Transfer of Control and Ownership Structure in Family Firms

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Abstract

This paper documents a novel channel of transfer of control in family firms. I provide evidence, from a natural experiment, that avoiding inheritance tax is the main motivation behind intra-group mergers. Due to tax reform that increases personal inheritance taxes by 25 percentage points, the difference of intra-group merger activities between firms burdened by a high and low personal inheritance tax is three times more likely to increase during post tax-reform period. This result suggests that firms with heavy inheritance tax burdens acquire smaller affiliates owned by the heirs. This way, heirs convert target shares to acquirer shares while avoiding inheritance tax. Among high tax burden firms, intra-group mergers are concentrated in "central firms" within a circular ownership chain allowing the heirs to consolidate their indirect control over the entire business. Because of these mergers, the ownership network among affiliates becomes distorted as central firms expand their boundaries in unnatural ways. Heirs do manage to avoid inheritance taxes, but minority shareholders suffer losses from these tax-motivated mergers that appear to have few operational synergies.

Keywords: Succession Tax, Intra-group Merger, Family Firm, Transfer of Control, Ownership Structure
JEL Codes: G30, G32, G34

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1   Introduction

"In exchange for these financial contributions, prosecutors say, Ms. Choi colluded with Ms. Park to ensure government backing for several deals, most notably a controversial merger of two Samsung affiliates in 2015 that helped Mr. Lee consolidate his hold over Samsung Electronics. The merger changed Samsung's intricate cross-holding structure and, prosecutors said, allowed Mr. Lee to avoid a steep inheritance-tax bill as he sought to succeed his father at the top of the conglomerate." (*Wall Street Journal*, August 25, 2017)[1]

Family firms compose more than 80% of firms worldwide[2], and succession is the preeminent issue that determines the fate of those firms. Only 30% of family firms last into a second generation, 12% remain viable into a third, and 3% operate into a fourth generation or beyond (Family Firm Institute). Reflecting its importance in the family firms, succession has attracted attention in the recent literature[3]. Despite succession being studied from many angles, detailed evidence on the effect of personal inheritance tax is not studied much in the literature. The implication of different transfer of control processes on these family firms is also understudied.

I fill this gap by studying a particular channel of transfer of control, intra-group mergers. The heirs are exposed to ownership dilution risk due to heavy inheritance taxes when they transfer control through ownership inheritance. Thus, the controlling family is incentivized to use

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[1] Eun-Young Jeong, "Samsung Heir Lee Jae-yong Convicted of Bribery, Gets Five Years in Jail." *Wall Street Journal*, August 25, 2017. Instead of intragroup merger, what if Mr. Lee tried to inherit his father's ownership stake in Samsung Electronics directly, he was expected to pay 2.8 billion dollars (=$165 billion dollars (market value of Samsung Electronics at the end of 2014) × 3.4% (chairman Lee's share) × 50% (inheritance tax rate)) in inheritance tax. Intra-group merger between two Samsung's group affiliates is detailed in Appendix B.

[2] Chase Peterson-Withorn, "New Report Reveals The 500 Largest Family-Owned Companies In The World." Forbes, April 20, 2015.

[3] Perez-Gonzalez (2006) and Bennedsen, Nielsen, Perez-Gonzalez, and Wolfenzon (2007) document that family CEOs perform worse than non-family CEOs. Mehrotra, Morck, Shim, and Wiwattanakantang (2013) also show that non-consanguineous-heir-run firms outperform heir-run and professional-manager-run firms. Bunkanwanicha, Fan, and Wiwattanakantang (2013) show that a network marriage between a controlling family member and a member of a prominent business or political family is followed by increasing stock prices. Tsoutsoura (2015) shows the impact of succession taxes on firm investment decisions and transfer of control. Lee, Shin, and Yun (2016) shows the impact of succession tournaments on risk-taking in family firms.

tax minimizing succession vehicles to ensure the heirs preserve sufficient control over the entire business group. A common tax saving strategy to avoid taxes during transfer of control in business groups is firms with heavy inheritance tax burdens acquire smaller affiliates owned by the heirs. Then, heirs convert target shares to acquirer shares. Through this intra-group merger, they can obtain large controlling stakes in a key strategic firm owned by the controlling family while avoiding inheritance tax.

I provide causal evidence, from a natural experiment, that avoiding inheritance tax is the main motivation behind intra-group mergers. For this natural experiment, Korea's major tax reform initiative undertaken in 1999, which suddenly increased the maximum personal inheritance tax rate by 25 percentage points during the post-tax-reform period, was exploited. Given the raised inheritance tax burden, I examine how firms responded by transferring control shares based on difference-in-differences (DiD) estimations. Specifically, I compare how firms with high and low expected tax burden prior to the 1999 tax reform transferred control shares via intra-group mergers upon this personal tax shock right after the Asian financial crisis. This is necessary to examine because in doing so we can come to understand the change in controlling family's inheritance tax saving benefit and relevant transaction cost of undergoing an intra-group merger, and how the overall ownership structure of family firm is rebalanced through this process.

Using 2,422 firm-year observations from the top 24 largest Korean chaebols[4] from 1997 to 2004 (sample years), I first document a pattern of unusual surges in intra-group mergers with

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[4] This family-owned large business conglomerates in Korea are generally called 'chaebol'. I empirically test based on Korean chaebol data because Korean chaebols have reported highly detailed inter-firm ownership information among their affiliates to Korean Fair Trade Commission since mid-1990s. Public access to this sort of information is limited in most countries, but available in South Korea. That is why I use Korean data. However, the story in my

high personal tax burdens. Next, using 1999 personal tax reform, I estimate the causal impact of the expected inheritance tax burden on intra-group merger waves. The result shows that the difference of intra-group merger activities between firms burdened by a high and low personal inheritance tax is three times more likely to increase upon this personal inheritance tax shock. I also find that among the firms with high tax burdens, intra-group mergers are concentrated in: 1) central firms[5], 2) firms located in the upper layer of the pyramid, and 3) firms within a circular ownership chain, i.e., the firms where the heirs can consolidate their indirect control over the entire business group. This result emphasizes that the ownership network of group affiliates determines the firms that initiate intra-group mergers among the firms with heavy inheritance tax burdens. I also find that this pattern is not relevant when it comes to non-intra-group merger activities.

To further identify the causal linkage that heavy inheritance tax burden leads to intra-group merger activities in pyramidal business groups, I test to see whether a reduction in personal tax burdens decreases intra-group merger activities. I find that intra-group mergers are rarely pursued by firms with heavy inheritance tax burdens that are indirectly owned by private foundations that are exempt from gift taxes. Finally, a difference-in-difference-in-differences (DiDiD) estimation of Korea's 1999 major tax reform drive confirms that unusual surges in intra-group mergers are primarily for tax arbitrage between ownership inheritance and intra-

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paper is never limited to Korea. Any family firm has such incentive to use tax minimizing succession strategy. Prior literature shows that controlling families siphon resources out of member firms for their private benefit. Similar personal tax saving effects implemented for the controlling family's benefit is likely to be observed in many alternative institutional contexts. For example, Asian casino king Stanley Ho implemented similar intra-group transactions to avoid inheritance tax.

[5] These companies are connected to many other member firms in the web of ownership, so that the controlling family can indirectly control affiliated firms through these key strategic firms in a pyramidal business group. Following Almeida et al. (2012), the centrality of firm i is measured as the average percentage difference in control rights of the controlling family across all group member firms except the firm itself after excluding a specific firm i from the group. Herein I refer to those firms with a high value of centrality as central firms.

group mergers. I also confirm that this sudden increase in intra-group mergers after tax reforms is not a consequence of the Asian financial crisis, either through the sudden shrinkage in the market value of Korea's capital market during the pre-crisis era or the post-crisis restructuring effect.

Then I investigate the channel of ownership re-allocation by identifying characteristics of target firms relating to intra-group merger activities. I find that the heirs of chaebol families receive high level of dividends from their private firms where they already have large ownership stakes; these firms become the targets of intra-group mergers. Heirs can take these dividends because they have substantial voting rights, with which they can determine the corporate policy in those merger target firms. Thus, they prefer short-term wealth gains over long-term investment commitments. The same behavior is not necessarily seen in the male relatives in the current chair's generation, for whom the succession process is officially over. Overall, these results suggest that, to avoid inheritance tax burdens, the heirs might first prefer to own private firms where they can cash out corporate resources quickly, then try to reallocate their ownership to the central firms by expanding firm boundaries through intra-group mergers.

While the heirs of the controlling family are likely to benefit from such reshuffling, the ownership network within the business group becomes further distorted as central firms expand their boundaries with additional circular shareholding links. The minority shareholders suffer losses from these tax-motivated mergers that have few operational synergies. For instance, upon the announcement of an intra-group merger, the two-day cumulative abnormal return dropped 35.8% more compared to non-intra-group mergers. Overall, this new piece of evidence supports the tunneling hypothesis.

This paper is related to several strands of the literature. This paper contributes to the firm boundaries literature by providing a novel inheritance tax channel that reshapes firm boundaries other than hold up problems. Following Coase (1937), who argues that transaction costs define the boundaries of the firm, a large body of work has focused on transaction costs. Property rights theory (Grossman and Hart 1986, Hart and Moore 1990, Hart 1995) argues that the boundaries of the firm are responsive to solving hold-up problems. Recent empirical work shows that expanding a firm's boundaries can help it overcome incentive problems (Robinson 2008). Other studies also demonstrate how firm boundaries affect their R&D activities (Seru 2014) and business performance (Mullainathan and Scharfstein 2001, Beshears 2013). However, Zingales (2000) raises a key criticism: the firms that were the basis of those theories were the traditional business corporations that emerged in the 20th century. The boundaries of the firm constantly change as human capital, not physical assets, increasingly determines a firm's boundaries and thus the success of firms. Still, Korean chaebols, which are asset intensive, highly vertically integrated, and hold a tight, hierarchical control over their employees, are sufficiently similar to 20th century firms that these theories do apply.

This paper also contributes to the literature on the effect of taxes on firms. The prior studies mainly emphasize the effects of corporate income taxes. Early studies focus on the effects of taxes on the right-hand side of the balance sheet, such as capital structure (Modigliani and Miller 1958, Miller 1963 and 1988) or dividend policy (Bradford 1981, Auerbach 1979, King 1974). More recent studies on tax effects explore topics such as the effects of the tax reforms on organizational forms (Desai and Hines 1999, Desai, Foley, and Hines 2004), or the effects of inheritance taxes (Tsoutsoura 2015). My paper connects these two recent works by deeper exploring the ownership networks among group affiliates as a key component of

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inheritance tax channels that initiates intra-group mergers among the firms with heavy inheritance taxes, through which the ownership network of a business group would be manifested.

Finally, this paper concerns merger waves. The previous literature explains that merger waves result from industry shocks as a means to improve allocative efficiency (Gort 1969, Mitchell and Mulherin 1996, Maksimovic and Phillips 2001, Harford 2005, Eisfeldt and Rampini 2006). Other studies find the cause of merger waves in market misevaluation. Shleifer and Vishny (2003) and Rhodes-Kropf and Viswanathan (2004) argue that merger waves are driven by the managerial timing of market overvaluation of firms. In addition, Ahern and Harford (2014) find that industry level network structure leads the formation and propagation of merger waves. I contribute to the literature by documenting a new kind of merger wave that stems from tax-motivated intra-group mergers. The presence of heavy tax burdens and the risk of ownership dilution encourage the controlling families of Korean chaebols to find alternative methods of business succession.

This paper is organized as follows: in Section 2, I introduce institutional background on inheritance tax reform and prediction. Section 3 contains a description of the data and sample summary statistics. Section 4 discusses the main result and the result analysis, and Section 5 concludes the paper.

2   Background

2.1   1999 Inheritance Tax Reform

Korea's inheritance tax laws and gift tax laws were first legislated in March and April of 1950, respectively. In November 1952, gift tax law was incorporated into inheritance tax law. In 1950, when the Inheritance Tax Act was first crafted, the system was progressive taxation, with 15 tax brackets and tax rates ranging from a minimum of 20% to a maximum of 90%. In the 1970s, the highest marginal tax rate remained high, at 75%, and these high rates of taxes brought about strong resistance among taxpayers, resulting in tax evasion. Over time, as the Korean economy grew more sophisticated, the inheritance laws were amended. In the 1980s, tax brackets decreased and tax rates were cut, and then, in the 1990s, various types of tax allowances were increased to help reduce the tax burden. The government gradually reduced the inheritance and gift tax rates to 67% in 1980 and finally to 40% in 1996, the lowest in history, while maintaining the business premium tax rate at 10%. Then, in 1996, the name of the law was officially changed to the Inheritance Tax and Gift Tax Act. As shown in Table 1, the cap of the inheritance tax rate was 55%, with 45% arising from the inheritance tax rate and 10% from the business premium tax, in 1997-1999, right before the tax reform.

[Table 1 around here]

However, this overall trend of decreasing inheritance tax rates suddenly shifted after the 1997-1998 Asian financial crisis. Soon after the first repayment of the IMF Supplemental Reserve Facility (SRF) in December 1998, President Kim announced special tax reform initiatives on the nation's Independence Day, 15th August 1999, laying out policy guidelines to prevent the tax-free inheritance of wealth. The tax reform initiative, driven by the President himself, lead to the adoption of a higher inheritance tax rate from the beginning of the year 2000[6].

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[6] The gap between the reform's announcement and implementation is only three and half months. I find only four cases that the portion of family's ownership decreased during this period. After excluding these firms, the results are
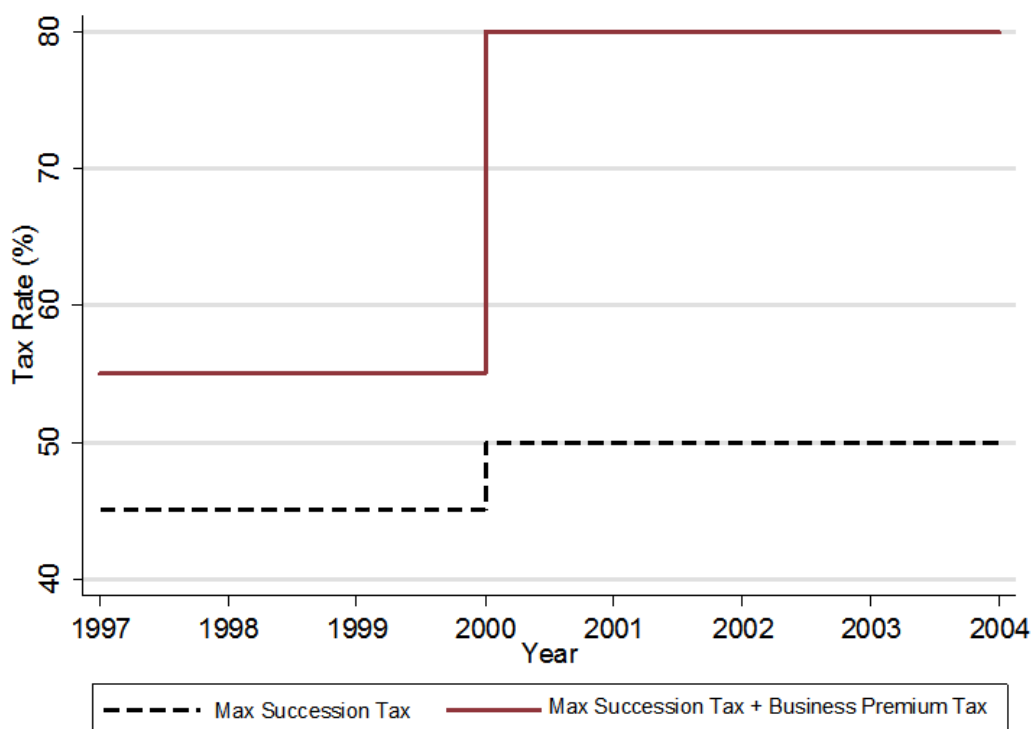
Figure 1: Tax Reform and the Maximum Succession Tax Rate

This figure summarizes the maximum succession tax rate and business premium tax rate in Korea before and after tax reforms. The full line represents the cap of the succession tax rate, and the gap between the full line and the dotted line represents the maximum business premium tax rate. The cap of the succession tax rate was as low as 45% from 1997-1999, with a constant 10% business premium tax. In 1999, right after the Asian financial crisis, the government undertook tax reform initiatives, laying out policy guidelines for "preventing tax-free inheritance of wealth," and, accordingly, in 2000 it began to apply a maximum succession tax rate of 80%, 50% of which comes from the succession tax rate and 30% from the business premium tax rate, which is the highest among OECD economies.

Accordingly, the threshold of the tax bracket subject to the marginal tax rate was lowered from five billion KRW to three billion KRW, and a maximum inheritance tax rate of 80%, composed of 50% from the inheritance tax rate and 30% from the business premium tax rate, was put in place from 2000; this is one of the highest inheritance tax rates among OECD economies[7]. In

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robust, so we don't need to worry about the early inheritance of ownership right before this temporal shock. Overall this tax shock was unexpected and inheritance tax specific shock.

[7] The U.K. and France have a maximum tax rate of 40% and the U.S. and Germany impose a top rate of 35% and 30%, respectively. As skepticism about inheritance taxes began to surface in the late 1970s, many countries, including Canada, Australia, New Zealand, Italy, Portugal, and Sweden, abolished inheritance taxes altogether. In place of inheritance taxes, a form of taxation on capital gains is becoming the norm.

2002, the government sought to remove tax loopholes to prevent high-net-worth individuals from engaging in irregular succession and donation of wealth; the government expanded the coverage of irregular succession practices to include recapitalization or capital reduction. It also streamlined the securities evaluation system, as the share of financial assets among the total inherited or donated property was steadily increasing. In 2003, with a view to expand the scope of inheritance and gift taxes, the government shifted the tax regime from the negative system to the positive system.

As indicated in Figure 1, the major tax reform undertaken in 1999 applies a new tax rate that is 25 percentage points higher than that of the pre-reform period. If firms had anticipated the move with enough time to prepare, family firms would have implemented business succession and inheritance of family wealth before the tax reform to avoid the higher tax rates. However, with the tax reform in full swing and strong regulations in place in the wake of the financial crisis, only a very limited number of within-family transfers were observed in the sample year of 1999.

2.2   Tax Arbitrage and Prediction

Figure 2 shows the typical three-layer pyramidal structure of a Korean business group from Almeida et al (2012). A tax arbitrage opportunity exists between ownership inheritance (Scenario 1) and intra-group mergers (Scenario 2) in pyramidal business groups due to the different tax rates applied in each scenario.

In Figure 2, the controlling family is the largest shareholder of Firm A, with a 10% stake. An heir of the business group owns Firm C with a 51% stake and Firm H with a 62.5%

Figure 2: Tax Arbitrage Between Inheritance and Merging in Pyramids

This figure shows the arbitrage opportunity between ownership inheritance (Scenario 1) and intra-group mergers (Scenario 2) in pyramid business groups due to different tax rates applied in each scenario. The full arrows represent the ownership flow of a business group, while dotted arrows represent the newly created post-merger ownership flow. The dotted box represents the new firm created from the intra-group merger. The controlling family is the largest shareholder of Firm A, with a 10% stake. An heir of the business group owns Firm C with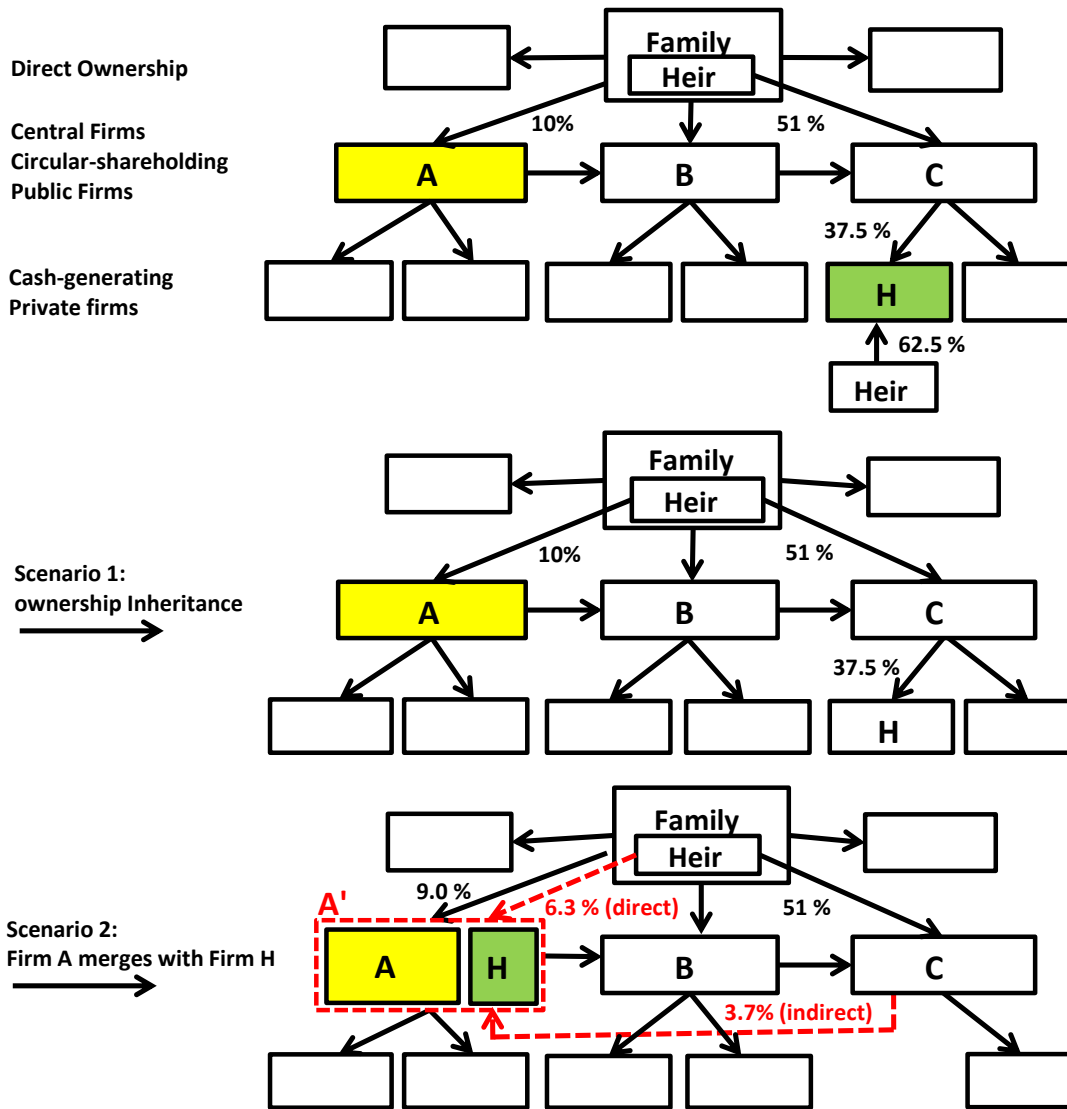 a 51% stake and Firm H with a 62.5% stake. Firm C owns Firm H with a 37.5% stake. The market value of Firm A is $1 billion and that of private Firm H is $112 million. The total inheritance tax rate of Firm A is 70%, composed of 50% from the inheritance tax rate and 20% from the business premium tax rate. In Scenario 1, the heir inherits 10% of Firm A's total stake after paying the $70 million inheritance tax ($1 billion×10%×70%) by selling their ownership in Firm H. In Scenario 2, Firm A merges with Firm H to create a new firm, Firm A', whose market value becomes $1.112 billion. No tax is applied, as there are no gains from the merger. The heir owns Firm A' with a total 10% ownership stake, of which 6.3% ($112 million×62.5%/$1.112 billion×100) is directly owned and 3.7% ($112 million× 37.5%/$1.112 billion×100) is an indirect ownership stake through Firm C. Firm H does not exist anymore, but the heir consolidates his power through additional circular-shareholding (A'→B→C→A'), while the controlling family maintains a 9% ownership stake ($1 billion×10% /$1.112 billion×100) in Firm A'. This figure, describing the pyramid structure, originates from Almeida et al. (2012).

stake. Firm C owns Firm H with a 37.5% stake. The market value of the central Firm A is $1 billion, and that of private Firm H at the bottom of pyramid is $112 million. If the family wants to transfer control over Firm A to the heir, a total of 70% inheritance tax rate is applied[8]. In Scenario 1, the heir inherits 10% of Firm A's total stake after paying the $70 million inheritance tax ($1 billion×10%×70%) by selling ownership in Firm H.

In Scenario 2, Firm A merges with Firm H to create a new Firm A'; this firm's market value becomes $1.112 billion. No tax is applied as there are no gains from the merger. The heir owns Firm A' with a total 10% ownership stake, of which 6.3% ($112 million×62.5%/1.11 billion×100) is directly owned and 3.7% (($112 million×37.5%)/$1.112 billion×100) is indirectly owned through Firm C. Firm H no longer exists, but the heir further inflates their effective ownership in the enlarged Firm A' through additional circular-shareholding (A'→B→C→A'). In brief, the heir has a 10% of control over Firm A and Firm A' respectively in each scenario, while the controlling family only maintains a 9% ownership stake ($1billion×10%/$1.112billion ×100) in Firm A' in scenario 2 with the newly created circular-shareholding.

Based on the tax arbitrage opportunity illustrated in Figure 2, I predict that firms in pyramidal business groups would respond to an inheritance tax burden by expanding the boundaries of firms through intra-group mergers until the benefits of additional ownership accrued to the heirs exceed the associated costs, i.e., the destroyed economic values due to intra-group mergers with no synergy value or governance concerns arising from additional cross-shareholding in the pyramids. I also predict that a reduction in tax burdens would decrease intra-group merger activities. In certain jurisdictions, including Korea, private foundations, such as

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[8] The 70% inheritance tax rate is composed of 50% as the inheritance tax rate and 20% as the business premium tax rate. According to Decree 63-3 of the Inheritance and Gift Tax Act, the business premium tax is applied to the largest shareholder's ownership from 1993.

charitable entities, are exempt from gift taxation and those foundations are often used as a preferred mechanism for succession. When an heir receives control of a foundation that owns family firms, the inheritance tax burden is relieved (Thomsen 1999, Villalonga and Amit 2009). Thus, I expect the firms owned by private foundations to have a reduced tax burden, which in turn means there is less incentive to initiate intra-group mergers.

Prediction 1: Firms burdened by a high (low) personal inheritance tax are more (less) likely to attempt intra-group mergers.

In Scenario 2 of Figure 2, heirs initially own private firms, such as Firm H, that would become merger targets. The heirs can cash out the resources of these firms quickly, as they have substantial holdings and managerial discretion. Eventually these target firms could be merged with the heavy tax burden firms that are directly owned by their parents. Through this channel of resource reallocation via intra-group mergers, the heirs can obtain shares in those heavy tax burden firms without paying inheritance tax. However, not all the firms with heavy tax burden initiate intra-group mergers. The ownership network among group affiliates in a family business group determines the inheritance tax channel that initiates the intra-group merger. To maximize their arbitrage profits by consolidating their indirect control over the entire business, I expect that the heirs' generation will reallocate their funds to accumulate stakes in central firms located in the upper layer of the pyramidal structure within circular shareholding chains.

Prediction 2:

[2-1] *Acquiring firms* should be (a) characterized by high centrality, (b) located in upper layer of the pyramid, and (c) connected to circular shareholding chains.

[2-2] *Target firms* should be characterized by (a) a high ownership stake held by the heirs' generation and (b) managerial myopia.

If an intra-group merger is intended only to meet the controlling family's need to increase the heirs' ownership stake without paying inheritance tax, the acquiring firm's investors who get frustrated with negative synergy gains (Moeller, Schlingemann, and Stulz 2005) from a merger (Morck, Shleifer, and Vishny 1990) initiated to grab an arbitrage opportunity will exit their stocks, and the consequent loss would be thrust on minority shareholders. In the Korean market environment, where the group-controlling family has almost complete control over all affiliated firms, an intra-group merger can take place even if it does not create any synergy value, and challenging a voting agreement via shareholders' meetings is very rare.

Prediction 3: Market responds negatively to the announcement of intra-group mergers.

3   Data

The main sample of our study consists of 2,422 family firms from the 24 largest business groups (controlled by 16 chaebol families) from 1997 to 2004 following the list made based on the Korean Fair Trade Commission's (KFTC, a Korean anti-trust authority) classification standards[9]. Since the mid-1990s, the KFTC has required leading Korean chaebols to report highly detailed ownership status information; public access to this sort of information is limited in most countries, but available in South Korea. This kind of aggregated firm-level ownership

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[9] The 24 family business groups include Samsung, CJ, Shinsaegae, Hansol, Hyundai, Hyundai Motors, Hyundai Heavy Industry, Hyundai Department Store, Hyundai Industry Development, KCC, LG, SK, Hanjin, Lotte, Kumho, Hanhwa, Doosan, Dongbu, Hyosung, Daelim, Kolon, Youngpoong, Dongyang, and Taihan Electric. The pan-Samsung groups (Samsung, CJ, Shinsaegae, Hansol) share a family, as do the pan-Hyundai groups (Hyundai, Hyundai Motors, Hyundai Heavy Industry, Hyundai Department Store, Hyundai Industry Development, KCC).

data helps to identify the extent of control concentration in each chaebol. I find that a chaebol family controls the entire group of firms with disproportionately small but key control stakes. In the sample, chaebol family members directly own only 533 (479 public and 54 private) out of the 2,422 firm-year observations, indicating the common exploitation of Korean chaebols' uniquely deep pyramidal structure. I retrieve M&A data from Thomson Reuters SDC Platinum and collect firms' financial and market data using Data Guide Pro, a database managed by the leading Korean financial data provider, FnGuide[10]. The total amount of assets controlled by these chaebols represents more than 56% of the nominal GDP of the Korean economy at the end of the sample year (778.4 trillion KRW).

To further convey their structures, I build family trees[11] for the 16 chaebol families using a publication by the Institute for Participatory Society, *The Chaebol of Korea: The Management Structure and Personal Network of Korean Chaebol* (2005)[12]. Information concerning an individual family member's ownership position is collected from the repository of Korea's corporate filings, DART (Data Analysis, Retrieval, and Transfer System), which is operated by the Financial Supervisory Service. Under Article 2 of the decree of the Act on External Audit of Stock Companies, any public or private company obligated to have an external audit is legally mandated to submit a complete annual report containing ownership information, such as the chairperson's relatives (spouses, blood relatives within the eighth degree and relatives by

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[10] The information in this database is approximately equivalent to the information reported in CRSP and Compustat for U.S. firms.

[11] A family tree starts with the founder's parents and includes the founder him/herself, their siblings and their spouses, and all direct and indirect (via marriage) descendants of the founder and the founder's siblings and their spouses. The generation of the founder's parents is coded as generation zero, the founder's as generation one, and so on. I allocate a unique ID to each family member in the family tree and collect detailed information on birth order, gender, direct or indirect (via marriage) descendants, marital status, presence (dead or living), and personal background.

[12] This book covers the family trees of the 30 largest Korean chaebols based on their total assets in 2004.

marriage within the fourth degree), and subsidiaries or foundations that are practically governed by the family.

[Table 2 around here]

Panel A of Table 2 summarizes the financial analysis of the sample firms. The analysis is based on data compiled as of the year end during the sample period. Succession tax burden refers to the maximum expected tax payment if the ownership of the current chair generation is passed to the next generation in a corresponding year[13]. The average succession tax burden for each firm is 2.3 billion KRW (1.93 million USD) and the maximal tax burden is 572 billion KRW (480 million USD)[14]. During the sample period, approximately 11% of chaebol firms initiated mergers, of which 27% are intra-group transactions between affiliates in the same business group. The financial characteristics of sample firms are comparable to those observed in previous studies that also focused on Korean chaebol firms (Bae et al. 2002; Almeida et al. 2011; Lee, Shin, and Yun 2016). Panel A also reports that 48% of the 2,422 firm-year observations in the sample are publicly listed firms, and the sample mean of firm age is 24.57 years.

In Panel B of Table 2, I summarize ownership variables, such as centrality, position[15], loop[16], cash-flow right, voting right, and discrepancy, to look at the pyramidal structures of

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[13] Succession tax burden = Ownership fraction of current chair generation × Total equity value × Tax rate in 10 billions of KRW. Total equity value refers to market value for public companies and Max [[(total asset-total debt) ×2+[{(NIt-3)×1+(NIt-2)×2+(NIt-1)×3}/6]/10%]/5] or total asset] for private companies, following Article 63-1 and 63-2 of the Inheritance Tax and Gift Tax Act. Tax rate refers to the sum of the succession and business premium tax rates.

[14] The exchange rate at the end of 2004, 1USD = 1,192 KRW, is applied.

[15] Position measures the distance between the family owner and a firm in the group. If the controlling family's shares are all held directly, the value of position of the company is one. In a simple pyramid structure with two firms, the firm i in the upper layer (chain 1) has a value of one, while the firm j in the lower layer (chain 2) has a value of 2. In this case, the position of firm i can be measured by the weighted average of chain 1 and chain 2, whose importance is weighted by the cash flow the family receives – the direct cash flow from firm i and the indirect cash flow from firm i through chain 2. The group firms directly owned by the controlling family have a low

Korean business groups. I observe that the maximal centrality of a group is 42.29%, which suggests a chaebol family's control across all group firms could decrease by that amount after I exclude one specific firm from the group. The average centrality of public firms (4.38) is 6.3 times higher than that of private firms (0.69), suggesting that highly central firms are the public firms in pyramidal business groups. The public firms have, on average, a position of 1.94 away from the controlling family, while the average position of private firms is 2.31. These average positions imply that public firms are more likely than private firms to be directly owned by the controlling family. In addition, 53% of the public firms are inside the circular ownership chains, whereas most of the private firms (79%) are outside these chains. These ownership metrics confirm that there is typically a highly-concentrated control structure in chaebols (Almeida et al. 2012), where owning a small stake in one or two key central firms allows the owner of the stakes to be the ultimate controller of the entire business group.

In Panel C of Table 2, I report controlling families' ownership, control, and the discrepancy between ownership and control over the sample chaebol firms. The ultimate cash-flow right (17.85%), voting right (63.18%), and discrepancy (45.34%) during the post-tax-reform period are much higher than those (15.53%, 43.93%, and 28.40%, respectively) during the pre-tax-reform period. This implies that the ownership networks among group affiliates are more distorted in the post-tax-reform period, as controlling families consolidate their indirect control through circular-shareholding mechanisms.

In Panel D of Table 2, I summarize the results of a univariate analysis of our main variables for the 2,422 sample family firms. The number of intra-group mergers is positively

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position value, while indirectly owned affiliates have a high position value. See Almeida et al. (2011) for more details of ownership metrics.

[16] Loop is an indicator that has a value of one if a firm is in a circular ownership chain, zero otherwise.

correlated with succession tax burden (0.08), centrality (0.28), and loop (0.07), but negatively related to position (-0.11). These results suggest that intra-group mergers are more likely to increase in firms with high succession tax burdens and central firms located in the upper layers of the pyramid within the circular ownership chains. These correlations are largely in line with my predictions.

[Table 3 around here]

Table 3 shows equity ownership involvement of different family members. I report the statistics separately for the current chairs' generations and the following current chair+1 generation. The number of observations is 128 chaebol family-years, and each chaebol family variable is computed as the arithmetic average across business groups. Analysis is based on data compiled as of the year end during the sample period. I find that, on average, 10.8 family members hold 62% of family ownership positions in the current chair's generation, while 7.06 family members hold 23% of the entire family ownership in the current chair+1 generation. For the current chair's generation, 7.26 male family members on average hold 53% of the total ownership held by family members, while 1.58 daughters hold just 5%. In-laws in the chair generation rarely hold ownership positions. For the current chair+1 generation, a similar pattern of predominance of male heirs in the direct bloodline was observed. Variable definitions are detailed in Appendix A.

4 Results

4.1 Succession Tax Burden and Intra-group Mergers

In Table 4, I test the main prediction to see how the burden of personal inheritance tax affects intra-group merger activities. As shown in Column 1 of Panel A, based on the Tobit model, I regress each firm's number of intra-group mergers on the Inheritance Tax Burden variable. I control for size (log of total assets), financial leverage (debt to equity ratio), and the number of each firm's affiliates, and then cluster the standard errors at the business group level since an intra-group merger takes place via group-level decision. All estimates include industry (2-digit SIC) and year indicator variables[17]. The estimated effect of the personal inheritance tax burden is both economically and statistically significant. The results shown in Column 1 imply that for every 334 billion KRW (277 million USD) increase in the personal inheritance tax in an affiliate, Korean chaebols initiate one additional intra-group merger (1=0.02997*33.4). Column 2 of Panel A shows the results of an identification test of the underlying economic stories. I count the number of non-intra-group mergers, which are irrelevant to arbitrage opportunities, as the heirs do not own the target firms of those mergers. I find that the estimated effect of non-intra-group mergers is negative (-0.00053) and statistically insignificant.

[Table 4 around here]

According to Prediction 2, I expect that to maximize their control over the entire business group, the heirs would be incentivized to reallocate their ownership to the central firms that are located in the upper layer of pyramid within circular ownership chains. In Columns 3 through 5 of Panel A, I extend the baseline model from Column 1 of Panel A to test the characteristics of acquirers. The right-hand-side (RHS) variable, Inheritance Tax Burden, is now decomposed into two, using the following dummy variables: (1) High Centrality vs. Low Centrality, (2) Upper

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[17] While Korean chaebols are diversified, the central firms of each business group are specialized in specific industries driven by the government since 1960-70s centrally planned economic era. Including a group dummy in addition to industry fixed effects does not explain additional within-group variation.

Layer of Pyramid vs. Lower Layer of Pyramid, and (3) Loop vs. No Loop. To facilitate the economic interpretation of our results, all explanatory variables are standardized to have a mean of zero and a standard deviation of one, so their point estimates directly represent their economic significance.

In Column 3 of Panel A, I find that an intra-group merger is mainly driven by central firms. Inheritance Tax Burden × High Centrality (0.08630) is statistically significant at the 1% level, whereas the effect of the opposite case, Inheritance Tax Burden × Low Centrality (-0.33633), is negative. In Column 4 of Panel A, I further confirm that an intra-group merger is more likely to occur in firms directly owned by a controlling family. Inheritance Tax Burden × Upper Layer of Pyramid (0.08488) is statistically significant at the 1% level, whereas Inheritance Tax Burden × Lower Layer of Pyramid (-0.11790) is negatively significant. In Column 5 of Panel A, consistent with the prediction, the results show the effect of the personal inheritance tax burden on the circular ownership structure. Inheritance Tax Burden × Loop (0.07792) is statistically significant at the 1% level, and its economic magnitude is more than twice (2.3=0.07792/0.03358) as large as the effect of the opposite case, Inheritance Tax Burden × No Loop. This result emphasizes that the ownership network of group affiliates determines the firms that initiate intra-group mergers among the firms with heavy personal inheritance tax burdens.

In Panel B, I repeat the analyses from Columns 1 to 5 in Panel A using a linear model with the same empirical specification, and I find a similarly significant, increasing trend of intra-group mergers with succession tax burdens. The estimated marginal effects of the succession tax burden are smaller than those in Panel A because the probability that a firm initiates an intra-group merger is much less than one. Overall, the results in Table 4 reveal a pattern: a high

inheritance tax burden leads to intra-group merger waves in pyramidal business groups; this implies that such unusual surges in intra-group mergers are motivated by a desire for tax arbitrage between ownership succession and an alternative succession mechanism.

4.2 The Effect of Tax Reform on Intra-group Mergers

One concern about the baseline findings is whether there is a causal relationship between a high personal inheritance tax burden and intra-group mergers. To investigate this issue, in Table 5, I examine the 1999 tax reform in Korea that applied a maximum inheritance tax rate of 80%, which is 25 percentage points higher than in the pre-tax-reform period. Factoring in this exogenous event raising the inheritance tax burden, I use difference-in-differences (DiD) estimations to estimate the causal impact of the personal inheritance tax burden on the frequency of intra-group mergers. The pre-tax-reform period refers to the years from 1997 through 1999, and the post-tax-reform period runs from 2000 through 2004, when the increased tax rate was applied. The treatment group, High Inheritance Tax Burden, is made up of the firms whose succession burden is greater than that of the top 10% of directly owned chaebol firms during the pre-tax-reform period[18].

[Table 5 around here]

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[18] There are no differences between the treatment and control group in the pre-tax–reform period, and the treatment group and control group do not switch during the entire sample period. These high tax burden firms are the most tax burdened firms over the sample period, regardless of the change in the tax rate, equity value, or ownership fraction of the current chair's generation. And only ownership difference determines the treatment and control group. Thus, separating the treatment group and control group by degree of inheritance tax burden does not raise the selection bias issue. The average frequency of treatment group (0.07) and that of control group (0.02) is statistically indifferent (p=0.16) during the pre-tax-reform period, while the average frequency of treatment group (0.37) and that of the control group (0.03) is statistically different (p=0.00) during the post-tax-reform period.

In Column 1 of Panel A, I regress each firm's number of intra-group mergers on an interaction term, High Inheritance Tax Burden $\times$ Post, and I find positive point estimates of 0.84602, significant at the 1% level. The coefficients imply that the differnce of intra-group merger activities between firms burdened by a high and low personal inheritance tax is three times (3.44= 0.84602/0.24610) more likely to increase during the post-tax-reform period. These are economically significant effects which suggest that high tax burden firms expand boundaries via initiating intra-group mergers during the post-tax-reform period because the tax saving benefits from increased boundaries cover relevant transaction costs.

In Columns 2 through 4 of Panel A, I repeat the conditional analysis from Columns 3 through 5 of Table 4. Using this additional layer of differences, I run a difference-in-differences and decompose (DiD-D) regression. The RHS variable, High Inheritance Tax Burden $\times$ Post, is now decomposed into two parts, using the following dummy variables: (1) High Centrality vs. Low Centrality, (2) Upper Layer of Pyramid vs. Lower Layer of Pyramid, and (3) Loop vs. No Loop. All the difference-in-differences and decompose (DiD-D) test for centrality, layer position, and loop confirm the earlier findings shown in Columns 2 to 4 of Table 4; the DiD-D effect of High Inheritance Tax Burden $\times$ Post $\times$ High Centrality (0.17605) is statistically significant at the 1% level, whereas I find an insignificant change in the number of intra-group mergers for low centrality firms (0.02403). This result sharply identifies the effects of a personal inheritance tax burden on intra-group mergers in Korean chaebols. These results are robust compared to other alternative specifications.

However, the non-linear model does not capture the treatment effect when we interpret the interaction term in a difference-in-differences model. In Panel B, I repeat the analyses from

Columns 1 to 4 in Panel A using a linear specification. The findings in Panel B, with OLS regression, confirm that the 1999 tax reform, which exogenously increased the inheritance tax burden, results in significant intra-group merger waves. This effect is likely causal.

4.3 Private Foundations and Tax Burden Reduction

To further identify causal evidence that a high inheritance tax burden leads to intra-group merger waves in pyramidal business groups, I test the alternative prediction to see whether a reduction in the tax burden decreases intra-group merger activities. The results are shown in Table 6. The inheritance tax burden is relieved through indirect shareholding by industry foundations (Thomsen 1999, Villalonga and Amit 2009). As charitable entities, the private foundations, which are often governed by the heirs who serve as board members, are exempt from gift taxation. Thus, I expect that a firm owned by a private foundation has its tax burden reduced, resulting in decreased motivation for the heirs to initiate intra-group mergers.

[Table 6 around here]

To examine the effects of private foundations, I employ the difference-in-difference-in-differences (DiDiD) analysis. In Column 1 of Panel A of Table 6, I extend the difference-in-differences (DiD) model of Table 5 by interacting the RHS variable, High Inheritance Tax Burden $\times$ Post, with Foundation as a dummy variable. Foundation here refers to an indicator that has a value of one if a firm is owned by private foundations and zero otherwise. The point estimate of the interaction term (-12.12192) implies that the incentive to initiate an intra-group merger drops by a net 99.6% (=-12.12192/12.17065) when the firm is owned by a private foundation. The interaction effect is statistically significant at the 1% level.

In Columns 2 through 4 of Panel A, I repeat the same conditional analysis from Columns 2 to 4 of Table 5. The RHS variable, High Inheritance Tax Burden × Post × Foundation, is now decomposed into two, using the following dummy variables: (1) High Centrality vs. Low Centrality, (2) Upper Layer of Pyramid vs. Lower Layer of Pyramid, and (3) Loop vs. No Loop. To facilitate the economic interpretation of our results, all explanatory variables are standardized to have a mean of zero and a standard deviation of one, so their point estimates directly represent their economic significance. The results of tests for centrality, layer position, and loop re-confirm the findings shown in Tables 4 and 5. An intra-group merger is less likely in central firms that are located in the upper layer of the pyramid within circular ownership chains if the marginal benefit of tax arbitrage is likely to decrease. In Column 2 of Panel A, the effect of High Inheritance Tax Burden × Post × Foundation × High Centrality (-1.21219) is statistically significant at the 1% level, and its economic magnitude is more than twice (2.3=-1.21219/-0.52184) as large as that of the effect of the opposite case, i.e., High Inheritance Tax Burden × Post × Foundation × Low Centrality.

The Tobit model does not capture the treatment effect when we interpret the interaction term in a difference-in-difference-in-differences model. In Panel B, I repeat the analyses from Columns 1 to 4 in Panel A using an OLS model, and the results support the causal evidence that a reduction in tax burden via a private foundation decreases intra-group merger activities. The causal evidence from Tables 5 and 6, taken together, highlight that intra-group mergers are primarily intended to seize arbitrage opportunities in the process of ownership succession.

4.4   Target Firms

In Table 7, I investigate the channel of ownership re-allocation by identifying the characteristics of firms targeted in intra-group mergers. The heirs in the chair+1 generation initially cash out corporate resources from their private firms, the targets of an intra-group merger, in which they already have high ownership stakes. They can take this pecuniary benefit since they have a substantial degree of managerial discretion with which they can control the dividend policy of the target private firm. Thus, they prefer short-term wealth gains over long-term investment commitments. Eventually, to maximize their control, the heirs in the chair+1 generation are willing to reallocate their funds to accumulate stakes in other strategically important firms within the business group. This behavior, though, is not necessarily anticipated for male relatives in the current chair's generation who already accumulated shares in those key firms.

[Table 7 around here]

Table 7 provides the results of analysis on target firms. The ownership stake and the managerial discretion on dividend policy are measured by the ownership fraction held by members of the current chair+1 generation (C+1) or current chairs' generation (C) (Columns 1 and 2) and voting rights (Column 3) of a controlling family. Short-term wealth gains are estimated by the dividend payout ratio (Column 4). I use the long-term R&D ratio (Column 5) as a proxy value for long-term investment commitments. I create an indicator for target private firms and test whether the heirs pursue short-term pecuniary benefits in those private firms. Based on an OLS regression, other empirical specifications are the same as in the previous regression analyses.

In Columns 1 and 3, I find the target private firms have a positive correlation with the family ownership fraction in the current chair+1 generation (7.14141) and voting rights (20.37031), and those estimates are statistically significant at the 1% level. But, in Column 2, I find a negative, insignificant point estimate of -6.92086 for the ownership fraction in the current chair's generation. In Columns 4 and 5, the target private firms have a positive point estimate (7.19319) with the dividend payout ratio, but a negative point estimate (-11.04820) with the long-term R&D ratio. Those estimates are statistically significant at the 10% and 1% level, respectively. This result implies that in those target private firms where the current chair+1 generation's ownership (on average 7.2% higher than in the rest of the chaebol firms) and voting rights (on average 20.4% higher than in the rest of the chaebol firms) are highly concentrated, the heirs benefit from dividends 7.2% higher than in the rest of the chaebol firms, while avoiding long-term investment commitments when an intra-group merger is anticipated.

The results shown in Table 7 and previous tables for acquirers, put together, underline that intra-group merger waves help heirs to consolidate control by reallocating their ownership to firms with high centrality from private target firms that have fallen into families' private safes.

4.5   Returns on Intra-group Merger Announcements

Finally, I provide evidence of tunneling by looking at the stock market's response to intra-group merger announcements during the sample period. In Section 2, I predict that minority shareholders will exit their stocks upon the announcement of a tax-motivated intra-group merger with no synergy value, sustaining losses, while the controlling family relishes arbitrage profits from the merger.

The merger data I use to test the financial market's response to an intra-group merger is based on the announcement of the first merger that occurs in a firm in a given year. Event Date is the day a firm initially announces an intra-group merger. For each event, I calculate the CAR over the 250 trading day window using a market model. First, I regress returns on market returns to obtain estimates of the alpha and beta. Then I find the abnormal returns by subtracting alpha plus beta times the market return from daily stock returns. I report the median of merger event CARs for given subsamples. In parentheses, I report the P-values for a signed-rank test for the median of full samples (Panel A) and the post-Asian-financial-crisis subsample (Panel B). I focus on the results in the post-crisis period (Panel B) to avoid the confounding effects of merger announcements and market shrinkage from the macro shock.

In Column 4 of Panel B, variable CAR [0, 1] reports the mean of the cumulative abnormal return information for the event day and the following day. The point estimates of Intra-group Merger and Non-intra-group Merger are -1.60547 and -1.18191 and are significant at the 5% and 1% levels, respectively. This result indicates that, in response to the announcement of an intra-group merger, the two-day cumulative abnormal return dropped 35.8% more than it did in response to the announcement of a non-intra-group merger. This is economically significant when I consider the two-day event window. The four-day cumulative abnormal return, CAR [0, 3], dropped 52.8% more than the average of total mergers and this trend weakens afterward. In Panel A of Table 7, with the full sample, I find a result similar to that shown in Panel B, but I only find a negatively significant result for non-intra-group mergers. However, the same

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significant negative results are not observed from other listed group affiliates interconnected by ownership with those merging firms.

The results in Table 7 show that minority shareholders sustain losses from intra-group mergers with few operational synergies, particularly when the controlling family aims to capture tax arbitrage between ownership succession and the intra-group merger. Overall, these findings represent a new piece of evidence for the tunneling hypothesis.

4.6 Robustness Test: Alternative Time Period

One of the important concerns is the implication of the Asian financial crisis, which led to (1) a sudden shrinkage in Korea's capital market,[19] and (2) post-crisis restructuring. The KOSPI Index, after dropping to one third of its pre-crisis level during the crisis, was still recovering to the pre-crisis level until early 1999, with the average personal inheritance tax burden reduced. If a chaebol heir suddenly inherited the ownership of the business group during the Asian financial crisis, during a time when the inheritance tax burden was somewhat relieved, an intra-group merger was therefore less likely to occur. Another concern about the crisis's distorted effect on the inheritance tax burden is that the market responses by individual firms to this macro-economic shock may vary greatly. To alleviate this concern, in Columns 1 through 3 of Table 9, I re-run my baseline analyses from the first columns of Tables 4, 5, and 6, by excluding 1997-1998, the period of the Asian financial crisis. As shown in Table 9, the results are similar to those of the baseline regression, indicating that a sudden shrinkage in market value does not lead to a pattern of decreasing intra-group mergers during the pre-tax-reform period.

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[19] KOSPI Index: 651.22 (1996.12), 376.31(1997.12), 280.00 (1998.6), 562.45 (1998.12), 1,028.07 (1999.12).

Another important concern is the post-crisis restructuring effect. Since the post-crisis period (1999-2001),[20] when restructuring efforts were active and overlapped with the period of the post-tax-reform period (2000-2004), one may argue that these confounding factors have led to the result. If the rise in intra-group mergers during the post-tax-reform period is mainly driven by business group restructuring, the restructuring effect should be stronger early in the post-tax-reform period (2000-2001) than later in the period (2002-2004). To distinguish and separate the impact of these two different factors – the inheritance tax burden and business restructuring – on intra-group mergers, in Columns 4 through 6 of Table 9, I first re-run our baseline analyses from the first columns of Tables 4, 5, and 6, excluding all intra-group and non-intra-group mergers initiated by firms with no ownership by the current chair generation. Then, in Columns 7 and 8, I decompose the Post dummy into two: Early Post (2000-2001) vs Late Post (2002-2004). All explanatory variables are standardized to have a mean of zero and a standard deviation of one, so their point estimates directly represent their economic significance. In Column 7 of Panel A, the effect of High Inheritance Tax Burden $\times$ Post $\times$ Late Post (0.22744) is statistically significant at the 1% level, and its economic magnitude is slightly (1.1=0.22744/0.20758) larger than the effect of the opposite case, i.e., High Inheritance Tax Burden $\times$ Post $\times$ Early Post. Column 8 also shows a similar result with DiDiD estimations. As shown in Columns 4 through 8, the results are robust to the potential confounding factor, suggesting that restructuring efforts in the wake of the Asian financial crisis were mainly about selling or liquidating inefficient firms with labor adjustments, rather than mergers between group affiliates.

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[20] After the first repayment of the IMF Supplemental Reserve Facility (SRF) in December 1998, the Korean government led restructuring efforts to meet the requirements imposed by the IMF. The IMF-supported financial program was terminated in August 2001.

5   Conclusion

Transfer of control is a tremendously important issue in any organization. In this paper, I try to understand how controlling families transfer control to the heirs by identifying a novel channel of transfer of control in family firms. Specifically, I discovered the intra-group merger to be a particular channel of transfer of control in family firms, a practice that is understudied in previous literature. This paper provides causal evidence, in practice, that controlling families indirectly transfer control through intra-group mergers to avoid taxes during the transfer of control in family firms. Thus, this paper highlights a novel personal inheritance tax channel that reshapes firm boundaries – high tax burden firms initiate intra-group mergers during the post-tax-reform period because the taxes saving benefits from increased boundaries cover relevant transaction costs. The major costs of undergoing intra-group mergers are the resulting distortions in network structure among affiliates, and the negative market response to tax-motivated intra-group mergers.

This paper shows that shock from personal inheritance tax distorts the ownership network among affiliates, providing unique evidence that tax shock causes exogenous changes in network structure for a subset of family firms. Network structure is determined highly endogenously, and it is difficult to prove that the corporate outcome is impacted by network structure or other underlying factors that determine the network structure. Using personal inheritance tax as instrument variable, future studies might identify the costs of the resulting distortions by personal tax shock on the network structure. The business groups with distorted ownership networks may be more vulnerable to potential risk, ongoing growth, or managerial quality. My work can be

also extended to policy makers by raising new questions, such as the optimal succession tax policy to prevent the cost of using tax minimizing succession vehicles.

While the heirs of the controlling family benefit from personal tax savings, the minority shareholders suffer losses from these tax-motivated intra-group mergers, as they create few operating synergies causing investors to exit their stocks. This result introduces a new piece of evidence of tunneling caused by heavy inheritance tax burdens in a specific institutional setting. Prior literature shows that controlling families in business groups use both investment and financing decisions as instruments to siphon resources out of member firms for their private benefit (Bertrand et al. 2002, Bae et al. 2002, and Baek et al. 2006). Prior empirical evidence of tunneling in emerging markets suggest that similar distorted ownership allocation in pursuit of personal tax savings are likely to be observed in many alternative institutional contexts.

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Table 1: Time-series Variation in the Succession Tax Rate

This table summarizes the maximum succession tax rate and business premium tax rate in Korea before and after tax reforms. In the 1970s, the highest marginal tax rate was 75%; these high tax rates brought about strong psychological resistance among taxpayers, resulting in tax evasion. To address this, as shown in the table, the government gradually reduced the inheritance and gift tax rate to 67% in 1980 and finally to 40% in 1996, the lowest in history, while maintaining the business premium tax rate at 10%. The cap of the inheritance tax rate was 55%, with 45% from the inheritance tax rate and 10% from the business premium tax rate from 1997 to 1999, right before the tax reforms. Then, in 1999, after the Asian financial crisis, the government undertook tax reform initiatives, laying out policy guidelines for "preventing tax-free inheritance of wealth," and, accordingly, in 2000 it began to apply a maximum succession tax rate of 80% percent, 50% of which comes from the succession tax rate and 30% from the business premium tax rate, which is the highest among OECD economies.

	1993-1995	1996	1997~1999	2000~2002	After 2003	
					SME	Chaebol
Cap of Succession Tax Rate	50%	40%	45%	50%	50%	50%
Business Premium Tax Rate (Largest shareholder < 50%)	10%	10%	10%	20%	10%	20%
Business Premium Tax Rate (Largest shareholder > 50%)	10%	10%	10%	30%	15%	30%
Total Succession Tax Rate	60%	50%	55%	80%	65%	80%

Table 2: Summary Statistics

The sample consists of 2,422 firm-year observations from 1997 to 2004 of Korea's top 24 largest business groups, controlled by 16 chaebol families, designated by the Korean Fair Trade Commission (KFTC). Analysis is based on data compiled as of the year end of the corresponding year.

Panel A: Succession tax burden refers to the maximum expected tax payment if the ownership of the current chair's generation is inherited by the next generation in the corresponding year; it is calculated as Ownership Fraction of Current Chair Generation × Total Equity Value × Tax Rate (in 10 billions of KRW). Total equity value refers to the market value of public companies and Max [[(total asset - total debt) ×2+[{(NIt-3)×1+(NIt-2)×2+(NIt-1)×3}/6] /10%]/5) or total asset] for private companies, following Articles 63-1 and 63-2 of the Inheritance Tax and Gift Tax Act. Tax rate refers to the sum of the succession tax rate and the business premium tax rate. Number of total mergers refers to the total number of M&A transactions in a given year. Number of intra-group mergers refers to the total number of mergers with and acquisitions of other affiliates in a business group in a given year. Total merger transactions refers to the total amount of merger and acquisition transactions in millions of USD in a given year. Intra-group merger transactions refers to the total amount of merger and acquisition transactions in millions of USD between two affiliates in a business group in a given year. Log of total assets refers to the logarithm of a firm's total assets in millions of KRW. Log of sales refers to the logarithm of a firm's total sales in millions of KRW. Leverage refers to a debt ratio calculated as a firm's total debt divided by its total equity. ROA refers to the ratio of a firm's earnings before interest and tax (EBIT) divided by its total assets. Payout ratio refers to the ratio of a firm's net dividends paid divided by its net income. Public firm is an indicator variable that equals one if a firm is listed on the KOSPI or KOSDAQ exchange, and zero otherwise. Firm age is the age of a firm in a business group as of the corresponding year.

Panel B: Panel B shows the ownership structure of sample firms based on KFTC reports. Centrality refers to the average percentage decrease in control rights across all group firms other than the firm itself, after I exclude a specific firm from the group. Position refers to the distance between the family and a firm in a business group; a value of 1 indicates that the firm is directly controlled by the founding family. Loop refers to an indicator that has a value of one if a firm is in a circular ownership chain, and is zero otherwise.

Panel C: Panel C reports controlling families' ownership, control, and the discrepancy between ownership and control over sample firms. Cash-flow right refers to the sum of direct equity ownership held by the founding family after excluding treasury stocks and cross shareholdings. Voting right refers to the ratio of the maximum number of stocks that founding family members can use for voting divided by the total number of the group's outstanding stocks. Discrepancy refers to the gap between cash-flow rights and voting rights. The Pre-tax-reform period includes the years 1997 to 1999, whereas the Post-tax-reform period includes the years 2000 to 2004.

Panel D: Panel D reports correlations for the sample firms among the main variables, summarized in Panels A and B.

Panel A: Financial Characteristics	Number of firms	Mean	Std. Dev	Min	Median	Max
Succession tax burden	2,422	0.23	2.84	0	0	57.20
Number of total mergers	2,422	0.11	0.62	0	0	13.00
Number of Intra-group mergers	2,422	0.03	0.28	0	0	7.00
Total merger transactions	2,422	7.20	85.42	0	0	2903.41
Intra-group merger transactions	2,422	3.57	74.37	0	0	2903.41
Log of total assets	2,422	12.42	2.04	7.43	12.34	18.33
Log of sales	2,422	5.28	0.95	1.19	5.30	7.91
Leverage	2,422	3.31	9.59	0	1.63	279.46
ROA	2,422	0.06	0.09	-0.60	0.05	0.85
Payout ratio	1,607	0.09	0.48	-8.11	0	1.98
Cash holding/Total asset	1,607	0.06	0.08	0	0.04	0.76
Public firm (dummy)	2,422	0.48	0.50	0	0	1
Firm age	2,422	24.57	15.85	1	21	75

Panel B: Ownership Structure	Number of firms	Mean	Std. Dev	Min	Median	Max
Centrality (%)	1,667	2.66	5.61	0	0.00	45.33
Public	891	4.38	6.89	0	1.00	45.33
Private	776	0.69	2.42	0	0.00	20.13
Position	1,667	2.11	0.84	1	2.01	5.31
Public	891	1.94	0.82	1	1.98	5.31
Private	776	2.31	0.82	1	2.17	5.01
Loop	1,667	0.38	0.49	0	0	1
Public	891	0.53	0.50	0	1	1
Private	776	0.21	0.41	0	0	1

Panel C: Ownership and Control	Number of firms	Mean	Std. Dev	Min	Median	Max
Cash-flow right (%)	1,667	17.20	17.46	0	11.75	100
Pre-tax-reform period	497	15.53	17.22	0	9.08	100
Post-tax-reform period	1,169	17.85	17.51	0	12.49	100
Difference (post-pre)		2.32		t=2.48 (p=0.01)		
Voting right (%)	1,667	57.46	30.27	0	50.43	100
Pre-tax-reform period	497	43.93	28.99	0	33.00	100
Post-tax-reform period	1,169	63.18	28.98	0	60.40	100
Difference (post-pre)		19.25		t=12.40 (p=0.00)		
Discrepancy (%)	1,667	40.26	28.77	0	36.84	100
Pre-tax-reform period	497	28.40	26.88	0	18.01	100
Post-tax-reform period	1,169	45.34	28.01	0	43.52	98.43
Difference (post-pre)		16.93		t=11.42 (p=0.00)		

Panel D: Correlation	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) Succession tax burden	1.00								
(2) Number of Intra-group mergers	0.08	1.00							
(3) Centrality	0.23	0.28	1.00						
(4) Position	-0.13	-0.11	-0.36	1.00					
(5) Loop	0.08	0.07	0.17	-0.17	1.00				
(6) ROA	-0.01	0.04	-0.03	-0.07	-0.02	1.00			
(7) Log of total assets	0.17	0.23	0.45	-0.15	0.42	-0.10	1.00		
(8) Leverage	0.00	0.01	0.06	-0.03	0.08	-0.04	0.12	1.00	
(9) Payout ratio	0.03	0.00	0.05	0.02	0.05	0.05	0.04	-0.01	1.00

Table 3: Family Involvement in Ownership

The sample consists of 2,422 firm-year observations from 1997 to 2004 of Korea's top 24 largest business groups, controlled by 16 chaebol families, designated by the Korean Fair Trade Commission (KFTC). The number of observations is 128 chaebol family-years, and each chaebol family variable is computed as the arithmetic average across business groups. Analysis is based on data compiled as of the year end during the sample period.

Panel A: For the current chair's generation, male [female, married male, married female] family members indicate the current chair and the chair's brothers [sisters, brothers-in-law, sisters-in-law]. In that generation, the number of male [female, married male, and married female] family members with ownership refers to the total number of male [female, married male, and married female] family members with ownership in the group firms. Total number of members with ownership in the current chair generation refers to the sum of the number of male, female, married male, and married female members with ownership in at least one of the group firms. Fraction of family ownership held by male [female, married male, and married female] family members refers to the ratio of the portion of ownership held by male [female, married male, and married female] family members in the current chair and his/her siblings' generation divided by the entire portion of ownership held by family members. Total fraction of ownership held by current chair generation refers to the sum of the fraction of family ownership held by male, female, married male, and married female family members.

Panel B: Current chair+1 generation refers to the generation following that of the current chair's. For the current chair+1 generation, the number of sons [daughters, sons-in-law, and daughters-in-law] with ownership is the total number of sons [daughters, sons-in-law, and daughters-in-law] of the current chair and his/her siblings with ownership of the group firms. Total number of members with ownership in the current chair+1 generation refers to the sum of the number of sons, daughters, sons-in-law, and daughters-in-law with ownership in at least one of the group firms. Fraction of family ownership held by sons [daughters, sons-in-law, and daughters-in-law] refers to the ratio of the portion of ownership held by sons [daughters, sons-in-law, and daughters-in-law] of the current chair and his/her siblings divided by the entire portion of ownership held by family members. Total fraction of ownership held by the current chair+1 generation refers to the sum of the fraction of family ownership held by sons, daughters, sons-in-law, and daughters-in-law of the current chair and his/her siblings.

	N	Mean	Std. Dev	Min	Median	Max
Panel A: Current chair generation						
Total number of members with ownership in curent chair generation	128	10.80	5.99	2	12	21
Number of male family members with ownership	128	7.26	4.27	1	7	15
Number of female family members with ownership	128	1.58	1.99	0	1	7
Number of married male members with ownership	128	1.13	1.68	0	0	6
Number of married female members with ownership	128	0.84	1.24	0	0	5
Total fraction of ownership held by current chair generation	128	0.62	0.22	0.16	0.63	1.00
Fraction of family ownership held by male family members	128	0.53	0.27	0.001	0.53	1.00
Fraction of family ownership held by female family members	128	0.05	0.14	0	0	0.83
Fraction of family ownership held by married male members	128	0.03	0.08	0	0	0.57
Fraction of family ownership held by married female members	128	0.02	0.05	0	0	0.24
Panel B: Current chair+1 generation						
Total number of members with ownership in curent chair+1 generation	128	7.06	8.66	0	4	26
Number of sons with ownership	128	4.38	5.67	0	2	19
Number of daughters with ownership	128	1.99	2.31	0	2	8
Number of sons-in-law with ownership	128	0.31	0.85	0	0	3
Number of daugeters-in-law with ownership	128	0.38	1.46	0	0	6
Total fraction of ownership held by current chair+1 generation	128	0.23	0.26	0	0.07	0.84
Fraction of family ownership held by sons	128	0.20	0.25	0	0.01	0.73
Fraction of family ownership held by daughters	128	0.03	0.05	0	0.01	0.27
Fraction of family ownership held by sons in law	128	0.002	0.007	0	0	0.03
Fraction of family ownership held by daughters in law	128	0.001	0.003	0	0	0.01

Table 4: Succession Tax Burden and Intra-group Mergers

Each column of Panel A reports the coefficients from a Tobit regression with heteroscedasticity-robust standard errors. Each column of Panel B reports the coefficients from an OLS regression. Standard errors are clustered at the business group level and reported in parentheses under the coefficient estimates. In Columns three to five, all explanatory variables are standardized, so their point estimates represent the economic magnitude of their effects. The dependent variable is the number of intra-group merger transactions between two affiliates in a business group. In Column 2, the dependent variable is the number of non-intra group mergers, obtained by subtracting the number of intra-group mergers from the total number of mergers. Succession tax burden refers to the maximum expected tax payment if the ownership of the current chair's generation is inherited by the next generation in a corresponding year, which is calculated as Ownership Fraction of Current Chair Generation × Total Equity Value × Tax Rate (in 10 billions of KRW). Total equity value refers to the market value for listed companies and Max [[(total asset - total debt)×2 +[{(NIt-3)×1+(NIt-2)×2+(NIt-1)×3}/6]/10%]/5] or total asset] for private companies, following Articles 63-1 and 63-2 of the Inheritance Tax and Gift Tax Act. Tax rate refers to the sum of the succession and business premium tax rates. Centrality refers to the average percentage decrease in control right across all group firms other than the firm itself after I exclude a specific firm from the group. High centrality refers to an indicator that has a value of one if centrality is greater than the average for chaebol firms, and zero otherwise. Low centrality refers to an indicator that has a value of one if centrality is lower than average for chaebol firms, and zero otherwise. Position refers to the distance between the founding family and a firm in a group; a value of one indicates that the firm is directly controlled by the founding family. Upper layer of pyramid refers to an indicator that has a value of one if the position of a firm is smaller than average for chaebol firms, and zero otherwise. Lower layer of pyramid refers to an indicator that has a value of one if the position of a firm is greater than or equal to the average for chaebol firms, and zero otherwise. Loop refers to an indicator that has a value of one if a firm is in a circular ownership chain, and zero otherwise. No loop refers to an indicator that has a value of one if a firm is not in a circular ownership chain, and zero otherwise. Controls include the log of total assets (in millions of KRW), the leverage ratio, and the number of group affiliates. All estimates include industry (SIC-2 digit) and year indicator variables. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

Panel A: Tobit	Dependent Variable: Number of Mergers				
	(1)	(2)	(3)	(4)	(5)
Variables	Intra-group	Non-intra group		Intra-group Mergers	
Succession Tax Burden	0.02997***	-0.00053			
	[0.001]	[0.003]			
Sucession Tax Burden × High Centrality			0.08630***		
			[0.004]		
Sucession Tax Burden × Low Centrality			-0.33633***		
			[0.468]		
Sucession Tax Burden × Upper Layer of Pyramid				0.08488***	
				[0.004]	
Sucession Tax Burden × Lower Layer of Pyramid				-0.11790***	
				[0.029]	
Sucession Tax Burden × Loop					0.07792***
					[0.003]
Sucession Tax Burden × No Loop					0.03358***
					[0.004]
Industry Fixed Effect	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes
Observations	2,422	2,422	2,422	2,422	2,422

Panel B: OLS	Dependent Variable: Number of Mergers				
	(1)	(2)	(3)	(4)	(5)
Variables	Intra-group	Non-intra group	Intra-group Mergers		
Succession Tax Burden	0.00517**	0.00393			
	[0.002]	[0.005]			
Sucession Tax Burden × High Centrality			0.01524**		
			[0.006]		
Sucession Tax Burden × Low Centrality			-0.00314***		
			[0.001]		
Sucession Tax Burden × Upper Layer of Pyramid				0.01477**	
				[0.006]	
Sucession Tax Burden × Lower Layer of Pyramid				-0.00237***	
				[0.001]	
Sucession Tax Burden × Loop					0.01470**
					[0.005]
Sucession Tax Burden × No Loop					0.00315
					[0.009]
Industry Fixed Effect	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes
Observations	2,422	2,422	2,422	2,422	2,422
R-squared	0.073	0.096	0.074	0.073	0.073

Table 5: The Effect of Tax Reform on Intra-group Mergers

Each column of Panel A reports the coefficients from a Tobit regression with heteroscedasticity-robust standard errors. Each column of Panel B reports the coefficients from an OLS regression. Standard errors are clustered at the business group level and reported in parentheses under the coefficient estimates. In Columns two to four, all explanatory variables are standardized, so their point estimates represent the economic magnitude of their effects. The dependent variable is the number of intra-group merger transactions between two affiliates in a business group. High succession tax burden refers to an indicator that has a value of one if the average succession tax burden of a firm is greater than that of the top 10% of directly owned chaebol firms during the pre-tax-reform period. Post refers to a year dummy that has a value of one after the tax reforms, i.e., from 2000 to 2004, and has a value of zero otherwise. Centrality refers to the average percentage decrease in control right across all group firms other than the firm itself after I exclude a specific firm from the group. High centrality refers to an indicator that has a value of one if centrality is greater than the average of all chaebol firms, and zero otherwise. Low centrality refers to an indicator that has a value of one if centrality is lower than the average of all chaebol firms, and zero otherwise. Position refers to the distance between the founding family and a firm in a group; a value of one indicates that the firm is directly controlled by the founding family. Upper layer of pyramid refers to an indicator that has a value of one if the firm's position is smaller than that of the average chaebol firm, and is zero otherwise. Lower layer of pyramid refers to an indicator that has a value of one if the firm's position is greater than or equal to that of the average chaebol firm, and is zero otherwise. Loop refers to an indicator that has a value of one if a firm is in a circular ownership chain, and zero otherwise. No loop refers to an indicator that has a value of one if a firm is not in a circular ownership chain, and zero otherwise. Controls include the log of total assets (in millions of KRW), the leverage ratio, and the number of group affiliates. All estimates include industry (SIC-2 digit) and year indicator variables. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

Panel A: Tobit	*Dependent Variable: Number of Intra-group Mergers*			
Variables	(1)	(2)	(3)	(4)
High Succession Tax Burden × Post	0.84602***			
	[0.128]			
High Succession Tax Burden × Post × High Centrality		0.17605***		
		[0.005]		
High Succession Tax Burden × Post × Low Centrality		0.02403		
		[0.019]		
High Succession Tax Burden × Post × Upper Layer of Pyramid			0.26543***	
			[0.004]	
High Succession Tax Burden × Post × Lower Layer of Pyramid			-0.02304	
			[0.018]	
High Succession Tax Burden × Post × Loop				0.07836***
				[0.009]
High Succession Tax Burden × Post × No Loop				0.06659
				[0.016]
High Succession Tax Burden	0.24610**	0.04138*	0.04489*	0.03875
	[0.124]	[0.024]	[0.026]	[0.025]
Post	-1.18087***	-0.52434***	-0.52959***	-0.53559***
	[0.110]	[0.041]	[0.040]	[0.044]
Industry Fixed Effect	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
Observations	2,422	2,422	2,422	2,422

Panel B: OLS	Dependent Variable: Number of Intra-group Mergers			
Variables	(1)	(2)	(3)	(4)
High Succession Tax Burden × Post	0.24917***			
	[0.069]			
High Succession Tax Burden × Post × High Centrality		0.03169***		
		[0.006]		
High Succession Tax Burden × Post × Low Centrality		0.01519**		
		[0.008]		
High Succession Tax Burden × Post × Upper Layer of Pyramid			0.03377***	
			[0.007]	
High Succession Tax Burden × Post × Lower Layer of Pyramid			0.01233*	
			[0.007]	
High Succession Tax Burden × Post × Loop				0.02153***
				[0.006]
High Succession Tax Burden × Post × No Loop				0.02223***
				[0.008]
High Succession Tax Burden	-0.01028	-0.00556	-0.00574	-0.00598
	[0.053]	[0.013]	[0.013]	[0.013]
Post	-0.01283	-0.00162	-0.00165	-0.00164
	[0.029]	[0.008]	[0.008]	[0.008]
Industry Fixed Effect	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
Observations	2,422	2,422	2,422	2,422
R-squared	0.080	0.085	0.086	0.081

Table 6: Private Foundations and Tax Burden Reduction

Each column of Panel A reports the coefficients from a Tobit regression with heteroscedasticity-robust standard errors. Each column of Panel B reports the coefficients from an OLS regression. Standard errors are clustered at the business group level and reported in parentheses under the coefficient estimates. In Columns two to four, all explanatory variables are standardized, so their point estimates represent the economic magnitude of their effects. The dependent variable is the number of intra-group merger transactions between two affiliates in a business group. High succession tax burden refers to an indicator that has a value of one if the average succession tax burden of a firm is greater than that of the top 10% of directly owned chaebol firms during the pre-tax-reform period. Post refers to a year dummy that has a value of one after the tax reform, i.e., from 2000 to 2004, and a value of zero otherwise. Foundation refers to an indicator that has a value of one if a firm is owned by private foundations, and zero otherwise. Centrality refers to the average percentage decrease in control right across all group firms other than the firm itself after I exclude a specific firm from the group. High centrality refers to an indicator that has a value of one if a firm's centrality is greater than the average of all chaebol firms, and is zero otherwise. Low centrality refers to an indicator that has a value of one if a firm's centrality is lower than the average of all chaebol firms, and is zero otherwise. Position refers to the distance between the founding family and a firm in a group; a value of one indicates that the firm is directly controlled by the founding family. Upper layer of pyramid refers to an indicator that has a value of one if a firm's position is smaller than the average of all chaebol firms, and zero otherwise. Lower layer of pyramid refers to an indicator that has a value of one if a firm's position is greater than or equal to the average of all chaebol firms, and zero otherwise. Loop refers to an indicator that has a value of one if a firm is in a circular ownership chain, and zero otherwise. No loop refers to an indicator that has a value of one if a firm is not in a circular ownership chain, and zero otherwise. Controls include the log of total assets (in millions of KRW), the leverage ratio, and the number of group affiliates. All estimates include industry (SIC-2 digit) and year indicator variables. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

Panel A: Tobit	Dependent Variable: Number of Intra-group Mergers			
Variables	(1)	(2)	(3)	(4)
High Succession Tax Burden × Post	12.17065***	1.59187***	1.61527***	1.57221***
	[0.179]	[0.031]	[0.030]	[0.019]
High Succession Tax Burden × Post × Foundation	-12.12192***			
	[0.227]			
High Succession Tax Burden × Post × Foundation × High Centrality		-1.21219***		
		[0.032]		
High Succession Tax Burden × Post × Foundation × Low Centrality		-0.52184***		
		[0.005]		
High Succession Tax Burden × Post × Foundation × Upper Layer of Pyramid			-1.19890***	
			[0.030]	
High Succession Tax Burden × Post × Foundation × Lower Layer of Pyramid			-0.58378***	
			[0.005]	
High Succession Tax Burden × Post × Foundation × Loop				-1.13900***
				[0.014]
High Succession Tax Burden × Post × Foundation × No Loop				-0.70902***
				[0.011]
High Succession Tax Burden × Foundation	10.41217***	1.56291***	1.59078***	1.54175***
	[0.193]	[0.037]	[0.036]	[0.023]
Post × Foundation	0.43627***	0.12470***	0.12411***	0.12188***
	[0.085]	[0.030]	[0.029]	[0.026]
Foundation	0.64235***	0.23220***	0.22933***	0.22911***
	[0.082]	[0.040]	[0.040]	[0.034]
Post	-1.18295***	-0.56019***	-0.54747***	-0.53256***
	[0.106]	[0.045]	[0.045]	[0.048]
High Succession Tax Burden	-10.25434***	-1.82810***	-1.86184***	-1.79194***
	[0.170]	[0.041]	[0.039]	[0.026]
Industry Fixed Effect	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes
Controls	No	Yes	Yes	Yes
Observations	2,422	2,422	2,422	2,422

Panel B: OLS	Dependent Variable: Number of Intra-group Mergers			
Variables	(1)	(2)	(3)	(4)
High Succession Tax Burden × Post	0.56673***	0.06760***	0.06762***	0.06761***
	[0.127]	[0.015]	[0.015]	[0.015]
High Succession Tax Burden × Post × Foundation	-0.52949***			
	[0.153]			
High Succession Tax Burden × Post × Foundation × High Centrality		-0.04451***		
		[0.014]		
High Succession Tax Burden × Post × Foundation × Low Centrality		-0.03019***		
		[0.009]		
High Succession Tax Burden × Post × Foundation × Upper Layer of Pyramid			-0.04223***	
			[0.013]	
High Succession Tax Burden × Post × Foundation × Lower Layer of Pyramid			-0.03360***	
			[0.009]	
High Succession Tax Burden × Post × Foundation × Loop				-0.05279***
				[0.013]
High Succession Tax Burden × Post × Foundation × No Loop				-0.01779*
				[0.010]
High Succession Tax Burden × Foundation	0.10927	0.01470	0.01468	0.01462
	[0.115]	[0.015]	[0.015]	[0.015]
Post × Foundation	0.11181***	0.03114***	0.03115***	0.03113***
	[0.034]	[0.009]	[0.009]	[0.009]
Foundation	0.00015	0.00009	0.00012	0.00026
	[0.028]	[0.010]	[0.010]	[0.010]
Post	-0.02856	-0.01296	-0.01299	-0.01319
	[0.030]	[0.014]	[0.014]	[0.014]
High Succession Tax Burden	-0.07712	-0.01220	-0.01216	-0.01218
	[0.095]	[0.015]	[0.015]	[0.015]
Industry Fixed Effect	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes
Controls	No	Yes	Yes	Yes
Observations	2,422	2,422	2,422	2,422
R-squared	0.094	0.094	0.094	0.097

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Table 7: Target Firms

Each column reports coefficients from an OLS regression with heteroscedasticity-robust standard errors. Standard errors are clustered at the business group level. The standard errors are reported in parentheses under the coefficient estimates. In Column one, the dependent variable is the fraction of ownership held by current chair+1 generation, which refers to the ratio of the portion of ownership held by sons, daughters, sons-in-law, and daughters-in-law of the current chair and his/her siblings divided by the entire portion of ownership held by family members in a particular firm in a business group. In Column two, the dependent variable is the fraction of ownership held by the current chair generation, which refers to the ratio of the portion of ownership held by male, female, married male, and married female family members in the current chair and his/her siblings' generation divided by the entire portion of ownership held by family members in a particular firm in a business group. In Column three, the dependent variable is voting right, which refers to the ratio of the maximum number of direct and indirect number of shares that founding family members can use for voting divided by the total number of the group's outstanding stocks. In Column four, the dependent variable is payout ratio, which refers to the ratio of a firm's net dividends paid divided by its net income. In Column five, the dependent variable is the long-term R&D ratio, which refers to the firm's long-term research and development (R&D) expenses divided by its total R&D expenses. Private target firm is an indicator that has a value of one if a private firm is the target of an intra-group merger in a given year, and is otherwise zero. Controls include log of total assets (millions of KRW), leverage ratio, number of group affiliates. All estimates include industry (SIC-2 digit) and year indicator variables. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

	Dependent Variable				
	C+1 gen Ownership Fraction (×100)	*C gen. Ownership Fraction (×100)*	*Voting Right (×100)*	*Payout Ratio(×100)*	*Long-term R&D Ratio (×100)*
Variables	(1)	(2)	(3)	(4)	(5)
Private Target Firm	7.14141***	-6.92086	20.37031***	7.19139*	-11.04820***
	[1.932]	[5.34]	[5.397]	[3.542]	[2.359]
Industry Fixed Effect	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes
Observations	2,422	2,422	2,422	2,422	2,422
R-squared	0.0574	0.186	0.363	0.008	0.149

Table 8: Intra-group Merger Announcement Returns

Each column reports the median of merger event CARs expressed in percentage terms for given subsamples. The p-values for a simple signed-rank test (against a null hypothesis of zero median) are reported in parentheses under the coefficient estimates. For each event I calculate the CAR over the trading window using a market model. First, I regress returns on market returns to obtain estimates for the alpha and beta. Then, abnormal returns are obtained by subtracting alpha plus beta times market return from daily stock returns. Event date is the day a firm initially announces the intra-group merger. I only include the first announcement if a firm has multiple intra-group mergers in a given year. In Column four, for example, the dependent variable CAR [0,1] reports cumulative abnormal return information for the event day and the following day. Intra-group mergers represent all the merger events between two affiliates in a business group. Non-intra-group mergers includes all other merger and acquisition events. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

Dependent Variables:	*CAR [-3,0]*	*CAR [-2,0]*	*CAR [-1,0]*	*CAR [0,1]*	*CAR [0,2]*	*CAR [0,3]*
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Full sample						
Intra-group Mergers	0.89817	0.22496	0.73584	-0.39388	-1.17390*	-2.09000**
	[0.3536]	[0.5609]	[0.1926]	[0.9062]	[0.0962]	[0.0477]
Non-intra-group Mergers	-0.57477	-0.12802	0.06290	-0.39930	-0.78328	-0.92715
	[0.7429]	[0.4952]	[0.7860]	[0.5231]	[0.4721]	[0.5782]
Total Mergers	-0.18298	-0.09047	0.40594	-0.39387	-0.79640	-1.06570
	[0.8376]	[0.8031]	[0.5956]	[0.5869]	[0.1398]	[0.1219]
Panel B: Post Asian Crisis						
Intra-group Mergers	0.59106	-0.15197	0.50815	-1.60547**	-1.53925**	-2.79603***
	[0.9094]	[0.8199]	[0.9274]	[0.0476]	[0.0382]	[0.0094]
Non-intra-group Mergers	-0.51923	-0.33417	-0.19902	-1.18191*	-0.99923	-1.45705
	[0.2882]	[0.1598]	[0.0534]	[0.0689]	[0.1863]	[0.1273]
Total Mergers	-0.27109	-0.23830	-0.00121	-1.33366**	-1.20189**	-1.82957***
	[0.4129]	[0.1849]	[0.1062]	[0.0108]	[0.0251]	[0.0063]

Table 9: Robustness Test: Alternative Time Period

In Columns one to three, I exclude the period of 1997-1998 to avoid the effects of sudden market shrinkage during the Asian financial crisis. In Columns four to six, I exclude all mergers initiated by firms that are not at least partially owned by the current chair generation in order to test the post-crisis restructuring effect. Each column of Panel A reports the coefficients from a Tobit regression with heteroscedasticity-robust standard errors. Each column of Panel B reports the coefficients from an OLS regression. Standard errors are clustered at the business group level and reported in parentheses under the coefficient estimates. The dependent variable is the number of intra-group merger transactions between two affiliates in a business group. High succession tax burden refers to an indicator that has a value of one if the average succession tax burden on a firm is greater than that of the top 10% of directly owned chaebol firms during the pre-tax-reform period. Post refers to a year dummy that has a value of one after the tax reform (which includes the years 2000 to 2004), and is zero otherwise. Early post refers to a year dummy that has a value of one for the first two years after the tax reforms, i.e., in 2000 and 2001, and is zero otherwise. Late post refers to a year dummy that has a value of one for the three years right after the early post-reform period (2002 to 2004), and is zero otherwise. Foundation refers to an indicator that has a value of one if a firm is owned by private foundations, and is zero otherwise. Centrality refers to the average percentage decrease in control right across all group firms other than the firm itself after I exclude a specific firm from the group. High centrality refers to an indicator that has a value of one if a firm's centrality is greater than the average of all chaebol firms, and is zero otherwise. Low centrality refers to an indicator that has a value of one if a firm's centrality is lower than the average of all chaebol firms, and is zero otherwise. Position refers to the distance between the founding family and a firm in a group; a value of one indicates that the firm is directly controlled by the founding family. Upper layer of pyramid refers to an indicator that has a value of one if a firm's position is smaller than the average of all chaebol firms, and is zero otherwise. Lower layer of pyramid refers to an indicator that has a value of one if a firm's position is greater than or equal to the average of all chaebol firms, and is zero otherwise. Loop refers to an indicator that has a value of one if a firm is in a circular ownership chain, and is zero otherwise. No loop refers to an indicator that has a value of one if a firm is not in a circular ownership chain, and is zero otherwise. Controls include the log of total assets (in millions of KRW), the leverage ratio, and the number of group affiliates. All estimates include industry (SIC-2 digit) and year indicator variables. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

Panel A: Tobit	Dependent Variable: Number of Inter-group Mergers							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	Market Shrinkage During Asian financial crisis			Restructuring Effect after Asian Financial Crisis				
Succession Tax Burden	0.02862***			0.09457***				
	[0.002]			[0.004]				
High Succession Tax Burden × Post		0.59626***	12.37471***		2.60543***	13.49572***		1.91204***
		[0.124]	[0.167]		[0.227]	[0.302]		[0.039]
High Succession Tax Burden × Post × Foundation			-12.76909***			-22.02351***		
			[0.212]			[0.338]		
High Succession Tax Burden × Post × Early Post							0.20758***	
							[0.009]	
High Succession Tax Burden × Post × Late Post							0.22744***	
							[0.030]	
High Succession Tax Burden × Post × Foundation × Early Post								-1.72317***
								[0.012]
High Succession Tax Burden × Post × Foundation × Late Post								-2.14809***
								[0.035]
High Succession Tax Burden × Foundation			11.10128***			19.90398***		3.31894***
			[0.208]			[0.342]		[0.047]
Post × Foundation			-0.14373***			11.75059***		3.67164***
			[0.087]			[0.272]		[0.072]
Foundation			1.18878***			-9.80145***		-4.10631***
			[0.086]			[0.283]		[0.093]
Post		-1.236***	-0.84339***		-3.17279***	-4.52701***	-3.10565***	-1.91936***
		[0.125]	[0.107]		[0.201]	[0.242]	[0.207]	[0.062]
High Succession Tax Burden		0.85627**	-10.52751***		-0.61368**	-10.68611***	-0.09750**	-2.10453***
		[0.144]	[0.177]		[0.251]	[0.310]	[0.039]	[0.050]
Industry Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,089	2,089	2,089	2,338	2,338	2,338	2,338	2,338

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Panel B: OLS	Dependent Variable: Number of Inter-group Mergers							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	Market Shrinkage During Asian financial crisis			Restructuring Effect after Asian Financial Crisis				
Succession Tax Burden	0.00475**			0.00781***				
	[0.002]			[0.001]				
High Succession Tax Burden × Post		0.19538**	0.57434***		0.33487***	0.59652***		
		[0.093]	[0.168]		[0.042]	[0.075]		
High Succession Tax Burden × Post × Foundation			-0.61660***			-0.39676***		0.07135***
			[0.203]			[0.092]		[0.009]
High Succession Tax Burden × Post × Early Post							0.04013***	
							[0.004]	
High Succession Tax Burden × Post × Late Post							0.01887***	
							[0.004]	
High Succession Tax Burden × Post × Foundation × Early Post								-0.01252*
								[0.006]
High Succession Tax Burden × Post × Foundation × Late Post								-0.04184***
								[0.007]
High Succession Tax Burden × Foundation			0.20330			0.09184		0.01222
			[0.172]			[0.069]		[0.009]
Post × Foundation			0.09907**			0.03256		0.00839
			[0.045]			[0.022]		[0.006]
Foundation			0.00705			-0.02855*		-0.00964*
			[0.041]			[0.017]		[0.006]
Post		-0.01297	-0.02043		-0.01950	-0.02724	-0.00772	-0.01149
		[0.032]	[0.033]		[0.018]	[0.018]	[0.008]	[0.008]
High Succession Tax Burden		0.04798	-0.09500		-0.00188	-0.05200	-0.00037	-0.00830
		[0.079]	[0.143]		[0.032]	[0.057]	[0.005]	[0.009]
Industry Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,089	2,089	2,089	2,338	2,338	2,338	2,338	2,338
R-squared	0.079	0.085	0.098	0.055	0.090	0.102	0.103	0.113

Appendix A: Variable Definitions

Variables Related to Succession Taxes

Succession tax burden – the maximum expected tax payment if the ownership of the current chair's generation is inherited by the next generation in a corresponding year; this is calculated as Ownership Fraction of Current Chair Generation × Total Equity Value* × Tax Rate** (in 10 billions of KRW).

*Total equity value – the market value for public companies and Max [[(total asset - total debt)×2 +[{(NIt-3)×1+(NIt-2)×2+(NIt-1)×3}/6]/10%]/5] or total asset] for private companies, following Articles 63-1 and 63-2 of the Inheritance Tax and Gift Tax Act.

**Tax rate – the sum of the succession business premium tax rates imposed on the largest shareholders.

Pre – a year dummy that has a value of one before the tax reform (1997-1999), and zero otherwise.

Post – a year dummy that has a value of one after the tax reform (2000-2004), and zero otherwise.

Early post – a year dummy that has a value of one for the first two years after the tax reform (2000-2001), and zero otherwise.

Late post – a year dummy that has a value of one for the three years following the early post period (2002-2004), and zero otherwise.

Foundation – an indicator that has a value of one if a firm is owned by private foundations, and zero otherwise.

Firm Characteristics Variables

Number of intra-group mergers – the total number of mergers and acquisitions between two affiliates in a business group in a given year.

Intra-group merger transactions – the total amount of merger and acquisition transactions in millions of USD between two affiliates in a business group in a given year.

Number of total mergers – the total number of M&A transactions in a given year.

Total merger transactions – the total amount of merger and acquisition transactions in millions of USD in a given year.

Log of total assets – the logarithm of total assets of each firm in millions of KRW.

Log of sales – the logarithm of total sales of each firm in millions of KRW.

Leverage – the debt ratio, calculated by total debt divided by total equity.

ROA – the ratio of earnings before interest and tax (EBIT) divided by total assets.

Payout ratio – the ratio of a firm's net dividends paid divided by its net income.

Long-term R&D ratio – the ratio of a firm's long-term research and development (R&D) investment divided by its total R&D investment. Long-term R&D expenses only include long-term R&D investments, which are regarded as assets on the balance sheet, and exclude short-term R&D investments, which are regarded as expenses on the balance sheet.

Public firm – an indicator variable that equals one if a firm is listed on the KOSPI or KOSDAQ exchange, and zero otherwise

Firm age – the age of each firm in a business group in the corresponding year

Ownership Structure Variables

Centrality – the average percentage difference in the control rights of the controlling family across all group member firms other than the firm itself, after excluding a specific firm i from the group. The key strategic member companies that the controlling family uses to set up and control new firms in a business group have a high value of centrality because those firms are connected to many other member firms in the web of ownership. See Almeida et al. (2011) for more details on ownership metrics.

High centrality – an indicator that has a value of one if a firm's centrality is greater than the average of all chaebol firms, and zero otherwise.

Low centrality – an indicator that has a value of one if a firm's centrality is lower than the average of all chaebol firms, and zero otherwise.

Position – the distance between the controlling family and a firm in a group. A value of one indicates that the firm is directly controlled by the founding family. In a simple pyramid structure with two firms, the firm i in the upper layer (chain 1) has a position value of one, while the firm j in the lower layer (chain 2) has a position value of two. In this case, the position of firm i can be measured by the weighted average of chain 1 and chain 2, whose importance is weighted by the cash flow the family receives – the direct cash flow from firm i and the indirect cash flow from firm j through chain 2. The group firms that are directly owned by the controlling family have a low position value, while indirectly owned affiliates have a high position value. See Almeida et al. (2011) for more details on ownership metrics.

Upper layer of pyramid – an indicator that has a value of one if a firm's position is smaller than the average of all chaebol firms, and zero otherwise.

Lower layer of pyramid – an indicator that has a value of one if a firm's position is greater than or equal to the average of all chaebol firms, and zero otherwise.

Loop – an indicator that has a value of one if a firm is in a circular ownership chain, and zero otherwise.

No loop – an indicator that has a value of one if a firm is not in a circular ownership chain, and zero otherwise.

Cash-flow right – the sum of direct and indirect equity ownership held by the founding family after excluding treasury stocks and cross shareholdings.

Voting right – the ratio of the maximum number of stocks that the founding family can use for voting divided by the total number of stocks outstanding. This includes direct and indirect voting shares held by the founding family, subsidiaries, senior managers in special relationships, and non-profit organizations.

Discrepancy – the difference between cash-flow rights and voting rights.

Family Involvement Variables

(Current chair's generation)

Total number of members with ownership – the sum of the number of male, female, married male, and married female members with ownership of the group firms.

Number of male [female, married male, and married female] family members with ownership – the total number of male [female, married male, and married female] family members in the current chair's generation with ownership in at least one of the group firms.

Total fraction of ownership held by current chair generation – the ratio of the portion of ownership held by male, female, married male, and married female family members in the current chair and his/her siblings' generation divided by the entire portion of ownership held by family members.

Fraction of family ownership held by male [female, married male, and married female] family members – the ratio of ownership held by male [female, married male, and married female] family members in the current chair's generation divided by the entire ownership held by family members.

(Current chair+1 generation)

Total number of members with ownership – sum of the number of sons, daughters, sons-in-law, and daughters-in-law with ownership of the group firms.
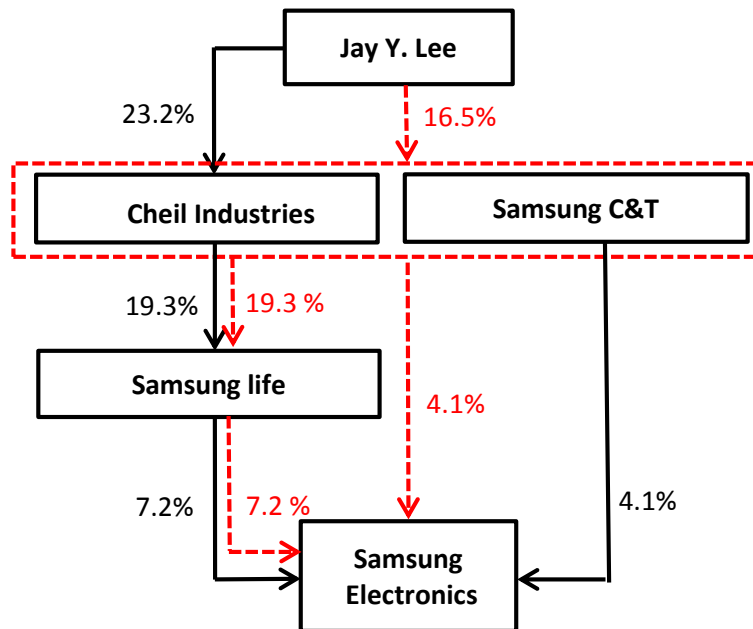
Number of sons [daughters, sons-in-law, and daughters-in-law] with ownership – total number of sons [daughters, sons-in-law, and daughters-in-law] of the current chair and the chair's siblings with ownership in at least one of the group's firms.

Total fraction of ownership held by current chair+1 generation – the ratio of the portion of ownership held by sons, daughters, sons-in-law, and daughters-in-law of the current chair and his/her siblings divided by the entire portion of ownership held by family members.

Fraction of family ownership held by sons [daughters, sons-in-law, and daughters-in-law] – the ratio of ownership held by sons [daughters, sons-in-law, and daughters-in-law] of the current chair and the chair's siblings divided by the entire ownership held by family members.

Appendix B: Merger Between Cheil Industries and Samsung C&T

The figure below shows how the intra-group merger of two Samsung affiliates, Cheil Industries and Samsung C&T, increases Jay Y. Lee's control over Samsung Electronics, the conglomerate's flagship unit, through indirect stake holdings, without Lee ever paying inheritance tax. The full lines represent the pre-merger ownership flow, while the dotted lines represent the post-merger ownership flow. The dotted box represents the new firm created from the intra-group merger.

An anecdote of an intra-group merger within the Samsung Group illustrates how intra-group mergers are used as a tax minimizing succession mechanism. The Lee family merged Samsung's de facto holding company, Cheil Industries, the textile firm, with Samsung C&T, the group's construction and trading arm, creating a new company with annual revenue of 31 billion USD. Before the merger, the heir apparent, Jay Y. Lee, controlled Samsung Electronics, the group's crown jewel, mainly through Cheil Industries, in which he held a 23.2% stake[21]. Cheil Industries was instrumental to the Lee family's control over 70 Samsung affiliates in the group's unique circular shareholding structure. Among Cheil Industries' most valuable holdings was Samsung Life, which had a 7.2% stake in Samsung Electronics. Cheil Industries held a 19.3% stake in Samsung Life. After the intra-group merger, Jay Y. Lee became the largest shareholder in the newly created company, with a 16.5% stake. This merger allowed Jay Y. Lee to achieve an

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[21] Jay Y. Lee and Kun-Hee Lee directly owned shares of Samsung Electronics at 0.57% and 3.38%, respectively, before the merger between Cheil Industries and Samsung C&T.

additional channel of control, albeit indirectly, over Samsung Electronics without paying an inordinate amount in inheritance tax, as Samsung C&T has a 4.1% stake in the company. (*Wall Street Journal*, May 26, 2015)[22].

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[22] Min-Jeong Lee and Jonathan Cheng, "Samsung Heir Apparent Jay Y Consolidates Power with Merger." *Wall Street Journal*, May 26, 2015