million of external capital. The family then expands into the shipping industry by creating *KShip*, whose equity comes from $5 million of *KChem*'s capital and $10 million of external capital. Finally, the family enters the energy industry by creating *KEnergy*, whose equity comes from $2 million of *KShip*'s capital and $4 of external capital. In creating each of these new companies, the equity capital is partly provided by another group firm to ensure family control over each firm's decision rights without having to increase its direct investments into the business group. Finally, suppose *KEnergy* now contributes $1 million of its capital to a capital increase in *KChem*, creating an ownership loop that has several implications. First, *KChem*'s capital increases from $10 to $11 million even though there are no "real" incremental contributions to the firm. Second, the family now controls $4/$11=36% of the equity in *KChem*, so the apparent capital increase serves to enhance the family's control over the company. One implication is that the family can free up some capital for other investments by lowering *KTex*'s stake in *KChem* while maintaining control over each company. In this way, circular shareholdings help *chaebols* grow while maintaining control and limiting the amount of direct capital investments into their business-group firms.

costs for governance and valuation purposes.

2.2   Reforming Circular Shareholdings

Over time, circular shareholdings' complex web-like structures attracted criticism from investors and regulators. The Asian Financial Crisis of 1997 first prompted alarm among regulators that the intricate networks of ownership among corporations propagated financial distress among firms.[6]

Regulators have subsequently focused on opaque governance as a problematic feature of circular cross-shareholding. The chronic undervaluation of Korean firms, known as 'the Korea discount', compared to other East Asian companies, has raised concerns among both regulators and investors. Observers have pointed to the ubiquity of ownership loops as a driver of this discount. In several of the interviews we conducted, Korean hedge-fund managers argued that opaque ownership structures made it challenging to assess the control and ownership of the controlling family, thus obscuring potential agency issues, making monitoring difficult, and driving valuations lower.

Consequently, reforming chaebols by motivating them to unwind circular-shareholding structures became a critical agenda of Korean regulators. In 1999, as a first step, regulators amended the Fair Trade Act to allow for the establishment of holding companies under certain conditions; in 2002, reciprocal contributions were prohibited by law. In 2007, the requirements for establishing a holding-company structure were further relaxed. For example, the debt-to-equity ratio ceiling for a holding company was raised from 100% to 200%, and its legally required minimum shareholding in subsidiaries was lowered from 30% to 20% for public subsidiaries and from 50% to 40% for private subsidiaries. To incentivize the transition to a holding-company structure, the government amended the tax code to provide holding companies tax relief on their dividend income. Holding companies' dividend income from subsidiaries is fully tax-exempt so long as it holds a significant portion of the subsidiary's shares (40% ownership of public or 80% of private subsidiary shares); holding companies that do not meet these statutory ownership thresholds receive an 80% tax exemption.

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[6]However, academic evidence (e.g., Almeida et al., 2011; Baek et al., 2004) suggests that chaebol firms withstood the financial crisis better than non-chaebol firms, primarily due to their access to internal capital markets.

The reform agenda gained momentum in the 2010s, partly due to popular pressure on politicians to regulate chaebols and reduce corruption. In 2014, the KFTC revised the country's antitrust law to classify as conglomerates all business groups with 10 trillion won (approximately US$10 billion) in assets, and to put them on a watchlist to monitor the prevalence of circular cross-shareholdings. In the same year, chaebols were banned from forming new circular shareholdings. The push to remove ownership loops was intensified by the 2017 election of a new political administration that backed the reforms pursued by the KFTC, elevating the implicit threat of regulation or perceived cost of non-compliance for chaebols.[7] As a result of these regulatory pressures, the number of chaebols with ownership loops dropped by 80% between 2011 and 2021, from 17 to four (Hyundai Motor Group, Teakwang Group, SM Group, and KG Group).

2.3 Common Mechanisms to Unwind Circular Shareholdings

This section briefly describes some common mechanisms by which chaebols unwound circular ownership structures. Some group firms sold their stakes in other group firms on the open market or to the controlling family; however, this model was typically considered costly for the controlling family, which had to expend considerable resources of their own to purchase these stakes in order to maintain control or mitigate the dilution of their economic interests.[8]

Another popular mechanism combined split-offs and mergers. Firms that belonged to loops were first split off into two companies, a holding company and an operating company; the holding company would own the operating company, and the original shareholders would own shares in both companies. Next, the holding companies of all the firms in a given loop would merge to form a consolidated holding company, in which the chaebol family would concentrate its ownership and control. This model imposed a lower financial burden on the family to preserve control. Figure 3 illustrates this mechanism using Lotte Group firms.

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[7]See, for example, "South Korea's Chaebol Edge Closer to Democracy," *Nikkei Asia*, Peter S. Kim, https://asia.nikkei.com/Economy/South-Korea-s-chaebol-edge-closer-to-democracy (accessed 9 May 21).

[8]For example, the Shin family of Lotte spent approximately $1 billion USD during the group's transition to a holding-company structure to implement this strategy.

After the transition, ownership in chaebol group firms embodies a straightforward linear struc-ture. Figure 4 illustrates a portion of Lotte Group's holding-company structure in 2017. Computing the Shin family's voting rights and effective ownership in the operating companies is much simpler under the new structure than in Figure 2.

3. Measuring Changes in Business-Group Structure

The elimination of circular cross-shareholdings in Korea, coupled with the detailed ownership data made available by the Korean Fair Trade Commission (KFTC), presents a unique opportunity to study the valuation and governance implications of improving the transparency of business group ownership structures. This section briefly describes the measurement techniques and data sources that enable us to accurately capture the phenomenon.

3.1 Group-Structure Metrics

This section describes our empirical measures of group structure, adopted from Almeida et al. (2011), which introduced these measures in the context of Korean chaebols. Our goal is twofold: to explain the concept behind each measure and to illustrate how complex ownership structures such as circular shareholdings make it challenging for investors to understand chaebol families' incentives across firms. For a detailed treatment of each measure, see Almeida et al. (2011).

To begin, computing group-structure metrics requires a matrix of inter-corporate ownership:

$$
C = \begin{bmatrix}
0 & c_{12} & ... & c_{1N} \\
c_{21} & 0 & ... & s_{2N} \\
. & . & . & . \\
. & . & . & . \\
c_{N1} & c_{N2} & ... & 0
\end{bmatrix},
$$

where c_{ij} represents the percent ownership of group firm i in group firm j and N represents the

total number of firms in the group. Moreover, understanding the controlling family's incentives across group firms requires knowledge of its direct stake in all firms in the group:

$$f = \begin{bmatrix} f_1 & f_2 & ... & f_N \end{bmatrix}'.$$

KFTC collects C and f from each chaebol annually and makes the information publicly available.

3.1.1 **Chaebol Families' Ultimate Ownership (Cash-Flow Rights)**

One way for an investor to understand the controlling family's incentives across group firms, or group-firm managers' incentives, is to assess the family's ultimate ownership or cash-flow rights in each group firm. The family's ultimate ownership in group firm i consists of its direct stake in the firm and its indirect stake via its holdings in other group firms that own direct or indirect stakes in i. Critically, calculating the family's ultimate ownership requires an investor to observe *all* the ownership ties between group firms in the chaebol. Ultimate ownership is difficult to infer even with such ownership data, particularly in the presence of ownership loops. In a pyramidal structure, determining the family's ultimate ownership of a given group firm calls for an investor to trace all possible links between the family and the firm in question, then multiply and sum ownership along each chain to determine the family's ultimate ownership. In the case of complex ownership webs involving circular shareholdings, this approach is infeasible because a firm in an ownership loop theoretically has *infinite* chains leading to it. Almeida et al. (2011) offers an elegant approach to determining ultimate ownership using the matrices defined above:

$$u = f'(I_N - C)^{-1} \tag{1}$$

where I_N is the $N \times N$ identity matrix, and $u = \begin{bmatrix} u_1 & u_2 & ... & u_N \end{bmatrix}'$ is the family's ultimate ownership in each group firm where u_i represents the family's ultimate percentage of ownership of the cash flows of group firm i in a particular year.

The intuition behind this formula lies in tracing the flow of one dollar of dividends paid by group firm i. In the first round, the family and all other group firms receive what their direct ownership in i warrants. In the next round, group firms pay out what they receive from firm i; the family receives part of this cash via its direct stake in these group firms. Iterating this process forward infinitely yields the above formula for the family's ultimate ownership in a dollar of each group firm's dividends. In our empirical tests, we refer to u_i as *Ultimate Ownership*.

3.1.2   Chaebol Families' Voting Rights and Control in Group Firms

Understanding the controlling family's incentives across group firms also requires an investor to assess the family's control rights in each group firm. Computation of control rights presents an even more challenging exercise, particularly in the presence of ownership loops; to ascertain whether a group firm is under the family's control requires an investor to determine the fraction of voting rights held by intermediate firms that the family controls, which in turn requires determining which of the intermediate firms are controlled by the family.

For pyramids, the literature (e.g., La Porta, Lopez-De-Silanes, and Shleifer, 1999) has taken the approach of identifying a "chain of control." This approach requires establishing a threshold of ownership that confers control and then identifying chains leading to the family in which each entity (firm or family) owns more than the threshold in the firm just below it in the chain. All firms that are part of such a chain of control are assumed to be controlled by the family. Faccio and Lang (2002) use the idea of the "weakest link" to compute effective voting rights in firms controlled by the family via a chain of control. The weakest link is defined as the minimum stake along the chain of control for a particular firm. If the family controls a firm through multiple chains of control, this approach would require adding up the minimum stakes throughout all the chains. As Almeida et al. (2011) points out, there is no clear intuition behind the idea of adding up the weakest links. Moreover, if multiple chains of control lead to a given firm, adding up the weakest links could imply that the family owns more than 100% of the voting rights in the firm.

These methods are particularly inappropriate for assessing control rights in the context of circular shareholdings. For example, the weakest-link concept is not well defined for loop firms, which in theory belong to infinite chains.

We adopt the approach introduced by Almeida et al. (2011), which relies on two assumptions: first, there is a threshold of voting rights, T, which determines whether a firm is under the family's control; second, if a family controls a firm, it also controls the votes that the firm holds directly in other firms. Thus, the chaebol family controls the following set of group firms:

$$C(T) = \left\{ i \in N : f_i + \sum_{j \in C(T), j \neq i} c_{ji} \geq T \right\}. \tag{2}$$

We compute this set for each group in each year by assuming a control threshold of 30%.[9] We designate firms in this set as being under the family's control in that year and create an indicator variable, *Control*, to capture the set.

Computing the family's effective voting rights in a group firm is relatively simple once we have identified the set of firms controlled by the family: an investor needs only to add up the family's direct ownership in that firm and the ownership in that firm of all other group firms controlled by the family. We label this variable *VR* in our empirical analysis.

Finally, we compute a measure that captures the extent of incentive conflicts between the chaebol family and minority shareholders. To do so, we estimate for each group firm the discrepancy between the chaebol family's effective voting rights and its ultimate cash-flow rights. In our empirical tests, we refer to this variable as *Separation*.

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[9]Under Enforcement Decree Articles 3-1 and 3-2 of the Fair Trade Act, a group firm in which the family has 30% effective ownership is deemed to be under the family's control (see, e.g., https://egroup.go.kr/egps/ps/io/lkm/kmbntDfn.do). Several other jurisdictions around the world, such as China, Hong Kong, and the UK, use the same 30% threshold to determine control for statutory purposes. Singapore applies a 15% threshold.

3.1.3 Ownership Loop

Our main analysis examines the consequences of the elimination of ownership loops. Thus a key variable is designating firms that do and do not belong to loops. Identification of loop firms relies on the property that when firm i in a loop pays out a dollar in dividends, a portion of that dollar flows to firm i. In other words, loop firms are those whose dividends return after a finite number of payment cycles.

More precisely, let

$$loop_i = min[n : n \geq 1 \text{ and } d_i'C^n d_i > 0] \tag{3}$$

where d_i, a unit vector where the ith element is 1 and 0 otherwise, represents i's dividend payout of 1 and all other group firms' payouts of 0. $loop_i$ gives the number of firms in the shortest loop of which i is a part; firm i is part of a loop if and only if $loop_i < \infty$.

The main variable of interest in our empirical analysis, *Removal Fraction*, is a group-year level variable defined as the fraction of group firms that had loops removed in a given year. A firm is deemed to be removed from ownership loops if it was part of a loop in the prior year and no longer part of a loop in the current year.

3.1.4 Position

Our empirical analysis also leverages the position of a firm within the business group's ownership hierarchy. We follow Almeida et al. (2011), which offers a robust measure of a firm's position in its business group, defined as its "distance" from the controlling family's ownership.

In a simple pyramidal structure, this distance is easy to capture. Consider a business-group structure where the controlling family holds a controlling stake in firm A, which owns stakes in firms B and C. Firm A, directly owned by the family, is in *position* 1; firms B and C are in *position* 2. In this simple example, determining a firm's position vis-à-vis the family simply requires an

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investor to enumerate the number of intervening firms in the ownership chain between it and the family. However, such an approach does not work for more complex organizational structures.

Almeida et al. (2011) offers an alternative and more general measure of position that can accommodate more complex ownership structures.

$$position_i = \frac{f'd_i}{u_i} \times 1 + \frac{f'Cd_i}{u_i} \times 2 + \frac{f'C^2d_i}{u_i} \times ... = \sum_{n=1}^{\infty} \frac{f'C^{n-1}d_i}{u_i} \times n = \frac{1}{u_i}f'(I_N - C)^{-2}d_i. \quad (4)$$

To understand this expression, recall that the family's ultimate claim on a dollar of firm i's dividends is given by u_i from Eq., (1). Thus if the family has direct ownership of i, it receives $f'd_i$ of u_i through the direct ownership chain (of distance 1). For an ownership chain between the family and i involving one intervening firm, the family receives $f'Cd_i$ through that chain (of distance 2). Thus, this position measure weights the distance between a firm and the family on a given ownership chain by the proportion of total cash flows that the family receives from that firm via that chain.

3.2   Data Description

To compute the measures of group structure described in the previous section, we rely on chaebol ownership data collected and published by the KFTC. A key mandate of the KFTC is to restrain the concentration of economic power, especially that of a small number of business groups. For that purpose the KFTC has a special division, the Business Group Bureau, which regulates chaebol activities, including formulating and administering corporate-governance policies. Among other regulations, the KFTC requires detailed disclosure of ownership data. Since the mid-1990s, Korean chaebols have had to report complete ownership information to the KFTC (Almeida et al., 2011). Since 2007, the KFTC has managed the *Business Group Portal* website, a market-monitoring tool through which chaebol firms are required to disclose complete ownership data annually on April 1. The website makes two primary datasets widely available to investors: chaebols' cross-shareholding, and insider-ownership data. The cross-shareholding dataset captures, in both share

counts and percentages, how much equity each chaebol group firm owns in another group company. The insider-ownership dataset captures the controlling family's direct stakes in group firms.

We obtain data on all chaebol firms for the 2011-2018 period and compute the group-structures metric described in the previous section for each public and private firm in each year of the sample. Our sample begins in 2011, when the adoption of the IFRS was completed, to ensure the comparability and consistency of accounting information. A focus on the 2011-2018 period is also appropriate because most transitions to a pyramidal structure took place after the 2008-2009 financial crisis. We obtain accounting and financial data for listed Korean companies from Worldscope and manually match them to the KFTC data. Specifically, we match KFTC data from April of a given year to financial data for the prior fiscal year. Our matching procedure yields a sample of approximately 1,850 firm-year observations on public chaebol firms in the 2011-2018 period. Finally, we obtain data on related-party transactions from the Korean Listed Company Association's database and analyst estimates from IBES.

3.3 Summary Statistics

Table 1 reports summary statistics for the main variables in our study pertinent to the accounting, financial, group structure, and ownership attributes of the listed chaebol firms in our sample. As the table shows, data availability varies across variables. The sample for our main regression analyses consists of around 1,850 firm-year observations in the 2011-2018 period, representing more than 200 public chaebol firms each year. Note that the sample including related-party transactions from the Korean Listed Companies Association database is smaller, containing 1,571 firm-year observations. The sample involving IBES, which we use to calculate *SUE* and *LTE Expectations*, is smaller yet. Our empirical tests use the available sample for each specification.

Table 1 suggests that, in our sample, the median firm is under a chaebol family's control; yet, the family's direct stake (*Direct Own*) in the median public firm is only 1%. Through cross-shareholding structures or circular ownership, however, the family's cash-flow rights (*Ultimate Ownership*) in the

median firm is 17%; the family's voting rights (VR) in the median firm (assuming a control threshold of 30%) are even higher at 33%, consistent with the family on average controlling more than half of the group firms. Indeed, the mean value of *Control* suggests that the family controls 54% of listed group firms.

One of the main business-structure variables of interest in our analyses is *Loop*, which indicates the presence of a circular shareholding in a firm in a particular year. Its mean value suggests that 16% of listed chaebol firms were part of an ownership loop. Naturally, the prevalence of a loop varies over time as groups unwind their circular cross-shareholdings.

Figure 5 depicts how chaebols' ownership complexity and families' control over group firms have evolved over our sample period. The top panel demonstrates that chaebols responded to Korean regulators' push to simplify corporate ownership structures: the proportion of business-group firms that are part of ownership loops declined proportionally by 81%, from 27% in 2011 to 5% in 2018. Yet, chaebol families' control over group firms has remained relatively constant; families controlled about 57% of chaebol firms in 2011 and in 2018.

In addition, the bottom panel of Figure 5 demonstrates that families' average direct ownership in firms and the average separation between families' voting rights and control rights remained fairly constant. In both 2011 and 2018, controlling families had about 15% of direct ownership in group firms on average, and obtained an average separation between their voting and cash-flow rights in group firms of 9%.

Table 2 reports the year-by-year means and medians of these key ownership, control, and incentive variables for our full sample of public chaebol firms (Panel A) and the sample of non-loop public chaebol firms (Panel B) analyzed in our primary analyses. In both samples, we see that these variables are relatively stable at the mean or the median.[10]

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[10]We note that, although the family's median voting rights (VR) exceed their median cash-flow rights (Ultimate Ownership), the median wedge between their voting and cash-flow rights is 0. This is because there are many firms in which VR and Ultimate Ownership are close, but when they differ, VR tends to be much higher than Ultimate Ownership. Our intuition is that families do not generally build up cash-flow rights without commensurate voting rights, but the reverse is not true.

The empirical patterns in Figure 5 and Table 2 are consistent with improvements in the transparency with which outside investors can observe chaebol families' ownership and incentive conflicts, while families' actual incentive conflicts vis-à-vis minority shareholders and degree of control over group firms had not changed significantly. These summary statistics suggest the possibility of a transparency effect at play in this setting, which we formally test empirically in the next section.

4. Empirical Analysis

In this section, we test the valuation implications of improving governance transparency. We begin by developing the theoretical predictions, motivated by Fischer and Verrecchia (2000). We then describe our empirical design for testing these predictions and detail our findings.

4.1   Theoretical Underpinnings

Our empirical analyses examine how greater governance transparency—the revelation of controllers' and managers' incentive conflicts vis-à-vis minority shareholders after simplifying business-group structures—impacts chaebol firms' values. In theory, the impact of making controllers' and managers' incentives more transparent on firm valuation is ambiguous ex-ante.

For intuition, consider the following simple valuation model:

$$P_i = \left(\frac{P}{\bar{E}}\right)_i \times \bar{E}_i, \tag{5}$$

where $\frac{P}{\bar{E}}$ is the multiple that market participants apply to a firm's (long-term) earnings and $\bar{E}$ is the market's expectation for the firm's long-term earnings. When managerial incentives become more transparent, market participants become more confident in their long-term earnings forecasts (e.g., reported earnings become more informative about the long-term payoffs for the company's investors as managerial incentives become more transparent) and apply higher earnings multiples. We call this the "earning informativeness" (or "ERC") channel, which is captured by the first right-

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hand-side term of Eq., (5). However, resolving uncertainty about managerial incentives could also lead investors to revise their expectations about the company's long-term earnings (and payoffs to its investors) either upward or downward. We call this the "expected incentives channel," which is captured by the second right-hand-side term of Eq., (5). Combined, these two channels imply that the transparency effect on valuation is ambiguous.

For example, this second channel could reinforce the positive earnings informativeness (or the "ERC") effect of transparency on firm value if investors discover that the controller's or the manager's incentive conflicts vis-à-vis minority shareholders are better than originally anticipated, leading investors to upward revise their expectations of long-term payoffs. On the other hand, the expected incentives channel can operate to lower firm valuation if investors discover that the incentive conflicts are worse than originally anticipated, leading to a downward revision in investors' expectations of long-term payoffs, and this negative effect dominates the positive value effect of the earnings informativeness channel. Thus, net-net, valuations of business-group firms could increase, decrease, or remain the same due to an improvement in the transparency of controllers' and managers' incentives.

More formally, these two channels can be gleaned from Fischer and Verrecchia (2000) by comparing the equilibrium pricing function under which investors are uncertain about managerial incentives to the pricing function under the full-revelation equilibrium whereby investors know the manager's incentives. This comparison shows that the revelation of incentives could bring about an increase, a decline, or a no change in firm value, depending on how the market updates its priors about the firm's fundamentals. For parsimony, we refer interested readers to the details in Appendix A.

From the above theoretical framework, we derive the following empirical predictions. First, we expect the simplification of group ownership structures to result in higher ERCs among the affected firms. Specifically, such ERC improvements should be most pronounced in those firms in which outside investors had the greatest uncertainty about controllers' and managers' incentives.

Second, consistent with the expected incentives channel playing a role, we predict the simplification of group ownership structures to lead to both increases and declines in value. The idea is that the revision in priors about firm incentives among these firms could differ based on their actual (but hard-to-observe) degrees of incentive conflicts. Specifically, assuming that investors make an on-average guess about the severity of incentive conflicts among the high-incentive-uncertainty firms, we expect to observe improvements in firm value where controllers actually had relatively good incentives. For this subset of firms, the ERC and expected incentives channels reinforce each other to increase firm value. Among those high-incentive-uncertainty firms in which controllers actually had relatively poor incentives, we expect to observe a smaller improvement or a decline in firm value. For this subset of firms, the ERC and expected incentives channels produce offsetting effects on firm value.

Although market participants' expectations are difficult to observe, another way to test the expected incentives channel is to use analysts' long-term earnings estimates. Assuming this is a reasonable approximation for market expectations, and again assuming that investors make an on-average guess about the severity of incentive conflicts among high-incentive-uncertainty firms, we expect to observe upward revisions in long-term earnings when controllers had relatively good incentives. Among those high-incentive-uncertainty firms in which controllers had relatively poor incentives, we expect to observe a smaller upward revision or a downward revision in analysts' long-term earnings estimates.

4.1.1   Empirical Strategy

To identify the effects of governance transparency on value, we focus on the subsample of non-loop chaebol firms—those having never belonged to ownership loops—whose values could be impacted by the ownership structure simplification. Non-loop firms are an appropriate subsample to test the effects of governance transparency. In theory, non-loop firms' values could be impacted by improving governance transparency because investors' evaluation of the consequences of controllers'

incentives in one group firm depends on how their incentive conflicts in that firm compare against those in other firms. For example, knowing the existence of an incentive wedge between a controller's voting and cash-flow rights *per se* is not enough to infer the potential consequences (e.g., the likelihood of expropriation) of these incentive conflicts; an investor would need to compare the severity the controller's incentive conflicts in a firm relative to her incentive conflicts in other group firms. Circular ownership structures obscure the controller's incentive conflicts across group firms, leading investors to form inaccurate expectations about the severity and consequences of agency issues. The simplification of a group's ownership structure results in a revelation of controlling family incentives across group firms, allowing investors to update their priors about the likelihood that a particular firm will benefit or lose from controllers' incentive conflicts.

Moreover, non-loop firms facilitate cleaner tests of the effects of governance transparency. The transition to holding company structures often required loop firms to engage in complicated M&A or other equity transactions (e.g., Figure 3). Loop firms' values could change through this process for reasons unrelated to transparency, such as potential value transfers between group firms involved in the M&A or equity swaps (Lee, 2017). Moreover, compared to other group firms, firms that are part of ownership loops tend to differ substantially in characteristics (Almeida et al., 2011). We, therefore, abstract from firms that belonged to ownership loops for our primary tests. Nevertheless, in untabulated tests, we find the predictions of the transparency hypothesis to hold in the subsample of loop firms.

4.1.2 Earnings Response Coefficients and the Earnings Informativeness Channel

We examine the transparency hypothesis by first testing how earnings informativeness changed due to the simplification of business-group structures. In theory, the revelation of agency issues should reduce investors' uncertainty about group firm managers' objectives and make reported earnings more informative (e.g., Ferri et al., 2018; Fischer and Verrecchia, 2000).

To test these predictions, we examine how investors' responses to annual earnings announce-

ments changed following the simplification of ownership structures. To empirically proxy for the degree of the ownership structure simplification, we construct *Removal Fraction*, a group-year level variable defined as the fraction of group firms that had loops removed in a given year.

We estimate the following empirical specification:

$$
\begin{aligned}
CAR_{i,j,g,t+1} &= \alpha + \beta_1 \times Removal\ Fraction_{g,t} \times SUE_{i,j,g,t+1} + \beta_2 \times SUE_{i,j,g,t+1} \\
&+ \beta_3 \times Removal\ Fraction_{g,t} + \gamma X_{i,j,g,t} + year_t + group_g + industry_j + \epsilon_{i,j,g,t} (6)
\end{aligned}
$$

The outcome variable of interest is $CAR_{i,j,g,t+1}$, the 3-day cumulative abnormal market reaction to a firm's (firm i in industry j and group g) earnings announcement for the next fiscal year. We measure *SUE* by subtracting analysts' median estimate, obtained from IBES, from the reported earnings, scaled by the firm's stock price at the end of the fiscal year. We choose the latest available consensus estimate for a fiscal period (i.e., prior to the announcement of that fiscal period's earnings) as our measure of *expected earnings*. The vector of controls ($X_{i,j,g,t}$) includes return-on-assets, log of market capitalization, leverage, the preceding 12 months' stock returns, and attributes that capture the discrepancy between the family's voting and ownership rights in a group firm, such as *Ultimate Ownership*, *Control*, and *VR*. Finally, our main specifications examine the impact of various fixed effects (i.e., year, business group, industry, and firm). Industry classification is based on the first digit of a firm's primary industry classification, which is analogous to a one-digit standard industrial classification in the United States. Finally, we cluster standard errors at the *group-year* level, given that the treatment variable of interest, *Removal Fraction*, varies at this level.

Table 3, column 1, reports results from estimating Eq., (6) using all non-loop chaebol firms. The main coefficient of interest in Eq., (6) is β_1 on *Removal Fraction $\times$ Forward SUE*, which captures the incremental earnings informativeness associated with the extent of simplification in a group's ownership structure. In column 1, we report a coefficient of 0.595 on *Removal Fraction $\times$ Forward SUE*, which is positive and statistically significant at the 5% level, consistent with governance transparency leading to greater earnings informativeness.

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If earnings informativeness improved due to governance transparency, we expect such effects to be concentrated in those firms for whom the ex-ante uncertainty about managerial incentives is the greatest (Fischer and Verrecchia, 2000). To capture investors' degree of uncertainty, we focus on the subsample of firms positioned lower in the group. Our intuition is that, in the presence of ownership loops, group firms' ownership structures are more easily observable when they are positioned higher in the group (i.e., closer to the controlling family with fewer intervening firms). Thus, the lower a firm's position in the group, the more opaque its ownership structure and the controller's voting and cash-flow rights, and the more difficult it is to understand incentive conflicts vis-à-vis the firm's minority shareholders.

Table 3, columns 2 and 3, report the results of estimating Table 3 for the non-loop firms lower in the group ($Position > 2$) and higher in the group ($Position \leq 2$).[11] Indeed, we find that the ERC effect is concentrated in those non-loop firms positioned lower in the business group: the coefficient is statistically significant at the 1% level and about twice the magnitude compared to that estimated using the pooled sample (column 1). For non-loop firms higher in business groups, the coefficient on *Removal Fraction* $\times$ *Forward SUE* (column 3) is small in magnitude (about a tenth of the coefficient size in column 2) and statistically insignificant at the 10% level.

We also consider an alternative measure that could capture variation in investors' uncertainty about firms' incentives in the presence of cross-shareholdings: controllers' direct ownership in group firms. When the controlling family holds a high level of direct ownership, which is easily observable, minority investors may infer that their interests are relatively well aligned with those of the controller and the company's managers. In such firms, the wedge between ownership and control will be low by construction. On the other hand, when the controlling family holds little to no direct ownership, as is the case for more than half of our sample of group firms (e.g., Table 1 and 2), their incentives are difficult to evaluate as they depend on the (*indirect*) cash flow and control rights established through the controllers' interests in other group firms, including those belonging

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[11]Based on this definition, a firm that is lower in the business group has at least one intervening group firm in the ownership chain between it and the family and more than one chain leading back to the family.

to ownership loops.[12] Thus, the transparency hypothesis predicts that the ERC effects in non-loop-removal firms should be concentrated in those with relatively low levels of direct ownership by family controllers.

Table 3, columns 4 and 5, report the results of estimating Eq., (6) for the non-loop firms with lower direct ownership (lower than sample median *Direct Own*) and higher direct ownership (higher than sample median *Direct Own*). Consistent with the transparency hypothesis, we find that the ERC effect is concentrated in those non-loop firms with relatively little direct ownership by the family controllers (column 4): the ERC coefficient is statistically significant at the 1% level and about twice the magnitude compared to that estimated using the pooled sample (column 1). For non-loop firms with relatively high levels of controller direct ownership, the coefficient is small in magnitude (less than a tenth of the coefficient size in column 4) and statistically insignificant at the 10% level. The results of the direct ownership analysis are consistent with those using group firms' positions in the business group.

Overall, the findings in Table 3 confirm the prediction that governance transparency would impact firm value through an earnings informativeness channel. The results are also consistent with the prediction that the increase in ERC should be concentrated in those firms for which investors had the greatest uncertainty about managerial incentives.

4.1.3   Firm Valuation and the Expected Incentives Channel

Having shown evidence of the presence of the ERC channel, we test the presence of the second—expected incentives—channel through which governance transparency could impact firm valuations. As explained above in our hypothesis development, this second channel predicts both positive and negative valuation effects from improvements in governance transparency: among the high-incentive-uncertainty firms, we expect to observe improvements in firm value when chaebol families

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[12]In interviews with us, hedge fund investors of Korean public company investors revealed that high direct ownership by the chaebol family is one of the most important indicators they use to identify investment targets that are least likely to experience expropriation. In our sample, chaebol firms with the highest levels of direct ownership by controllers tend to have the best observability and incentives (i.e., have High Position and Low Separation).

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had relatively good incentives and a smaller improvement or a decline in firm value when chaebol families had relatively poor incentives.

To test these predictions, we examine how non-loop firms' values change when group ownership structures simplify. In particular, we focus on the subsample of firms where investors likely had the greatest uncertainty about the severity of incentive conflicts: firms lower in the group or with lower direct ownership.

We estimate the following empirical specification:

$$Q_{i,j,g,t+1} = \alpha + \beta_1 \times Removal\ Fraction_{g,t} + \gamma X_{i,j,g,t} + year_t + group_g + industry_j + \epsilon_{i,j,g,t}, \quad (7)$$

where $Q_{i,j,g,t+1}$ is a firm's (firm i in industry j and group g) Tobin Q in the first fiscal-year-end following the group structure measurement, and *Removal Fraction* and the vector of controls $(X_{i,j,g,t})$ are the same as in Eq., (6). As in Table 3, we include year-, business-group-, and industry-fixed effects, and cluster standard errors at the group level.

We begin by estimating Eq., (7) for the full set of high-uncertainty non-loop firms. The results are reported in Table 4, columns 1 and 2. Whether measuring by lower position (column 1) or low direct ownership (column 2), we do not find the degree of ownership simplification in a business group to be associated with firm value. In both cases, we obtain positive coefficients that are not statistically different from zero (at the 10% level).

A simple model that could explain these results is that investors take an on-average guess about the degree of incentive conflicts among these high-incentive-uncertainty firms. Thus, for about half of the firms, the actual incentive conflicts would be better than investors expected, and for the other half of the firms, the actual incentive conflicts would be worse than investors expected.

Such a model of expected incentives also predicts that the pattern of value changes among the high-incentive-uncertainty firms could differ based on the severity of chaebol families' incentive conflicts. To test this hypothesis, we proxy for the actual degree of incentive conflicts using *Separation*, and partition the sample into High-Separation and Low-Separation subsamples based

on cross-sectional medians of the measure. Minority shareholders in firms with *Separation* higher (lower) than the median in a given year are assumed to have relatively higher (lower) degrees of conflicts of interest vis-à-vis the controllers or the firms' managers.[13]

When the incentive revelation occurs as a result of group structure simplification, the value should increase for the subset of these firms in which the actual incentives are better than investors previously anticipated, because the positive revision in expected incentives reinforces the ERC effect (e.g., Eq., (5)). Thus, we expect an increase in Tobin's Q associated with group simplification in the Low-Separation subsample.

Table 4, columns 3 and 4, report the results of estimating Eq., (7) using the Low-Separation high-incentive-uncertainty firms. Column 3 analyzes the sample of firms lower in the group and column 4 analyzes the sample of firms with a low degree of controller direct ownership. Consistent with our predictions, we find consistent evidence across both specifications that hard-to-observe firms with relatively low degrees of incentive conflicts experienced a statistically significant (at the 5% level) improvement in value. The effect sizes are also economically meaningful: column 1 suggests that the transparency effects accompanying the average level of *Removal Fraction* are associated with improvements in Tobin's Q of about 0.05, or a 5% increase relative to the sample median Tobin's Q.

Among the High-Separation subsample, we expect investors to negatively revise their priors about hard-to-observe firms' incentive conflicts. However, the net impact on value is ambiguous (e.g., Eq., (5)): it depends on the relative magnitudes of the earnings informativeness effect, which increases value, and the incentive revision effect, which lowers value. Thus, compared to the High-Separation subsample, we expect a less positive increase in Tobin's Q associated with group simplification.

Table 4, columns 5 and 6, report the results of estimating Eq., (7) using the High-Separation subsample of firms. Column 5 analyzes the sample of firms lower in the group and column 6

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[13]The mean and median values of *Separation* for the High-Separation subsample are both 22%, while the mean and median values of *Separation* for the Low-Separation subsample are -3% and -1%.

analyzes the sample of firms with a low degree of controller direct ownership. Consistent with our predictions, we find consistent evidence across both specifications that hard-to-observe firms with relatively high degrees of incentive conflicts do not obtain a positive and significant association between *Remove Fraction* and Tobin's Q. In column 5, we find that firms lower in the group with relatively severe incentive conflicts experienced a statistically significant (at the 10% level) decline in value, consistent with market participants' negative revision effect dominating the earnings informativeness effect on firm value. In column 6, we again obtain a negative coefficient on *Remove Fraction* that is very similar in magnitude to that of column 5; however, we do not obtain statistical significance at the 10% level. Moreover, across both specifications, the effect sizes are about half of those reported in columns 3 and 4. These results are consistent with the idea that, among these firms with relatively severe but hard-to-observe incentive conflicts, the negative revision effect on value stemming from improving governance transparency is offset by a positive earnings informativeness effect on value.

In Table 5, we estimate the same regression specifications as Table 4 but use an alternative measure of Tobin's Q ("stand-alone Q"), based on Almeida et al. (2011). As Almeida et al. (2011) notes, one issue with Tobin's Q for chaebol firms is that it includes the value of equity stakes that this firm holds in other group firms, both listed and unlisted. However, adjusting for the values of these equity stakes is challenging because the value of private firms in not observable. Like Almeida et al. (2011), our preferred measure of firm value is Tobin's Q. Nevertheless, to show that our results are not likely driven by mismeasurement, we also re-run our results using stand-alone Q.

The results of Table 5 are qualitatively similar to those of Table 4. Among the high-incentive uncertainty firms (columns 1 and 2), the relation between *Removal Fraction* and stand-alone Q is small and statistically not different from zero (at the 10% level). Among the subsamples of Low-Separation firms, the coefficients on *Removal Fraction* are again positive and statistically significant, this time at the 10% level. Among the subsamples of High-Separation firms, we now

find the coefficients on *Removal Fraction* to be both negative and statistically significant at the 5% level.

While the point estimates vary between these two tables, both sets of results are consistent with our predictions on the effects of governance transparency on firm values. These results are also consistent with the presence of the expected incentives channel and its potentially countervailing effects on firm value vis-à-vis the earnings informativeness channel (Eq., (5)).

4.1.4 Analysts' Long-Term Earnings Estimates and the Expected Incentives Channel

Thus far, we have tested the predictions of the expected incentives channel by examining how firm value changes when ownership structures simplify and afford greater governance transparency. The reliance on these tests stems from our inability to perfectly observe market participants' expectations about group firms' long-term earnings prospects.

Next, we attempt to test the expected incentives channel more directly using a proxy for the market's expectations about firms' long-term earnings: analysts' long-term earnings expectations. Our maintained assumption is that changes in analysts' expectations about agency issues would be reflected in their long-term earnings forecasts. Our hypotheses suggest that analysts' long-term earnings forecasts should revise upward after business group simplification for hard-to-observe firms with relatively less severe incentive conflicts, and they should revise downward for hard-to-observe firms with relatively more severe incentive conflicts.

In Table 6, estimate the same regression specifications as Table 4 but use *Forward LTE Expectations* as the main dependent variable of interest, computed as analysts' median three-year-ahead earnings forecasts scaled by common equity. The results from this table provide some suggestive evidence for the expected incentives channel. For example, column 3 suggests that analysts revised their long-term earnings forecasts upward for firms lower in the business group that have relatively good incentives. The coefficient on *Removal Fraction* is positive and statistically significant at the 5% level and is economically significant in magnitude. It suggests that a transparency improve-

ment accompanying the average level of *Removal Fraction* is associated with an approximately 27% increase in earnings expectations relative to the sample average *LTE Expectations*. In column 4, which examines the long-term earnings forecasts for firms with relatively low degrees of controllers' direct ownership and with relatively good incentives, we again find a positive coefficient on *Removal Fraction*. However, the coefficient is not statistically significant at the 10% level, but the coefficient magnitude remains substantial. This suggests that a transparency improvement accompanying the average level of *Removal Fraction* is associated with an approximately 7% increase in earnings expectations relative to the sample average *LTE Expectations*.

Columns 5 and 6 analyze the long-term earnings forecasts for hard-to-observe firms with relatively poor incentives. Across both specifications, we obtain a negative coefficient on *Removal Fraction*, which is directionally consistent with the value effects we observe in these firms. However, neither coefficient is statistically significant at the 10% level.

We stress that the power of these tests depends on how well analysts' consensus long-term earnings forecasts approximate investors' priors about chaebol firms' long-term profitability, which is fundamentally unobservable. Another challenge with these tests is that our sample size is further restricted by the availability of analysts' earnings forecasts.

Nevertheless, the results in Table 3, 4, 5 and 6 are broadly consistent with the predictions of the transparency hypothesis and the possibility that the opacity in cross-shareholdings leads group firms' investors to make imprecise guesstimates of the controllers' and managers' relative incentive conflicts in group firms. Market participants' revisions in firms' incentives could reinforce the ERC effect (if markets revise earnings upward), leading to a value increase, or offset the ERC effect (if markets revise earnings downward), leading to an ambiguous (and potentially negative) net value effect.

4.1.5   Robustness Tests

To conclude our empirical analyses, we provide several robustness tests to verify whether our results on firm value are indeed a consequence of governance transparency. Research in the business group literature suggests that business groups may function as mechanisms of expropriation by controlling families (e.g., La Porta et al., 1999; Johnson, La Porta, Lopez-de Silanes, and Shleifer, 2000; Bertrand and Mullainathan, 2000). To the extent that the simplification of ownership structures in chaebols accentuated the conflicts of interests between controlling families and minority shareholders in those firms, increasing expectations of future expropriation and under-performance, valuations of loop-removal firms could have consequently changed.

Table 7 reports estimates from the same regression specifications as Table 4 but using *Forward Separation* (in Panel A) and *Forward Control* (in Panel B) as the main dependent variables of interest. For parsimony, we suppress the coefficients on control variables and focus on the Low-Separation (columns 1 and 2) and High-Separation (columns 3 and 4) subsamples.

The results of Table 7, Panels A and B, suggest that the simplification of chaebol ownership structures did not accompany economically or statistically significant changes in controllers' incentive conflicts in or their degree of control of the high-incentive-uncertainty firms. In both panels, we obtain coefficients on *Removal Fraction* that are statistically not different from zero for both Low-Separation and High-Separation subsamples. Thus, we do not find any evidence suggesting that the value changes documented in 4 and 5 are driven by real changes in the severity of chaebol families' incentive conflicts or degree of control.

We further examine whether the group-structure simplification process could have impacted the extent of expropriation. An extensive literature (e.g., Bertrand et al., 2002) has documented tunneling in business groups, including Korean chaebols. We use two measures to capture tunneling: (net) related party sales and profitability.[14] Table 8 reports estimates from the same regression specifications as Table 7 but using *Forward Net RPT* (in Panel A) and *Forward ROA* (in Panel B)

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[14]Hwang and Kim (2016) document that related party sales are used as a means of financial support between firms in Korean chaebols; Almeida et al. (2011) and Bertrand et al. (2002) use profitability to examine tunneling.

as the main dependent variables of interest.

The results of Table 8, Panels A and B, suggest that the simplification of chaebol owner-ship structures did not accompany significant changes in related party transactions or profitability among the high-incentive-uncertainty firms. In both panels, we obtain coefficients on *Removal Fraction* that are statistically not different from zero for both Low-Separation and High-Separation subsamples. Consistent with the findings in Table 7, these results suggest that the value changes documented in 4 and 5 are not driven by real changes in the degree of expropriation in these firms *after* the group structure simplification process.

To be sure, we provide a further check to examine the possibility that value could have been transferred to (the Low-Separation firms) or from (the High-Separation firms) *during* the process of unwinding complex ownership loops, for example via sales or purchases of group-firm shares at prices advantageous to the controlling family. If so, the relation between firm value and *Removal Fraction* should be driven by the subsample of group firms with significant equity transactions.

In Table 9, we re-estimate the specifications of Table 4 but omit from the sample all firms that experienced a greater than 5% change in the ratio of treasury shares to total outstanding shares. The results are qualitatively similar to those of Table 4 and suggest that the value changes we document are not driven by value transfers that occurred *during* the group structure simplification process.

5.   Conclusion

This paper sheds new light on the valuation consequences of corporate governance transparency. We demonstrate two important and potentially offsetting channels (i.e., the earnings informative-ness channel and the expected incentives channel) through which greater transparency about busi-ness group controllers' incentive conflicts vis-à-vis minority shareholders could impact value.

Our empirical analysis exploits the transition of Korean chaebols to simpler ownership struc-tures. Focusing on the sample of non-loop firms, we provide empirical evidence of the transparency

hypothesis and the presence of both effect channels. In doing so, our work demonstrates the nuanced effects of incentive transparency on firm valuation.

We leave several questions for future research. Though we document differential value effects among group firms, we do not attempt to infer the aggregate value implications of South Korea's governance reform, aimed at improving the transparency of ownership structure and incentives. Moreover, our findings analyze the short-horizon effects of the reform, while the long-term effects remain to be seen. Such analyses could have important policy implications, particularly relevant for economies where complex cross-shareholdings are prevalent or where controllers' incentives are particularly opaque.

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Appendix A   The Effects of Governance Transparency on Valuation: An Analytical Illustration

In this appendix, we explain the theoretical predictions for how governance transparency could affect firm valuation.

1.1   Setup

We utilize Fischer and Verrecchia (2000), which provides a model for how uncertainty in managerial incentives impacts market valuations.

This is a one-period reporting game with a risk-neutral manager in which a firm's true value is unknown ex-ante and the prior distribution of value is common knowledge:

$$\tilde{v} \sim \mathcal{N}(\mu_v, \sigma_v^2).$$

During the period, the firm manager privately observes earnings, a noisy signal of firm value:

$$\tilde{e} = \tilde{v} + \tilde{n},$$

where $\tilde{n} \sim \mathcal{N}(\mu_n, \sigma_n^2)$ and $\sigma_{\tilde{n}, \tilde{v}} = 0$ which is common knowledge. After observing earnings of $\tilde{e} = e$, the manager makes a report of earnings r which can differ from e by a bias ($b = r - e$). However, in biasing earnings reports the manager bears a private cost

$$C(b) = c \cdot b^2/2,$$

where c is a positive parameter and $C(.)$ convex.

The market, which is assumed to be perfectly competitive and risk-neutral, does not observe the realization of $\tilde{e}$ and sets price based on rational expectations of $\tilde{v}$ conditional on the manager's earnings report:

$$P = \mathbb{E}[\tilde{v}|r].$$

In this model, the manager may have short-term incentives (e.g., due to compensation structure) to either boost or tank earnings and prices, but she also has long-run disincentives for distorting earnings (e.g., due to litigation, reputation, or psychic costs). Her incentives are captured in the following optimization problem:

$$\max_b \; x \cdot P - c \cdot \frac{b^2}{2}.$$

Here, x reflects the direction and intensity of the manager's short-term incentives, which the market does not know ex-ante but has a common prior:

$$\tilde{x} \sim \mathcal{N}(\mu_x, \sigma_x^2) \text{ and } \sigma_{\tilde{x}, \tilde{v}} = \sigma_{\tilde{x}, \tilde{n}} = 0.$$

Note that x can be positive or negative (i.e., managers may have incentives to pump up or depress stock price), $x \cdot P$ captures the benefits manager obtains by biasing the report, and σ_x captures

the uncertainty in the manager's reporting objectives. Thus, Fischer and Verrecchia (2000) can be viewed as a generalization of Stein (1989), which assumes that the manager's incentives are known to investors ex-ante.

In our research setting, the complexity of the ownership structure (or the opacity around the wedge between the controller's cash flow and voting rights) creates a source of uncertainty over the incentives of the managers, whose incentives are assumed to be aligned with those of the controlling investors. Managers and controllers may have incentives to prop up stock prices in some firms to maximize the value of financial interests or to facilitate M&A transactions using those firms' equity; on the other hand, managers and controllers may have incentives to depress stock prices in other firms to facilitate M&A transactions (e.g., making them cheaper to acquire) that transfer value to the chaebol family. Once ownership structures become more transparent, the incentive conflicts or managers and controlling shareholders become apparent to the minority investors, who update stock prices accordingly.

1.2 Predictions

To assess the value implications of governance transparency, that is. the price effects from revealing the incentive conflicts of managers and the controlling shareholders they serve, we compare two equilibria implied from the above model.

The model predicts the following equilibrium market prices when there is uncertainty about managerial incentives:

$$
P_0 = \underbrace{\frac{\sigma_v^2}{\sigma_v^2 + \sigma_n^2 + \left(\frac{\beta_0^*}{c}\right)^2 \sigma_x^2}}_{\beta_0^*} \left(\underbrace{e + \frac{\beta_0^*}{c}x}_{r_0^*} - \frac{\beta_0^*}{c}\mu_x \right),
$$

where β_0^* is the ERC on reported earnings (r_0^*). When there is revelation about managerial incentives, that is x is known $(\mu_x = x$ and $\sigma_x^2 = 0)$, equilibrium market prices are given by:

$$
P_1 = \underbrace{\frac{\sigma_v^2}{\sigma_v^2 + \sigma_n^2}}_{\beta_1^*} \left(\underbrace{e + \frac{\beta_1^*}{c}x}_{r_1^*} - \frac{\beta_1^*}{c}x \right) = \beta_1^* e,
$$

where β_1^* is the ERC on reported earnings $(r_1^* = e - \beta^* x/c)$. Because of the incentive revelation, market participants can undo the reporting bias and precisely infer the manager's signal about firm value (e), similar to the equilibrium in Stein (1989). Thus, the change in stock prices resulting from governance transparency (or incentive revelation) can be analyzed by the ratio of the two

equilibrium prices:

$$\frac{P_1}{P_0} = \underbrace{\frac{\sigma_v^2 + \sigma_n^2 + \left(\frac{\beta_0^*}{c}\right)^2 \sigma_x^2}{\sigma_v^2 + \sigma_n^2}}_{\text{Earnings Informativeness Effect}} \times \underbrace{\frac{e}{e + \frac{\beta_0^*}{c}(x - \mu_x)}}_{\text{Expected Incentives Effect}} .$$

The above expression suggests two channels through which the revelation of managerial incentives can impact prices. The first is an "earnings informativeness" channel (the first term on the right-hand side). This channel suggests that, all else equal, when uncertainty about managerial incentives is resolved, the market applies a higher multiple on each dollar of expected earnings (i.e., because it has greater confidence about those earnings expectations). The effect of incentive revelation through this channel is an unambiguous increase in stock price.

However, the above expression also suggests another effect channel, which we call the "expected incentives" channel (the second term on the right-hand side). This channel suggests that, all else equal, when uncertainty about managerial incentives is resolved, the market updates its priors about the manager's incentive conflicts (and hence non-controlling shareholders' payoffs). The effects on value through this channel are ambiguous, since the revelation may lead the market to realize that the manager's incentives conflicts are better or worse than its priors.

The total effect of incentive revelation on stock price thus depends on how these two channels balance out. We can further simplify the total effect of incentive revelation as follows:

$$\frac{P_1}{P_0} = \frac{1 + \left(\frac{\beta_0^*}{c}\right)^2 \frac{\sigma_x^2}{\sigma_v^2 + \sigma_n^2}}{1 + \left(\frac{\beta_0^*}{c}\right)^2 \frac{x - \mu_x}{\beta_0^* e}}.$$

This expression suggests that the effect of the revelation of incentives depends on the direction of the revelation about incentives (i.e., $x - \mu_x$). Moreover, revelation leads to a price increase if and only if the increase in earnings responsiveness outweighs the reduction in expected long-term earnings:

$$\frac{\sigma_x^2}{\sigma_v^2 + \sigma_n^2} > \frac{x - \mu_x}{\beta_0^* e}.$$

Thus, the effect of the revelation of managerial incentives on stock prices is ex-ante ambiguous.

Appendix B Description of Variables

This table defines accounting and financial variables used in our analyses. The construction of variables based on ownership data obtained from the Korea Fair Trade Commission Business Group Portal (`https://www.egroup.go.kr/egps/wi/stat/spo/psitnCmpnyStockHoldList.do`) is described in Section 2.. Data on related-party transactions are obtained from the Korean Listed Companies Association. Data on analysts' earnings estimates are obtained from IBES. All financial data are obtained from the Thomson Reuters Datastream database: Datastream variable codes are specified in brackets in the Computation column. *Forward* variables refer to one-year-ahead value; *Lagged* variables refer to prior-year value.

| Variable	Description	Computation
CAR	3-day cumulative abnormal returns around the date of an earnings announcement	(Return Index at day $d+1$ [$RI_{i,d+1}$] / Return Index at day $d-2$ [$RI_{i,d-2}$]) – (Market Return Index at day $d+1$ [$RI_{m,d+1}$] / Market Return Index at day $d-2$ [$RI_{m,d-2}$])
Log leverage	Natural logarithm of the ratio of long-term debt to total assets	ln(1 + Long Term Debt [WC03251] / Total Assets [WC02999])
Log market-cap	Natural logarithm of market capitalization	ln(Market Value [MV])
LTE Expectations	Long-term earnings expectations	Median 3-year ahead earnings expectations (Forecast Period Indicator = 3)/ Common Equity [WC03501] *NB: We use the latest available analyst forecasts before the announcement of annual earnings.*
Net RPT	Ratio of net income (income - expense) from related party transactions to lagged sales	(RPT Income – RPT Expense) / Lagged Total Sales [WC01001]
Q	Tobin's Q	(Total Assets [WC02999] + Market Value [MV] – Common Equity [WC03501]) / Total Assets [WC02999]
Q*	Tobin's Q of the standalone entity	(Total Assets [WC02999] + Market Value [MV] – Share of Market Value of Associates – Common Equity [WC03501]) / (Total Assets [WC02999] – Investment in Associates [WC02256])
Returns	Net stock returns measured over the 12 months prior to fiscal end	(Return Index at time t [RI_t] / Return Index at time (t-1) [RI_{t-365}]) – 1
ROA	Return on assets	Operating Income [WC01250] / Lagged Total Assets [WC02999]
SUE	Standardized unexpected earnings	(Actual earnings [actual] – Median analyst forecast estimate [medest]) / Price *NB: We use the latest available analyst forecasts before the announcement of annual earnings.*
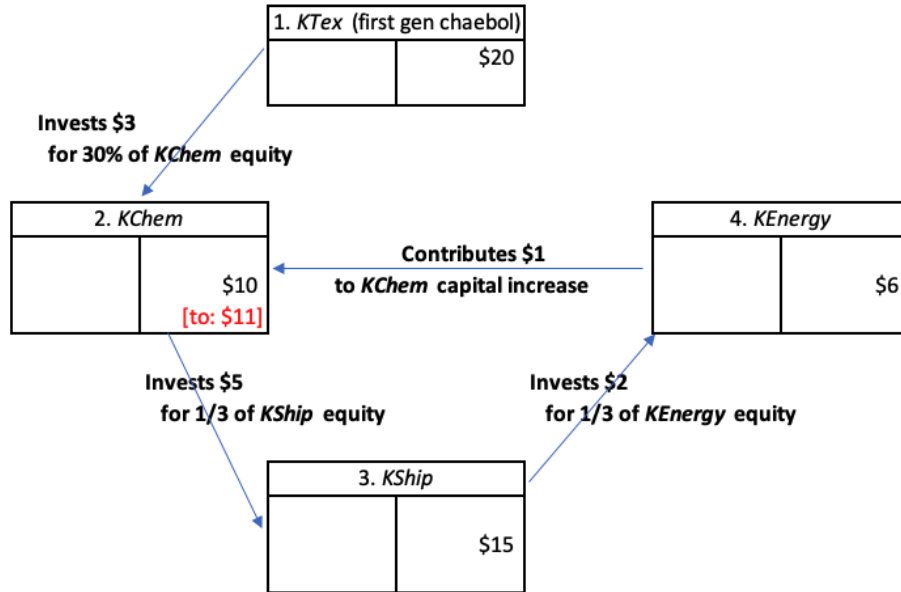
Fig. 1. An Illustration of Circular Contributions' Role in Business Group Growth and Control
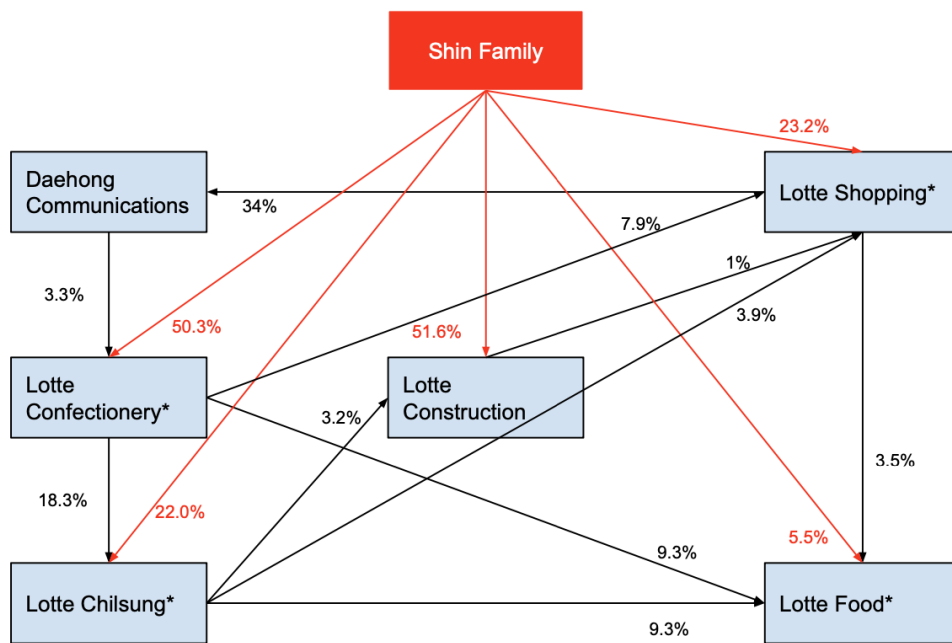
Fig. 2. A partial example of Lotte's ownership structure in 2016
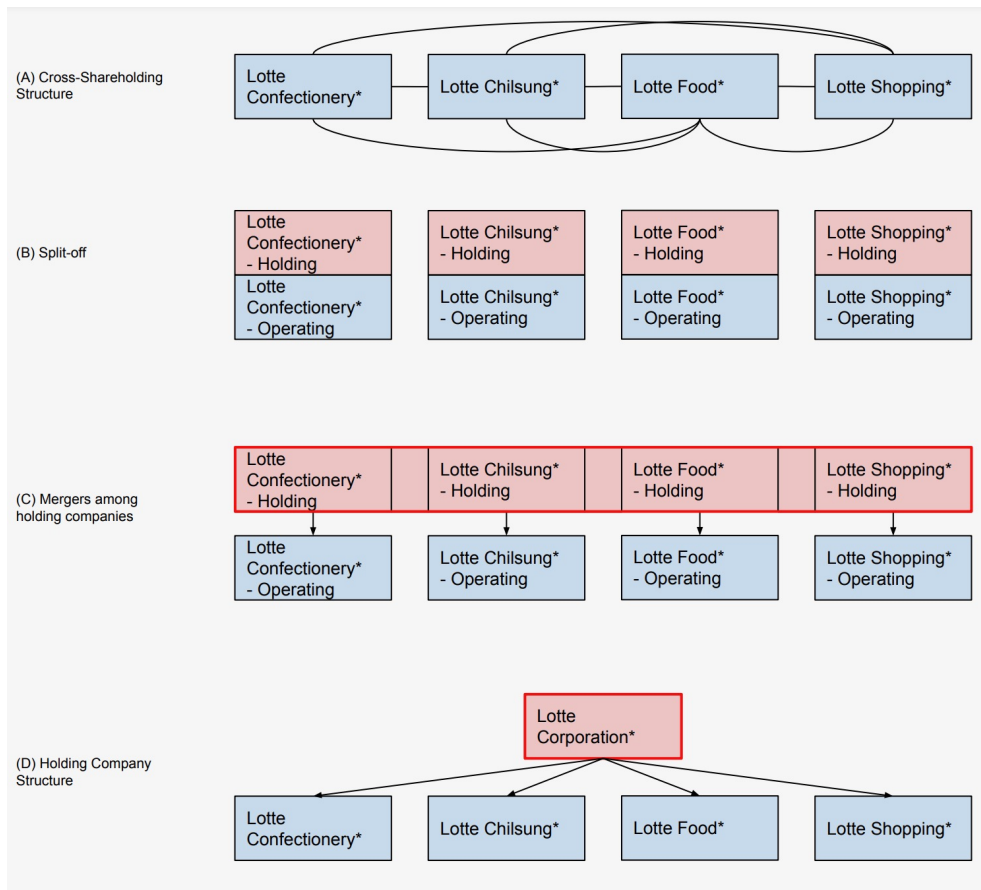
Fig. 3. An example of transition process at Lotte: Split-off and Merge
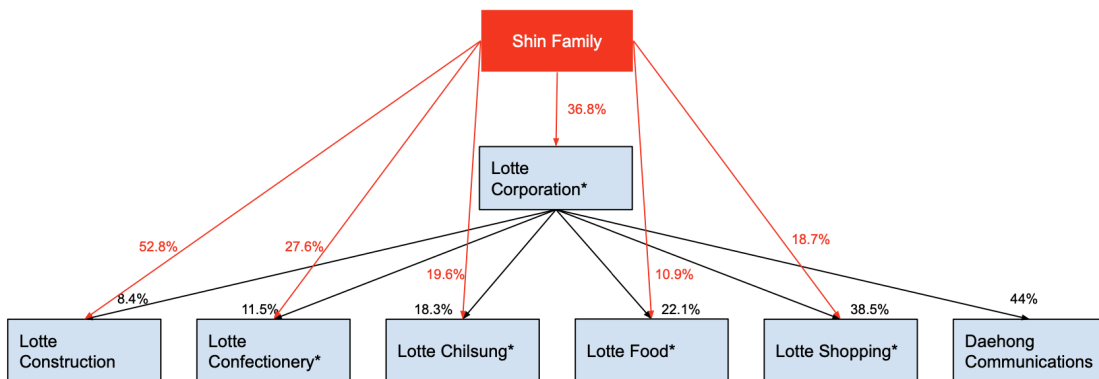
Fig. 4. A partial example of Lotte's ownership structure in 2017
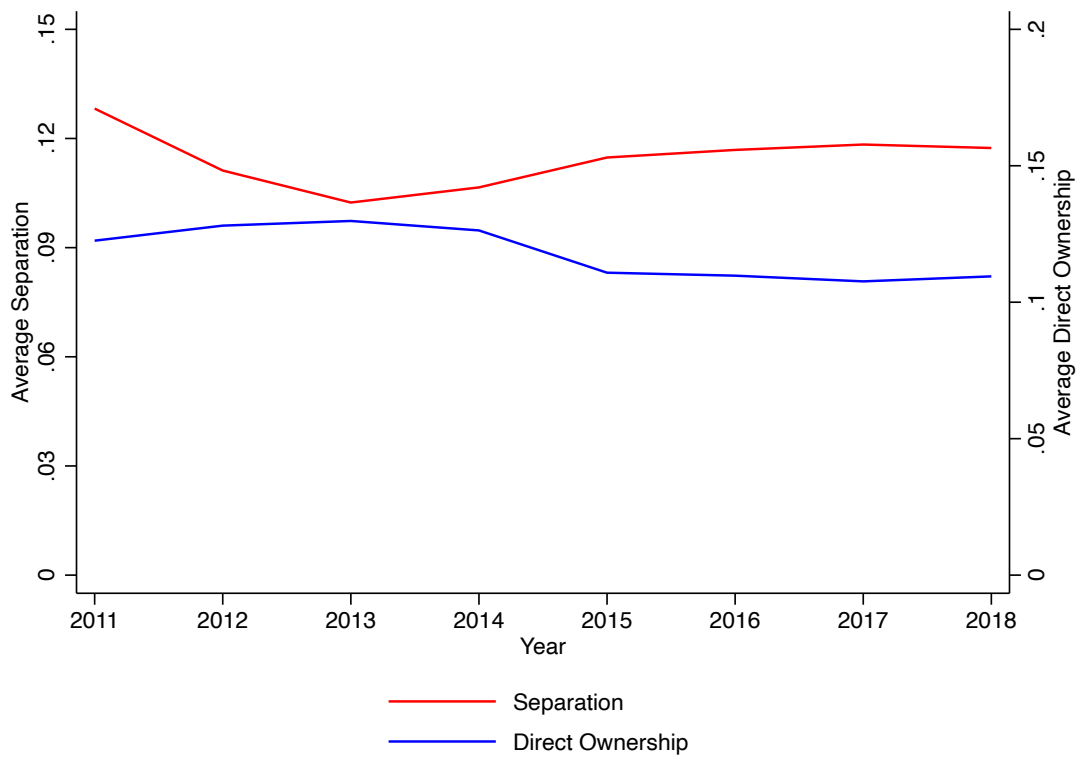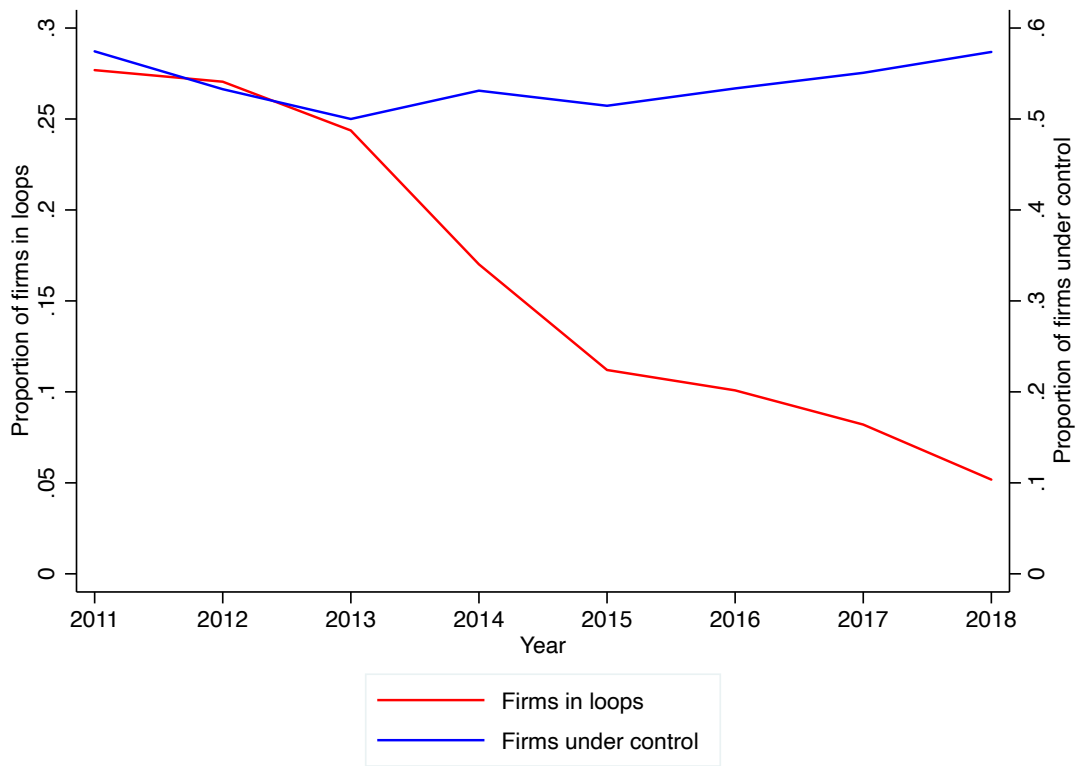
Fig. 5. Simplification of Business Group Structure Over Time

Table 1. Firm Characteristics and Ownership Variables of Public Group Firms, Summary Statistics

Table 1 reports summary statistics on the firm characteristics and ownership variables of publicly listed chaebol firms in our sample from 2011 through 2018. All continuous variables, both financial and ownership-related, are winsorized at the top and bottom 1% of the cross-sectional distribution. Accounting and financial variables are described in Appendix B. The variables on ownership structure are described in Section 2.

	$p25$	$p50$	$Mean$	$p75$	$p95$	SD	$Count$
CAR	-0.03	-0.00	-0.00	0.02	0.08	0.05	1,154
Centrality	0.00	0.00	0.05	0.05	0.32	0.11	1,950
Control	0.00	1.00	0.54	1.00	1.00	0.50	1,951
Direct Ownership	0.00	0.01	0.12	0.20	0.49	0.19	1,951
Log Leverage	0.01	0.09	0.11	0.17	0.28	0.10	1,941
Log Market-cap	12.34	13.49	13.60	14.83	16.55	1.67	1,843
Loop	0.00	0.00	0.16	0.00	1.00	0.37	1,951
LTE Expectations	0.08	0.12	0.14	0.18	0.32	0.10	1,156
Net RPT	-0.04	0.01	0.06	0.11	0.58	0.23	1,569
Position	1.24	2.00	1.96	2.38	3.27	0.81	1,951
Q	0.88	1.00	1.18	1.24	2.33	0.64	1,843
Removal Fraction	0.00	0.00	0.02	0.00	0.10	0.06	1,951
Returns	-0.22	-0.03	0.03	0.18	0.73	0.39	1,790
ROA	0.01	0.04	0.04	0.07	0.16	0.06	1,908
Separation	-0.01	0.00	0.10	0.22	0.44	0.17	1,951
SUE	-0.03	-0.01	-0.03	-0.00	0.02	0.11	1,180
Ultimate Ownership	0.08	0.17	0.22	0.32	0.57	0.18	1,951
VR	0.08	0.33	0.32	0.49	0.73	0.24	1,951

Table 2. Evolution of Family's Ownership and Incentives over Time

Table 2 reports summary statistics on ownership variables of publicly listed chaebol firms in our sample from 2011 through 2018. Panel A reports statistics for all public firms in our sample. Panel B reports results on the sample of "Non-Loop" firms, where we exclude all firms which were a part of loops or were removed from loops. We analyze the latter sample in our main empirical tests. All variables are winsorized at the top and bottom 1% of the cross-sectional distribution. Ownership structure variables are described in Section 2.

Panel A: All Firms

Year	Direct Ownership		Control		Ultimate Ownership		VR		Separation	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
2011	0.12	0.01	0.57	1.00	0.22	0.18	0.33	0.34	0.11	0.02
2012	0.13	0.01	0.53	1.00	0.22	0.16	0.32	0.33	0.10	0.00
2013	0.12	0.02	0.50	0.50	0.23	0.17	0.31	0.30	0.08	0.00
2014	0.12	0.01	0.53	1.00	0.22	0.16	0.31	0.32	0.09	0.00
2015	0.11	0.01	0.51	1.00	0.21	0.16	0.31	0.31	0.09	0.00
2016	0.11	0.01	0.53	1.00	0.22	0.17	0.32	0.33	0.10	0.00
2017	0.11	0.00	0.55	1.00	0.22	0.17	0.32	0.33	0.10	0.00
2018	0.11	0.00	0.57	1.00	0.23	0.18	0.33	0.34	0.10	0.00

Panel B: Non-Loop Firms

Year	Direct Ownership		Control		Ultimate Ownership		VR		Separation	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
2011	0.12	0.00	0.63	1.00	0.24	0.19	0.36	0.35	0.12	0.03
2012	0.13	0.00	0.59	1.00	0.24	0.18	0.34	0.35	0.10	0.00
2013	0.13	0.00	0.57	1.00	0.25	0.19	0.34	0.35	0.10	0.00
2014	0.13	0.00	0.61	1.00	0.24	0.18	0.35	0.36	0.11	0.00
2015	0.11	0.00	0.56	1.00	0.22	0.17	0.33	0.34	0.11	0.00
2016	0.11	0.00	0.55	1.00	0.22	0.16	0.33	0.34	0.10	0.00
2017	0.11	0.00	0.56	1.00	0.22	0.17	0.33	0.34	0.10	0.00
2018	0.10	0.00	0.56	1.00	0.23	0.18	0.33	0.34	0.10	0.00

Table 3. Earnings Informativeness

Table 3 reports the results of regressions that test the spillover effects of loop removal on earnings informativeness. The sample for this test excludes all firms that either had loops removed or were part of a loop. The dependent variable in columns 1–5 is *Forward CAR*, the 3-day cumulative abnormal returns around the date of the following fiscal year's earnings announcement. The explanatory variables include *Removal Fraction*, measured at the group-year level and defined as the fraction of group firms in a year that had loops removed, and *Forward SUE*, the scaled unexpected earnings in the year following loop removal. The main coefficient of interest is on the interaction term, capturing the differential earnings responsiveness for groups with loop removal. Column 1 reports results using the entire sample; columns 2 and 3 report results for samples partitioned by *Position*: column 2 reports results for the sample of chaebol firms with *Position* greater than the sample median (i.e., firms positioned lower in a chaebol); column 3 reports results for firms with *Position* less than or equal to the sample median (i.e., firms positioned higher in a chaebol). Columns 4 and 5 report results for samples partitioned by *Direct Own*. Column 3 reports results for the sample of chaebol firms with the family's direct stake lower than or equal to the sample median; column 5 reports results for firms with *Direct Own* greater than the sample median. All specifications include industry-, group-, and time-fixed effects and a set of firm-level control variables: *ROA*, *Log Market-cap*, *Log Leverage*, *Returns*, *Ultimate Ownership*, *Control*, and *VR*. Accounting and financial variables are defined in Appendix B. Variables related to group structure and ownership are defined in Section 2.. Standard errors, clustered at the firm and group-year levels, are reported in parentheses. Significance levels are indicated by *, **, and *** for 10%, 5%, and 1% respectively.

	Sample				
	All	Lower in Group	Higher in Group	Low Direct Own	High Direct Own
	(1) Forward CAR	(2) Forward CAR	(3) Forward CAR	(4) Forward CAR	(5) Forward CAR
Removal Fraction × Forward SUE	0.592**	1.162***	-0.157	1.107***	0.070
	(0.29)	(0.25)	(0.84)	(0.37)	(0.72)
Forward SUE	0.029	0.012	0.045	0.014	0.059
	(0.02)	(0.01)	(0.04)	(0.02)	(0.04)
Removal Fraction	0.062*	0.099	0.075	0.157	0.059
	(0.03)	(0.08)	(0.05)	(0.10)	(0.04)
Centrality	-0.005	-0.053	-0.003	-0.078*	0.015
	(0.01)	(0.05)	(0.02)	(0.04)	(0.02)
Ultimate Ownership	0.002	0.015	0.007	-0.076	-0.024
	(0.01)	(0.05)	(0.02)	(0.05)	(0.02)
Control	-0.012*	-0.029	-0.010	-0.021	-0.006
	(0.01)	(0.02)	(0.01)	(0.02)	(0.01)
VR	-0.010	0.037	-0.015	0.024	0.007
	(0.01)	(0.05)	(0.03)	(0.04)	(0.02)
ROA	0.034	-0.036	0.045	0.023	-0.020
	(0.04)	(0.06)	(0.06)	(0.05)	(0.08)
Log Market-cap	-0.000	0.005*	-0.003	0.000	-0.002
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Log Leverage	0.008	0.017	0.023	0.045	-0.017
	(0.02)	(0.03)	(0.03)	(0.03)	(0.04)
Returns	-0.011**	-0.020***	-0.008	-0.013*	-0.008
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Industry FE	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes
Group FE	Yes	Yes	Yes	Yes	Yes
Observations	699	234	459	326	365
R-sq	0.0374	0.0386	0.0386	0.0171	0.0378

Table 4. Valuation Effects of Governance Transparency: Tobin's Q

Table 4 reports the results of regressions that test the effect of group structure simplification on the valuation of non-loop firms in which incentive conflicts are more difficult to observe ("high-incentive-uncertainty" firms): those located lower in the group (*Position* greater than the sample median) or had lower direct ownership (*Direct Own* less than the sample median). The sample excludes all firms that either had loops removed or were part of a loop. The dependent variable in all columns is *Forward Q*. The main variable of interest, *Removal Fraction*, is measured at the group-year level and defined as the fraction of group firms in a year that had loops removed. Columns 1 and 2 examine the sample of all the high-incentive-uncertainty firms. Columns 3 and 4 report results for the subsample of high-incentive-uncertainty firms with lower *Separation* and thus lower conflicts of interest (Low Separation); columns 5 and 6 report results for the subsample of high-incentive-uncertainty firms with higher *Separation* and thus higher conflicts of interest (High Separation). All specifications include industry-, group-, and time-fixed effects as well as a set of firm-level control variables: *Centrality*, *ROA*, *Log Market-cap*, *Log Leverage*, *Returns*, *Ultimate Ownership*, *Control*, and *VR*. Accounting and financial variables are defined in Appendix B. Variables related to group structure and ownership are defined in Section 2. Standard errors, clustered at the firm and group-year level, are reported in parentheses. Significance levels are indicated by *, **, and *** for 10%, 5%, and 1% respectively.

	Sample					
	All Firms		Low Separation		High Separation	
	Lower in Group	Low Direct Own	Lower in Group	Low Direct Own	Lower in Group	Low Direct Own
	(1) Forward Q	(2) Forward Q	(3) Forward Q	(4) Forward Q	(5) Forward Q	(6) Forward Q
Removal Fraction	0.521	0.337	2.507**	2.438**	-1.256*	-1.233
	(0.38)	(0.43)	(1.09)	(1.05)	(0.67)	(0.95)
Centrality	0.254	0.201	-0.162	0.471	-0.132	-0.638
	(0.41)	(0.69)	(0.78)	(0.56)	(0.34)	(0.68)
Ultimate Ownership	-0.613	0.353	1.774	2.536*	0.205	0.825
	(1.00)	(0.95)	(2.23)	(1.38)	(0.47)	(0.93)
Control	-0.034	-0.018	0.000	0.000	-0.122	-0.206
	(0.23)	(0.21)	(0.00)	(0.00)	(0.24)	(0.20)
VR	-0.141	-0.253	-14.186***	-9.244***	0.139	0.014
	(0.46)	(0.42)	(4.68)	(2.80)	(0.54)	(0.58)
ROA	0.009	0.983	-1.011	0.168	1.099	1.547
	(0.78)	(1.12)	(0.77)	(0.61)	(1.07)	(1.58)
Log Market-cap	-0.065	-0.001	-0.098	-0.095	0.009	0.038
	(0.05)	(0.05)	(0.06)	(0.06)	(0.07)	(0.06)
Log Leverage	-0.368	-0.462	-0.446	-0.341	-0.127	-0.099
	(0.40)	(0.39)	(0.48)	(0.45)	(0.66)	(0.50)
Returns	0.301***	0.215**	-0.049	-0.083	0.389***	0.295**
	(0.11)	(0.09)	(0.19)	(0.17)	(0.11)	(0.12)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Group FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	497	666	177	235	315	425
R-sq	0.4856	0.4904	0.6204	0.5838	0.5211	0.6054

Table 5. Valuation Effects of Governance Transparency: "Stand-Alone" Tobin's Q

Table 5 reports the results of regressions that test the effect of group structure simplification on the valuation of non-loop firms in which incentive conflicts are more difficult to observe ("high-incentive-uncertainty" firms): those located lower in the group (*Position* greater than the sample median) or had lower direct ownership (*Direct Own* less than the sample median). The sample excludes all firms that either had loops removed or were part of a loop. The dependent variable in all columns is *Forward Q**, where Q^* is a firm's stand-alone Tobin's Q, computed following Almeida et al. (2011). The main variable of interest, *Removal Fraction*, is measured at the group-year level and defined as the fraction of group firms in a year that had loops removed. Columns 1 and 2 examine the sample of all the high-incentive-uncertainty firms. Columns 3 and 4 report results for the subsample of high-incentive-uncertainty firms with lower *Separation* and thus lower conflicts of interest (Low Separation); columns 5 and 6 report results for the subsample of high-incentive-uncertainty firms with higher *Separation* and thus higher conflicts of interest (High Separation). All specifications include industry-, group-, and time-fixed effects as well as a set of firm-level control variables: *Centrality*, *ROA*, *Log Market-cap*, *Log Leverage*, *Returns*, *Ultimate Ownership*, *Control*, and *VR*. Accounting and financial variables are defined in Appendix B. Variables related to group structure and ownership are defined in Section 2.. Standard errors, clustered at the firm and group-year level, are reported in parentheses. Significance levels are indicated by *, **, and *** for 10%, 5%, and 1% respectively.

	Sample					
	All Firms		Low Separation		High Separation	
	Lower in Group	Low Direct Own	Lower in Group	Low Direct Own	Lower in Group	Low Direct Own
	(1) Forward Q^*	(2) Forward Q^*	(3) Forward Q^*	(4) Forward Q^*	(5) Forward Q^*	(6) Forward Q^*
Removal Fraction	0.195	0.000	1.649*	1.627*	-1.305**	-1.451**
	(0.22)	(0.15)	(0.98)	(0.95)	(0.62)	(0.66)
Centrality	0.527	0.407	0.916	1.247*	0.485	0.408
	(0.70)	(0.83)	(0.89)	(0.63)	(0.44)	(0.46)
Ultimate Ownership	-0.492	0.419	1.594	2.479*	0.151	0.703
	(1.12)	(1.04)	(2.07)	(1.25)	(0.30)	(0.54)
Control	0.071	0.010	0.000	0.000	-0.221**	-0.204*
	(0.28)	(0.24)	(0.00)	(0.00)	(0.09)	(0.11)
VR	-0.183	-0.159	-14.415***	-11.170***	-0.412*	-0.569*
	(0.53)	(0.47)	(4.52)	(3.62)	(0.22)	(0.29)
ROA	0.040	1.032	-0.724	0.437	0.763	1.294
	(0.89)	(1.17)	(0.97)	(0.80)	(0.80)	(1.15)
Log Market-cap	-0.040	0.028	-0.082	-0.075	-0.018	0.010
	(0.06)	(0.05)	(0.07)	(0.06)	(0.03)	(0.03)
Log Leverage	-0.771*	-0.867**	-0.946**	-0.825*	0.060	0.182
	(0.44)	(0.44)	(0.46)	(0.47)	(0.35)	(0.30)
Returns	0.306**	0.219*	-0.118	-0.129	0.197***	0.147**
	(0.14)	(0.11)	(0.21)	(0.19)	(0.06)	(0.06)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Group FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	479	650	170	226	305	417
R-sq	0.4576	0.4866	0.6035	0.5831	0.4971	0.6089

Table 6. LTE Expectations

Table 6 reports the results of regressions that test the effect of group structure simplification on analysts' long-term earnings expectations of non-loop firms in which incentive conflicts are more difficult to observe ("high-incentive-uncertainty" firms): those located lower in the group (*Position* greater than the sample median) or had lower direct ownership (*Direct Own* less than the sample median). The sample excludes all firms that either had loops removed or were part of a loop. The dependent variable in all columns is *Forward LTE Expectations*. The main variable of interest, *Removal Fraction*, is measured at the group-year level and defined as the fraction of group firms in a year that had loops removed. Columns 1 and 2 examine the sample of all the high-incentive-uncertainty firms. Columns 3 and 4 report results for the subsample of high-incentive-uncertainty firms with lower *Separation* and thus lower conflicts of interest (Low Separation); columns 5 and 6 report results for the subsample of high-incentive-uncertainty firms with higher *Separation* and thus higher conflicts of interest (High Separation). All specifications include industry-, group-, and time-fixed effects as well as a set of firm-level control variables: *Centrality*, *ROA*, *Log Market-cap*, *Log Leverage*, *Returns*, *Ultimate Ownership*, *Control*, and *VR*. Accounting and financial variables are defined in Appendix B. Variables related to group structure and ownership are defined in Section 2.. Standard errors, clustered at the firm and group-year level, are reported in parentheses. Significance levels are indicated by *, **, and *** for 10%, 5%, and 1% respectively.

	Sample					
	All Firms		Low Separation		High Separation	
	Lower in Group	Low Direct Own	Lower in Group	Low Direct Own	Lower in Group	Low Direct Own
	(1) Forward LTE Expectations	(2) Forward LTE Expectations	(3) Forward LTE Expectations	(4) Forward LTE Expectations	(5) Forward LTE Expectations	(6) Forward LTE Expectations
Removal Fraction	-0.364	-0.441	1.886**	0.452	-0.369	-0.532
	(0.43)	(0.43)	(0.90)	(0.35)	(0.44)	(0.53)
Centrality	0.160	0.004	0.067	-0.119	0.197	0.102
	(0.18)	(0.19)	(0.39)	(0.27)	(0.19)	(0.22)
Ultimate Ownership	-0.043	0.045	0.664	0.014	0.119	-0.032
	(0.17)	(0.19)	(1.11)	(0.16)	(0.23)	(0.28)
Control	0.020	-0.002	0.000	0.000	0.057	0.010
	(0.04)	(0.03)	(0.00)	(0.00)	(0.04)	(0.04)
VR	-0.063	-0.023	-0.135	-2.325	-0.228*	-0.068
	(0.08)	(0.09)	(5.07)	(10.44)	(0.13)	(0.10)
ROA	0.415	0.544**	0.264	0.404	0.424	0.513
	(0.27)	(0.25)	(0.28)	(0.28)	(0.43)	(0.34)
Log Market-cap	-0.012	-0.012	-0.027	-0.005	-0.032*	-0.020**
	(0.01)	(0.01)	(0.02)	(0.01)	(0.02)	(0.01)
Log Leverage	0.176	0.097	-0.219	-0.146	0.393*	0.234
	(0.17)	(0.12)	(0.19)	(0.16)	(0.22)	(0.16)
Returns	0.091***	0.086***	0.084*	0.062*	0.110**	0.102**
	(0.03)	(0.03)	(0.04)	(0.03)	(0.05)	(0.04)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Group FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	272	378	86	119	185	258
R-sq	0.3011	0.3109	0.4090	0.4270	0.3441	0.3234

Table 7. Robustness: Separation and Control

Table 7 reports the results of regressions that test the effect of group structure simplification on measures relating to the family's incentives in non-loop firms in which incentive conflicts are more difficult to observe ("high-incentive-uncertainty" firms): those located lower in the group (*Position* greater than the sample median) or had lower direct ownership (*Direct Own* less than the sample median). The sample excludes all firms that either had loops removed or were part of a loop. The dependent variable in all columns in Panel A is *Forward Separation* and in Panel B is *Forward Control*. The main variable of interest, *Removal Fraction*, is measured at the group-year level and defined as the fraction of group firms in a year that had loops removed. Columns 1 and 2 report results for the subsample of high-incentive-uncertainty firms with lower *Separation* and thus lower conflicts of interest (Low Separation); columns 3 and 4 report results for the subsample of high-incentive-uncertainty firms with higher *Separation* and thus higher conflicts of interest (High Separation). All specifications include industry-, group-, and time-fixed effects as well as a set of firm-level control variables: *Centrality*, *ROA*, *Log Market-cap*, *Log Leverage*, *Returns*, *Ultimate Ownership*, *Control*, and *VR*. Accounting and financial variables are defined in Appendix B. Variables related to group structure and ownership are defined in Section 2.. Standard errors, clustered at the firm and group-year level, are reported in parentheses. Significance levels are indicated by *, **, and *** for 10%, 5%, and 1% respectively.

Panel A: Separation

	Sample			
	Low Separation		High Separation	
	Lower in Group	Low Direct Own	Lower in Group	Low Direct Own
	(1) Forward Separation	(2) Forward Separation	(3) Forward Separation	(4) Forward Separation
Removal Fraction	-0.041 (0.29)	-0.092 (0.27)	0.214 (0.18)	0.179 (0.25)
Industry FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Group FE	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
Observations	164	214	303	409
R-sq	0.2931	0.5004	0.6909	0.6454

Panel B: Control

	Sample			
	Low Separation		High Separation	
	Lower in Group	Low Direct Own	Lower in Group	Low Direct Own
	(1) Forward Control	(2) Forward Control	(3) Forward Control	(4) Forward Control
Removal Fraction	-0.028 (0.59)	-0.126 (0.57)	0.303 (0.34)	0.322 (0.54)
Industry FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Group FE	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
Observations	164	214	303	409
R-sq	0.5149	0.8219	0.7847	0.6795

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Table 8. Robustness: Related Party Transactions and Profitability

Table 8 reports the results of regressions that test the effect of group structure simplification on measures relating to consequences of expropriation in non-loop firms in which incentive conflicts are more difficult to observe ("high-incentive-uncertainty" firms): those located lower in the group (*Position* greater than the sample median) or had lower direct ownership (*Direct Own* less than the sample median). The sample excludes all firms that either had loops removed or were part of a loop. The dependent variable in all columns in Panel A is *Forward Net RPT* and in Panel B is *Forward ROA*. The main variable of interest, *Removal Fraction*, is measured at the group-year level and defined as the fraction of group firms in a year that had loops removed. Columns 1 and 2 report results for the subsample of high-incentive-uncertainty firms with lower *Separation* and thus lower conflicts of interest (Low Separation); columns 3 and 4 report results for the subsample of high-incentive-uncertainty firms with higher *Separation* and thus higher conflicts of interest (High Separation). All specifications include industry-, group-, and time-fixed effects as well as a set of firm-level control variables: *Centrality*, *ROA*, *Log Market-cap*, *Log Leverage*, *Returns*, *Ultimate Ownership*, *Control*, and *VR*. Accounting and financial variables are defined in Appendix B. Variables related to group structure and ownership are defined in Section 2.. Standard errors, clustered at the firm and group-year level, are reported in parentheses. Significance levels are indicated by *, **, and *** for 10%, 5%, and 1% respectively.

Panel A: Net Related Party Transactions

	Sample			
	Low Separation		High Separation	
	Lower in Group	Low Direct Own	Lower in Group	Low Direct Own
	(1) Forward Net RPT	(2) Forward Net RPT	(3) Forward Net RPT	(4) Forward Net RPT
Removal Fraction	0.006	0.092	0.653	0.136
	(0.39)	(0.28)	(0.44)	(0.65)
Industry FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Group FE	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
Observations	104	142	219	304
R-sq	0.7874	0.6450	0.4541	0.4559

Panel B: Return on Assets

	Sample			
	Low Separation		High Separation	
	Lower in Group	Low Direct Own	Lower in Group	Low Direct Own
	(1) Forward ROA	(2) Forward ROA	(3) Forward ROA	(4) Forward ROA
Removal Fraction	-0.154	-0.037	-0.227	-0.274
	(0.11)	(0.08)	(0.22)	(0.24)
Industry FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Group FE	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
Observations	177	235	315	425
R-sq	0.3790	0.3940	0.5423	0.6057

Table 9. Robustness: Valuation Effects of Governance Transparency (No Equity Transactions Subsample)

Table 9 reports the results of regressions that test the effect of group structure simplification on the valuation of non-loop firms in which incentive conflicts are more difficult to observe ("high-incentive-uncertainty" firms): those located lower in the group (*Position* greater than the sample median) or had lower direct ownership (*Direct Own* less than the sample median). The sample excludes all firms that either had loops removed or were part of a loop and firms that experienced more than a 5% change in the ratio of treasury shares to total outstanding shares. The dependent variable in all columns is *Forward Q*. The main variable of interest, *Removal Fraction*, is measured at the group-year level and defined as the fraction of group firms in a year that had loops removed. Columns 1 and 2 examine the sample of all the high-incentive-uncertainty firms. Columns 3 and 4 report results for the subsample of high-incentive-uncertainty firms with lower *Separation* and thus lower conflicts of interest (Low Separation); columns 5 and 6 report results for the subsample of high-incentive-uncertainty firms with higher *Separation* and thus higher conflicts of interest (High Separation). All specifications include industry-, group-, and time-fixed effects as well as a set of firm-level control variables: *Centrality*, *ROA*, *Log Market-cap*, *Log Leverage*, *Returns*, *Ultimate Ownership*, *Control*, and *VR*. Accounting and financial variables are defined in Appendix B. Variables related to group structure and ownership are defined in Section 2.. Standard errors, clustered at the firm and group-year level, are reported in parentheses. Significance levels are indicated by *, **, and *** for 10%, 5%, and 1% respectively.

	Sample					
	All Firms		Low Separation		High Separation	
	Lower in Group	Low Direct Own	Lower in Group	Low Direct Own	Lower in Group	Low Direct Own
	(1) Forward Q	(2) Forward Q	(3) Forward Q	(4) Forward Q	(5) Forward Q	(6) Forward Q
Removal Fraction	0.883	0.324	3.540**	2.802***	-0.775	-0.840
	(0.67)	(0.61)	(1.48)	(1.05)	(0.94)	(1.37)
Centrality	0.059	0.261	-1.342**	-0.263	-0.073	-0.603
	(0.35)	(0.72)	(0.54)	(0.73)	(0.40)	(0.80)
Ultimate Ownership	-0.355	0.564	3.414	2.999*	0.386	1.249
	(1.09)	(1.15)	(2.54)	(1.65)	(0.51)	(1.08)
Control	-0.033	-0.057	0.000	0.000	-0.194	-0.288
	(0.25)	(0.24)	(0.00)	(0.00)	(0.26)	(0.23)
VR	-0.188	-0.262	0.738	-4.709**	0.313	0.061
	(0.49)	(0.48)	(3.29)	(2.11)	(0.65)	(0.66)
ROA	-0.396	0.958	-1.682+	-0.365	0.700	1.464
	(0.84)	(1.28)	(1.01)	(0.83)	(1.14)	(1.87)
Log Market-cap	-0.073	0.006	-0.085	-0.074	0.032	0.059
	(0.06)	(0.05)	(0.07)	(0.07)	(0.09)	(0.06)
Log Leverage	-0.352	-0.564	-0.189	-0.555	-0.238	-0.226
	(0.42)	(0.41)	(0.48)	(0.48)	(0.77)	(0.57)
Returns	0.309***	0.202**	0.072	-0.015	0.362***	0.241**
	(0.11)	(0.09)	(0.13)	(0.13)	(0.12)	(0.12)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Group FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	437	576	161	208	269	361
R-sq	0.4948	0.4709	0.6747	0.6208	0.5596	0.6086