ESSAYS ON SUCCESSION IN FAMILY FIRMS

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ABSTRACT

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This dissertation is composed of three essays related to the succession in family firms. The first essay documents a novel channel of transfer of control in family firms. I provide evidence, from a natural experiment, that avoiding inheritance tax is the motivation behind intra-group mergers. Due to tax reform that increases personal inheritance taxes by 25 percentage points, the firms burdened by a high personal inheritance tax are most likely to increase intra-group merger activities 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. In my second essay, I identify succession as a novel determinant of risk-taking in family firms. I find significantly higher risk-taking (M&A and cash flow volatility) and lower operating efficiency in firms controlled by families with multiple sons during the pre- rather than the post-succession period compared to family firms with one or no sons. Pre-succession risk-taking by sons decreased after the instatement of inheritance legislation that required some sharing of wealth between them. An infusion of outside talent via daughters' marriages also alleviates sons' relative rank-seeking behaviors during succession tournaments. The third essay documents an unusual surge in fraud investigations for family firms with many sons prior to leadership successions, which are accompanied by negative shareholder reactions. Such fraud investigations are concentrated in firms run by families with extensive internal conflicts, including public feuds, as well as families

with half-brothers. Using the sudden death of a chairman as an exogenous shock that increases conflicts inside the family, we find sharply increasing fraud investigations following the chair's death. Overall, our results shed new light on the significant spillover from family governance to corporate governance in family-run organizations.

To Jiyeun and my family

ACNOWLEDGEMENTS

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ESSAY 1: Transfer of Control and Ownership Structure in Family Firms

1.1   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]

This anecdote illustrates, in practice, how family firms indirectly transfer control to the heirs through a channel of transfer of control, that is intra-group merger[2]. When the controlling families try to transfer their control through direct ownership inheritance, heirs inherit the family's ownership by paying inheritance tax. This is what we generally expect when we talk about the transfer of control in family firms. However, 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 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, heirs can obtain large controlling stakes in a key strategic firm owned by the controlling family while avoiding inheritance tax.

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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.

[2] 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 Figure 1.2.

Family firms compose more than 80% of firms worldwide [3], 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 [4]. Despite succession being studied from many angles, detailed evidence on the effect of personal inheritance tax (Tsoutsoura, 2015) 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.

I provide causal evidence, from a natural experiment, that avoiding inheritance tax is the 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

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

[4] 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. Lee, Shin, and Yun (2016) shows the impact of succession tournaments on risk-taking in family firms.

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[5] from 1997 to 2004 (sample years), 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 paper is never limited to Korea. It is such a human nature. The governments always try to take taxes from the firms, and the firms resist it by finding alternative ways to avoid it. Thus, any family firm has its own incentive to use tax minimizing succession strategy.[6]

I first document a pattern of unusual surges in intra-group mergers with 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[7], 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.

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[5] This family-owned large business conglomerates in Korea are generally called 'chaebol'.

[6] 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.

[7] 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.

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-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.

I then 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. Since the heirs only own their target firms to merge them with central firms, 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 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 on investment decision (Tsoutsoura 2015). My paper connects these two recent works by deeper exploring the ownership networks among group affiliates as a key component of 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.

This paper also 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 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.

1.2   Institutional Background

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.

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[8].

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[8] 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 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.
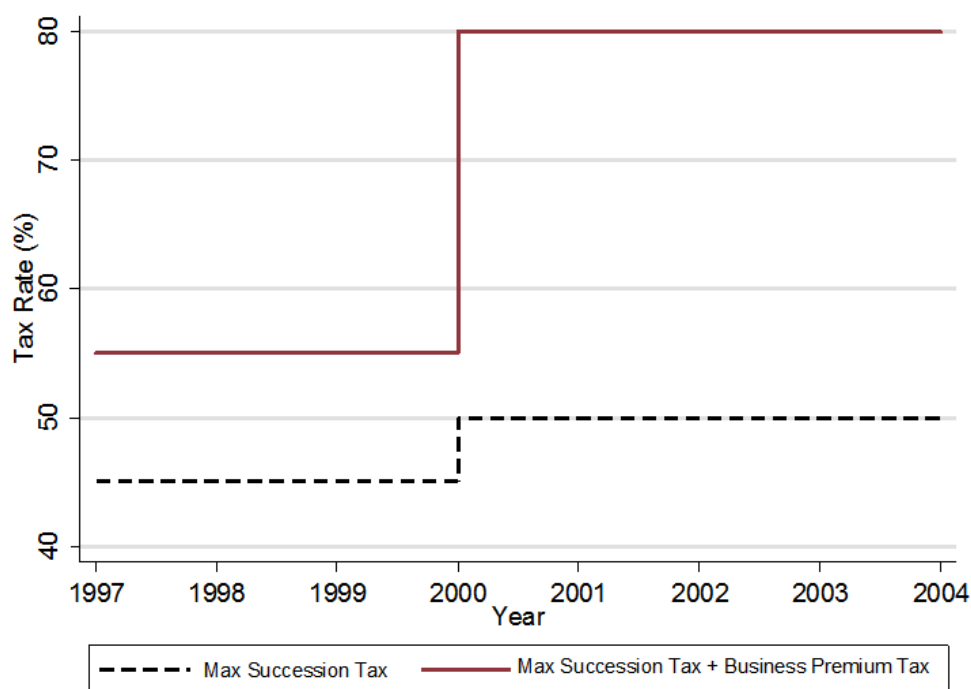
Figure 1.1: Tax Reform and the Maximum Succession Tax Rate

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[9]. In 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

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[9] 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.

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, 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 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.

1.3   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[10]. Since the mid-1990s, the KFTC has required leading Korean chaebols to report

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[10] 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,

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 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[11]. 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[12] 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)[13]. 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

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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).

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

[12] 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.

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

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

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[14]. 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)[15]. 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. 2012; 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[16], loop[17], cash-flow right, voting right, and discrepancy, to look at the pyramidal structures of

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[14] Succession tax burden = Ownership fraction of current chair generation $\times$ Total equity value $\times$ Tax rate in 10 billions of KRW. Total equity value refers to market value for public companies and Max [[(total asset-total debt) $\times 2 + [\{(NIt-3) \times 1 + (NIt-2) \times 2 + (NIt-1) \times 3\}/6]/10\%]/5]$ 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.

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

[16] 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.

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 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 position value, while indirectly owned affiliates have a high position value. See Almeida et al. (2012) for more details of ownership metrics.

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

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 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 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 B.

1.4   Results

1.4.1   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[18]. 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.

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

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[18] 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.

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.

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.

1.4.2 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.

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

18

centrality firms (0.02403). This result sharply identifies the effects of a personal inheritance tax burden on intra-group mergers in Korean chaebols.

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.

1.4.3   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.

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 × 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.

1.4.4 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 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.

21

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.

1.4.5   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

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.

1.4.6 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.

1.5   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 negative market response to tax-motivated intra-group mergers, and the resulting distortions in ownerships structure among group affiliates.

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.

This paper also implies that shock from personal inheritance tax distorts the ownership structure among affiliates, providing unique evidence that tax shock causes exogenous changes in ownership structure for a subset of family firms. Ownership structure is determined highly endogenously, and it is difficult to prove that the corporate outcome is impacted by ownership structure or other underlying factors that determine the ownership structure. Future studies might identify the costs of the resulting distortions by personal tax shock on the ownership structure in family firms. The business groups with distorted ownership structure 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.

ESSAY 2: Family Feud: Succession Tournaments and Risk-taking in Family Firms

2.1   Introduction

Around the world, family firms are prevalent and comprise a large portion of the economy. La Porta, Lopez-de-Silanes, and Shleifer (1999) document that, except for in a few advanced economies with strong investor protections, firms are often controlled by families. Even in the United States, family firms contribute 57% of the GDP (Annual Family Business Survey) and employ 63% of the workforce in the country (Family Enterprise USA, 2011).[21] Reflecting their importance in the world economy, family firms have attracted attention in the recent literature. Despite the many papers that describe various aspects of family firms, studies that examine potential conflicts within a family on inheritance issues are relatively rare. Specifically, the literature has not fully explored the cultural and institutional factors that might determine how succession tournaments are played out within a family. How these tournaments could affect corporate outcomes of a family-run business is an important question, yet has not been fully addressed in the literature. We fill the void in this paper.

We examine whether succession tournaments inside the controlling family induce risk-taking incentives among the heirs of a family firm. To determine whether the risks taken by the heirs are excessive (at least in the short run), we study their performance consequences. We answer these key questions using Korean family business group data for several interesting and important reasons. First, the standard prescriptions for remedy of potential agency problems, such as optimal contracting, often do not work well in Korea because exogenous, unalterable factors including bloodline, gender, or seniority within a family, play an important role in determining succession outcomes of a business group. The long-standing Confucian culture in Korea implies that succession tournaments in Korean family business groups are primarily

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[21] Family Enterprise USA, "Annual Family Business Survey: General Results and Conclusions." 2011.

between male, direct bloodline heirs rather than female heirs or any external male family members who join the family through adoption or marriage. Understanding the impact of these innate factors on firms is a first step towards finding solutions to steer family firms back to profit maximization. Second, succession tournaments are more likely in Korean business groups because the controlling stakes within a group are interconnected by a web of cross-ownership among the member firms, making it strategically important to control several key firms, rather than just owning stakes in many firms within the business group. Typically, a tournament winner is endowed with the controlling stakes in those key firms, through which the winner controls the whole business group. This steep option-like payoff structure in the succession process in Korean family business groups results in strong tournament incentives among the heirs of the business groups.

While this paper takes a special situation in Korea as its empirical setup, sibling rivalry is a widespread phenomenon among human families (Sulloway, 2001); its origin goes back to the Darwinian theory, which suggests that most offspring have to compete for parental favor and investment. Therefore, understanding potential outcomes of this sibling infighting could have broad and important implications for family firms in various economies around the globe. The findings of this paper can also shed light on succession in public firms run by professional managers, where an incumbent CEO or controlling shareholder favors a particular divisional manager. Becoming the next CEO is then considered by other divisional managers as a far out-of-the-money option, which could create incentives for risk taking among them.[22] In the case of U.S. public firms, financial data at the division level are rather limited, and therefore our study,

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[22] For example, Ajit Jain and Greg Abel are competing to succeed Warren Buffet at Berkshire Hathaway. Greg Abel, who is a relatively young and new contender, focuses on riskier strategies such as acquisitions (Das, Anupreeta, "Berkshire Hathaway's Vice Chairman Offers Hint of Warren Buffett Successor; Ajit Jain or Greg Abel could be candidates, Charles Munger suggest," Wall Street Journal, February 15, 2015).

which uses more detailed Korean market data, could serve as useful guidance on the forces at work during general CEO promotion processes in dispersed shareholder owned U.S. public companies.

Using a panel of firms within Korean family business groups known as *chaebols* and detailed information on their family trees and marital histories in the 1983–2004 period, we first find that chaebols, particularly those that undergo successions during our sample period, have a 2.52% higher cash flow volatility and greater M&A activity than non-family controlled business groups. Further delving into the cross-sectional and temporal characteristics of risk-taking practices in family business groups, we find significantly higher cash flow volatility in the member firms of a family business group when its controlling family has multiple sons in the generation immediately following the current chair's generation. Firms controlled by a family with more than two sons have a 2.31% higher cash flow volatility before the completion of a succession than those controlled by a family with a single son, or no sons. This difference-in-differences effect is concentrated in chaebols that have a controlling family with a narrow age gap between sons and also in chaebols whose families are engaged in a family feud over inheritance issues, indicated by media reports. In contrast, the number of daughters and sons-in-law in a chaebol's controlling family has no significant impact on cash flow volatility around successions. These results suggest that family composition and family governance are important risk factors for family firms. Failing family governance, such as sibling infighting, could lead to significantly higher risk-taking by the heirs, and therefore, such family disharmony could serve as an important family-specific factor that distinguishes the risks of family firms from those of non-family run organizations.

We also examine the performance consequences of the risks taken by chaebol families. Consistent with the notion that excess risk-taking destroys value in the short run, we find that firm performance (measured by ROA and operating income scaled by total assets) is weaker before the succession than after the succession is completed. The effect is also more pronounced in chaebols whose families have more than two sons. Changes in ROA (i.e., the increase in ROA after succession is completed) are 3.99% larger for firms controlled by a family with multiple sons in the chair+1 generation, compared to firms controlled by a family with a single son, or with none in that generation. That is, the depression in ROA during the pre-succession period is more severe for firms with multiple contestants in the succession tournaments.

We further investigate whether the positive relation between the number of succession contestants (i.e., the number of adult sons) and firm volatility is causal using two events: the sudden death of a Hyundai chairman and a change in inheritance law. In the first test, we use the unexpected suicide of a Hyundai Group chairman in his fifth year in office. Using this exogenous shock to Hyundai's succession tournament, which suddenly reopened to the deceased chair's old rivals, his brothers, we confirm that increased competition (more adult male succession contenders) leads to greater risk-taking. The effect is concentrated in firms controlled by the chair's brothers, who rejoined the newly open succession competition, while insignificant in firms controlled by the deceased chair's uncles, who are in the founder's generation (i.e., the deceased chair's father), and so are less likely to be directly involved in this suddenly reopened succession tournament.[23] Our results are robust to potential restructuring effects following the chairman's sudden death. We further rule out the possibility that the *reactions* of Hyundai affiliates' suppliers and customers, rather than the *actions* of the deceased chair's brothers, could

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[23] This within-Hyundai-Group analysis is important, as it effectively rules out a potential confounding factor – the shared risk arising from the Hyundai chair's sudden death to all Hyundai-affiliated entities.

drive our results. Overall, we provide direct evidence on the empire building actions of the deceased chair's old rivals.

In the second causal test, we exploit regulatory changes in Korean inheritance law, which strongly favored the eldest son before a 1991 amendment. Under the new law, the family estate must be equally distributed to all of the deceased's descendants, regardless of their gender, birth order, and marital status. With this payoff equality in *cash flow* rights among the succession contestants, the heirs' incentive to take risks weakens, because the result of winning or losing the succession tournament is less extreme (Lazear, 1989, Chen, 2003). We indeed find that the change in cash flow volatility before and after the succession becomes much weaker following the 1991 Korean inheritance law change.[24]

Last but not least, we also explore several other promotion mechanisms as potential remedies for the excessive risk-taking by sons during chaebol successions. We show that a seniority promotion system such as primogeniture, in which the firstborn son always inherits his parents' entire or main estate, could mitigate unnecessarily high competition among heirs. The cross-sectional expansion of a family via daughters' marriages to talented sons-in-law could also alleviate "relative rank" seeking behaviors by sons in chaebol successions. Highly talented sons-in-law, although culturally ineligible to be the next group chairman, by demonstrating high performance standards, can motivate sons to reach absolute performance objectives rather than seeking relative rank preferences.

Our work contributes to the literature on succession in family firms. We focus on risk-taking incentives among the heirs of a family firm during succession tournaments and introduce the succession tournaments as an important family-specific factor that explains corporate risk-

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[24] However, it should be noted that the effect is statistically and economically marginal, given the ultimate *control rights* that cannot be shared among the heirs.

taking. In this regard, our study contrasts from many prior studies that mainly focus on the performance impacts of successions (Perez-Gonzalez, 2006, Bennedsen, Nielsen, Perez-Gonzalez, and Wolfenzon, 2007, Bertrand, Johnson, Samphantharak, and Schoar, 2008). We propose the corporate risk implication of family firm succession as an important background risk of family-run organizations around the world.

Our work also relates to the gender and corporate finance literature. Adhikari, Agrawal, and Malm (2015), Cronqvist and Yu (2015), Faccio, Marchica, and Mura (2015), and Nguyen (2015) find differences in corporate decision-making outcomes based on the gender of CEOs and the CEOs' children. Ongena and Popov (2015) show differences in access to the credit market based on the gender of companies' CEOs. Our work shows the importance of gender within a family in explaining corporate risk-taking outcomes: daughters are crucial to mitigating risk-taking incentives in tournament games. However, our results further emphasize that it is not mere biological gender differences that lead to such outcomes, but rather different social roles within a family; sons and sons-in-law have differential implications on corporate risk-taking.

We also apply messages from the tournament and risk-taking literature to the family firm literature. Theories on tournaments and risk-taking incentives (Lazear and Rosen, 1981, Nalebuff and Stiglitz, 1983, Lazear, 1989, Hvide, 2002, Chen, 2003, Taylor, 2003, among others) are extensively applied to mutual funds (Brown, Harlow, and Starks, 1996, Chevalier and Ellison, 1997, and Kempf and Ruenzi, 2008, among others) and U.S. stand-alone corporation analyses (Kini and Williams, 2012, among others). However, investigation of the implications for family business groups is rare. We are the first to use tournament theories to understand risk-taking incentives in family-run business organizations.

Finally, our work extends the literature on chaebols. Existing studies (Bae, Kang, and Kim, 2002, Joh, 2003, Baek, Kang, and Lee, 2006, and Almeida, Park, Subrahmanyam, and Wolfenzon, 2011) mainly focus on the prevailing pyramidal control structure and/or resulting agency problems, such as resource tunneling. Our approach differs from theirs, as we introduce potential succession tournaments within a family that arise due to the option-like payoff structure to heirs when deep ownership pyramids are present. Our work also explains how cultural factors shape and affect the scope of these succession games. Our results indicate that these cultural considerations are important keys to understand the "family" side of business group operations.

Our paper is organized as follows: Section 2 provides background on Korean business groups and develops testable hypotheses. In Section 3, we describe the sample and variables used in our test. Section 4 provides our main results and robustness tests. In Section 5, we conclude.

2.2   Institutional Background and Hypothesis Development

2.2.1   Institutional Background

One of the predominant business organization models in Korea is the chaebol, a family-run business group that consists of multiple independent legal entities. Since 1960, chaebols have emerged under a series of government-driven economic development plans and expanded; they now control more than 57% of Korean national wealth (Economic Reform Research Institute, Feb 11, 2014).[25]

While chaebols have grown economically, one of the central concerns to a controlling family has been the succession of the business group's leadership to the next generations. To economize on succession costs (e.g., inheritance taxes), in many chaebols, families control the

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[25] "The concentration of economic power in large corporations and conglomerates and their dynamic change analysis (1987 – 2012)." Economic Reform Research Institute Report, Feb 11, 2014.

whole group of affiliates through miniscule control stakes in several key entities known as "central" firms (Almeida et al., 2011). Such a concentrated control structure extensively uses a complex pyramidal ownership web that often also accompanies circular ownership links. Group succession has occurred exclusively within the direct bloodline of a chaebol family, and, as of 2015, most chaebol families are preparing for succession to their third generation (Nikkei Asian Review, Aug 20, 2015).[26]

Although smooth and efficient transition of group control to the next generation is a common interest for a chaebol family, significant within-family conflicts may arise from different incentives among heirs. The highly concentrated control structure of a chaebol implies a steep option-like payoff that can induce a succession tournament (among the heirs), where the winner takes all – i.e., ultimate *control* over the entire business group.[27]

Chaebol succession tournaments have recently received substantial attention as the media popularize the brutal succession battle between two sons of the Lotte group, the fourth-largest Korean chaebol, whose market capitalization amounts to $96 billion (Economist, Aug 15, 2015).[28] In this infighting situation, the younger brother has dismissed his old father (born in 1922) – the founder of the Lotte group – from group chairmanship, and is engaging in a legal battle over group control against his elder brother who insists he is the next chairman approved by their old father. This on-going succession debacle is costly to their shareholders. The group's largest company, Lotte Shopping, lost 8% of its market capitalization in just over a week

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[26] Ogura, Kentaro, "Hereditary Succession Rankles 'Chaebol' Investors, Public." Nikkei Asian Review, Aug 20, 2015.

[27] This ultimate control right is important because it ensures that the winner of the succession tournament can enjoy substantial private benefits by controlling the central segments of the family's business. Sons who lost the succession tournament are either excluded from the management team or can keep their managerial positions at the non-core segments of the family's business.

[28] Economist, "A Whole Lotte Drama: a fraternal feud over inheritance fires up South Koreans and regulators." Aug 15, 2015.

following the media announcement of the family feud (CNBC, Aug 5, 2015).[29] Rivalries over inheritance are not uncommon in chaebols. According to Chaebul.com, which tracks chaebol inheritance issues, roughly half of the top 40 chaebols have been embroiled in disputes over founders' succession plans.

The scope and design of succession tournaments are influenced by both family and non-family factors. On the one hand, sibling rivalry is widespread among human families (Sulloway, 2001). The desire for "getting ahead of the Joneses" (Roussanov, 2010) within a family is common and tends to be severe when the age gap between siblings is narrow.[30] In the family firm context, Bertrand and Schoar (2006) document an unintended consequence of severe sibling rivalry in a succession that ended in a brutal siblicide in a Thai family business group.

In addition to sibling rivalry, there are also several important cultural factors that affect how the succession game is played in chaebols. Through the social norms established by a long tradition of Confucian culture in Korea, preferences for male, more senior, and direct bloodline heirs, i.e., male-preference cognatic primogeniture, are widely perceived as key norms in Korean culture, and these cultural factors suggest that succession tournaments in Korea tend to be driven by male family members – in particular, by sons.

Strict preference for heirs from direct bloodlines suggests the unique role played by daughters and their spouses in chaebol succession games. Sons-in-law cannot rule over the whole group, even if they possess strong managerial talents; they can only partially engage in the family's business as professional managers (Burkart et al., 2003). Anecdotal evidence suggests that daughters own group firms, while sons-in-law manage them, often without ownership (The

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[29] Nyshka Chandran, "Vicious South Korean family feud exposes chaebol peril." CNBC Aug 5, 2015.
[30] Lawrence Kutner, "Parent & Child." New York Times Aug 31 1989.

Korean Herald, April 21, 2014).[31] Through this separation between ownership and management, daughters' marital status can indirectly influence the mode of a succession tournament by setting a higher managerial quality standard for the winner of the tournament.[32] If the winner of the succession tournament cannot prove that he has superior managerial talent compared to external family members, his victory would be bittersweet. This notion of chaebol marriage is in line with Mehrotra et al. (2013) and Bunkanwanicha et al. (2013), who document adopted heirs and marriages to other renowned families as ways a founding family can overcome the human capital risk that originates from the cultural guidelines on who can inherit the corporate empire.

Based on the discussions above, we make the following assumptions about the chaebol succession game:

A1: Succession tournaments exist exclusively among sons in the generation that immediately follows the generation of the current group chairman. For natural reasons, tournament intensity is higher when the age gap among sons is narrow.

A2: Daughters own group affiliates but tend to not manage them.

A3: Sons-in-law can manage group affiliates but do not own them. They cannot receive family benefits that are exclusively available to those in the direct bloodline due to innately different family names/origins. For these reasons, they do not compete against sons in succession tournaments.

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[31] Korean Herald, "Superrich Sons-in-law." April 21, 2014. This little ownership of sons-in-law is evident for those in the succession generation. External male family members in the group chair's generation could own some, but still, to a limited extent.

[32] We provide the anecdotal evidence on high quality sons-in-law who successfully manage several chaebol affiliates in our Appendix F. The managerial success by these talented sons-in-law could change the public notion of the main business segments within each chaebol.

2.2.2 Hypothesis Development

Below we hypothesize how family composition, such as the number of sons and their age distributions, affects corporate risk-taking in a family business group as an outcome of a succession tournament.

Our first testable hypothesis relates to the succession process and the risk-taking behaviors of firms controlled by potential successors:

H1: Risk-taking by potential successors increases when the succession outcome is not firmly established.

The main insight of this first hypothesis comes from the option-like payoff of a succession tournament. Given the deep pyramidal control structure of Korean business groups, the winner of a succession tournament reaps much greater rewards than the other (losing) contestants. When it is less certain who will become the successor – in part because there are multiple sons in a close age gap without a perceived dominant successor – their option-like payoffs become more convex, inducing greater risk-taking incentives. In other words, potential infighting among these successors intensifies.[33]

Our second hypothesis considers how risk-taking incentives among successors change when the rewards from the succession tournament change:

H2: Risk-taking by potential successors diminishes when the consequences of losing the succession tournament become less extreme.

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[33] Appendix G illustrates a potential underlying economic mechanism of **H1**.

H2 provides the testable implications of the change in inheritance law in Korea. Originally legislated in 1950, Korean inheritance law has undergone major changes over time. Before 1960 when the patriarchal Family Head System (a.k.a. Hoju System) was in place, the first son was entitled to the entire family estate, with his wife eligible for the inheritance through family-head succession in case of his absence. After 1961, the law was amended to designate specific proportions of the estate to each family member: 1.5 to the first son, 1 to the other sons, 0.5 to unmarried daughters, and 0.25 to married daughters. The law still preferred sons to daughters and unmarried daughters to married ones, as the unmarried are still under the late father's family registry. In 1978, the law was revised again to adjust the proportion to be claimed by unmarried daughters to the same level as their brothers', so that 1.5 went to the eldest son, 1 to the remaining sons, 1 to unmarried daughters, and 0.25 to married daughters. However, over time, opposition to the amendment grew because it violated gender equality, forcing the government to find a more equitable system of distributing a family estate. The result was the current inheritance law, which took effect in January of 1991; it stipulates the equal distribution of a family estate to all the descendants regardless of their gender, birth order, or marital status. Our **H2** predicts that following the introduction of this 1991 law which provides some inheritance to all potential successors, risk-taking during succession tournaments will attenuate.[34]

2.3 Data

The main sample of our study consists of 2,508 family and non-family firms from 30 large Korean business groups designated by the Korean Fair Trade Commission (KFTC) from

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[34] Despite equal distribution among the successors, key control rights over the chaebol's main business segments cannot be shared among the successors even after this law change. Hence there will still be some residual control motivations for the heirs before the succession is completed. This could moderate the effects predicted by **H2**.

1983 to 2004 (hereinafter "sample years").[35] To build family trees of chaebol families, we start with a publication by the Institute for Participatory Society, *The Chaebol of Korea: The Management Structure and Personal Network of Korean Chaebol* (2005), which provides the family tree snapshots of 30 largest Korean chaebols based on their total assets in 2004.[36] The snapshot includes the date of birth (or death) of each family member, which enable us to construct dynamic family trees for our sample period. However, the book does not provide full coverage of specific marriage year information. We therefore manually collect the relevant information. From Korean news articles, we secure marriage year information for 70% of the current chair+1 (c+1) generations. For the remaining 30%, we extrapolate the marriage years from the birth year of the marriage's first child.

We retrieve M&A data from Thomson Reuters SDC Platinum and collect financial data of firms using Data Guide Pro, a database managed by the leading Korean financial data provider, FnGuide.[37] The total amount of assets controlled by all family firms in our sample represents more than 70% of the nominal GDP of the Korean economy as of 2004 (984.7 trillion KRW).

Table 1 is an overview of the business groups and succession status during sample years. [38] The firms in 30 business groups are classified into three types: (1) firms largely controlled by the 12 founding families where business succession took place within the family during the sample years (hereinafter "family firms with succession"), (2) firms largely controlled

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[35] A key reason for focusing on the samples before 2004 is the limitation of comprehensive data on family tree and personal records (e.g., marriage dates), which we obtain from the reference mentioned above.

[36] 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.

[37] The financial data in Data Guide Pro are comparable to the information reported in CRSP and Compustat for U.S. firms.

[38] Shinsaegae (1997), CJ (1996), and Hansol (1991) groups spun-off from Samsung Group, and Hyundai motors (2000), Hyundai Heavy Industry (2002), Hyundai Devlopment (1999), KCC (2000), and Hyundai Department (1999) spun off from Hyundai Group during sample years. For those eight business groups which are separately classified by the KFTC, their sample data are available from the year when they were spun off.

by the another 11 founding family where business succession did not take place within the family during the sample years (hereinafter "family firms without succession"), and (3) firms that belong to the remaining seven business groups whose controlling shareholders are not families but corporate entities (hereinafter "non-family firms"). Among 23 business groups that are controlled by the founding families, 12 business groups had experienced generation-to-generation succession during our sample years. For these groups, pre- and post-succession periods are jointly defined. Firm-years prior to the year of succession are defined as the pre-succession period. Likewise, we define the post- succession period as the firm-years that follow the succession year. Our post-succession period is well-defined as there was no generation-to-generation succession from the end of our sample period till the end of 2016. For all chaebols in our sample, therefore, there are no possible conflicts during their post-succession periods.[39] We exclude within-generation successions based on family's mutual agreements because no sibling competitions are involved in these cases.

Table 2 summarizes financial characteristics of our sample firms (panel A) and the overview of 23 chaebol families in our sample (panel B). Appendix C provides the details of our variable definitions. Firm financial variables are defined as of year-end snapshots during our sample period. *Cash Flow Volatility* is the standard deviation of cash flow from investment activities for the five-year around the year of interest.[40] The average cash flow volatility in our sample is 8.86%. *Total M&A ratio* refers to the ratio of total amount of non-intra group M&A transactions divided by the book value of total assets. As expected, the variable is left-censored and relatively right-skewed. We exclude all intra-group M&A transactions to avoid any

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[39] Our results are also robust to alternative definitions of pre- and post-succession periods using a more balanced time interval before and after each succession year. Results are reported in Table 7.

[40] Cash flow from investment activities is defined with the following accounting items: Capital expenditure, Sales of property, plants, and equipment, Increase in investment, Sales of Investment, Short-term investment change, Acquisitions, and Other investing activity.

confounders that are associated with business group restructuring in the post-succession period. Our sample comprehensively covers chaebol-affiliated entities during our sample years, and thus, the financial characteristics of our sample firms are similar to those reported in the existing studies that also focused on large chaebol firms in Korea (for e.g., Bae et al., 2002, Almeida et al., 2011, among others). The average *ROA*, *Leverage* ratio, and the *Number of affiliates* are 7%, 3.46, and 66.56, respectively. 78% of our sample firms are public (*Listed*), and their average firm age (*Firm age*) is 26.12 years.

In Panel B of Table 2, we provide an overview of 23 chaebol families. The average family in our sample has 12.50 members; there is substantial cross-sectional variation in family size due to the variation in the number of family generations. The majority of the current chairs belong to the second generation, and the average numbers of male and female family members are 6.31 and 6.18, respectively. In the current chair+1 generation, there are, on average, 2.24 sons, 1.48 daughters, 0.94 sons-in-law, and 1.55 daughters-in-law. [41] We observed 47% of families whose founders are alive during sample years.

2.4   Results

2.4.1. Corporate Risk Taking in Family Firms Versus Non-Family Firms

To motivate the relevance of our notion of succession tournaments to corporate risk-taking in family business groups, we first compare corporate risks of the following three types of firms in our sample: (1) family firms with succession, (2) family firms without succession, and (3) firms that are not controlled by families, i.e., non-family firms. [42] If succession tournaments induce greater risk-taking by sons of a family firm as hypothesized in **H1**, corporate risk-taking

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[41] Sons below age-15 are excluded from the sample since they are not legally eligible to work in Korea.
[42] We interchangeably use family firms and firms in family business groups throughout the manuscript.

is expected to be highest for (1) family firms with succession, and then followed by (2) family firms without succession and (3) non-family firms, respectively. We test this argument in Table 3 by running the following ordinary least squares (OLS) regression for firm i in business group j in year t using $Cash\ Flow\ Volatility_{i,j,t}$ as our main dependent variable: [43]

$$Cash\ Flow\ Volatility_{i,j,t} = \alpha + \beta \cdot Firm\ Type\ Indicator_j + \text{Controls} + I_{SIC4} + \delta_t + \epsilon_{i,j,t}$$

Eq. (1)

Our key explanatory variable is $Firm\ Type\ Indicator_j$, which indicates one of the three types of firms that we introduced above. It should be noted that this firm-level dummy is determined solely based on the business group-j characteristics that firm-i belongs to. Following the specification used in Almeida et al. (2011), we include industry and year fixed effects, where I_{SIC4} and δ_t denote the vectors of industry (SIC-4 digit) and year fixed effect dummies, respectively. Controls include *ROA*, size (*Log of total assets*), *Leverage*, *Number of affiliates*, and *Firm age*. We cluster the standard errors at the business group level.

In Column 1, we use a simple family firm indicator as our main explanatory variable. The point estimate of *Family firm (Indicator)* is 2.51889, which is statistically significant at the 5% level. The results indicate that family firms have on average 2.51% higher cash flow volatility than non-family firms that are, by definition, not associated with family characteristics. This family-specific effect corresponds to a net 28.33% increase in cash flow risk from its sample average (8.86%). This is an economically significant effect.

In the next Column 2, we further decompose family firms into two types: (1) family firms *with succession* and (2) family firms *without succession*. By comparing the risks of these two types of family firms, we can more sharply identify the effects of family successions on

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[43] Collapsing panel data into pre- and post-succession period for each firm (to avoid overlapping time periods of cash flow volatility) yields qualitatively similar results.

corporate risks. We find that family firms with succession have 1.14562% higher cash flow volatility than family firms without succession. Family firms without succession also have on average 1.95429% higher risks than their non-family firm counterparts. Put together, these two sets of results are in line with our prior – corporate risk-taking is highest for family firms with succession, followed by family firms without succession and then non-family firms, respectively. These results are statistically significant at the 5% level.

In Columns 3 and 4 of the same table, we use *Total M&A Ratio* as an alternative dependent variable, which captures risk-taking "actions" by family managers. To avoid any group restructuring effects in the post-succession period, we exclude intra-group M&A transactions when constructing this variable. As the M&A ratio is left-censored and clustered at zero, we use the Tobit model and repeat the same analyses as we did in Columns 1 and 2. We find overall consistent results – family firms have higher M&A activities than non-family firms (3.82291 in column 3), while family firms with succession mainly drive such trend as they have even higher M&A activities than family firms without successions (1.24815 in column 4). All these results are statistically significant at the 1% level.

Overall, our results in Table 3 suggest that family firms exhibit higher cash flow risk than non-family firms, and among the family firms, the firms in a business group that underwent generation-to-generation succession during our sample period show particularly high cash flow volatility compared to the family firms that did not go through such events. Further tests using M&A transactions by the three different types of firms also exhibit similar risk-taking patterns. These documented differences in risk-taking between family firms and non-family firms should be explained by the controlling family characteristics. One of such family-specific factors that

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could drive our risk-taking results is severe sibling rivalry in the pre-succession period as we hypothesized in **H1**.[44]

2.4.2 Succession Tournaments in Family Firms

Is the higher risk in family firms associated with families with many sons in the (c+1)-generation? Is it also particularly the case during the "pre"-succession period? We jointly investigate these cross-sectional and temporal characteristics of chaebol successions implied by our **H1**. We focus on family firms that underwent succession events during our sample period and develop test specifications based on the assumptions (**A1**, **A2**, and **A3**) we introduced in Section 2.1.

From this test, we will show that only sons (who are eligible for succession) increase the risk in family firms (**A1**). Neither daughters nor sons-in-law in the controlling family can explain similar increase in risk for family firms during the pre-succession period (**A2** and **A3**). Moreover, we will show that sons' risk-taking incentives significantly decrease in the post-succession period following the succession outcomes. We test these predictions in the standard difference-in-differences specification. We employ both the linear OLS model and the non-linear Tobit model, whose estimation methodologies for the difference-in-differences effects are explained below. In both models, we exclude families whose pre- and post-succession periods have less than two years in order to balance the number of observations in the pre- and post-succession periods.

$$E\left[Cash\ Flow\ Volatility \mid D_{son\geq2}, D_{post,} X\right] = \beta_1 D_{son\geq2} + \beta_2 D_{post} + \beta_{12} D_{son\geq2} \times D_{post} + X'\beta,$$

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[44] Such succession tournaments are quite rare in non-family business groups. In unreported results, we find that most of CEO selection processes in non-family business groups in Korea are external-driven. On average, 84.3% of their CEO appointments are controlled by government, whereas only 4.3% of CEO successions are from internal promotions. Among 84.3% CEOs appointed under government control, 56.3% are high-ranking ex-government officials, 5% are politicians, and 23% are former military generals.

Eq. (2)

where $D_{son \geq 2}$ is an indicator for a family business group whose number of sons in the current chair+1 generation is equal to or greater than two. D_{post} is the post-succession period dummy that indicates the period following the year of succession. X is the vector of control variables. **H1** implies $\beta_{12} < 0$.

$Cash\ Flow\ Volatility$ is a risk-taking outcome rather than risk-taking "actions." It is therefore important to show the evidence of increasing risk-taking actions by sons during succession tournaments relative to their actions in the post-succession period. We use *Total M&A Ratio* as an alternative dependent variable in this model, which captures risk-seeking, empire-building incentives by sons during succession tournaments. As *Total M&A Ratio* is left-censored and clustered at zero, we employee the difference-in-differences estimation in the following non-linear Tobit model:

$$E\left[y\,\middle|\,y^* > 0, D_{son \geq 2}, D_{post}, X\right] = F\left(\beta_1 D_{son \geq 21} + \beta_2 D_{post} + \beta_{12} D_{son \geq 2} \times D_{post} + X'\beta\right)$$

$$= F(u), \hspace{3cm} \text{Eq. (3)}$$

where y is *Total M&A Ratio* we observe in the data, while y^* is its latent value. The left-censoring value of this Tobit is zero. $D_{son \geq 2}$ and D_{post} are similarly defined as in the previous OLS model. The difference-in-differences estimation in this Tobit model is non-linear, and therefore, we cannot directly inference out the average treatment effect from the sign of β_{12}. Following Ai and Norton (2003) and Norton et al. (2004), we use the synthetic estimate of the difference-in-differences by linearly combining four marginal effects from the combination of the two dummy variables, $D_{son \geq 2}$ and D_{post}. The detailed derivation of our difference-in-differences estimator in this Tobit model is as follows:

$$\frac{\Delta^2 F(u)}{\Delta D_{son \geq 21} \Delta D_{post}} = \left[F\big(D_{son \geq 2} = 1, D_{post} = 1\big) - F\big(D_{son \geq 2} = 1, D_{post} = 0\big) \right]$$

$$- \left[F\big(D_{son \geq 2} = 0, D_{post} = 1\big) - F\big(D_{son \geq 2} = 0, D_{post} = 0\big) \right]$$

$$= F\left(\beta_1 + \beta_2 + \beta_{12} + X'\beta\right) - F\left(\beta_1 + X'\beta\right) - F\left(\beta_2 + X'\beta\right) + F\left(X'\beta\right)$$

Eq. (4)

Table 4 reports these estimation results. In Column 1, we first use the OLS model by regressing each firm's *Cash Flow Volatility* on *Number of Sons* ≥ 2 (i.e., $D_{son \geq 2}$) and *Post* (i.e., D_{post}) dummies. We include the interaction term, *Number of Sons* $\geq 2 \times Post$, on the right-hand-side (RHS) of the regression. Other specifications such as controls and the way we cluster the standard errors are the same as in Eq. (1) for Table 3. The difference-in-differences estimate is -2.31043 for *Number of Sons* $\geq 2 \times Post$, which is statistically significant at the 5% level. This point estimate implies higher risk-taking in the pre-succession period for a family firm with more than two sons (*treated group*) relative to a family firm with a single son or no sons (*control group*). This difference-in-differences is largely consistent with our hypothesis, $\beta_{12} < 0$.

In the next two Columns 2 and 3 of Table 4, we conduct placebo tests using cross-sectional variations in family compositions, i.e., dummy variables for multiple daughters and multiple sons-in-laws who are not eligible for the succession tournaments for cultural reasons. We replace *Number of Sons* ≥ 2 with *Number of Daughters* ≥ 2 (column 2) or *Number of Sons-in-law* ≥ 2 (column 3). In those two columns, we find relatively loose connections between the presence of these female or external male family members in the (c +1)-generation of the family and corporate risks. Specifically, the point estimate of the interaction term between multiple daughters' dummy and *Post* (0.58506) as well as the estimate for the multiple sons-in-law' dummy and *Post* (1.27018), both, are positive and statistically insignificant. These results

validate our underlying assumptions about how succession tournaments are played out within a chaebol family (**A1**, **A2**, and **A3**), and further render supports for our **H1**.[45]

In Column 4 of Table 4, we conduct a conditional test to identify the effects of sibling rivalry in chaebol successions. Tournament incentives are likely to be high when sons are symmetric in their competitive positions (Hvide, 2002). Sibling rivalry is also severe when their age gap is narrow (Sulloway, 2001; see also our **A1**). We test this effect of sons' age distribution in the (c+1)-generation on family firms' risks in Column 4. We decompose the difference-in-differences (*Number of Sons ≥ 2 × Post*) into two groups using *Low age gap* and *High age gap* dummies, and test which group mainly drives our baseline findings in Column 1. We find that when sons' age gap is small (i.e. less than sample average age gap), corporate risk is significantly higher in the pre-succession period than the post-succession period (-3.81196 with the *p-value* of less than 1%). We also find a much weaker trend of reducing risk-taking from pre-succession periods to the post-succession periods when sons' age gap is large (-1.81645 with the *p-value* of 5%). The difference between these two effects is statistically significant at the 5% level (coefficient equality with an *F-statistic* of 5.66).

In the last Column 5 of the same table, we use the Tobit regression, where *Total M&A Ratio* is used as an alternative dependent variable. The sign and statistical significance of the point estimate for *Number of Sons ≥ 2 × Post* (-0.98730 with the *p-value* of 1%) are in line with our earlier OLS results in Column 1. However, the non-linearity of this Tobit model, these are not sufficient to draw inferences on the marginal treatment effect. Hence we report the post-estimated difference-in-differences at the bottom of the column labelled as **Difference-in-**

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[45] The notation, "diff-in-diff," in these analyses do not necessarily imply any sort of exogeneity in the succession events. They rather denote the changes in relative differences between multiple vs. single (or no son) firms before and after successions. Tests that address potential endogeneity concerns are provided in the later sections. There we use the sudden death of a Hyundai group chairman as well as the exogenous change in Korean inheritance law as quasi-natural experiments.

Differences using Eq. (4). The negative synthetic point estimate for the difference in differences, -0.16607, is statistically significant at the 1% level.

In Table 11, we repeat the same analyses as in Column 1 and Column 5 of Table 4 using our full sample. The sample includes all types of firms, namely, family firms with succession, family firms without succession, and non-family firms. In that table, we employ the standard difference-in-differences-in-differences specification. *Number of sons ≥ 2 × Post* and *Post* dummy are naturally omitted in this analysis due to the perfect collinearity. Post-succession period is relevant to only family firms with succession. We find results that are largely consistent with what we report in both Tables 3 and 4.

2.4.3 Family Feud and Succession Tournaments in Family Firms

Family disharmony underlies our notion of succession tournaments. To tie down our findings in Table 4 more closely to the "tournament" notion of chaebol successions, we conduct several conditional tests along the factors that are perceived to induce internal family conflicts. We test whether our documented succession effects in Table 4 are stronger for chaebols with significant family governance failures.

We consider the three conditions that could proxy for significant internal family conflicts. The first condition is defined with the *Feud news* dummy, which equals one for a family with known news about their family disharmony during successions. Next condition is defined based on the *Half-brother* dummy, which indicates a potential mediation failure by senior family members such as mothers on the internal family feud during successions. The last condition we use is based on the inability of conflict resolution inside the family by the traditional Confucian culture (e.g., enforcement by family head, mediation by senior members, etc.). We proxy for this

non-Confucian culture among sons in succession tournaments using the *Foreign bachelor* dummy, which indicates the existence of a son in the (c+1)-generation who spent substantial amount of time under western educational systems.

Table 5 reports the results. Consistent with the notion of family feud, in Column 1 of Table 5 we find that corporate risk is more likely to be higher during the pre-succession period than the post-succession for a controlling family with known family feud news covered by media (-3.16148 at the 1% statistical significance). In the next Column 2, we further find similar effects with the existence of half-brothers in the (c+1)-generation. A family with half-brothers results in relatively higher risk-taking in the pre-succession period than the post-succession period (-5.00398). In the same column, we find much weaker risk-reduction trend from the pre- to post-succession periods for families without half-brothers (-1.66031). Coefficient equality test suggests that such difference is statistically significant at the 1% level (*F-statistic* of 23.11). In the last Column 3, we find that a family whose sons are educated overseas, and therefore, are more likely to be influenced by new (western) values, tends to show greater risk-taking incentives in the pre-succession period than the-post succession period (-3.55221 at the 1% statistical significance).

2.4.4 Performance

In Table 6, we report the correlations between family compositions and operating performance. Based on our tournament theory described in Section 2.2 and our risk-taking results from Tables 4 and 5, we expect that higher corporate risks are likely to be associated with excessive, unpriced risks. As a result, we expect weaker performance of a family firm with multiple sons during the pre-succession period than the post-succession period, relative to the

family firm with a single son or no sons, i.e., only daughters. Our expected sign of the point estimate for *Number of Sons ≥ 2 × Post* is, therefore, positive.

In Column 1 of Table 6, we show the results of regressing each firm's *ROA* on the *Number of Sons ≥ 2* and *Post* dummies using the OLS model. Specification is similar as our base model in Column 1 of Table 4. The point estimate of *Number of Sons ≥ 2 × Post* is 3.99636, which is statistically significant at the 1% level. The result implies that pre-succession performance is significantly lower than that of post succession period for the family firm with multiple sons relative to its control group. This is consistent with Bertrand et al. (2008), who find similar operating inefficiency in Thai family business groups when founders have many sons, who compete for the next group chair position. We supplement and extend their proposition of "race to the bottom" phenomena by providing evidence on a specific channel that affects performance — the (at least in the short run) excessive risk-taking by sons in succession tournaments.

In Columns 2 and 3 of Table 6, we continue to examine whether our earlier risk-taking results for daughters and sons-in-law consistently explain group performance. We find a negative, marginally significant performance effect for *Number of Daughters ≥ 2 × Post* (-1.74160) and a positive and insignificant effect for *Number of Sons-in-law ≥ 2 × Post* (0.57935). These results are in sharp contrast to the results we found for multiple sons in the succession tournament.

In the remaining Columns 4 to 6, we repeat the same analyses as in Columns 1-3 using *Operating Income Ratio* as an alternative performance measure. We find results that are largely consistent with our earlier findings.

2.4.5 General Robustness Checks

In this section, we conduct general robustness checks of our main results. We report the results in Table 7.

Potential imbalance in the pre- and post-succession period could be a concern when we make statistical and economic inferences of our results. In Columns 1 to 5, we show the robustness of our results to this specific concern. We limit both pre- and post- succession periods to be no more than by 10 years, and re-run our Table 4 analyses. We choose 10 years as an average duration of successions in Korean chaebols based on the information provided by Korean news media. It indicates that the duration is usually around 10 years (Hankyoreh, March 6, 2005).[46] Using this more balanced sample before and after the chaebol succession, we show the robustness of our results.

Next, CJ and Hansol groups are spun off entities from the original Samsung group. These two business groups also underwent successions during our sample period. As CJ and Hansol share the same family root with the Samsung group, it is not clear how to define their family boundary, and consequently the scope of their succession tournaments. To address these Pan-Samsung group family concerns, we re-run our baseline analysis in Column 1 of Table 4, while excluding the firms that belong to CJ and Hansol.[47] We report the results in Column 6 of Table 7. Our results still carry through even without these entities affiliated with CJ and Hansol groups.

In the last Column 7 of Table 7, we further investigate the family boundary issues. Even after spin-offs, controlling families of the spun-off business groups still show significant cross-group ownership links. KFTC designates the spun-off groups of an original chaebol as separate

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[46] "Chaebols complete succession super-fast" Hankyoreh, March 6, 2005

[47] It should be noted that other spun-off business groups besides the CJ and Hansol are Hyundai-affiliated cases, Hyundai Motors, Hyundai Heavy Industry, Hyundai Development, KCC, and Hyundai Department. As none of them went through successions during our sample years, they are already excluded in this robustness test.

and independent business groups. However, due to the significant cross-group ownership links, such KFTC definitions of chaebol boundaries could significantly undermine our family-level factors that are shown to affect family firm risk-taking. Hence we re-define chaebols more broadly using their original family roots rather than the narrow KFTC designations. For example, we re-group all the affiliated entities of spun-off entities of the original Hyundai group, including Hyundai Motors, Hyundai Heavy Industry, Hyundai Development, KCC, and Hyundai Department under a single Hyundai umbrella. Using this extended definition of chaebols, we update their family composition variable such as the number of sons in (c+1) generation accordingly. Our new results using these extended definitions of chaebols and their controlling families are reported in Column 7. There we find similar results to those that we reported in Column 1 of Table 4. These results suggest that sibling competitions are not only defined locally at each chaebol sub-group level but also more broadly defined at the whole chaebol family-root level. In the next Section 4.6, we show an anecdote where the original chaebol family-root matters in a "reverse" succession tournament that exogenously reopened to old succession contestants.

2.4.6 A Natural Experiment: Reverse Succession Tournaments in Hyundai Following the Sudden Death of a Group Chairman

A potential concern in our previous test results is endogenous succession timing. To show that the positive relation between the increased number of sons in the (c+1)-generation and firm volatility is causal, we estimate a local treatment effect of succession tournaments on corporate risks using the sudden death of a Hyundai chairman, Mong-hun Chung, who became the chairman of Hyundai in 1998 and suddenly committed suicide on August 4th, 2003. Upon his

death, succession tournaments exogenously reopened to the c-generation male relatives – Mong-hun's brothers, Mong-koo and Mong-jun. Following Mong-hun's death, Mong-koo and Mong-jun competed for the official title of Hyundai chairman against the interim chair, Hyun, Jung-eun, Mong-hun's widow. The older generation of the Hyundai family (i.e., Mong-hun's uncles) lacked the mandate within the family to become the next group chair. Appendix E further provides the details on this pan-Hyundai event. Using this exogenous increase in succession competition following the young chair's sudden death, we estimate the causal effect of succession tournament on corporate risk-taking using a difference-in-differences-in-differences (DiDiD) specification.[48]

The dependent variable of our regression is the change in a firm's riskiness, for which we use the change in cash flow volatility (ΔCash Flow Volatility), measured as the difference of five-year cash flow volatility before and after the chairman's death. We exclude the year 2004, as well as the firms that were directly controlled by the chairman who died suddenly, to avoid any confounding effect, namely the increasing business uncertainty around the CEO's sudden death. We control for the changes in five-year average ROA, log of total assets, leverage, and the number of affiliates before and after Mong-hun's death. We cluster standard errors at the business group level.

Results are reported in Table 8. In Column 1, we find a positive and statistically significant point estimate, 0.74610%, for Hyundai Event (indicator), which is zero for all other chaebols but Hyundai. When the succession tournaments exogenously reopen due to the chair's sudden death, group entities' risks increase significantly in the post-2004 period.

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[48] For convenience, we denote it as a DiDiD, but this is not strictly accurate. To be technically exact, we decompose our DiD estimate into two parts, one associated with strong contenders, the other with weak ones. We do this decomposition to isolate any common effects of the chairman's sudden death on all Hyundai affiliates.

To further tease out the succession tournament effects within the Hyundai Group, in Column 2, we partition the Hyundai affiliates into (1) firms controlled by the brothers of Mong-hun and (2) firms controlled by Mong-hun's uncles, who are in the same generation as his father, the Hyundai founder – Chung, Ju-young. When Mong-hun was appointed as the group chairman, his brothers were strong competitors (Asiaweek, June 16, 2000), and for them Mong-hun's death was regarded as a second chance to become the "official" successor of his father.[49] The (c-1) generation uncles were less likely (or at least indirectly) to be involved in this reverse succession tournament, because they were in the same generation as the founder, Chung, Ju-young.

Using this additional layer of difference within Hyundai, we run a DiDiD regression. The variable, Hyundai Event indicator, is now decomposed into (1) Hyundai Event $\times$ Strong Contender and (2) Hyundai Event $\times$ Weak Contender. Strong Contender is an indicator for the Hyundai firms controlled by Mong-hun's brothers in the c-generation, whereas Weak Contender indicates the Hyundai firms controlled by Mong-hun's uncles in the (c-1) generation who are likely to act like regents rather than contestants. This within-Hyundai-Group analysis shows that the increase in the number of male contestants in the succession tournament induces greater risk-taking, particularly for the entities managed by Mong-hun's brothers. This DiDiD effect, Hyundai Event $\times$ Strong Contender, is positive (1.23693) and statistically significant at the 1% level, whereas we find negatively significant cash flow volatility change for Hyundai-affiliated firms managed by Mong-hun's uncles (-1.46228).

In Column 3, we repeat the same analysis as in Column 2 with an alternative dependent variable – change in merger ratio, measured by the difference of five-year non-intra-group merger ratios before and after the chair's death. We focus only on large M&A's whose transaction amount exceeds 50 million US dollars. To be cautious about potential within-group

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[49] Laxmi Nakarmi, "Of Father and Sons." Asiaweek, June 16 2000.

restructuring effects in Hyundai after the chairman's death, we further exclude any intra-group acquisitions involving the entities that were formerly under the dead chair's control. We find consistent results with our earlier findings in Column 2.

Overall, our results in Table 8 suggest that the sudden death of the Hyundai chairman, which exogenously increased the competition in the reverse Hyundai succession tournament, led to increasing Hyundai firm risks. The effect is likely to be causal.

2.4.7 Does Pay Equality Mitigate Sons' Tournament Incentives? Evidence from the Change in Korean Inheritance Law in 1991

As described in Section 2, the 1991 amendment to Korean inheritance law stipulates equal distribution of family estate to all descendants regardless of their gender, order of birth, and marital status. This 1991 inheritance law change in Korea exogenously introduced equal payoff to sons who participate in succession tournaments. Although these sons primarily compete for the ultimate control rights, equal cash flow rights following the inheritance law change could mitigate tournament incentives among sons (Lazear, 1989, Chen, 2003). Using this event as a quasi-natural experiment, we test whether the greater risk-taking by sons in the pre-succession period could reduce in the post-1991 time period. We use a DiDiD specification in this test.

Table 9 reports the results. In Column 1, we decompose our baseline difference-in-differences estimate in Column 1 of Table 4 into two parts, one associated with families who experienced succession before the change in Korean family law in 1991, the other with families who experienced succession after the change in family law. The sample consists of 1,162 family

firms with succession across eight years before and after January of 1991.[50] The DiDiD effect of

Number of Sons $\geq 2 \times$ Post $\times$ Before Law (-3.08819) is statistically significant at the 1% level,

whereas we find insignificant cash flow volatility for families who experienced successions after

the law change in 1991 (-2.10955). Coefficient equality test, however, indicates that these two

estimates are not statistically different at the conventional level (*F-statistic* of 2.20).

In Column 2, we repeat the same analysis as in Column 1 while we exclude successions

that occur around potentially endogenous timing, namely two years before and after the family

law passage. We exclude family successions that took place between 1989 and 1993 in this

analysis. In Column 2, we find similar results in Column 1 with a new *F-statistic* of 3.29. This

corresponds to 10.7% statistical significance. Overall, our first two columns' results suggest that

the 1991 Korean inheritance law change seems to mitigate the tournament incentives among

chaebol heirs to a certain extent.

During the post-1991 period, Korean economy underwent another important event that

might affect chaebol affiliates' risks, namely the 1997 Asian Financial Crisis. Following this

event, major corporate governance reforms were introduced by the Korean government. Foreign

institutions also imposed external governance pressures through the stricter disclosure mandates

implied by cross-listed shares of some chaebol-affiliated entities. To identify the cleaner effects

of the 1991 Korean inheritance law change, in Column 3 we exclude cross-listed firms and re-

run our Column 2 analysis. The *F-statistic* of 4.20 in that column suggests that the 1991 Korean

inheritance law significantly mitigates sons' risk-taking behaviors during the succession

tournaments, and that it is unlikely to be confounded by the wave of corporate governance

reforms that targeted the chaebol affiliates in the post-Asian financial crisis period.

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[50] Recall that our sample starts in 1983.

2.4.8 Other Promotion Mechanisms that Mitigate Sons' Tournament Behaviors: Primogeniture, Daughters' Marriages, and Sons-in-law

One extreme form of promotion designs that effectively discourage sons' tournament behaviors is primogeniture – first son inherits his parent's entire (or main) estate. Under this succession principle, sibling competition is absent in theory. Hence we test whether chaebol families that followed this primogeniture for their succession processes exhibit significantly lower risks than families that do not strictly follow such succession principle.

Column 1 of Table 10 reports the results. We first decompose our difference-in-differences effects of multi-son succession tournaments on corporate risks into two parts – one case where the first-born son of the controlling family becomes the next group chair (*First Son Chair*) and all the others (*No First Son Chair*). In Column 1 of Table 10, we find significantly stronger difference-in-differences effects of succession tournaments on corporate risk-taking for the groups with *No First Son Chairs* (*F-statistic* of 3.88). The results are largely in line with our predictions above.

From our assumption **A3** in Section 2.1, sons-in-law, the external male family members, are culturally excluded from the succession tournaments, and therefore, these sons-in-law could maximize a chaebol's profits rather than pursuing private control benefits. A high quality son-in-law (see Appendix F for anecdotes), if he could outperform in managerial skill even the winning son of the succession tournament, could significantly damage the winner's reputation as a formal successor of the renowned chaebol family. In the presence of such high quality sons-in-law, successors need to care both their within-son performance ranks as well as their absolute performance standards over the highly skilled sons-in-law. Otherwise, the sons face potentially bittersweet outcomes of their succession tournaments as they would look inferior (by the public)

to the highly talented external male family members in the managerial capability. The lines of business under their control may also look minor to those under the control of sons-in-law. Based on these arguments, we examine whether daughters' marriages to highly talented sons-in-law could mitigate risk-taking incentives of sons during the succession tournaments.

Columns 2 and 3 of Table 10 report the results. We find that families with daughter's marriage show a significantly lower risk-shifting by sons in the pre-succession period. The economic magnitude of the risk-shifting in the *Daughter's marriage* case is almost half the magnitude of that in the *No Daughter's marriage*, which indicates a positive externality that sons-in-law could potentially bring to the family. In Column 3, we further test the effects of sons-in-law by focusing on those who actually participate in the family management. There we find consistent results with those that are already reported in Column 2. The *F-statistic* of 12.99 indicates that such risk mitigation is statistically meaningful at the 1% level.

2.5   Conclusion

We study the impact of succession tournaments on risk-taking in Korean chaebols. Consistent with theories documented in the tournament and risk-taking literature, we find that chaebol firms whose controlling families have more than two sons have higher cash flow volatility and greater M&A activities prior to successions, relative to the chaebols with families that have no sons or a only son. We further show that the risks taken by sons in the pre-succession period are (at least in the short run) excessive and unpriced. We compare the risks of state-owned business groups (i.e., non-family business groups) to those of chaebols and document significantly higher risks in chaebols than their non-family business group counterparts. These results, put together, indicate that internal promotion tournaments inside the

controlling families are important family-specific factors that explain risk-taking in family firms. Using an exogenously re-open succession tournament of the Hyundai group as a natural experiment, we show that our results are likely to be causal. We further discuss and test several potential remedies that could mitigate excessive risk-shifting by sons in chaebol families, including pay equality (e.g., the 1991 amendment to the Korean inheritance law), seniority promotion system, and the cross-sectional expansion of the chaebol families through daughters' marriages. For all these alternative promotion mechanisms, we find supporting evidence that they could mitigate the underlying sibling rivalry and relative rank-seeking behavior of sons in succession tournaments.

Overall, our study emphasizes the importance of human capital risk in family-run organizations. As family firms account for a substantial portion of the world's economy, negative externalities among potential heirs could have large social costs. Our study emphasizes family governance and cultural elements that underlie the succession in family firms. Our results suggest that one has to consider these institutional and cultural factors when making an economic deliberation on the optimal succession plans for the socially, politically, and economically important organizations around the globe.

ESSAY 3: Sabotage! Whistle-blowing Inside Family Firms During Succession Tournaments

3.1 Introduction

One of the distinguishing features of family firms in contrast to general shareholder companies is that these firms are run by family members. What role does the family itself play in these firms? Does it even matter? This paper focuses on a particular aspect – the impact of family governance on the corporate governance of family firms, especially around CEO successions. CEOs play key roles in shaping corporate policies, and thus the process of selecting the next company leader is one of the most important parts of corporate governance. The selection processes carry greater weight in family firms because only a limited set of human capital competes for leadership of the next generation due to significant bequest motives inside families. Despite the prevalence of family firms and their importance to the world economy (La Porta Lopez-de-Silanes, and Shleifer, 1999, among others), the succession processes of family firms are not well-understood. In addition, these processes do not seem economically efficient, because family firms' leadership selections often rely on relative performance rank inside the family and are heavily influenced by non-economic factors, such as sibling rivalry, family tradition, and culture. Whether and how such family governance could affect family firm governance is therefore an important research question (Bennedsen, Perez-Gonzalez, and Wolfenzon, 2010; Bennedsen, Fan, Jian, and Yeh, 2015).[51] Yet the question has not been rigorously examined in the literature. We fill the void in this paper.

Specifically, we examine how internal family dynamics, such as sibling competition and family (dis)harmony, could affect family firm governance within and outside the succession

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[51] Bennedsen, Perez-Gonzalez, and Wolfenzon (2010); "[...] the future of family firm governance research seems intrinsically linked to family governance." Bennedsen, Fan, Jian, and Yeh (2015); "Understanding how family dynamics and family governance mechanisms affect firm financing and governance decisions [...] is a promising research area."

period. Taking the view that corporate fraud is a manifestation of poorly-functioning corporate governance, we investigate whether intense competition among the heirs of a controlling family during a succession period leads to increased (or decreased) fraud litigation. We further delve into how family structure and family culture profoundly affect such governance outcomes. By answering these questions jointly, we aim to enhance our understanding of if and how family governance mechanisms affect corporate governance practices in family-run organizations.

Sibling competition during succession tournaments could have an ambiguous effect on corporate governance. The effect would depend on how competition inside the family is guided and regulated by senior family members. On the one hand, having competition in the succession process to identify the best candidate is appealing because it incentivizes contestants to exert more effort to win succession tournaments (Lazear and Rosen, 1981; Nalebuff and Stiglitz, 1983). On the other hand, excess competition among contestants, who are overly focused on their "relative" succession status, could result in censured behaviors (Lazear, 1989; Konrad, 2000; Chen, 2003; Charness and Levine, 2004; Charness, Masclet, and Villeval, 2014; Lee, Shin, and Yun, 2016). Contestants could sabotage their rivals rather than competing fairly. It is also possible that contestants may adopt excessively risky strategies to win the tournament, which could eventually breach regulatory guidelines. Such negative internal actions would result in negative value consequences to shareholders.[52] It is an empirical question which side among the two dominates – the bright side or the dark side of sibling competition in succession tournaments. How family tradition and culture influence the mode of succession tournaments is an additional important question to be empirically examined.

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[52] Sabotage could divert contestants' value-improving efforts from their first-best level (Lazear, 1989; Chen, 2003, among others), causing negative value consequences. Lee, Shin, and Yun (2016) propose a risky, lazy trap among the heirs of Korean family business groups, which results in operational inefficiency.

We test our key research questions using data on Korean family business groups known as chaebols. The Korean chaebol data have several advantages in addressing our research questions. First, in Korea, family governance plays a critical role in determining the pool of candidates who are eligible to be the next business group leader. Due to strong Confucian cultural influences, succession tournaments in Korean chaebols are primarily played out between male, direct bloodline heirs rather than female heirs or any external male family members who join the family through adoption or marriage. Moreover, the cultural influences often mean that senior family members play an important role, in that they set the succession game guidelines, and the eldest male heirs generally have initial advantages in the succession tournament. Second, the competition incentives among heirs of Korean chaebols are strong due to institutional characteristics. Controlling stakes within Korean chaebols are often interconnected by a web of cross-shareholding among member firms due to significant inheritance costs. This concentrated ownership structure in turn makes it very important to strategically control several key firms rather than just owning stakes in many firms within the business group. As a result, a tournament winner who inherits the controlling stakes in those key firms can control the whole business group, i.e., winner takes all. This creates strong tournament incentives for the heirs of Korean chaebols.

Using 1,299 firm-year observations of the 16 largest Korean chaebols from 2000 to 2004, we find an unusual surge in fraud investigations for chaebols with many sons during succession tournaments. The intensity of the fraud investigation is, on average, four times higher than that of fraud investigated outside the tournament period, and is statistically significant at the 5% level. The increasing fraud investigations during succession tournaments are driven by sons who are eligible to work in Korea, and who therefore could compete for the next generation's group

leadership position. In contrast, we find no significant effects for senior male relatives in the same generation as the current chair, who do not directly participate in the succession tournaments. We also find negative shareholder reactions to the announcement of fraud investigations during succession tournaments. Our results, put together, highlight a potential dark side of sibling competition in family firms during leadership successions.

We show that these results are significantly influenced by family governance. The surge in fraud investigations during succession tournaments is concentrated in chaebols with internal conflicts, such as family feuds, and in chaebols that have a controlling family that contains half-brothers. Fraud investigation intensity during succession tournaments is more than seven times higher for chaebols with family disharmony than chaebols without such family feuds. We further find much weaker tournament effects for chaebols whose controlling families follow strict male-preference primogeniture, i.e., the tradition of a family appointing their first-born male child as the next group chairman.

We also provide relative evidence on two mutually non-exclusive potential channels of chaebol fraud. The surge in fraud investigations during succession tournaments could be driven by an increase of fraud committed by succession contestants, by an increase in fraud reported by contestants' rivals in an attempt to sabotage their succession prospects, or by both. We narrowly define contestants' sabotaging actions as those that are related to revealing private information they know about their rivals' actions to those outside the family. We define contestants' spreading rumors and transmission of negative (or possibly even false) information about their rivals to the external media or regulators as a specific form of sabotage. With this definition of sabotage, fraud commission is defined as contestants' own negative self-effort that could directly

damage their own performance if detected by regulators. We examine the relative extent to which each of the two channels explains our main findings.

We first examine the types of fraud investigations that occur during succession tournaments. We find that fraud committed by sons during succession tournaments results in minor penalties (i.e., correction orders), rather than severe fines or prosecution. These results suggest that fraud during chaebol succession tournaments may not be seriously intended by contestants to enhance their performance metrics, at least in the short-run. Rather, on a relative basis, the contestants' misdemeanors could be "over-detected" by other family insiders, particularly by their rivals, who are then willing to divulge such internal family information to the external media (or, eventually, to regulators) to win the tournaments. In contrast, other senior family members, including the current chairman (i.e., the contestants' father), would prefer to settle any internal conflicts without disclosing them to the public, due in part to the resulting severe public criticism of their failing family governance. Such increasing media attention could ultimately lead to significant regulatory intervention in their business practices (The Korea Times, June 11, 2016).[53]

We test sons' and senior family members' varying incentives to reveal negative family information to the public. Using the amount of advertising purchased from major media companies by various family members, we define the following media control variables: public media control by (1) the whole family, (2) only sons in succession tournaments, and (3) senior family members in the current chair's generation, who supervise how the sons play their succession game. We first find that when the controlling family as a whole tightly controls mass media, no significant fraud litigation is observed during succession tournaments. This pattern is

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[53] The Korea Times, "Lotte probe again ignites management succession feud," June 11, 2016.

driven by the senior members' media control. In sharp contrast, we find that fraud litigation is significantly more likely when the sons tightly control the media. The results collectively suggest that succession contestants may use mass media to sabotage their rivals, while senior family members try to minimize the revelation of family information to the public .[54]

We further investigate whether the positive relation between the number of succession contestants (i.e., the number of adult sons) and the surge in fraud investigation during succession tournaments is causal. In August 2003, the chairman of the Hyundai Group committed suicide during his fifth year in office. This suddenly re-opened the Hyundai succession tournament to his old rivals – his brothers. Using the data resulting from this event, we confirm that increased competition in the succession tournament (changes in the number of adult male succession contenders) leads to an increase in the number of fraud investigations. This effect is mostly concentrated in group entities controlled by promising contenders (the deceased chair's brothers), while no significant effect is observed in firms controlled by long-shot contenders (the deceased chair's uncles in the founder's generation) who are less likely to be directly involved in the suddenly re-open succession tournament. We find such effects are significant over a short time period – the three months following the chair's death. We also find that all Hyundai fraud cases were committed prior to the group chair's death, which is strong support for the fraud detection channel (sabotage), rather than the fraud commission channel (contestants' negative self-effort).

Our work significantly contributes to the literature on family firm governance by providing a novel insight into whether and how family structure and internal family dynamics affect firm governance during leadership successions. There have been many studies that

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[54] One could argue that sons commit more fraud when they are closely connected to mass media because they enjoy lax monitoring by media companies. However, this possibility cannot explain why fraud is significantly more likely when senior family members have no significant connections to public media companies.

examine succession's impact on a family firm's performance (Perez-Gonzalez, 2006; Bennedsen, Nielsen, Perez-Gonzalez, and Wolfenzon, 2007; Mehrotra, Morck, Shim, and Wiwattanakantang, 2013). However, few studies have examined the effects of sibling rivalry inside the controlling family; Bertrand, Johnson, Samphantharak, and Schoar (2008) study 586 firms in Thai business groups and document that sons "race to the bottom," tunneling resources out of group firms following a founder's death. Lee, Shin, and Yun (2016) focus on corporate risk-taking, one of the most widely studied corporate policies, as a specific channel that affects performance inefficiency. These studies highlight succession tournaments as an important background risk in family-run organizations, while none of them directly delves into the relation between family governance and corporate governance. Our paper contributes to the literature by directly examining this important link.[55]

Our work also introduces aspects of promotion tournaments that are less explored by the corporate governance literature – i.e., sabotage. An extensive personnel economics literature highlights the existence of sabotaging actions by tournament contestants (Lazear, 1989; Konrad, 2000; Chen, 2003; Charness and Levine, 2004; Charness, Masclet, and Villeval, 2014). However, investigation of sabotage's effect on corporate governance is sparse. We provide novel insights on the existence and corporate governance implications of these negative peer effects during family firm successions.

Our work also extends the competition and corporate governance literature in general. Many papers have studied whether and how external competition in product markets improves corporate governance and reduces managerial slack (Hart, 1983; Scharfstein, 1988; Kole and Lehn, 1999; Shleifer, 2004; Giroud and Mueller, 2010; Wang and Winton, 2016). We discuss

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[55] Studies on family firm fraud are also rare. Only a limited number of studies (Fan, Wong, and Zhang, 2012, among others) exist, and they study earnings management in family firms instead of fraud litigation.

these general competition effects on governance in the family firm context. We highlight a potential dark side of competition *internal to* the controlling family for firm governance. We further provide causal evidence on the negative sibling competition effects using a quasi-natural experiment based on the sudden death of a family firm chairman.

Last but not least, we also extend the literature on corporate fraud (Dyck, Morse, and Zingales, 2010; Wang, Winton, and Yu, 2010; Yu and Yu, 2011).[56] Our work is closely related to that of Dyck, Morse, and Zingales (2010), who emphasize the channels of fraud detection for U.S. corporations. We introduce succession tournaments inside a family firm and demonstrate how within-family conflicts create whistle-blowing incentives among the firm's heirs. This internal whistle-blowing mechanism on corporate fraud is consistent with the findings of Dyck, Morse, and Zingales (2010), who emphasize the governance role played by employees and media. Our findings broaden our understanding of the potential channels for fraud in family-run organizations around the globe, as well as provide possible explanations for a puzzling phenomenon: why controlling family members divulge negative news about their own firms.

This paper is organized as follows: Section 2 provides background on relevant tournament theories and develops our main hypotheses. In Section 3, we describe our sample and key variables used in our regression analyses. We provide our main results in Section 4, and in Section 5, we conclude.

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[56] Dyck, Morse, and Zingales (2010) emphasize the role played by inside employees and public media as potential fraud detection channels. Wang, Winton, and Yu (2010) explicitly model fraud commission and fraud detection channels when analyzing corporate fraud intensity. Yu and Yu (2011) also demonstrate how fraud detection intensity reduces when a firm establishes strong political connections to regulators.

3.2 Hypotheses Development

In this section, we develop the main hypotheses that we test using Korean chaebol data. For cultural reasons, we assume that succession tournaments in Korean chaebols occur exclusively among sons in the generation that immediately follows the current chair's generation (Lee, Shin, and Yun, 2016). We describe the potential tournament behaviors of these direct bloodline male contestants in the chair+1 generation as follows:

H1: Competition in succession tournaments improves family firm governance. As the succession competition intensifies, fewer fraudulent activities are observed in family firms.

Lazear and Rosen (1981) and Nalebuff and Stiglitz (1983) show that when the cost of risk borne by agents is not significant (e.g., risk-neutral agents) and the Informativeness Principle (Holmstrom, 1979) holds for agents' hidden actions, setting the prize wedge high enough to incentivize the agents to work hard will achieve the full-information first-best outcome. In this case, agents provide their first-best positive self-efforts, which enhance tournament outcomes. In this case, succession tournaments enhance family firm governance and consequently lead to enhancement of the firm's value.

As a sharp contrast to **H1**, we can consider the following alternative hypothesis:

H2: Competition in succession tournaments exacerbates problems in family firm governance. As the competition of succession tournament intensifies, more fraud is observed in family firms.

This alternative hypothesis is derived from the following two distinct groups of tournament theories; (1) tournaments with sabotage (Lazear, 1989; Chen, 2003, among others) and (2) theories on a risky, lazy trap tournament equilibrium (Hvide, 2002; Lee, Shin, and Yun, 2016,

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among others). The first theories on sabotage highlight agents' non-cooperative actions toward rivals, which adversely affect the rivals' performance. The second group of theories, however, does not assume such indirect performance consequences. They rather focus on risky strategies directly employed by the contestants themselves. If their strategies are excessively risky, they could violate formal regulatory guidelines. In this case, agents' negative self-actions damage their performance directly. These two mutually non-exclusive sub-hypotheses to **H2** are summarized:

> **H2-a (Sabotage):** In the severe competition of succession tournaments, sons are more likely to detect their rivals' misdemeanors. Ex post penalty on fraud would be minor.

> **H2-b (Negative self-effort):** Sons commit fraud to win the tournaments; this fraud is caught by regulators. There will be a severe ex post penalty on this fraud.

Hereafter, **H2-a (Sabotage)** and **H2-b (Negative self-effort)** will be referred to as the *fraud detection* channel and the *fraud commission* channel, respectively. Sabotage diverts contestants' value-improving efforts from their first-best level, and therefore causes efficiency losses in the tournament outcome (Lazear, 1989; Chen, 2003). In the negative self-effort case, either severe regulatory penalties or the expected outcome of a risky, lazy trap equilibrium (Hvide, 2003; Lee, Shin, and Yun, 2016), where contestants do not work hard and take excessive risks to win the tournament, could imply operational inefficiency during succession tournaments.

3.3   Data

Our sample period is from 2000 to 2004. We construct family trees for Korean chaebol families from a publication entitled *The Chaebol of Korea: The Management Structure and Personal Network of Korean Chaebol*. This publication covers the family trees of the controlling

families of the top 30 Korean chaebols in terms of total assets as of 2004. We could merge 16 of these chaebols with the annual list of large business groups compiled by the Korea Fair Trade Commission (KFTC, a Korean anti-trust authority) during the 2000-2004 time period. Our sample includes only family-run business groups in Korea from 2000 to 2004. The total assets managed by the chaebols in our sample account for approximately 56% of the nominal GDP of the Korean economy in the year 2004 (KRW 778.4 trillion).

We construct a family tree following the approach used by Lee, Shin, and Yun (2016). A family tree starts with the founder's parents' generation, followed by the generation of the founders, their siblings, and their spouses, and then the generations of all their blood and marriage descendants. The founder's parents' generation is coded as generation zero, and, from there, each of the following generations is coded as generation one, two, and so on (e.g., the founder's generation is coded as generation one). We assign a unique ID to each family member and collect detailed information on their birth order, gender, marital status, blood or marriage descendants, and half-brothers. Using these family trees, we define the sons and nephews of the current chair as the potential contestants in the chaebol's succession tournaments.[57] This group of contestants is referred to as sons in the current chair +1 (c+1) generation. Family members who are younger than 15 years in a given year are excluded from this group, as they are legally ineligible to work in Korea. Using relevant marital data that we manually collect from numerous Korean news articles, we extend our family trees backward from 2004 to 2000.

We next obtain fraud-related data. Fraud cases are associated with internal transactions, collusion, and unfair trade practices, which are based on the KFTC's decisions on law

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[57] Ex ante, we cannot rule out a possibility that the current chairman unexpectedly dies and is replaced with his/her siblings. Doosan is a case in which the current chair's nephew inherited the business group rather than his son.

violations.[58] To prevent illegal internal transactions, a firm is required to acquire its board's approval and disclose the board's decision before an internal transaction takes place. These prerequisite disclosure data were obtained from the KIND database operated by Korea Exchange. Data concerning tax evasion, accounting, and disclosure fraud were collected from the DART database managed by the Financial Supervisory Service in Korea. These data include only the cases in which a surcharge was imposed.

Finally, we merge our family trees and corporate fraud data with firm-level accounting and market data from Data Guide Pro, a database managed by FnGuide, the leading Korean financial data provider. Our financial data cover 1,299 firm-year observations (489 for public firms and 810 for private firms) from 16 large business groups designated by the KFTC as chaebols, from 2000 to 2004. The appendix D provides definitions of the variables used in our study.

Table 1 gives an overview of the 16 large Korean business groups, their controlling families, and their financial characteristics during the sample period of five years. In Panel A of Table 1, we observe that the controlling families have an average of 58.6 members; because of the variation in the number of family generations, there is substantial cross-sectional variation in family size. The majority of the current chairs belong to the second generation, and the average current chair tenure is 12.1 years. The maximum tenure of a group chair is 38 years in our sample. The average numbers of males and females in a chaebol family are 29.4 and 26.6, respectively. The family members in the current chair+1 (c+1) generation include the current chair's children and their spouses, as well as the current chair's siblings. In the (c+1) generation,

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there are on average 6.9 sons, 5.5 daughters, 2.6 sons-in-law, and 2.1 daughters-in-law. Founders are alive for 20% of the chaebols in our sample.

Panel B of Table 1 summarizes the financial characteristics of our sample firms. The analysis is based on data compiled as of the year end during the sample period. The financial characteristics of our sample firms are similar to those observed in the existing studies on Korean chaebols (Bae et al., 2002; Almeida et al., 2011, among others). ROA, payout ratio, and cash flow to asset ratio are 7%, 1%, and 7%, respectively. Thirty-eight percent of our observations are for publicly listed firms, and the average firm age is 20.76 years.

Table 2 summarizes our corporate fraud sample. Panel A illustrates the number of corporate fraud cases filed against our sample firms in each year. Fraud filings are somewhat evenly distributed over our 5-year sample period. Among a total of 140 fraud cases, collusion accounts for the highest number of corporate fraud (69 cases), followed by unfair internal transaction (59 cases). Tax evasion was intensively cracked down on and disclosed in 2004. Embezzlement and breach of trust data were not included in our sample because they are available only after 2004, when the data were officially required to be disclosed in the DART system.[59] Although not reported in Table 2, for 113 fraud cases out of a total of 140 cases, we find that fraud cases are filed with a 460-day (≈ 15.33 months) delay on average from the dates when they were committed.

Panel B of Table 2 further categorizes corporate fraud into three types according to their ex-post settlement outcomes (correction order, fine imposition, and prosecution, in order from lowest to highest severity). We compare the settlement types for fraud investigated during

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[59] This is a couple of years after independent board system was introduced in 2001.

succession tournament and non-succession tournament periods, respectively. A succession tournament period refers to business group-years within 5 years [-5, -1] of upcoming successions. We further include within the tournament period business group-years when the tenure of the current chair is longer than the 95th percentile of our sample (35 years).[60] Panel B shows that the incidence of corporate fraud that results in a correction order is 2.3 times higher during succession tournaments (21.7%) than in non-succession tournament periods (9.4%). This implies that the types of fraud investigated amid succession battles are more likely to be relatively minor offenses than those investigated outside the succession periods. The proportion of other types of fraud varies little between succession tournament and non-tournament periods.

Finally, Table 3 summarizes the correlations among our main variables. The number of sons (c+1 generation) is more positively correlated with the number of fraud cases during succession tournaments (0.14 in Panel B) than non-succession periods (0.03 in Panel C). The correlation coefficients for the number of sons (c generation) and the number of sons (below age 15) are negative or close to zero in all panels. These univariate results are largely consistent with our **H2**, which predicts a potential dark side of sibling rivalry during succession tournaments.

3.4 Results

3.4.1 Succession Tournaments Among Sons and Corporate Fraud

In Table 4, we test our main hypotheses **H1** (or **H2)** to see whether succession tournaments among sons induce decreased (or increased) numbers of fraud investigations for family firms. In Columns 1 and 2 of Table 4, we regress each firm's total number of fraud filings, measured by Log (1+number of fraud), on the interaction term [Number of Sons (c+1 generation)

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[60] This 95% of the current chair's tenure corresponds to the average chair's age of 70.5 years. A succession within the same generation due to within-family agreement by brothers is not considered a succession tournament.

× Succession Tournament], while we control for the standalone terms in the same regression. In Column 2, we additionally control for the natural logarithms of total sales and leverage; we do not control for them in Column 1. All models control for year fixed effects, and standard errors are clustered at the business group level.

We find positive and statistically significant point estimates for Number of Sons (c+1 generation) × Succession Tournament of 0.00478 and 0.00436 in Columns 1 and 2, respectively. In both columns, these point estimates are statistically significant at the 5% level. In terms of economic significance, these results indicate that the number of fraud filings against the firms of a chaebol that is controlled by a family with many sons surge during succession tournaments by a net of 4.6 times (= 0.00478/0.00104 in Column1) and 3.5 times (= 0.00436/0.00125 in Column2).

In Columns 3 to 6, we conduct several falsification tests for identification. We define the set of succession contestants using family members who are not eligible for or less likely to engage in succession tournaments; (1) sons below age 15, who are not legally allowed to work in Korea (Columns 3 and 4) and (2) male relatives in the current chair's generation whose succession tournaments are de facto over during our sample period (Columns 5 and 6). We find that the presence of these males reduces, rather than increases, corporate fraud during succession periods. For example, in Column 3, where we include the number of sons younger than 15, sons' effects on fraud during succession tournaments are negative (-0.00568). In Column 5, similar negative effects (-0.00203) are observed for bloodline male relatives in the current chair's generation. In Columns 4 and 6, where we further control for the log of total sales and leverage in the same regressions, we obtain consistent results both economically and statistically. These

results in Columns 3 to 6 suggest that our baseline results in Columns 1 and 2 are likely to be driven by those who actively engage in succession tournaments.

3.4.2 Financial Market Reactions to Fraud Announcements

We examine stock market reactions to the news of increasing fraud investigations during succession tournaments. As explained in Section 2, these increasing fraud investigations may be induced by either sabotage (**H2-a**) or negative self-effort (**H2-b**) by agents during succession tournaments, or both. When these underlying channels are signaled to the market via fraud announcements, we expect negative value reactions by shareholders. Shareholders could view internal sabotage as an indication of reduced positive efforts by the sons in the succession tournaments. They may also view the negative self-efforts as sons' direct value-reducing activities when they are caught by regulators.

We use the first announced fraud in each year to minimize any confounding effect. After identifying 66 clean fraud investigation announcements, we apply a standard event study methodology to estimate cumulative abnormal returns (CARs) over three different event windows; (1) [-1,1], (2) [-2,2], and (3) [-3,3]. For each event window, we use regression specifications that are similar to our baseline regressions. We run the regressions with (Columns 2, 4, 6) and without (Columns 1, 3, 5) controlling for log total sales and leverage.

The results are reported in Table 5. First, in Columns 3 and 4, where we measure CAR[-2,2] (cumulative abnormal return over five days around each event), we find the coefficient on the interaction term (Number of Sons (c+1 generation) × Succession Tournament) is -0.61678 (Column 3) and -0.70765 (Column 4). These are statistically significant at the 10% and 5% levels, respectively. The coefficients imply that CAR [-2, 2] drops by a net of 3.6%

(=0.61678/0.16945 in Column 3) and 7.2% (=0.70765/0.09816 in Column 4) upon the announcement of a fraud investigation during a succession tournament for a chaebol with many sons in the chair+1 generation. These are economically significant effects.

In Columns 1 and 2 (5 and 6) of the same table, we conduct similar analyses using a different event window: CAR [-1, 1] (CAR [-3, 3]). The results consistently show shareholders' negative reactions to news of fraud investigations during succession tournaments for chaebols with many sons. However, the results using alternative event windows are statistically insignificant.

Overall, our results in Table 5 show that shareholders of a family firm tend to view news of a fraud investigation during a succession period negatively, particularly when the succession processes are driven by many sons in competition for the next group chairman position.

3.4.3 Family Governance and Corporate Fraud

To examine the effect of family governance on the surge in fraud investigations during succession tournaments, we extend our baseline model from Columns 1 and 2 of Table 4. The interaction term (Number of Sons (c+1 generation) × Succession Tournament) is now decomposed into two using the following three different dummy variables: (1) Family feud vs No family Feud, (2) Half-brothers vs No half-brothers, and (3) First son chair vs No first son chair. To facilitate the ease of 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 Columns 1 and 2 of Table 6, the interaction term (Number of Sons (c+1 generation) × Succession Tournament) is now decomposed into (1) Number of Sons (c+1 generation) ×

79

Succession Tournament × Family feud and (2) Number of Sons (c+1 generation) × Succession Tournament × No family feud. Family feud is an indicator variable that has a value of one if a business group has a news release about family disputes over ownership or a management position during our sample period. No family feud is an indicator that a group has no news release regarding such internal disputes. In Column 1, we find that corporate fraud is more likely in a chaebol controlled by a family with known internal conflicts during succession tournaments. The effect of Number of Sons (c+1 generation) × Succession Tournament × Family feud (0.02082) is statistically significant at the 1% level, and its economic magnitude is more than seven times (7.4=0.02082/0.00281) larger than the effect of the opposite case, i.e., Number of Sons (c+1 generation) × Succession Tournament × No family feud. In Column 2, we show that the result is robust to additionally controlling for the log of total assets and leverage.

In Columns 3 and 4, we further confirm that the surge in fraud investigations during succession tournaments is mainly driven by chaebols with half-brothers in their family tree. The existence of half-brothers in the family could indicate a potential mediation failure by senior family members, including mothers, on internal feuds. We show that this failure by family governance to mitigate internal family tensions could make fraud investigations significantly more likely during succession tournaments.

Consistent with this notion of family governance, in Columns 5 and 6, we show insignificant succession tournament effects when strong male-preference primogeniture is present. When a family has a strong tradition of appointing their first-born male child as the next group chairman, within-family promotion tournaments are less likely and sibling competition decreases, leading to the insignificant tournament effects we find in Columns 5 and 6.

Overall, our results in Table 7 show that internal family dynamics and family governance issues significantly spill over to corporate governance in family firms. Sibling competition more adversely affects corporate governance during succession tournaments when the controlling family has weak internal controls, and so cannot adequately mitigate within-family conflicts.

3.4.4. Types of Fraud

To identify the relative extent to which each of the two channels, fraud detection (sabotage) and fraud commission (negative self-effort), explain   the increase in fraud investigations during chaebol succession tournaments, we examine the resolutions of the fraud cases against our sample firms. If negative self-effort underlies our baseline findings, observed fraud cases during succession tournaments are more likely to be intended by contestants and consequently to end with serious ex post penalties. We decompose fraud cases in our sample into three different types using their ex post settlement outcomes: (1) fraud that results in a correction order, (2) fraud that results in a fine, and (3) prosecuted fraud. The first type of fraud is a more minor offense, while the latter two types are associated with severe ex post penalties, and thus are more likely to be intended by contestants.

In Columns 1 and 2 of Table 7, we first consider minor fraud cases that result in the imposition of a correction on the left-hand-side (LHS) of our baseline regressions, which are used in the first two columns of Table 4. We find similar patterns of an unusual surge in fraud investigations during succession tournaments in these minor fraud cases. The point estimates for the interaction term (Number of Sons (c+1 generation) $\times$ Succession Tournament) are 0.00393 (Column 1) and 0.00387 (Column 2). They are both statistically significant at the 1% level.

However, in Columns 3 to 6 of Table 7, we do not find a significant increase in investigations during succession periods for the other types of fraud, those that result in more serious ex post penalties. There we use litigation that results in the impositions of a fine (Columns 3 and 4) and litigation that is followed by prosecution (Columns 5 and 6) and find that the effects of sibling competition during succession tournaments are insignificant, both statistically and economically.

Our results in Table 7 highlight that the type of fraud that increases during succession tournaments is the type that is not seriously intended by contestants, based on their settlement outcomes. If sons in a succession tournament try to manipulate their short-term performance metrics through accounting fraud or slush funds, their actions are likely to be severely penalized by regulators ex post. Our Table 7 results, however, suggest that such cases are relatively rare during succession tournaments, which supports the other possibility: sons' misdemeanors could be "overly detected" by their rivals in the succession tournament.

3.4.5 Family Information, Media Control, and Corporate Fraud

Succession contestants have strong incentives to transmit negative (or possibly even false) information about their rivals to the external media (or directly to regulators) to win the tournament. However, senior family members, such as their father (i.e., the current chair), their mother, and their uncles, who supervise the juniors as they play their succession game, could have starkly different opinions about the revelation of family-specific information to the public. When negative information inside a family business is leaked to the public, it can trigger investigation by regulators. These investigations could result in substantial damage to their family's reputation and business prospects. We test sons' and senior family members' varying

incentives to reveal negative family information to the media and interpret the results to identify the underlying fraud mechanism; in other words, we investigate the relative extent to which fraud detection and fraud commission explain the increase in fraud litigation during succession tournaments.

We define the strength of connections between each family member and mass media companies using media spending by firms that are directly controlled by the family member. We define three media control variables: media spending by (1) the whole family, (2) sons in succession tournaments, and (3) senior family members in the current chair's generation, who monitor rather than participate in succession tournaments. We then decompose Number of Sons (c+1 generation) × Succession Tournament into high and low media control cases using each of the three media control variables. We standardize all explanatory variables to have a mean of zero and a standard deviation of one in this regression.

In Columns 1 and 2 of Table 8, we decompose Number of Sons (c+1 generation) × Succession Tournament into high and low media control by the whole family. There we find that chaebols that purchase large amounts of advertising from the major public media companies have fewer fraud cases during succession tournaments. The high media control effect (0.01117) is statistically insignificant, and its economic magnitude is 56.9% (=0.01117/0.01961×100) of the low media control effect (0.01961); that is statistically significant at the 5% level.

These general effects of high media control are driven by senior family members, i.e., the current chair and other family members in the older generations. In Columns 5 and 6 of Table 8, we find that corporate fraud is less likely when these senior members strongly control potential family information leakage to the public media. In sharp contrast, in Columns 3 and 4 of the

same table, where we consider the advertisement expenses of firms controlled by sons in succession tournaments, we find completely opposite results. Fraud is significantly more likely when sons in tournaments tightly control the media through advertising expenditure. Fraud litigation is almost twice (2.05=0.01806/0.00879) as likely during succession tournaments when sons are closely connected to major media companies. When they are not connected to the media, we find that fraud investigations are much less likely.

In summary, these results in Table 8 collectively suggest that sons do divulge their family's private information to the public using mass media. At the same time, we confirm that senior family members prefer to minimize such disclosures using their own media connections. These results are more consistent with **H2-a (Sabotage)**, which states that chaebol fraud tends to be made known to the public through sons' efforts to sabotage their rivals. Senior members, who are out of the succession tournament, have few incentives to commit fraud, so observed fraud is likely to be committed by junior family members. At the same time, a significant increase in fraud cases when seniors have loose media control suggests that sabotage of rivals, rather than negative self-effort, is more likely to explain our baseline findings. However, it should be noted that these two channels are not mutually exclusive; one explanation cannot completely rule out the other potential explanation.

3.4.6 Nature Experiment: The Sudden Death of the Hyundai Chairman

One concern about our baseline findings is whether the results are causal. To investigate this issue, we examine Hyundai Group's case: how corporate fraud levels have changed around the sudden death of its group chairman. Chung, Mong-hun, who became the chairman of the Hyundai Group in 1998, committed suicide on August 4, 2003. With his sudden death, succession tournaments resumed among Mong-hun's brothers, i.e., the current chair-generation

(c-generation) male relatives. Using this exogenous increase in the number of male contestants in Hyundai's succession tournament, we estimate the causal impact of the succession battle on fraud investigations using difference in difference in differences (DiDiD) estimations.[61]

Figure 1 provides the details of the Hyundai Group event timeline, and Figure 2 depicts the number of fraud investigations of the Hyundai Group around the event time. We plot the number of fraud filings against Hyundai affiliates in each month from January 2001 to December 2014. The biggest spike in the number of Hyundai fraud cases is found in October 2003, when the family tension about who would be the next group chairman reached its maximum after Mong-hun's death (Panel A of Figure 2). The spike is driven by the Hyundai firms controlled by the dead chair's brothers (Panel B of Figure 2).

On October 22, 2003, Mong-hun's wife, Hyun, Chung-eun, became the interim chair of the Hyundai Group without internal support from the senior family members of Hyundai (Kyunghyang Weekly, April 8 2008).[62] The dead chair's uncles are known to indirectly support Mong-hun's brothers as the formal successor of the Hyundai Group. During this time of deep family troubles, the KFTC announced fraud investigations on Oct 21 and 23, 2003, respectively against Hyundai Motors led by Chung, Mong-koo, and Hyundai Heavy Industry led by Chung, Mong-jun – the two brothers of the dead chairman, who compete for the next generation Hyundai leadership position. Mong-koo and Mong-jun had also been strong rivals of Mong-hun

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[61] For convenience, we denote it as a DiDiD, but this is not strictly accurate. To be technically exact, we decompose our DiD estimate into two parts, one associated with strong contenders, the other with weak ones. We do this decomposition to isolate any common effects of the chairman's sudden death on all Hyundai affiliates.
[62] Deuk-jin Cho, "Hyundai Must Be Inherited by the Chung Family," Kyunghyang Weekly, April 8 2008.

for the Hyundai chairman position (Asiaweek, June 16, 2000).[63] Following Mong-hun's death, they were again considered potential official leaders of the Hyundai Group.

With this background, we conduct our causal estimations. The dependent variable of our regression model is the change in the firm's number of fraud cases, measured by the 3-month difference of the logarithm of one plus the sum of the total number of corporate fraud filings before and after the chairman's death.[64] We use such a short event window because fraud detection is more likely to be a short-run channel relative to the fraud commission channel, where fraud must first be committed then later investigated by regulators. In fact, all the fraud cases used in this test have a gap between commission and filing dates of more than three months, so our results in this test are unlikely to be driven by the fraud commission channel. We exclude from our test the firms that were under the direct control of the dead chairman to eliminate any direct performance effect caused by the chair's sudden death. We cluster standard errors at the business group level.

In Columns 1 and 2 of Table 9, we assume that the male bloodline relatives of the dead chair's generation (c generation) return to the succession tournament, and compete with sons in the c+1 generation, who were already participating in the tournament before the chair's death. The Number of New Sons in Tournament (add c-generation) variable, therefore, has a value of zero for all other groups, whereas for Hyundai Group, the variable is the number of sons in the c-generation, i.e., Mong-hun's brothers. We test whether this increasing number of sons in the exogenously re-opened succession tournament leads to sharply increasing corporate fraud. In Column 1, we find 0.00538 as a point estimate of Number of New Sons in Tournament (add c-

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[63] Laxmi Nakarmi, "Of Father and Sons." Asiaweek, June 16 2000.
[64] Our results hold for various other alternative test windows around the chair's sudden death; [-6 months, +6 months], [-1 year, +1 year], and [-2 years, +2 years].

generation), which indicates a 0.538% increase in fraud for every marginal increase in the number of new contestants in the resumed succession tournament. In Column 2, we additionally control for the change in average log sales and leverage before and after Mong-hun's death, and find that our results are virtually the same with these additional controls.[65]

To show that the results in the first two columns are not driven by a common confounder on all Hyundai affiliated entities, namely, the increasing business risk of the Hyundai Group caused by the chair's sudden death, in Column 3, we divide Hyundai group affiliates into two: (1) firms controlled by the brothers of Chung, Mong-hun (c-generation), and (2) firms controlled by Mong-hun's uncles (the c-1 generation). When Chung, Mong-hun, was named group chairman, his brothers were strong competitors, and for them, Mong-hun's death was a second chance to be a formal successor of the Hyundai Group, with a fairly high probability of winning the succession game. However, the (c-1) generation males, who were in the same generation as the group's founder, Chung, Ju-young, were least likely to engage in the succession tournament following Mong-hun's sudden death. They act as regents, rather than as contestants in the tournaments.

Using this additional difference, we decompose our difference in differences (DiD) effects into (1) Number of New Sons in Tournament (add c) × Strong Contender and (2) Number of New Sons in Tournament (add c) × Weak Contender. Strong Contender is a dummy for the Hyundai firms controlled by Mong-hun's brothers (c-generation), whereas Weak Contender indicates the Hyundai firms controlled by Mong-hun's uncles (c-1 generation). This within-Hyundai-Group analysis shows that the increased number of contestants in the succession tournament results in increased fraud investigations, particularly for the firms managed by

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[65] Changes in total sales and leverage refer to the difference of the 1-year average logarithm of a firm's total sales (in KRW millions) and leverage in 2002 and 2003.

Mong-hun's brothers. This triple difference effect of Number of New Sons in Tournament (add c) × Strong Contender (0.00783) is statistically significant at the 1% level, whereas we find an insignificant change in the number of fraud investigations for Hyundai-affiliated firms managed by Mong-hun's uncles (-0.00018). These results sharply capture the effects of succession tournaments on corporate fraud outcomes.

In Columns 4 to 6 in Table 9, we repeat the same analysis under an alternative assumption: that sons in the c+1 generation are fully excluded when their uncles are back in the tournament. We swap sons in the c+1 generation with their uncles in the c-generation, and thus the difference in the numbers of sons in the c and c+1 generations defines the exogenous change in the number of contestants in the succession tournaments. Both difference in differences (DiD) (Columns 4 and 5) and triple difference (Column 6) tests confirm our earlier results, reported in Columns 1 to 3. In Columns 7 to 9, we use a Hyundai Event indicator as an alternative explanatory variable and re-run our DiD and DiDiD analyses. Our results are robust with this alternative indicator as well.

Overall, our findings in Table 9 suggest that exogenously increasing family tension triggered by the sudden death of the Hyundai Group chairman results in a significant increase in fraud investigations, particularly for the group affiliates controlled by the dead chair's brothers. This causal effect is identified just over three months following the sudden death of the Hyundai chairman, indicating that the trend is more likely to be induced by increased fraud detection arising from the sons' sabotaging actions, rather than from an actual increase in fraud committed by the brothers over the short time period. The fraud cases used in our causal test were not committed during this short time interval, which further supports our conclusion that sabotage is the potential underlying channel of the increase in Hyundai Group fraud cases.

3.5   Conclusion

We study whether and how family governance issues spill over to corporate governance in family firms. This is an important question, given that family firms comprise a large portion of the world economy, and their succession processes are heavily influenced by internal family governance. We test whether sibling competition during a succession tournament in a family firm results in improved corporate governance or an increase in governance failure, measured by the incidence of corporate fraud.

Based on various tournament theories, we hypothesize two mutually exclusive corporate governance outcomes, the bright side and the dark side of sibling competition during succession processes. Then we further hypothesize two potential channels of the dark side of internal family conflicts: (1) contestants revealing their rivals' minor offenses to the public (as a form of sabotage) or (2) contestants' direct, negative efforts, such as highly risky strategies intended to win the tournament in a myopic way, which would be very costly to their shareholders if their actions were caught by regulators. We test the relative extent to which each of these two mutually non-exclusive channels is associated with our findings.

Using five years of data on Korean family business groups, where succession processes are heavily influenced by family governance and are also likely to be a kind of tournament due to the prevailing deep pyramidal control structures, we show increased fraud investigations during succession tournaments; this increased level of fraud disappears outside tournament periods. This shows the potential dark side of sibling competition during succession tournaments. These effects are evident for families whose internal governance cannot adequately control family feuds, and also for the cases where senior family members fail to control potential tattletales

inside the family. Fraud cases investigated during succession tournaments are likely to be minor offenses rather than those that are more serious and thus settled with heavy ex post penalties. We find that shareholders react negatively to announcements of fraud investigations during succession tournaments, when negative private actions by sons in are revealed to the public. Using the sudden death of a business group chairman as an exogenous shock that increases family conflicts about succession processes, we show causal evidence on our main findings.

Our study emphasizes the importance of family governance to the corporate governance of family firms. These family aspects of family firm governance are underexplored in the existing literature. By showing evidence of governance spillover from the controlling family to the firm, our research directs the family firm literature to pay more attention to family-specific factors, as they are important background risks in family firm operations. Information on how family governance is intertwined with the institutional characteristics of a firm would help broaden our understanding of how social, institutional, and cultural environments affect business practices through families. Given the prevalence of family firms around the world, this important macro-to-micro connection should be thoroughly examined.

APPENDICES

Appendix A: Tables and Figures

Table 1.1: 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 1.2: 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

Table 1.2 (cont'd)

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 1.3: 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 1.4: 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 +[{(NI_{t-3})×1+(NI_{t-2})×2+(NI_{t-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***		
			[0.005]		
Succession Tax Burden × Upper Layer of Pyramid				0.08488***	
				[0.004]	
Succession Tax Burden × Lower Layer of Pyramid				-0.11790***	
				[0.003]	
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

Table 1.4 (cont'd)

Panel B: OLS	Dependent Variable: Number of Mergers				
	(1)	(2)	(3)	(4)	(5)
Variables	Intra-group	Non-intra group	Intra-group Mergers		
Sucession 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 1.5: 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

Table 1.5 (cont'd)

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 1.6: 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

Table 1.6 (cont'd)

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

Table 1.7: 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 1.8: 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 1.9: 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.

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

Table 1.9 (cont'd)

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

Figure 1.2: 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.
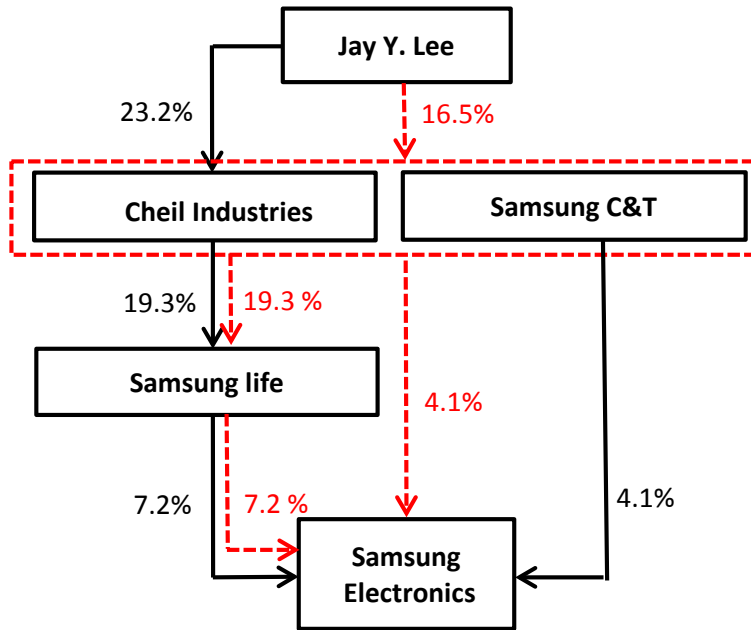
An anecdote of an intra-group merger within the Samsung Group illustrates how intra-group mergers are used as a tax minimizing succession mechanism. The Lee family merged Samsung's de facto holding company, Cheil Industries, the textile firm, with Samsung C&T, the group's construction and trading arm, 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[66]. 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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[66] 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)[67].

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

Figure 1.3: 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. This figure, describing the pyramid structure, originates from Almeida et al. (2012).
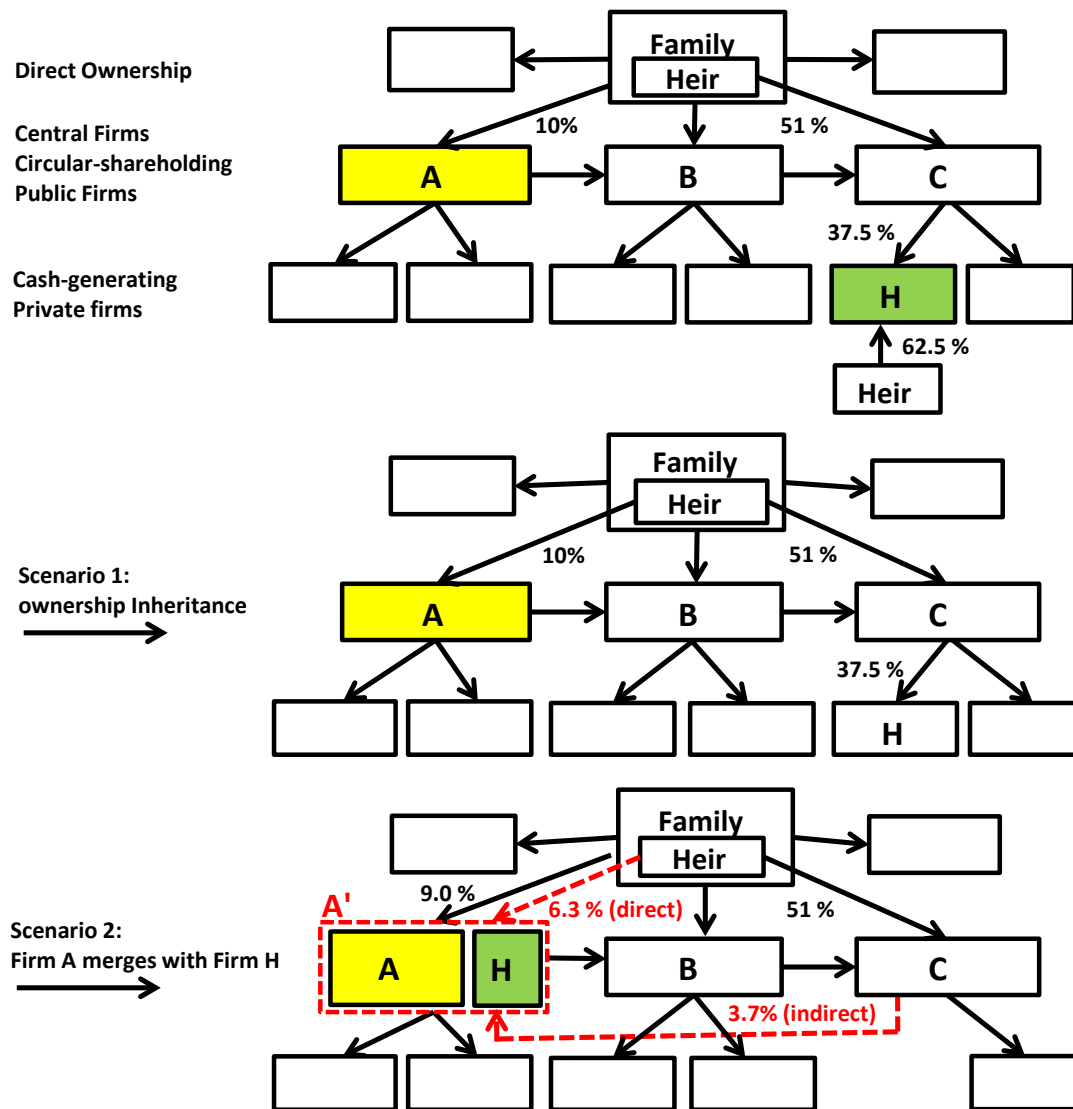
The controlling family is the largest shareholder of Firm A, with a 10% stake. An heir of the business group owns Firm C with a 51% stake and Firm H with a 62.5% stake. Firm C owns Firm H with a 37.5% stake. The market value of Firm A is $1 billion and that of private Firm H

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'.

Table 2.1: Business Groups and Their Succession History

The sample consists of 30 large Korean business groups, designated by the Korean Fair Trade Commission (KFTC), from 1983 to 2004. The 30 business groups are categorized into three types: (1) 12 business groups largely controlled by their founding families, in which business succession took place within the family during the sample years ("Family with succession"), (2) another 11 business groups largely controlled by their founding families, in which business succession did not take place during our sample years ("Family without succession"), and (3) seven business groups whose controlling shareholders are not members of their founding families but rather corporate entities ("Non-family"). Among the 24 business groups that are controlled by their founding families, 12 business groups experienced generation-to-generation succession during the sample years. We exclude successions from a generation to the same generation by family agreements as the cases do not involve any sibling competition for successions.

Group			Chairperson and Succession			
Type	Number	Name	Founder (1st generation)	Chairs in 2nd generation	Chairs in 3rd generation	Year of Succession
Family with succession	1	Samsung	Lee, Byung Chul (1938)	**Lee, Gun Hee (1987)**		1987
	2	CJ		Lee, Meng Hee (spin off from Samsung, 1996)	**Lee, Jae Hyun (2002)**	2002
	3	Hansol		Lee, In Hee (spin off from Samsung, 1991)	**Cho, Dong Gil (2002)**	2002
	4	Hyundai	Chung, Ju Young (1950)	**Chung, Mong Hun (1998)** Hyun, Jung Eun (2003)		1998
	5	LG	Goo, In Hoi (1947)	Goo, Ja Kyung (1970)	**Goo, Bon Moo (1995)**	1995
	6	SK	Choi, Jong Gun (1953) Choi, Jong Hyun (1973)	**Choi, Tae Won (1998)**		1998
	7	Hanjin	Joh, Joong Hoon (1945)	**Joh, Yang Ho (2003)**		2003
	8	Kumho	Park, In Cheon (1946)	**Park, Sung Yong (1984)** Park, Jung Gu (1996) Park, Sam Gu (2002)		1984
	9	Daelim	Lee, Jae Jun (1939)	**Lee, Jun Yong (1993)**		1993
	10	Kolon	Lee, Won Man (1957)	Lee, Dong Chan (1977)	**Lee, Woung Yeul (1996)**	1996
	11	Youngpoong	Jang, Byung Hee (1949)	**Jang, Hyung Jin (1993)**		1993
	12	Dongyang	Lee, Yang Gu (1957)	**Hyun, Jae Hyun (1989)**		1989
Family without succession	13	Shinsaegae		Lee, Myung Hee (spin off from Samsung, 1997)		
	14	Hyundai Motors		Chung, Mong Goo (spin off from Hyundai, 2000)		
	15	Hyundai Heavy Industry		Chung, Mong Joon (spin off from Hyundai, 2002)		
	16	Hyundai Development		Chung, Mong Gyu (spin off from Hyundai, 1999)		
	17	KCC		Chung, Mong Jin (spin off from Hyundai, 2000)		
	18	Hyundai Department		Chung, Mong Gun (spin off from Hyundai, 1999)		
	19	Lotte	Shin, Kyuk ho (1966)			
	20	Hanhwa	Kim, Jong Hee (1952)	Kim, Seung Yeon (1981)		
	21	Dongbu	Kim, Jun Ki (1969)			
	22	Hyosung	Cho, Hong Jae (1966)	Cho, Suk Rae (1981)		
	23	Taihan Elect	Sul, Kyung Dong (1942)	Sul, Won Ryang (1972)		
Non-Family	24	POSCO				
	25	NH				
	26	KT				
	27	KEPCO				
	28	KOGAS				
	29	KEC				
	30	SH				

Table 2.2: Summary Statistics

The sample consists of 2,508 firm-year observations of Korea's top 30 business groups based on their size from 1983 to 2004. The list of these business groups is designated by the Korean Fair Trade Commission (KFTC). In Panel B, the number of observations is 416 chaebol family-years, and each chaebol family variable is computed as the arithmetic average across business groups. Our analysis is based on the data compiled as a year-end snapshot for each year of interest.

  Panel A: Cash Flow Volatility refers to the standard deviation of cash flows from investment activities from the t-2 to the t+2 periods. Total M&A Ratio refers to the total amount of non-intra-group M&A transactions divided by total assets; we do not consider any intra-group M&A's, which occur between two affiliates in a single business group, to avoid group restructuring effects. Number of Mergers refers to the total frequency of non-intra-group M&A transactions in a given year. ROA refers to the ratio of a firm's earnings before interest and tax (EBIT) divided by its total assets. 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. Number of Affiliates refers to the number of total affiliates of the business group to which a firm belongs. Firm Age is the age of a firm in a business group as of the corresponding year. Listed is an indicator variable that equals one if a firm is listed on the KOSPI or KOSDAQ exchange, and zero otherwise.

  Panel B: Family Size is the total number of family members, including the current chairman, the chair's spouse, the direct and indirect descendants (married in) of the current chairman, and the parents or grandparents of the current chairman, up to the founder's generation. The number of generations refers to the distance between the founder (generation 1) and the most recent generation that is included in Family Size. The Current Chair's Generation refers to the generation to which the current chairman of a business group belongs. Current Chair Tenure refers to the number of years the current chair of a business group has held the chairmanship since he was officially appointed. The Number of Male Family Members refers to the total number of direct and indirect male family members in a business group. The Number of Female Family Members refers to the total number of direct and indirect female family members in a business group. The Number of Sons [Daughters, Sons-in-law, and Daughters-in-law] in the Current Chair+1 Generation (c+1 generation) refers to the total number of sons [daughters, sons-in-law, and daughters-in-law] of the current chair. Founder Dead is an indicator variable that equals one if the founder is dead as of the corresponding year, and zero otherwise.

Panel A: Firm	N	Mean	Std. Dev	Min	Median	Max
Cash Flow Volatility (%)	2,508	8.86	5.28	0.00	7.78	32.29
Total M&A ratio (%)	2,508	0.19	1.66	0	0	50.27
Number of merger	2,508	0.13	0.68	0	0	13
ROA	2,508	0.07	0.07	-0.29	0.07	0.81
Log of total assets	2,508	12.70	1.69	7.98	12.64	16.82
Log of total sales	2,498	12.54	1.71	1.11	12.51	16.48
Leverage	2,508	3.46	4.58	0.03	2.18	35.30
Number of affiliates	2,508	66.56	44.75	1	46	154
Firm age	2,508	26.12	13.64	0	25	73
Listed	2,508	0.78	0.42	0	1	1

Table 2.2 (cont'd)

Panel B: Family	N	Mean	Std. Dev	Min	Median	Max
Family size	416	12.50	12.52	3	8	64
Number of generation	416	3.30	0.46	3	3	4
Current chair generation	416	1.75	0.56	1	2	3
Current chair tenure (years)	416	16.86	14.92	0	12	57
Number of male family members	416	6.31	6.35	1	4	32
Number of female family members	416	6.18	6.32	1	4	32
Number of sons (c+1 gen.)	416	2.24	1.64	0	2	8
Number of daughters (c+1 gen.)	416	1.48	1.30	0	1	5
Number of sons in law (c+1 gen.)	416	0.94	1.22	0	1	5
Number of daughters in law (c+1 gen.)	416	1.55	1.86	0	1	8
Founder dead	416	0.53	0.50	0	1	1

Table 2.3: Corporate Risk Taking in Family Firms Versus Non-Family Firms

The sample consists of 2,508 firm-year observations of Korea's top 30 business groups based on their size from 1983 to 2004. These business groups are designated by the Korean Fair Trade Commission (KFTC). Each column reports the coefficients from an OLS (Columns 1 and 2) or a Tobit (Columns 3 and 4) regression with heteroscedasticity-robust standard errors. Standard errors are clustered at the business group level and reported in square brackets under the coefficient estimates. The dependent variable for Columns 1 and 2 is Cash Flow Volatility, which refers to the standard deviation of cash flows from investment activities from the t-2 to the t+2 periods. In Columns 3 and 4, the dependent variable is Total M&A Ratio, which refers to the total amount of non-intra-group M&A transactions divided by total assets. We do not consider intra-group M&A's, which occur between two affiliates in the same business group, to avoid group restructuring effects. Family Firm is an indicator that has a value of one if a firm belongs to a business group whose controlling shareholders are the founding family, and zero otherwise. Family Firm with Succession is an indicator that has a value of one if a family firm experiences a generation-to-generation succession during the sample years, and zero otherwise. Controls include ROA, log of total assets (millions of KRW), leverage ratio, number of group affiliates, and firm age. All estimates include industry (SIC-4 digit) and year indicator variables. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

| | Dependent Variable | | | |
| | Cash Flow Volatility (%) | | Non-intra-group M&A/Tasset (%) | |
Variables	(1)	(2)	(3)	(4)
Family firm with succession		1.14562**		1.24815***
		[0.534]		[0.250]
Family firm (Indicator)	2.51889**	1.95429**	3.82291***	3.18890***
	[0.935]	[0.889]	[0.279]	[0.276]
Indusrty FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Contorls	Yes	Yes	Yes	Yes
Regression Type	OLS	OLS	Tobit	Tobit
Observations	2,508	2,508	2,508	2,508
R-squared	0.460	0.463		

Table 2.4: Succession Tournaments in Family Firms

The sample consists of 1,478 family firms with in-sample succession. To ensure the effectiveness of sample size balancing between the pre-succession and post-succession periods, we exclude families whose succession periods do not meet the minimum two years requirement. Each column reports the coefficients from an OLS (Columns 1 to 4) or a Tobit (Column 5) regression with heteroscedasticity-robust standard errors. Standard errors are clustered at the business group level and reported in square brackets under the coefficient estimates. In Columns 4, Coefficient Equality reports the F statistics for the coefficients of the decomposed variables, with the p-values in rounded brackets. In Column 5, the difference-in-differences reports a synthetic linear combination of the marginal effects of coefficients from the first-stage Tobit regression. The dependent variable in Columns 1 to 4 is Cash Flow Volatility, which refers to the standard deviation of cash flows from investment activities from t-2 to t+2 periods. In Column 5, the dependent variable is Total M&A ratio, which refers to the total amount of non-intra-group M&A transactions divided by the total assets. We do not consider any intra-group M&A's, which occur between two affiliates in the same business group to avoid group restructuring effects. Number of Sons [Daughters, Sons-in-law] $\geq$ 2 refers to an indicator that has a value of one if the total number of sons [daughters, and sons-in-law] of the current chair is greater than or equal to two, and zero otherwise. Post refers to an indicator that has a value of one during the period from the succession year to the end of the sample years, and zero otherwise. In Column 4, Low Age Gap is an indicator that equals one if the difference between the eldest and youngest son's age is smaller than or equal to the average value of age difference, and zero otherwise. High Age Gap is an indicator that equals one only if the difference between the current chair's eldest and youngest son's age is greater than the average value of age difference in our sample. Controls include ROA, log of total assets (millions of KRW), leverage ratio, number of group affiliates, and firm age. All estimates include industry (SIC-4 digit) and year indicator variables. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

Variables	Dependent Variable				
	Cash Flow Volatility (%)				Non-intra-group M&A/Tasset (%)
	(1)	(2)	(3)	(4)	(5)
	Sons	Family composition		Age gap	Sons
Number of Sons $\geq$ 2 × Post	-2.31043**				-0.98730***
	[0.806]				[0.179]
Number of Daughters $\geq$ 2 × Post		0.58506			
		[1.812]			
Number of Sons-in-law $\geq$ 2 × Post			1.27018		
			[1.104]		
Number of Sons $\geq$ 2 × Post × Low age gap				-3.81196***	
				[1.003]	
Number of Sons $\geq$ 2 × Post × High age gap				-1.81645**	
				[0.691]	
Post	2.50733**	0.00675	-0.19405	2.60992***	1.52236***
	[0.807]	[1.273]	[0.712]	[0.795]	[0.192]
Number of Sons $\geq$ 2	1.57365*			2.01193**	2.31550***
	[0.800]			[0.849]	[0.153]
Number of Daughters $\geq$ 2		-0.22002			
		[0.967]			
Number of Sons-in-law $\geq$ 2			-0.40659		
			[0.968]		
Difference-in-Differences					**-0.16607***
					[0.033]
Coefficient equality (F-test)				5.66**	
				(0.039)	
Indusrty FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes
Regression Type	OLS	OLS	OLS	OLS	Tobit
Observations	1,478	1,478	1,478	1,478	1,478
R-squared	0.498	0.495	0.496	0.503	

Table 2.5: Family Feud and Succession Tournaments in Family Firms

The sample consists of 1,478 family firms with in-sample succession. To ensure the effectiveness of sample size balancing between the pre-succession and post-succession periods, we exclude families whose succession periods do not meet the minimum two years requirement. Each column reports the coefficients from an OLS regression with heteroscedasticity-robust standard errors. Standard errors are clustered at the business group level and reported in square brackets under the coefficient estimates. Coefficient Equality reports the F statistic for the coefficients of the decomposed variables, with the p-value in rounded brackets. The dependent variable is Cash Flow Volatility, which refers to the standard deviation of cash flows from investment activities from t-2 to t+2 periods. Number of Sons ≥ 2 refers to an indicator that has a value of one if the total number of sons of the current chair is greater than or equal to two, and zero otherwise. Post refers to an indicator that has a value of one during the period from the succession year to the end of the sample years, and zero otherwise. In Column 1, Feud News is an indicator that has a value of one if a group has had a news release about family disputes over ownership or management positions during the sample years, and zero otherwise. No Feud News is an indicator that has a value of one if a group has had no news release about family disputes over ownership or management positions during the sample years, and zero otherwise. In Column 2, Half-brother is an indicator that has a value of one if the founder of a business group has children with different mothers, and zero otherwise. No Half-brother is an indicator that has a value of one if the founder of a business group does not have children with different mothers, and zero otherwise. In Column 3, Foreign Bachelor's is an indicator that has a value of one if a son has a bachelor's degree from a foreign university, and zero otherwise. No Foreign Bachelor's is an indicator that has a value of one if all sons have their bachelor's degrees from domestic universities, and zero otherwise. Controls include ROA, log of total assets (millions of KRW), leverage ratio, number of group affiliates, and firm age. All estimates include industry (SIC-4 digit) and year indicator variables. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

	Dependent Variable		
	Cash Flow Volatility (%)		
Variables	(1)	(2)	(3)
Number of Sons ≥ 2 × Post × Feud news	-3.16148***		
	[0.880]		
Number of Sons ≥ 2 × Post × No feud news	-1.80154**		
	[0.755]		
Number of Sons ≥ 2 × Post × Half brother		-5.00398***	
		[0.880]	
Number of Sons ≥ 2 × Post × No half brother		-1.66031**	
		[0.561]	
Number of Sons ≥ 2 × Post × Foreigh bachelor			-3.55221***
			[0.996]
Number of Sons ≥ 2 × Post × No foreign bachelor			-1.77126**
			[0.763]
Post	2.48232***	2.71210***	2.92811***
	[0.307]	[0.802]	[0.890]
Number of Sons ≥ 2	0.87141***	2.43467**	1.66606**
	[0.276]	[0.822]	[0.688]
Coefficient equality (F-test)	4.45*	23.11***	4.43*
	(0.061)	(0.000)	(0.062)
Indusrty FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Controls	Yes	Yes	Yes
Regression Type	OLS	OLS	OLS
Observations	1,478	1,478	1,478
R-squared	0.510	0.510	0.503

Table 2.6: Performance

The sample consists of 1,478 family firms with succession. Each column reports the coefficients from an OLS regression with heteroscedasticity-robust standard errors. Standard errors are clustered at the business group level and reported in square brackets under the coefficient estimates. The dependent variable used in Columns 1 to 3 is ROA, which refers to the ratio of a firm's earnings before interest and tax (EBIT) divided by its total assets. In Columns 4 to 6, the dependent variable is Operating Income Ratio, which refers to the ratio of a firm's operating income divided by its total assets. Number of Sons [Daughters, Sons-in-law] ≥ 2 refers to an indicator that has a value of one if the total number of sons [daughters, sons-in-law] of the current chair is greater than or equal to two, and zero otherwise. Post refers to an indicator that has a value of one for the period from the succession year to the end of the sample years. Controls include the log of total assets (millions of KRW), leverage ratio, the number of group affiliates, and firm age. All estimates include industry (SIC-4 digit) and year indicator variables. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

| | Dependent Variable | | | | | |
| | ROA (%) | | | Operating Income/Toatal asset (%) | | |
Variables	(1)	(2)	(3)	(4)	(5)	(6)
Number of Sons ≥ 2 × Post	3.99636***			3.77638***		
	[0.355]			[0.433]		
Number of Daughters ≥ 2 × Post		-1.74160*			-1.49294	
		[0.903]			[0.883]	
Number of Sons-in-law ≥ 2 × Post			0.57935			0.76157
			[0.968]			[0.965]
Post	-2.70651***	1.92949***	0.44993	-2.52358***	1.76202***	0.34634
	[0.458]	[0.585]	[0.626]	[0.521]	[0.489]	[0.524]
Number of Sons ≥ 2	0.26471			0.37842		
	[1.540]			[1.523]		
Number of Daughters ≥ 2		0.79830			0.57088	
		[0.501]			[0.475]	
Number of Sons-in-law ≥ 2			-0.35412			-0.37471
			[1.112]			[0.996]
Indusrty FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Regression Type	OLS	OLS	OLS	OLS	OLS	OLS
Observations	1,478	1,478	1,478	1,478	1,478	1,478
R-squared	0.487	0.479	0.478	0.466	0.456	0.455

Table 2.7: General Robustness Checks

In Columns 1 to 5, we repeat our baseline analyses for family firms with succession in Table 4, while we limit their pre- and post-succession periods by 10 years. In Column 6, we exclude chaebols that went through spin-offs during our sample period. In Column 7, we broadly re-classify business groups based on their family roots. For example, the pan-Samsung group includes all of the Samsung, Shinsaegae, CJ, and Hansol groups, which have the same founder but are separately classified by the KFTC following group spin-offs. Each column reports the coefficients from an OLS (Columns 1 to 4 and Columns 6 to 7) or a Tobit (Column 5) regression with heteroscedasticity-robust standard errors. Standard errors are clustered at the business group level and reported in square brackets under the coefficient estimates. Coefficient equality test is conducted in Column 4 with its F statistic. Associated p-value is reported in the rounded brackets in the same column. In Column 5, the difference-in-differences reports the synthetic linear combination of the four marginal effects obtained from the first-stage Tobit regression. Except in Column 5, our dependent variable is Cash Flow Volatility. In Column 5, we use Total M&A ratio as our dependent variable. Controls include ROA, log of total assets (millions of KRW), leverage ratio, number of group affiliates, and firm age. All estimates include industry (SIC-4 digit) and year indicator variables. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

					Dependent Variable		
					Non-intra-group M&A/Tasset (%)	Cash Flow Volatility (%)	
		Cash Flow Volatility (%)					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
						Exclude	Pan-business
Variables	Sons	Family composition		Age gap	Sons	Spin-offs	Group
Number of Sons ≥ 2 × Post	-2.39366**				-0.87568***	-2.16602*	-2.12419**
	[0.943]				[0.142]	[0.918]	[0.766]
Number of Daughters ≥ 2 × Post		0.93451					
		[1.882]					
Number of Sons-in-law ≥ 2 × Post			1.81681				
			[1.159]				
Number of Sons ≥ 2 × Post × Low age gap				-4.07405***			
				[0.981]			
Number of Sons ≥ 2 × Post × High age gap				-1.82867**			
				[0.782]			
Post	2.52474**	-0.28306	-0.48402	2.65326**	0.01686	2.88894	2.73896**
	[0.926]	[1.280]	[0.733]	[0.896]	[0.148]	[1.553]	[0.869]
Number of Sons ≥ 2	1.91964*			2.45264**	3.11337***	1.96487*	1.44003*
	[0.920]			[0.927]	[0.077]	[0.994]	[0.721]
Number of Daughters ≥ 2		-0.37341					
		[1.134]					
Number of Sons-in-law ≥ 2			-0.44015				
			[1.209]				
Difference-in-Differences					-0.08982***		
					[0.021]		
Coefficient equality (F-test)				7.60**			
				(0.020)			
Indusrty FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Regression Type	OLS	OLS	OLS	OLS	Tobit	OLS	OLS
Observations	1,326	1,326	1,326	1,326	1,326	845	1,478
R-squared	0.511	0.507	0.510	0.517		0.494	0.499

Table 2.8: The Sudden Death of a Hyundai Chairman

The sample consists of a cross-section of family firms as of 2004. Each column reports the coefficients from an OLS regression with heteroscedasticity-robust standard errors. Standard errors are clustered at the business group level and reported in square brackets under the coefficient estimates. The dependent variable from Columns 1 and 2 is the change in the standard deviation of cash flows from investment activities from the t-2 to the t+2 periods, which refers to the difference in the five-year cash flow volatility before and after the Hyundai chairman's death on Aug 4th, 2003. In Column 3, the dependent variable is the change in the total amount of non-intra-group M&A transactions divided by total assets, which refers to the difference in the five-year total M&A transaction ratios before and after the Hyundai chairman's death on Aug 4th, 2003. We exclude the year 2004, as well as the firms that were directly controlled by the chairman who died suddenly, to avoid any confounding effect, namely the increasing business uncertainty around the CEO's unexpected death. We also do not consider any intra-group M&A's that involve Hyundai entities that were formerly controlled by the dead chairman to avoid group restructuring effects, if any. Column 1 uses Hyundai Event (an indicator) as an explanatory variable; this is a dummy that is one for Hyundai Group firms and zero otherwise. In Columns 2 and 3, Hyundai Event is interacted with two dummies, Strong Contender and Weak Contender. Strong Contender is a dummy for firms in Hyundai Group controlled by sons in the current chair's generation. Weak Contender is a dummy for firms controlled by male relatives in the current chair-1 generation. We control for Δ ROA, Δ log total assets, Δ leverage Δ number of affiliates, which refer to the difference in the five-year average ROA, the logarithm of a firm's total assets (in KRW millions), leverage ratio, and number of affiliates before and after (excluding 2004) the chairman's death in 2003. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

	Dependent Variable		
	Δ Cash Flow Volatility (%)		Δ Non-intra-group M&A/Tasset (%)
Variables	(1)	(2)	(3)
Hyundai Event (indicator)	0.74610**		
	[0.314]		
Hyundai Event × Strong Contender		1.23693***	0.26794***
		[0.323]	[0.046]
Hyundai Event × Weak Contender		-1.46228***	0.00619
		[0.370]	[0.044]
Controls	Yes	Yes	Yes
Regression Type	OLS	OLS	OLS
Observations	152	152	280
R-squared	0.003	0.023	0.038

Table 2.9: Does Pay Equality Mitigate Sons' Tournament Behaviors?

Each column reports the coefficients from an OLS regression with heteroscedasticity-robust standard errors. Standard errors are clustered at the business group level and reported in square brackets under the coefficient estimates. In Column 1, the sample consists of 1,162 family firms with succession during the 8 years before and after inheritance law change in January of 1991. In Column 2, we exclude families with potentially endogenous succession timing (i.e,. successions from 1989 to 1993) from our analysis in Column 1. In Column 3, we also exclude firms with cross-listed shares from the sample we used in Column 2. Coefficient equality reports the F statistic for the coefficients of the decomposed variables, with the p-value in the rounded brackets. The dependent variable is Cash Flow Volatility, which refers to the standard deviation of cash flows from investment activities from the t-2 to the t+2 periods. Number of Sons $\geq$ 2 refers to an indicator that has a value of one if the total number of sons of the current chair is greater than or equal to two, and zero otherwise. Post refers to an indicator that has a value of one in the period from the succession year to the end of the sample year, and zero otherwise. Before Law is an indicator that has a value of one if a business group has a succession event before 1991, and zero otherwise. After Law is an indicator that has a value of one if a business group has a succession event after 1991, and zero otherwise. Controls include ROA, log of total assets (millions of KRW), leverage ratio, number of group affiliates, and firm age. All estimates include industry (SIC-4 digit) and year indicator variables. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

	Dependent Variable		
	Cash Flow Volatility (%)		
	(1)	(2)	(3)
Variables	Inheritance Law	Exclude endogenous succession timing	Exclude cross-listing firms
Number of Sons $\geq$ 2 × Post × Before Law	-3.08819***	-2.75611**	-2.92887***
	[0.853]	[0.886]	[0.848]
Number of Sons $\geq$ 2 × Post × After Law	-2.10955	-1.34160	-1.26259
	[0.937]	[0.846]	[0.752]
Post	2.71238**	2.64281**	2.55941**
	[0.920]	[1.051]	[1.009]
Number of Sons $\geq$ 2	1.00291	1.18752	1.02730
	[0.826]	[1.186]	[1.230]
Coefficient equality (F-test)	2.20	3.29	4.20*
	(0.169)	(0.107)	(0.075)
Indusrty FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Controls	Yes	Yes	Yes
Regression Type	OLS	OLS	OLS
Observations	1,162	1,056	952
R-squared	0.531	0.559	0.553

Table 2.10: Family Governance: Primogeniture, Daughters' Marriages, and Sons-in-law

The sample consists of 1,478 family firms with succession from 1983 to 2004. Each column reports the coefficients from an OLS regression with heteroscedasticity-robust standard errors. Standard errors are clustered at the business group level and reported in square brackets under the coefficient estimates. Coefficient Equality reports the F statistic for the coefficients of the decomposed variables, with the p-value in the rounded brackets. The dependent variable is Cash Flow Volatility, which refers to the standard deviation of cash flows from investment activities from the t-2 to the t+2 periods. Number of Sons [Daughters, Sons-in-law] ≥ 2 refers to an indicator that has a value of one if the total number of sons [daughters, sons-in-law] of the current chair is greater than or equal to two, and zero otherwise. Post refers to an indicator that has a value of one in the period from the succession year to the end of sample years, and zero otherwise. In Column 1, First Son Chair is an indicator that has a value of one if the current chairman is the first son. No First Son Chair is an indicator that has a value of one if the current chairman is not the first son. In Column 2, Daughters' Marriage is an indicator that equals one if the current chair has a married daughter, and zero otherwise. No Daughters' Marriage is an indicator that equals one if the current chair has no married daughters, and zero otherwise. In Column 3, Sons-in-law in Management is an indicator that has a value of one if the family has a son-in-law who participates in management or ownership. Sons-in-law Not in Management is an indicator that has a value of one if the family has no son-in-law who participates in management or has ownership. Controls include ROA, the log of total assets (millions of KRW), leverage ratio, the number of group affiliates, and firm age. All estimates include industry (SIC-4 digit) and year indicator variables. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

	Dependent Variable		
	Dependent Variable: Cash Flow Volatility (%)		
	(1)	(2)	(3)
Variables	Primogeniture	Daugter's marriage	Quality sons-in-law
Number of Sons ≥ 2 × Post × First son chair	-1.91152**		
	[0.815]		
Number of Sons ≥ 2 × Post × No first son chair	-2.99454***		
	[0.768]		
Number of Sons ≥ 2 × Post × Daughters' marriage		-2.08312**	
		[0.722]	
Number of Sons ≥ 2 × Post × No daughters' marriage		-5.25030***	
		[0.752]	
Number of Sons ≥ 2 × Post × Sons-in-law in management			-1.59559**
			[0.559]
Number of Sons ≥ 2 × Post × Sons-in-law not in management			-3.87621***
			[0.875]
Post	2.74181***	2.57296**	2.67086***
	[0.805]	[0.814]	[0.779]
Number of Sons ≥ 2	1.61297**	2.08948*	2.22758**
	[0.720]	[0.938]	[0.764]
Coefficient equality (F-test)	3.88*	27.97***	12.99***
	(0.077)	(0.061)	(0.005)
Indusrty FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Controls	Yes	Yes	Yes
Regression Type	OLS	OLS	OLS
Observations	1,478	1,478	1,478
R-squared	0.501	0.502	0.506

Table 2.11: Succession in Family Firms, Full Sample

The sample consists of 2,508 firm-year observations from Korea's top 30 large business groups, designated by the Korean Fair Trade Commission (KFTC), from 1983 to 2004. Each column reports the coefficients from an OLS (Column 1) or a Tobit (Column 2) regression, with heteroscedasticity-robust standard errors. Standard errors are clustered at the business group level and reported in square brackets under the coefficient estimates. In Column 2, the difference-in-differences reports a synthetic linear combination of marginal effects of coefficients from the first-stage Tobit regression. The dependent variable from Column 1 is Cash Flow Volatility, which refers to the standard deviation of cash flows from investment activities from the t-2 to the t+2 period. In Column 2, the dependent variable is Total M&A Ratio, which refers to the total amount of non-intra-group M&A transactions divided by total assets; we do not consider any intra-group M&A's, which occur between two affiliates in the same business group, to avoid group restructuring effects. Number of Sons ≥ 2 refers to an indicator that has a value of one if the total number of sons of the current chair is greater than or equal to two, and zero otherwise. Family Firm with Succession is an indicator that has a value of one if a family firm experiences a generation-to-generation succession during the sample years, and zero otherwise. Post refers to an indicator that has a value of one in the period from the succession year to the end of the sample years, and zero otherwise. Controls include ROA, log of total assets (millions of KRW), leverage ratio, number of group affiliates, and firm age. All estimates include industry (SIC-4 digit) and year indicator variables. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

	Dependent Variable	
	Cash Flow Volatility (× 100)	M&A/Tasset (× 100)
Variables	(1)	(2)
Number of Sons ≥ 2 × Family firm with succession × Post	-1.87523**	-0.13200
	[0.835]	[0.249]
Number of Sons ≥ 2 × Family firm with succession	0.76560	0.42170**
	[1.210]	[0.209]
Family firm with succession × Post	1.67089**	-2.49355***
	[0.753]	[0.239]
Family firm with succession	0.62860	4.77580***
	[0.774]	[0.205]
Number of Sons ≥ 2	1.52652**	-0.83122***
	[0.690]	[0.203]
Difference-in-Difference-in-Differences		**-0.14298***
		[0.022]
Indusrty FE	Yes	Yes
Year FE	Yes	Yes
Contorls	Yes	Yes
Regression Type	OLS	Tobit
Observations	2,508	2,508
R-squared	0.466	

Table 3.1: Chaebol Summary Statistics

The sample consists of Korea's top 16 large business groups (chaebols) designated by the Korean Fair Trade Commission (KFTC) in 2000 to 2004. Each chaebol family variable is computed as the arithmetic average across firms in a business group. The sample comprises 1,299 firm-year observations of firms that are legally required to submit a comprehensive summary report of their financial performance (equivalent to 10-K filings in the U.S.) to the KFTC. Analyses are based on data compiled as of the year end during the sample period.

Panel A: Family size refers to the founder's siblings and their descendants, and the founder's parents. Family members who are younger than 15 years as of each year during the sample period are excluded. The number of generations refers to the distance between the founder (generation 1) and the most recent generation that is included in family size. The current chair's generation refers to the generation to which the current chairman of a business group belongs. Current chair tenure refers to the number of years the current chair of each business group has held the chairmanship. The number of male [female] family members refers to the total number of direct and indirect male [female] family members in a business group. The number of sons [daughters, sons-in-law, and daughters-in-law] in the current chair+1 generation (c+1 generation) refers to the total number of sons [daughters, sons-in-law, and daughters-in-law] of the current chair and the chair's siblings. Founder dead is an indicator variable that equals one if the founder is dead as of each sample year, and zero otherwise.

Panel B: 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. Public firm is an indicator variable that equals one if a firm is listed on the KOSPI or KOSDAQ exchange, and zero otherwise. Log of advertisement expense refers to the logarithm of total advertisement expense of each firm in millions of KRW. Firm age is the age of a firm in a business group.

Panel A: Family	N	Mean	Std. Dev	Min	Median	Max
Family size	80	58.6	30.9	15	60	143
Number of generation	80	3.1	0.6	2	3	4
Current chair generation	80	1.9	0.7	1	2	3
Current chair tenure (years)	80	12.1	10.7	0	7	38
Number of male family members	80	29.4	14.5	7	31	69
Number of female family members	80	26.6	15.4	7	24	74
Number of sons (c+1 generation)	80	6.9	4.1	0	7	15
Number of daughters (c+1 generation)	80	5.5	4.4	0	4	16
Number of sons in law (c+1 generation)	80	2.6	3.7	0	1	11
Number of daughters in law (c+1 generation)	80	2.1	3.0	0	0	9
Founder dead	80	0.8	0.4	0	1	1

Panel B: Firm	N	Mean	Std. Dev	Min	Median	Max
Log of total assets	1299	12.70	2.11	7.43	12.60	17.65
Log of sales	1299	12.45	2.23	2.73	12.50	17.58
Leverage	1299	2.55	4.63	-16.68	1.59	28.19
ROA	1225	0.07	0.10	-0.60	0.06	0.85
Dividend paid/Total asset	1299	0.01	0.02	0	0	0.12
Cash flow/Total asset	1299	0.07	0.11	0	0.03	0.77
Public firm (dummy)	1299	0.38	0.48	0	0	1
Log of advertisement expense	1130	5.89	3.19	-3.96	5.73	14.27
Firm age	1297	20.76	15.32	0	18	72

Table 3.2: Fraud Summary Statistics

Table 2 reports corporate fraud cases filed against all 1,299 firm-year observations from 2000 to 2004. Panel A shows the number of corporate fraud cases each year. Types of corporate fraud include internal transaction, collusion, unfair trade, tax evasion, and accounting & disclosure fraud. Fraud-related data concerning internal transactions, collusion, and unfair trade practices are collected from the Korean Fair Trade Commission (KFTC). The KFTC decision criteria on legal violations are publicly available on the authority's web page. Data concerning tax evasion and accounting & disclosure fraud are collected from the DART database managed by the Financial Supervisory Service in Korea. Tax evasion and accounting & disclosure fraud cases only include those in which surcharges were imposed. Embezzlement and breach of trust data became available only after 2004 in the DART database, so they are omitted from our fraud sample. Panel B categorizes corporate fraud by the three types of enforcement measures taken – correction order, fine imposition, and prosecution. Succession Tournament includes business group-years within the 5 years [-5, -1] prior to an upcoming succession. Business groups that, in a given year, have a current chairman whose tenure is longer than that of 95% of the group of chairmen are considered to be in a succession tournament period. A succession in which chairmanship transfers within a single generation by agreement among brothers is not considered to cause a succession tournament. Hyundai group is considered to be in a succession tournament period after the Hyundai chairman's sudden death on Aug 4th, 2003. All other periods are regarded as Non-succession Tournament.

Panel A:	Corporate fraud					
	Internal transaction	Collusion	Tax Evasion	Unfair Trade	Accounting/ Disclosure	Total number of fraud
2000	16	13	1	0	0	30
2001	29	19	0	0	0	48
2002	2	15	1	0	0	18
2003	11	9	0	1	0	21
2004	1	13	8	0	1	23
Total	59	69	10	1	1	140

Panel B:	Types of investigation			
	Correction Order	Fine Imposition	Prosecution	Total
Succession Tournament	5 (21.7%)	15 (65.2%)	3 (13.1%)	23
Non-succession Tournament	11(9.4%)	80 (68.4%)	26 (22.2%)	117
All periods	16 (11.4%)	95 (67.9%)	29 (20.7%)	140

Table 3.3: Correlation

Table 3 reports correlations among the main variables summarized in the previous tables for all 1,299 firm-year observations from 2000 to 2004. Panel A shows correlations for all periods, and Panels B and C report correlations for Succession Tournament periods and Non-succession Tournament periods, respectively. Succession Tournament includes business group-years within the 5 years [-5, -1] prior to an upcoming succession. Business groups that, in a given year, have a current chairman whose tenure is longer than that of 95% of the group of chairmen are considered to be in a succession tournament period. A succession in which chairmanship transfers within a single generation by agreement among brothers is not considered to cause a succession tournament. Hyundai group is considered to be in a succession tournament period after the Hyundai chairman's sudden death on Aug 4th, 2003. All other periods are regarded as Non-succession Tournament. Number of fraud cases refers to the sum of the total number of corporate fraud cases, including internal transaction, collusion, tax evasion, unfair trade, accounting, and disclosure fraud. Number of sons (c+1 generation) refers to the total number of sons of the current chair and his/her siblings. Number of sons (c generation) refers to the total number of brothers of the current chair, including the chairman himself. Number of sons (below age 15) refers to the total number of sons of the current chair and the chair's siblings who are younger than 15; these sons are excluded from the sample since in Korea they are not legally eligible to work. Group age refers to the number of years a business group has existed in the corresponding sample year. 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.

Panel A: All periods		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1)	Number of fraud	1.00								
(2)	Number of sons (c+1 generation)	0.05	1.00							
(3)	Number of sons (c generation)	-0.02	-0.20	1.00						
(4)	Number of sons (below age 15)	-0.07	-0.26	0.08	1.00					
(5)	Group age	0.00	0.15	-0.08	0.23	1.00				
(6)	Log of total assets	0.08	-0.01	0.09	0.09	0.05	1.00			
(7)	Log total sales	0.08	-0.04	0.10	0.10	0.07	0.87	1.00		
(8)	Leverage	0.00	-0.07	0.08	0.01	-0.14	0.20	0.15	1.00	
(9)	ROA	-0.01	-0.04	-0.01	0.06	0.00	-0.11	0.05	-0.15	1.00

Table 3.3 (cont'd)

Panel B: Succession Tournament	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) Number of fraud	1.00								
(2) Number of sons (c+1 generation)	0.14	1.00							
(3) Number of sons (c generation)	-0.12	-0.66	1.00						
(4) Number of sons (below age 15)	-0.10	-0.71	0.89	1.00					
(5) Group age	0.06	0.57	0.18	-0.14	1.00				
(6) Log of total assets	0.07	0.04	0.01	0.07	-0.01	1.00			
(7) Log total sales	0.08	0.05	0.00	0.05	0.01	0.80	1.00		
(8) Leverage	-0.04	-0.27	0.23	0.27	-0.14	0.15	-0.02	1.00	
(9) ROA	-0.01	-0.08	0.04	-0.04	0.01	-0.17	0.09	-0.11	1.00

Panel C: Non-succession Tournament	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) Number of fraud	1.00								
(2) Number of sons (c+1 generation)	0.03	1.00							
(3) Number of sons (c generation)	0.00	-0.16	1.00						
(4) Number of sons (below age 15)	-0.07	-0.12	-0.06	1.00					
(5) Group age	0.00	0.17	-0.10	0.25	1.00				
(6) Log of total assets	0.08	-0.04	0.10	0.11	0.06	1.00			
(7) Log total sales	0.08	-0.05	0.13	0.12	0.08	0.89	1.00		
(8) Leverage	0.01	-0.02	0.06	-0.04	-0.14	0.21	0.18	1.00	
(9) ROA	-0.01	-0.05	-0.02	0.08	-0.01	-0.09	0.06	-0.16	1.00

Table 3.4: Succession Tournaments Among Sons and Corporate Fraud

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. The dependent variable is Log (1+number of fraud), which refers to the logarithm of one plus the total number of corporate fraud cases, including internal transaction, collusion, tax evasion, unfair trade, accounting, and disclosure fraud, in each sample year. Columns (1) and (2) use the number of sons in the current chair+1 generation as an explanatory variable; this refers to the total number of sons of the current chair and the chair's siblings. Columns (3) and (4) use the number of sons in the current chair+1 generation who are younger than 15 as an explanatory variable. Columns (5) and (6) use the number of males in the current chair's generation as an explanatory variable; this refers to the number of brothers of the current chair, plus the chairman himself. Succession Tournament is an indicator that has a value of one for business group-years within the 5 years [-5, -1] prior to an upcoming succession, and zero otherwise. Business groups that, in a given year, have a current chairman whose tenure is longer than that of 95% of the group of chairmen are considered to be in a succession tournament period. A succession in which chairmanship is transferred within a single generation by agreement among brothers is not considered to cause a succession tournament. Hyundai group is included in the period of succession tournament after the Hyundai chairman's sudden death on Aug 4th, 2003. 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. All models include annual year dummy variables. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

Variables	Dependent Variable: Log (1+ number of fraud)					
	(1)	(2)	(3)	(4)	(5)	(6)
	C+1 generation		Under age		C generation	
Number of sons × Succession Tournament	0.00478**	0.00436**	-0.00586	-0.00494	-0.00203**	-0.00184**
	[0.002]	[0.002]	[0.009]	[0.008]	[0.001]	[0.001]
Number of sons	0.00104	0.00125	-0.00665**	-0.00771***	0.00015	-0.00001
	[0.001]	[0.001]	[0.003]	[0.002]	[0.000]	[0.000]
Succession Tournament	-0.05134**	-0.04744**	0.00872	0.00732	0.03290**	0.03061**
	[0.021]	[0.020]	[0.014]	[0.012]	[0.013]	[0.013]
Log total sales		0.00427**		0.00464**		0.00426**
		[0.002]		[0.002]		[0.002]
Leverage		-0.00005		-0.00021		-0.00010
		[0.000]		[0.000]		[0.000]
Constant	0.01984	-0.03549	0.03625***	-0.02015	0.02648**	-0.02511
	[0.015]	[0.022]	[0.010]	[0.020]	[0.012]	[0.016]
Observations	1,299	1,299	1,299	1,299	1,299	1,299
R-squared	0.011	0.018	0.011	0.019	0.009	0.015

Table 3.5: Fraud Announcement Returns

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. For each event we calculate the CAR over the 250 day estimate window using a market model. First, we regress returns on market returns to obtain estimates for alpha and beta. Then we obtain abnormal return by subtracting alpha plus beta times market return from daily stock returns. We only include the first fraud announcement date as an event date if a firm has multiple fraud filings in a given year. In Columns (1) and (2), the dependent variable CAR [-1, 1] indicates the cumulative abnormal return for three days around event dates – the event day and the preceding and following day. In Columns (3) and (4), the dependent variable CAR [-2, 2] reports the cumulative abnormal return for five days around event dates. In Columns (5) and (6), the dependent variable CAR [-3, 3] reports the cumulative abnormal return for seven days around event dates. Succession Tournament is an indicator that has a value of one for business group-years within the 5 years [-5, -1] prior to an upcoming succession, and zero otherwise. Business groups that, in a given year, have a current chairman whose tenure is longer than that of 95% of the group of chairmen are considered to be in a succession tournament period. A succession in which chairmanship is transferred within a single generation by agreement among brothers is not considered to cause a succession tournament. Hyundai group is considered to be in a succession tournament period after the Hyundai chairman's sudden death on Aug 4th, 2003. 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. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

Dependent Variables:	CAR [-1,1]		CAR [-2,2]		CAR [-3,3]	
	(1)	(2)	(3)	(4)	(5)	(6)
Number of sons × Succession Tournament	-0.02975	-0.14837	-0.61678*	-0.70765**	-0.60699	-0.79419
	[0.168]	[0.187]	[0.296]	[0.314]	[0.658]	[0.612]
Number of sons (c+1 generation)	-0.22972	-0.15793	-0.16945	-0.09816	-0.28448	-0.20985
	[0.235]	[0.195]	[0.401]	[0.322]	[0.583]	[0.511]
Succession Tournament	2.97315	4.16559**	9.14262**	10.05198***	9.03907	10.93050*
	[2.098]	[1.854]	[3.431]	[3.053]	[6.929]	[6.092]
Log total sales		-0.66853*		-0.54665		-0.97307*
		[0.352]		[0.399]		[0.480]
Leverage		0.17295		0.17672		0.16803
		[0.202]		[0.289]		[0.347]
Constant	2.29709	10.83087	2.25876	9.00617	3.60213	16.57034*
	[2.581]	[6.289]	[3.660]	[6.226]	[4.838]	[7.970]
Observations	66	66	66	66	66	66
R-squared	0.082	0.128	0.099	0.123	0.075	0.105

127

Table 3.6: Family Governance and Corporate Fraud

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. All explanatory variables are standardized, so their point estimates represent the economic magnitude of their effects. The dependent variable is Log (1+number of fraud), which refers to the logarithm of one plus the total number of corporate fraud cases, including internal transaction, collusion, tax evasion, unfair trade, accounting, and disclosure fraud, in each sample year. Succession Tournament is an indicator that has a value of one for business group-years within the 5 years [-5, -1] prior to an upcoming succession, and zero otherwise. Business groups that, in a given year, have a current chairman whose tenure is longer than that of 95% of the group of chairmen are considered to be in a succession tournament period. A succession in which chairmanship is transferred within a single generation by agreement among brothers is not considered to cause a succession tournament. Hyundai group is considered to be in a succession tournament period after the Hyundai chairman's sudden death on Aug 4th, 2003. Family feud is an indicator that has a value of one if a group has a news release about family disputes over ownership or management positions in 2000-2004, and is zero otherwise. No family feud is an indicator that has a value of one if a group has no news release about family disputes over ownership or management positions in 2000-2004, and is zero otherwise. Half-brothers is an indicator that has a value of one if the founder of a business group has children with different mothers, and is zero otherwise. No half-brothers is an indicator that has a value of one if the founder of a business group does not have children with different mothers, and is zero otherwise. First son chair is an indicator that has a value of one if the current chairman of a business group is the first son, and is zero otherwise. No first son chair is an indicator that has a value of one if the current chairman of a business group is not the first son, and is zero otherwise. 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. All models include annual year dummy variables. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

Variables	Dependent Variable: Log (1+ number of fraud)					
	(1)	(2)	(3)	(4)	(5)	(6)
Number of sons × Succession Tournament × Family feud	0.02082***	0.01910***				
	[0.006]	[0.006]				
Number of sons × Succession Tournament × No family feud	0.00281**	0.00271**				
	[0.001]	[0.001]				
Number of sons × Succession Tournament × Half brothers			0.00938***	0.00770***		
			[0.002]	[0.002]		
Number of sons × Succession Tournament × No half brothers			-0.00418*	-0.00425*		
			[0.002]	[0.002]		
Number of sons × Succession Tournament × First son chair					0.01638	0.01390
					[0.009]	[0.008]
Number of sons × Succession Tournament × No first son chair					0.01972*	0.01723*
					[0.009]	[0.009]
Number of sons (c+1 generation)	0.00339	0.00411	0.00343	0.00416	0.00337	0.00408
	[0.004]	[0.004]	[0.004]	[0.004]	[0.004]	[0.004]
Succession Tournament	-0.01832***	-0.01703***	-0.00325	-0.00206	-0.02169*	-0.01879*
	[0.005]	[0.005]	[0.003]	[0.003]	[0.012]	[0.010]
Log total sales		0.00954**		0.00939**		0.00950**
		[0.004]		[0.004]		[0.004]
Leverage		-0.00023		-0.00036		-0.00027
		[0.002]		[0.002]		[0.002]
Constant	0.02991***	0.02928***	0.03036***	0.02967***	0.02965***	0.02904***
	[0.010]	[0.010]	[0.010]	[0.009]	[0.009]	[0.009]
Observations	1,299	1,299	1,299	1,299	1,299	1,299
R-squared	0.011	0.018	0.012	0.018	0.011	0.018

Table 3.7: Types of Fraud Investigation

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. For Columns (1) and (2), the dependent variable is administrative order, which refers to the logarithm of one plus the total number of corporate fraud cases that end with a correction order. For Columns (3) and (4), fine imposition refers to the logarithm of one plus the total number of corporate fraud cases where surcharges are imposed. For Columns (5) and (6), prosecution refers to the logarithm of one plus the total number of corporate fraud cases which are examined by prosecution. Succession Tournament is an indicator that has a value of one for business group-years within the 5 years [-5, -1] prior to an upcoming succession, and zero otherwise. Business groups that, in a given year, have a current chairman whose tenure is longer than that of 95% of the group of chairmen are considered to be in a succession tournament period. A succession in which chairmanship is transferred within a single generation by agreement among brothers is not considered to cause a succession tournament. Hyundai group is considered to be in a succession tournament period after the Hyundai chairman's sudden death on Aug 4th, 2003. 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. All models include annual year dummy variables. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

Variables	Dependent Variable: Log (1+ number of fraud)					
	(1)	(2)	(3)	(4)	(5)	(6)
	Correction Order		Fine Imposition		Prosecution	
Number of sons × Succession Tournament	0.00393***	0.00387***	0.00082	0.00048	0.00003	0.00001
	[0.001]	[0.001]	[0.001]	[0.001]	[0.000]	[0.000]
Number of sons (c+1 generation)	-0.00033	-0.00029	0.00148*	0.00166*	-0.00012	-0.00012
	[0.001]	[0.001]	[0.001]	[0.001]	[0.000]	[0.000]
Succession Tournament	-0.03723***	-0.03672***	-0.01365	-0.01044	-0.00047	-0.00028
	[0.012]	[0.012]	[0.013]	[0.012]	[0.001]	[0.001]
Log total sales		0.00066		0.00358***		0.00004
		[0.001]		[0.001]		[0.000]
Leverage		0.00003		-0.00001		-0.00006
		[0.000]		[0.000]		[0.000]
Constant	0.00578	-0.00281	0.01310	-0.03333*	0.00097	0.00065
	[0.005]	[0.008]	[0.011]	[0.019]	[0.001]	[0.001]
Observations	1,299	1,299	1,299	1,299	1,299	1,299
R-squared	0.010	0.010	0.010	0.016	0.004	0.004

Table 3.8: Family Information, Media Control, and Corporate Fraud

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. All explanatory variables are standardized, so their point estimates represent the economic magnitude of their effects. The dependent variable is Log (1+number of fraud cases), which refers to the logarithm of one plus the total number of corporate fraud cases, including internal transaction, collusion, tax evasion, unfair trade, accounting, and disclosure fraud, in each sample year. Succession Tournament is an indicator that has a value of one for business group-years within the 5 years [-5, -1] prior to an upcoming succession, and is zero otherwise. Business groups that, in a given year, have a current chairman whose tenure is longer than that of 95% of the group of chairmen are considered to be in a succession tournament period. A succession in which chairmanship transfers within a single generation by agreement among brothers is not considered to cause a succession tournament. Hyundai group is considered to be in a succession tournament period after the Hyundai chairman's sudden death on Aug 4th, 2003. High Media control is an indicator that has a value of one if the sum of advertisement expense in a chaebol group is greater than that of the average of all chaebols, and is zero otherwise. Low media control is an indicator that has a value of one if the sum of advertisement expense in a chaebol group is lower than that of the average of all chaebols, and is zero otherwise. High media control by sons is an indicator that has a value of one if the total advertisement expenditure of firms controlled by sons in the c+1 generation in a chaebol is greater than the sample average, and is zero otherwise. Low media control by sons is an indicator that has a value of one if the total advertisement expenditure of firms controlled by sons in the c+1 generation in a chaebol is less than the sample average, and is zero otherwise. High media control by seniors is an indicator that has a value of one if the total advertisement expenditure by firms controlled by family members in the generation of or above the current chair of a chaebol is greater than the sample average, and is zero otherwise. Low media control by seniors is an indicator that has a value of one if the total advertisement expenditure by firms controlled by family members in the generation of or above the current chair of a chaebol is less than the sample average, and is zero otherwise. 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. All models include annual year dummy variables. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

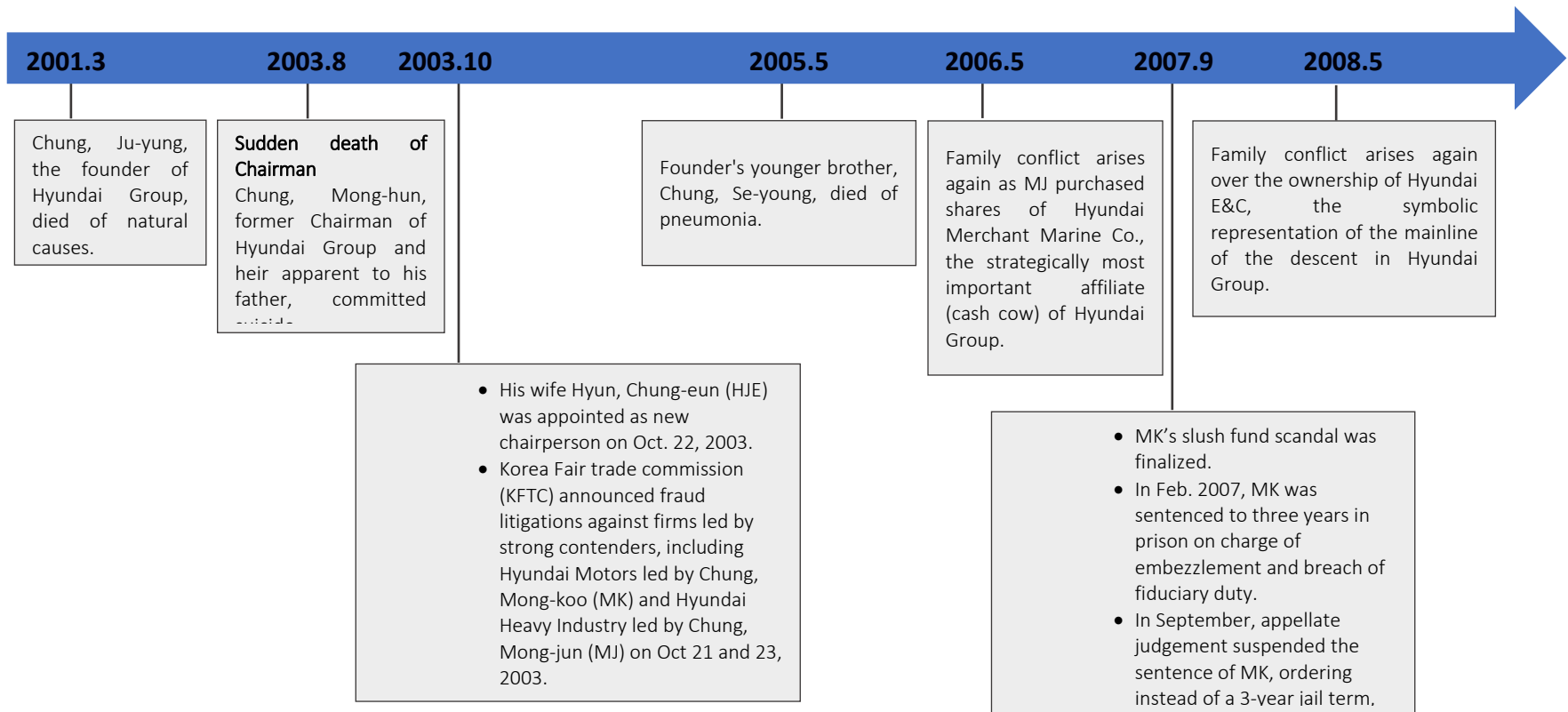| Variables	Dependent Variable: Log (1+ number of fraud)					
	(1)	(2)	(3)	(4)	(5)	(6)
Number of sons × Succession Tournament × High media control	0.01117	0.00926				
	[0.007]	[0.006]				
Number of sons × Succession Tournament × Low media control	0.01961**	0.01716*				
	[0.009]	[0.008]				
Number of sons × Succession Tournament × High media control by sons			0.01806**	0.01634*		
			[0.008]	[0.008]		
Number of sons × Succession Tournament × Low media control by sons			0.00879***	0.00827***		
			[0.002]	[0.002]		
Number of sons × Succession Tournament × High media control by seniors					0.00939	0.00715
					[0.006]	[0.005]
Number of sons × Succession Tournament × Low media control by seniors					0.01767**	0.01514**
					[0.008]	[0.007]
Number of sons (c+1 generation)	0.00352	0.00422	0.00352	0.00422	0.00352	0.00423
	[0.004]	[0.004]	[0.004]	[0.004]	[0.004]	[0.004]
Succession Tournament	-0.01969*	-0.01709*	-0.01732**	-0.01592**	-0.01714*	-0.01431*
	[0.010]	[0.009]	[0.007]	[0.007]	[0.009]	[0.008]
Log total sales		0.00952**		0.00950**		0.00958**
		[0.004]		[0.004]		[0.004]
Leverage		-0.00021		-0.00012		-0.00017
		[0.002]		[0.002]		[0.002]
Constant	0.02913***	0.02846***	0.02914***	0.02852***	0.02901***	0.02831***
	[0.009]	[0.009]	[0.009]	[0.009]	[0.009]	[0.009]
Observations	1,299	1,299	1,299	1,299	1,299	1,299
R-squared	0.011	0.018	0.012	0.019	0.011	0.018

Table 3.9: Natural Experiment: The Sudden Death of Group Chairman

Each column reports coefficients from an OLS regression with heteroscedasticity-robust standard errors. Standard errors are clustered at the business group level and reported in parentheses under the coefficient estimates. The dependent variable of our regression is the change in the number of fraud cases, which refers to the three-month difference of the natural logarithm of one plus the total number of corporate fraud filings before and after the Hyundai chairman's sudden death on Aug 4th, 2003. Columns (1) and (2) use Number of New Sons in Tournament (add c-generation) as an explanatory variable; this is the total number of sons in the current chair's generation for Hyundai Group and is zero for all other groups. In Column (3), Number of New Sons in Tournament (add c-generation) is interacted with the Strong Contender and Weak Contender dummies. Strong Contender is an indicator that has a value of one for firms controlled by sons in the current chair's generation in Hyundai Group, and is zero otherwise. Weak Contender is an indicator that has a value of one for firms controlled by sons in the current chair-1 generation, and is zero otherwise. Columns (4) and (5) use Number of New Sons in Tournament (swap c+1 with c generation) as an explanatory variable; this is the difference of the total number of sons in the current chair's generation and the current chair+1 generation for Hyundai Group, and is zero for all other groups. In Column (6), we interact Number of New Sons in Tournament (swap c+1 with c generation) with the Strong Contender and Weak Contender dummies. In Columns (7) and (8), Hyundai Event is an indicator that has a value of one for Hyundai Group firms and is zero otherwise. In Column (9), Hyundai Event is interacted with the Strong Contender and Weak Contender dummies. We control for Δ Log total sales and Δ Leverage, which refer to the difference of the 1-year average logarithm of a firm's total sales (in KRW millions) and leverage (in KRW millions) before and after the chairman's death in 2003. ***, **, and* denote significance at the 1%, 5%, and 10% level, respectively.

Variables	Dependent Variable: Δ Log (1+ number of fraud)								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Number of New Sons in Tournament (add c-generation)	0.00538***	0.00552***							
	[0.000]	[0.000]							
Number of New Sons in Tournament (add c) × Strong contender			0.00783***						
			[0.000]						
Number of New Sons in Tournament (add c) × Weak contender			-0.00018						
			[0.000]						
Number of New Sons In Tournament (swap c+1 with c generation)				0.00911***	0.00934***				
				[0.000]	[0.000]				
Number of New Sons in Tournament (swap c) × Strong contender						0.01325***			
						[0.000]			
Number of New Sons in Tournament (swap c) × Weak contender						-0.00031			
						[0.000]			
Hyundai Event							0.11846***	0.12142***	
							[0.006]	[0.006]	
Hyundai Event × Strong contender									0.17229***
									[0.006]
Hyundai Event × Weak contender									-0.00403
									[0.003]
Δ Log total sales		-0.01328	-0.01075		-0.01328	-0.01075		-0.01328	-0.01075
		[0.012]	[0.011]		[0.012]	[0.011]		[0.012]	[0.011]
Δ Leverage		-0.00002	-0.00002		-0.00002	-0.00002		-0.00002	-0.00002
		[0.000]	[0.000]		[0.000]	[0.000]		[0.000]	[0.000]
Constant	0.01195*	0.01400	0.01351	0.01195*	0.01400	0.01351	0.01195*	0.01400	0.01351
	[0.006]	[0.008]	[0.008]	[0.006]	[0.008]	[0.008]	[0.006]	[0.008]	[0.008]
Observations	267	267	267	267	267	267	267	267	267
R-squared	0.068	0.072	0.109	0.068	0.072	0.109	0.068	0.072	0.109

Figure 3.1: Timeline of Conflicts Among Family Members of Hyundai Group

This figure shows a chronological timeline of family conflicts or events indicative of such conflicts among family members of Hyundai Group from January 2001 to December 2014. This timeline of conflict corresponds to the dotted lines displayed in Figure 2.

| 2001.3 | 2003.8 | 2003.10 | 2005.5 | 2006.5 | 2007.9 | 2008.5 |

Chung, Ju-yung, the founder of Hyundai Group, died of natural causes.

Sudden death of Chairman
Chung, Mong-hun, former Chairman of Hyundai Group and heir apparent to his father, committed suicide.

Founder's younger brother, Chung, Se-young, died of pneumonia.

Family conflict arises again as MJ purchased shares of Hyundai Merchant Marine Co., the strategically most important affiliate (cash cow) of Hyundai Group.

Family conflict arises again over the ownership of Hyundai E&C, the symbolic representation of the mainline of the descent in Hyundai Group.

- His wife Hyun, Chung-eun (HJE) was appointed as new chairperson on Oct. 22, 2003.
- Korea Fair trade commission (KFTC) announced fraud litigations against firms led by strong contenders, including Hyundai Motors led by Chung, Mong-koo (MK) and Hyundai Heavy Industry led by Chung, Mong-jun (MJ) on Oct 21 and 23, 2003.

- MK's slush fund scandal was finalized.
- In Feb. 2007, MK was sentenced to three years in prison on charge of embezzlement and breach of fiduciary duty.
- In September, appellate judgement suspended the sentence of MK, ordering instead of a 3-year jail term.

132

Figure 3.2: Monthly Fraud Investigations of Hyundai Group

The figures show the chronicle of Hyundai group's monthly fraud investigations from January 2001 to December 2014. Panel A shows the total number of monthly fraud cases that are filed against all Hyundai affiliates, and Panels B and C show the number of monthly fraud cases that are filed against Hyundai affiliates controlled by strong and weak succession contenders, respectively. Strong contenders refer to sons in the current chair's generation in Hyundai Group, whereas weak contenders refer to sons in the current chair-1 generation. Dotted lines indicate times when conflicts among family members of Hyundai Group or events indicative of possible conflict, such as the chairman's death, took place. Monthly fraud investigations spike around the events of conflicts among family members of Hyundai Group. The detailed explanation of the timeline of conflicts is summarized in Figure 1.
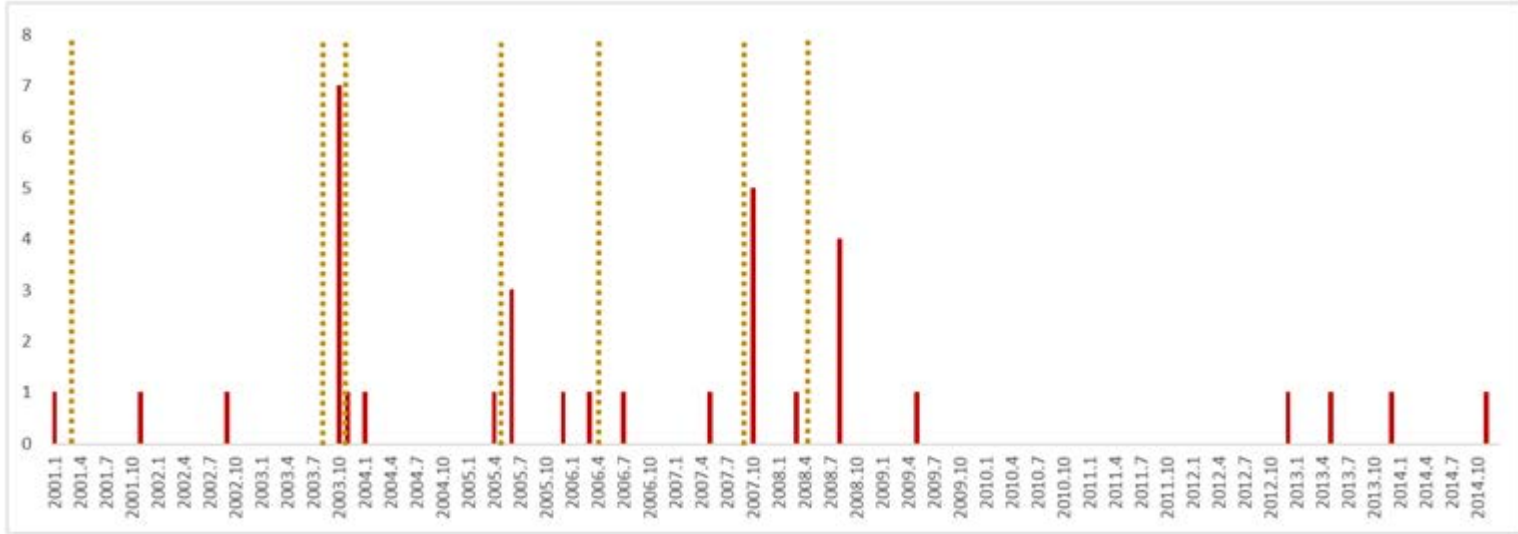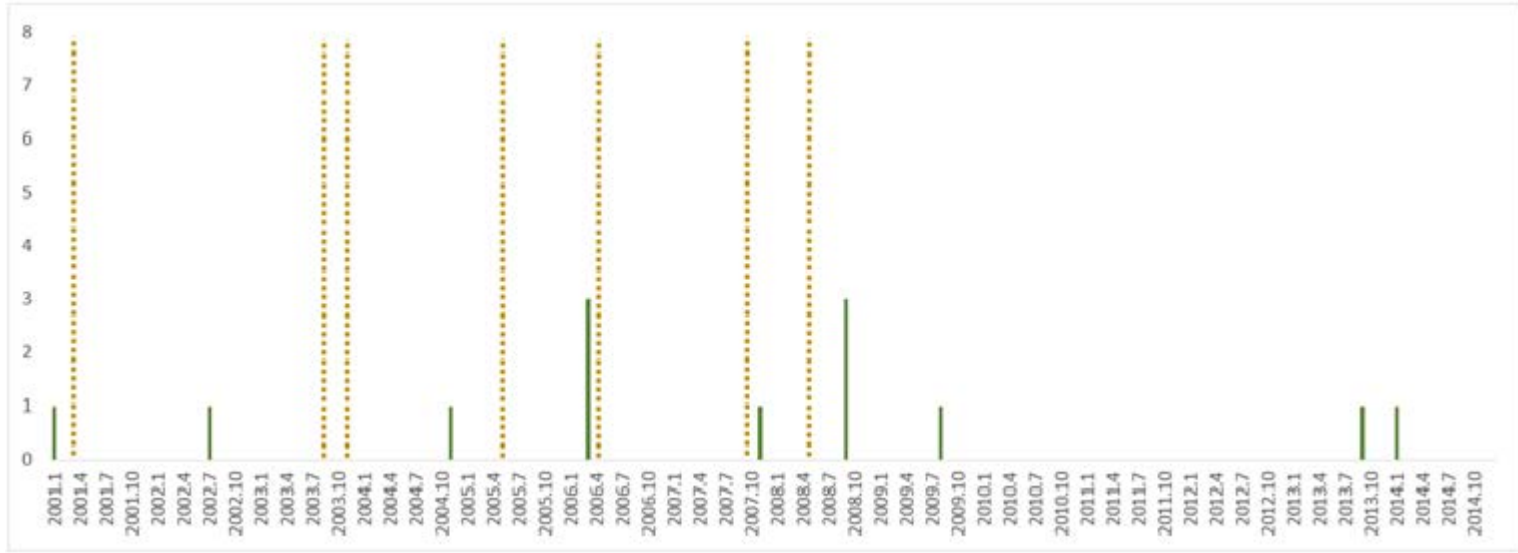
A. Total Fraud

133
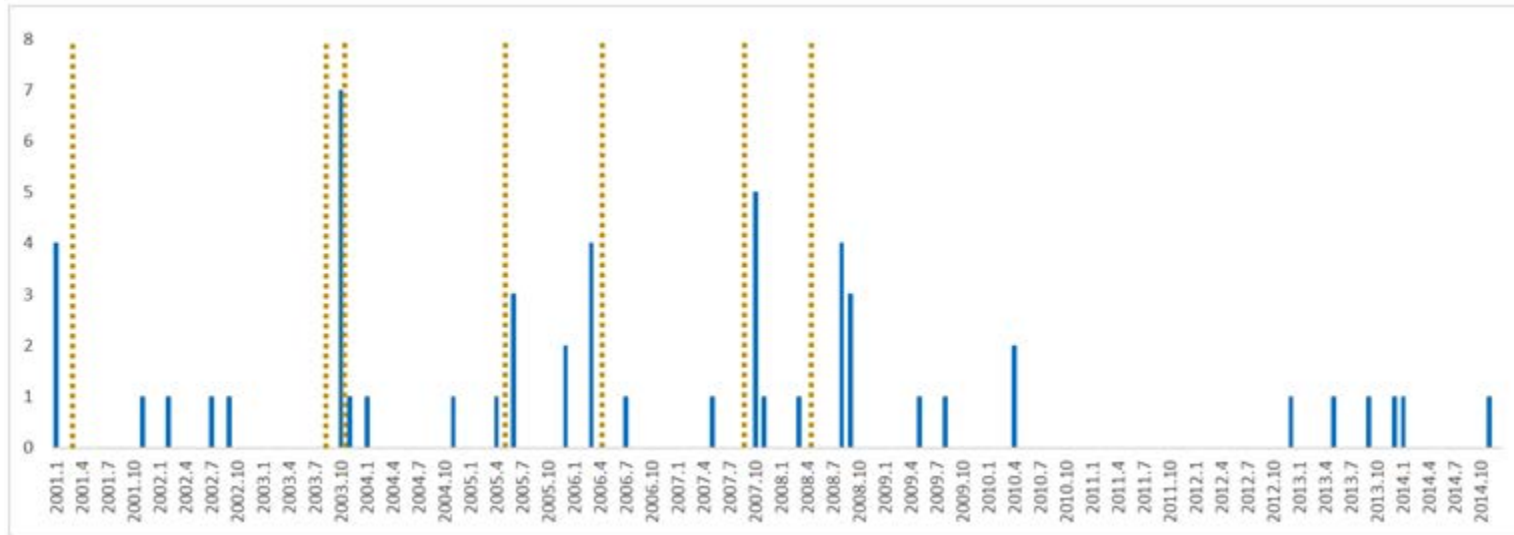
Figure 3.2 (cont'd)

B. Fraud Committed by Strong Contenders

C. Fraud Committed by Weak Contenders

Appendix B: Variable Definitions for Essay 1

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. (2012) 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. (2012) 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 C: Variable Definitions for Essay 2

Family Characteristics variables

Family Firm	An indicator that has a value of one if a firm belongs to a business group whose controlling shareholders are the founding family, and zero otherwise.
Family Firm with Succession	An indicator that has a value of one if a firm's controlling family experiences a generation-to-generation succession during the sample years, and zero otherwise. A succession within a single generation, by agreement or arising from the sudden death of the chairman, is not considered, since we do not expect any sibling competition during the pre-succession period in those cases.
Family Firm Without Succession	An indicator that has a value of one if the controlling family does not experience a generation-to-generation succession during the sample years, and zero otherwise.
Non-family Firm	An indicator that has a value of one if a firm belongs to a business group whose controlling shareholders are not families but rather corporate entities.
Family Size	Family size is the total number of family members, including the current chairman, the chair's spouse, their direct and indirect (married in) descendants, and the parents or grandparents of the current chairman, up to the founder's generation.
Number of Generations	The number of generations in the family. The founder's generation is the first, and then each successive generation is counted, up to the most recent generation that is included in family size.
Current Chair's Generation	The generation that the current chairman of each business group belongs to.
Current Chair's Tenure	The number of years that the current chairman of each business group has been officially appointed as the group's chairman, as of the corresponding year.
Number of Male Family Members	The total number of direct and indirect (married in) male family members who are included in family size.
Number of Female Family Members	The total number of direct and indirect (married in) female family members who are included in family size.

Number of Sons [Daughters, Sons-in-law, Daughters-in-law] (c+1 generation)	The total number of sons [daughters, sons-in-law, and daughters-in-law] of the current chair.
Founder Dead	An indicator variable that equals one if the founder is dead as of the corresponding year, and zero otherwise.

Family Feud – Sibling Competition

Pre-succession	An indicator that has a value of one if the period is from the beginning of the sample years to the year before the succession year, and zero otherwise.
Post-succession	An indicator that has a value of one if the period is from the succession year to the end of sample years, and zero otherwise.
Number of Sons [Daughters, Sons-in-law] ≥ 2	An indicator that has a value of one if the total number of sons [daughters, sons-in-law] of the current chair is greater than or equal to two, and zero otherwise.
Number of Sons ≥ 3 [$= 2$, $= 1$]	An indicator that has a value of one if the total number of sons of the current chair is greater than or equal to two [equal to two, equal to one], and zero otherwise.
Low Age Gap	An indicator that is equal to one if the difference between the current chair's eldest son's age and youngest son's age is smaller than the average of all the age differences, and is zero otherwise.
High age gap	An indicator that is equal to one if the difference between the current chair's eldest son's age and youngest son's age is greater than the average of all the age differences, and is zero otherwise.
Half-brother	An indicator variable that equals one if the founder of a business group has children by different mothers, and is zero otherwise.
No Half-brother	An indicator variable that equals one if the founder of a business group does not have children by different mothers, and is zero otherwise.
Feud News	An indicator that has a value of one if there is a news release about family disputes over a group's ownership or management positions during the sample years, and is zero otherwise.
No Feud News	An indicator that has a value of one if there is a release about family disputes over a group's ownership or management

	positions in during the sample years, and is zero otherwise.
Foreign Bachelor's	An indicator that has a value of one if a son has a bachelor's degree from a foreign university, and is zero otherwise.
No Foreign Bachelor's	An indicator that has a value of one if all sons have their bachelor's degree from domestic universities, and zero otherwise.
First Son Chair	An indicator variable that equals one if the current chairman is the first son, and is zero otherwise.
No First Son Chair	An indicator variable that equals one if the current chairman is not the first son, and is zero otherwise.
Daughters' Marriage	An indicator that equals one if the current chair has a married daughter, and is zero otherwise.
No Daughters' Marriage	An indicator that equals one if the current chair has no married daughters, and is zero otherwise.
Sons-in-law in Management	An indicator that has a value of one if a family has a son-in-law who participates in the group's management or ownership, and is zero otherwise.
Sons-in-law Not in Management	An indicator that has a value of one if a family has no sons-in-law who participate in the group's management or ownership, and is zero otherwise.
Before Law	An indicator that has a value of one if a business group had a succession event before 1991, and is zero otherwise.
After Law	An indicator that has a value of one if a business group had a succession event after 1991, and is zero otherwise.
Before Asian Crisis	An indicator that has a value of one if a business group had a succession event before 1997, and is zero otherwise.
After Asian Crisis	An indicator that has a value of one if a business group had a succession event after 1997, and is zero otherwise.
Hyundai Event	An indicator that has a value of one for Hyundai Group firms, and is zero otherwise.
Strong Contender	An indicator that has a value of one for firms in the Hyundai Group that are controlled by sons in the current chair's generation, and is zero otherwise.
Weak Contender	An indicator that has a value of one for firms in the Hyundai Group that are controlled by male relatives in the current chair-1 generation, and is zero otherwise.

Financial Variables

Cash Flow Volatility   The standard deviation of cash flows from investment activities from the t-2 to t+2 periods.

Total M&A Ratio   The ratio of the total amount of non-intra-group M&A transactions divided by total assets. We do not consider any intra-group M&A's, which occur between two affiliates in the same business group, to avoid group restructuring effects.

Number of Mergers   Total frequency of non-intra-group M&A transactions in a given year.

ROA   The ratio of earnings before interest and tax (EBIT) divided by total assets

Log of Total Assets   The logarithm of the total assets of each firm in millions of KRW.

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

Leverage   The debt ratio calculated by total debt divided by total equity.

Number of Affiliates   The total number of affiliates of a business group to which a firm belongs.

Firm Age   The age of each firm in a business group in the corresponding year.

Listed   An indicator variable that equals one if a firm is listed on the KOSPI or KOSDAQ exchange, and is zero otherwise.

Appendix D: Variable Definitions for Essay 3

Fraud related variables

Log (1+number of fraud)	The logarithm of one plus the total number of corporate fraud cases that are related to internal transaction, collusion, unfair trade, tax evasion, accounting, and disclosure fraud in each sample year. Corporate fraud is categorized by three types of ex-post measures – correction order, fine imposition, and prosecution, in order from lowest to highest severity.
Correction order	The logarithm of one plus the total number of corporate fraud cases in which a correction order is imposed.
Fine imposition	The logarithm of one plus the total number of corporate fraud cases in which a surcharge is imposed.
Prosecution	The logarithm of one plus the total number of corporate fraud cases that are examined by prosecution.
Succession Tournament	An indicator that has a value of one for business group-years within the 5 years [-5, -1] prior to an upcoming succession, and is zero otherwise. Business groups that, in a given year, have a current chairman whose tenure is longer than that of 95% of the group of chairmen are considered to be in a succession tournament period. A succession in which chairmanship transfers within a single generation by agreement among brothers is not considered to cause a succession tournament.
Non-succession Tournament	All business group-years that are not included in Succession Tournament.
Family feud	An indicator that has a value of one if a group has a news release about family disputes over ownership or management positions in 2000-2004, and is zero otherwise.
No family feud	An indicator that has a value of one if a group has no news releases about family disputes over ownership or management positions in 2000-2004, and is zero otherwise.
Half brother	An indicator that has a value of one if the founder of a business group has sons by different mothers, and is zero otherwise. The sons must be included in the family tree; hidden sons are not included.
No half brother	An indicator that has a value of one if the founder of a business group does not have sons by different mothers, and is zero otherwise.
First son chair	An indicator that has a value of one if the current chairman of

a business group is the first son in the family, and is zero otherwise.

No first son chair | An indicator that has a value of one if the current chairman of a business group is not the first son in the family, and is zero otherwise.

High media control | An indicator that has value one if sum of advertisement expense in a chaebol group is greater than that of average chaebols, zero otherwise.

Low media control | An indicator that has value one if sum of advertisement expense in a chaebol group is lower than that of average chaebols, zero otherwise.

High media control by sons | An indicator that has value one if sum of advertisement expense spent by firms controlled by sons in $c+1$ generation in a chaebol group is greater than average, zero otherwise. We include firms where sons' ownership dominates other family members'.

Low media control by sons | An indicator that has value one if sum of advertisement expense spent by firms controlled by sons in $c+1$ generation in a chaebol group is less than average, zero otherwise.

High media control by seniors | An indicator that has value one if sum of advertisement expense spent by firms controlled by family members in current chair or upper generation in a chaebol group is greater than average, zero otherwise.

Low media control by seniors | An indicator that has value one if sum of advertisement expense spent by firms controlled by family members in current chair or upper generation in a chaebol group is less than average, zero otherwise

Family characteristics variables

Family size | The total number of direct and indirect descendants of the parents of the founder of each business group and the founder's parents themselves. Family size includes the founder's siblings, the descendants of the founder's siblings, and their spouses. Family members who are younger than 15 years in a given year are excluded.

Number of generation | The number of generations in the family. The founder's generation is the first, and then each successive generation is counted, up to the most recent generation that is included in family size. The generation of founder's parents (generation 0) is excluded.

Current chair generation	The generation that the current chairman of each business group belongs to.
Current chair tenure	The years that the current chairman of each business group has been officially appointed as the group's chairman in corresponding year.
Number of male family members	The total number of direct and indirect (married in) male family members who are included in family size.
Number of female family members	The total number of direct and indirect (married in) female family members who are included in family size.
Number of sons [daughters, sons-in-law, and daughters-in-law] (c+1 generation)	The total number of sons [daughters, sons-in-law, and daughters-in-law] of the current chair and chair's siblings.
Number of sons (c generation)	Total number of the current chair and the chair's brothers.
Sons below age 15	Sons of the current chair and the chair's siblings whose age is below 15. Those sons are excluded from sample since in Korea they are not legally eligible to work.
Number of New Sons in Tournament (add c-generation)	The total number of sons added in tournament after the Hyundai chairman's sudden death on Aug 4th, 2003. Hyundai Group equals to the total number of sons in the current chair's generation and zero for all other groups.
Number of New Sons in Tournament (swap c+1 with c-generation)	The total number of sons swapped from c+1 to c generation in tournament after the Hyundai chairman's sudden death on Aug 4th, 2003. Hyundai Group equals to the difference of the total number of sons in the current chair generation and the current chair+1 generation and zero for all other groups.
Hyundai Event	An indicator that has a value of one for Hyundai Group firms, zero otherwise.
Founder dead	An indicator variable that equals one if the founder is dead in a given year, and zero otherwise.

Firm and group characteristics variables

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.
Log of advertisement expense	The logarithm of total advertisement expense of each firm in millions of KRW.
Leverage	The debt ratio calculated by total debt divided by total equity.

Δ Log total sales	The difference of the one-year average logarithm of a firm's total sales (in KRW millions) before and after the chairman's death in 2003.
Δ leverage	The difference of the one-year average logarithm of a firm's leverage (in KRW millions) before and after the chairman's death in 2003.
ROA	The ratio of earnings before interest and tax (EBIT) divided by total assets
Group age	Age of a business group in the corresponding year.
Firm age	Age of each firm in a business group in the corresponding year.
Public firm	An indicator variable that equals one if a firm is listed on the KOSPI or KOSDAQ exchange, and is zero otherwise.
Strong Contender	An indicator that has a value of one for firms controlled by sons in the current chair's generation in Hyundai Group, and is zero otherwise.
Weak Contender	An indicator that has a value of one for firms controlled by sons in the current chair-1 generation in Hyundai Group, and is zero otherwise.

Appendix E: Background of the Hyundai Group Succession Tournaments

In 1998, when the founder and honorary chairman of Hyundai Group, Chung Ju-young, retired from day-to-day management, his fifth son, Mong-hun, along with his second son, Mong-koo, took over as co-chairmen. At that time, Mong-hun was gaining in-group influence, as he led major affiliates of Hyundai; people in the know said that he was the heir apparent. When Chung Ju-young ultimately decided to appoint Mong-hun as the sole President of Hyundai Manager's Consulting Committee (i.e., as Hyundai Group's head) in 2000, Mong-koo expressed disagreement with his father's decision by replacing executives who were sympathetic to Mong-hun with his own allies in the firms under his control. For example, several key senior executives from Hyundai Securities – a core financial affiliate of the Hyundai Group – were replaced with Mong-koo's allies. Mong-koo also talked another brother, Mong-jun (the sixth son), into suing Mong-hun's two firms for incurring financial losses for Hyundai Heavy Industries, Mong-jun's key firm. The founder, Chung Ju-young, who sided with Mong-hun, stepped in and quelled the revolt. This aborted attempted rebellion – which is termed the "War of Princes" – eventually led Mong-koo to step down from his co-chairmanship and made Mong-hun the sole chair of the Hyundai Group. The fraternal dispute over managerial rights ended following this event, and, as a compromise to bring peace within Hyundai, Mong-koo was granted control of Hyundai Motor Group, whereas Mong-jun became mainly responsible for Hyundai Heavy Industries. All these firms kept the Hyundai brand and remained under the Hyundai Group umbrella, continuing to follow the practice of coordinated business plans, which is how chaebols compete against their rivals ("MK's Coup D'état: It was Doomed to be a Failure," The Donga Weekly Volume 228, April 6, 2000).

In August of 2003, Mong-hun, the founder-favored new chairman of Hyundai, committed suicide. Prior to Mong-hun's death, the Hyundai Group had been under investigation for illegal fund transfers to North Korea, made during the previous presidential administration. Hyundai was, at the time of the transfers, supporting President Kim Dae-jung's sunshine policy towards North Korea, and so had direct business transactions with North Korea, with the president's informal support. However, when a new administration took office, these informal fund transfers were investigated; the investigation was a political maneuver intended to tame Hyundai Group. This eventually led Mong-hun, the group chairman, to commit suicide (James Brooke, "Indicted Hyundai Executive Plunges to Death in Seoul," The New York Times, August 4, 2003).

After Mong-hun's sudden death, infighting within Hyundai's controlling family began again. Mong-hun's brothers Mong-koo and Mong-jun, as well as Mong-hun's widow, Hyun Jung-eun, competed for the official title of Hyundai chairman. The older generation of the Hyundai family (i.e., Mong-hun's uncles) lacked the mandate within the family to become the next group chairman. Instead, they were

indirectly involved in this succession tournament by siding with and sponsoring one of the potential candidates. Their support came mostly through public endorsement and/or the promise of proxy votes in favor of their preferred candidate ("The Scrupulous Regent of the Hyundai Family," The Hankyung, September 4, 2006). For example, KCC Corp., led by Chung Sang-young (Mong-hun's uncle), acquired a stake in Hyundai Elevator Co. Ltd, a company formerly run by Mong-hun, in order to keep the firm from going to Hyun Jung-eun following Mong-hun's death. Sang-young thus indirectly supported Mong-hun's brothers as the formal successors to the Hyundai Group's chair, rather than Mong-hun's wife (Deuk-jin Cho, "Hyundai Must Be Inherited by the Chung Family," Kyunghyang Weekly, April 8, 2008). The internal power struggle ended in 2011, when Mong-koo acquired, with the family's approval, control over the group's symbolic company – Hyundai Engineering & Construction, the company with which the founder of Hyundai Group, Chung Ju-young, started his corporate empire in January of 1950 (Won-suk Choi and Noo-ri Ha, "Chung Family in Bid to Buy Hyundai Engineering," The Chosun Ilbo, July 1, 2010; Joong-sik Cho and Kyoung-yup Ho, "The Prince Returns to the Palace As a King After 11 Years," The Chosun Ilbo, April 2, 2011).

Using differences in firm-level volatility before and after the sudden death of Hyundai Group's chairman on August 4th, 2003, we identify a causal link between increased competition among succession contestants and corporate risk-taking. The background described above supports the notion that, upon the chairman's sudden death, succession tournaments exogenously reopened, primarily to the c-generation male relatives (i.e., Mong-hun's brothers), rather than Mong-hun's uncles, who are in his father's generation. The article in the Choson Ilbo (Won-suk Choi and Noo-ri Ha, "Chung Family in Bid to Buy Hyundai Engineering," July 1, 2010) clearly shows the regent role played by Mong-hun's uncles during this exogenously reopened Hyundai succession tournament.

Appendix F: High Quality Sons-in-law

In our sample, we find that, on average, chaebol sons-in-law have better educational histories than chaebol sons. When we compare their bachelor's degrees, we find that 64.3% of the sons-in-law in our sample graduated from one of the top six universities in Korea, whereas only 45.3% of the sons graduated from those top domestic institutions. We also find that chaebol sons (39.1%) tend to study abroad for their college educations, while only 21.4% of sons-in-law received bachelor degrees from overseas institutions. Sons-in-law also tend to have more advanced and professional degrees, such as master's degrees (14.3%), MBAs (50.0%), Ph.D.s (21.4%), JDs (7.1%), and MDs (21.4%) than sons (master's degrees (7.8%), MBAs (40.6%), Ph.D.s (1.6%), JDs (1.6%), and MDs (0%)). Based on the Financial Times Global MBA Rankings, 35.7% of the sons-in-law received their MBA degrees from one of the top 10 MBA programs, while 21.9% of the sons did so.

Below we provide anecdotal evidence of high quality sons-in-law who manage affiliates for their chaebols by marriage; this evidence is easy to come by, as high quality sons-in-law are, anecdotally, common in chaebol families. Here we discuss two specific cases for chaebols in our sample (SK and Hyundai), as well as two other cases for chaebols not included in our sample (Aekyung and Crown-Haitai Confectionary).

1. *SK Group – Jang-suk Park*

Jang-suk Park, the second son-in-law of SK Group's founder, Chey Jong-gun, is currently participating in the group's management. Park joined SK Group in 1979 and was appointed as the CEO of SKC in 2004; SKC is the SK group affiliate that drives its chemicals and film specialist business. Once Park became the CEO, he pushed forward the company's restructuring by liquidating its outdated VCR tape business and re-anchoring the group's core business to new and growing sectors, such as industrial optical films. Park's innovative drive and forward-looking approach led to tangible positive outcomes; SKC came to occupy 27% of the global solar cell polyester film market and developed solar cell EVA and fluoride film. In 2009, SKC became the only company that is capable of producing all three types of solar cell films. In 2011, thanks to Park's support of technical innovation, SKC had its highest sales record ever, breaking the KRW 1 trillion mark.

2. *Hyundai Group – Ted Chung*

In May 2015, Tae-young Chung (or Ted Chung), the second son-in-law of the Hyundai Motors Group chairman, was promoted, becoming the vice chairman of the group's financial units. This promotion signifies a probable change in his status and role in the group's future succession scheme,

especially for its financial affiliates, which include Hyundai Capital, Hyundai Card, Hyundai Commercial, HMC Investment Securities, and Hyundai Life. Chung is known as an "icon of innovation" in the financial world, and has gained a reputation as a celebrity CEO. Under his leadership, Hyundai Card's market share grew from 2% to 12%. However, Chung's greatest strength is the culture-based marketing and dedication to corporate culture innovation. Ted Chung graduated from Seoul National University with a bachelor's degree in French, and he also received an MBA from the Massachusetts Institute of Technology.

3.   *Aekyung Group – Yong-chan Ahn*

Yong-chan Ahn is the vice chairman of Aekyung Group's consumer products and airline division. Ahn is considered a professional CEO of Aekyung, rather than merely a son-in-law of the Aekyung Group. Ahn joined Aekyung's marketing department in 1987, after obtaining his MBA from the Wharton School of the University of Pennsylvania. He served as chairman of the Wharton alumni association until 2010. Since his appointment as CEO of Aekyung, Ahn has gained a reputation for his aggressive management by promoting the restructuring of businesses. He dropped some consumer brands that had not been reaching their full sales potential, and increased sales by 10%, on average, for the following 10 years. The company's debt ratio, which was 870% in 1995, dropped to 190% over the same period. Ahn, after he was promoted to the group's vice chairmanship in 2006, brought one of the group's affiliates, Cheju Airline, into the black; it had a 3.4 million operating profit for the first time in the company's history.

4.   *Crown-Haitai Confectionary – Jung-hoon Shin*

Jung-hoon Shin, Crown-Haitai Confectionary Chairman Young dal Yun's son-in-law, was selected as the CEO of Haitai Confectionery and Foods Co. Ltd after he played a leading role in Crown's (No. 4 in the industry ranking) acquisition of Haitai Confectionery and Food (No. 2) in 2005. He gained recognition for his managerial talent when he helped the company overcome the 2008 Chinese milk scandal from the firm's OEM factories in China. Following that episode, Shin turned his eye to overseas markets to look for new business opportunities. As part of these efforts, in 2014, he took over Palazzo del Freddo, the world's oldest gelato company, based in Rome and founded in 1880; this company became world famous after Audrey Hepburn took a bite of its gelato in the movie "Roman Holiday." Shin is planning to open 200 overseas stores in the Europe and Asia. Before joining Crown-Haitai Confectionery and Foods, Shin served as a Director of Bain & Company, one of the most well-known global

management consulting firms. He graduated from Seoul National University with a bachelor's degree in business administration, and earned his MBA from the University of Michigan.

Appendix G: Model of Competition among Heirs

To illustrate one of the possible underlying economic mechanisms of **H1**, let's consider the following stylized version of Hvide's (2002) two-son tournament game; the results can easily be generalized to hold for an arbitrary number of sons by pairing them. We consider a father and his two sons, 1 and 2, all of whom are risk-neutral. If a son $i=1,2$ chooses the effort level of μ_i, a stochastic outcome, Y_i, is achieved with an i.i.d. standard normal performance shock of ϵ_i, i.e., $Y_i = \mu_i + \epsilon_i$ where $E[\epsilon_i] = 0, E[\epsilon_i^2] = \sigma_i^2$. Hence, ϵ_i is an unpriced risk, while the priced risk is normalized to be zero. Effort is costly, with a quadratic cost function of $\frac{c}{2}\mu^2$ where c>0. Without loss of generality, we assume that son 1 is favored by the father over son 2. The father's relative favoritism to son 1 over son 2 is captured by $k (\geq 1)$, where the father interprets k-times more favorably son 1's end of period performance than that of son 2. Therefore, $k \cdot Y_1$ and Y_2 are the performance metrics available for son 1 and son 2, respectively. The son with the greater end of period performance metric wins the tournament. The winner of the tournament receives the group control benefit, W, while the loser receives nothing. W is the "marginal" payoff to the tournament winner, which is assumed to be substantial. With no tournament reward (W=0), we assume that sons behave as if they were profit maximizers.

Son 1 maximizes $U_1 = W \cdot P - \frac{c}{2}\mu_1^2$ over μ_1 and σ_1, and son 2 maximizes $U_2 = W \cdot (1 - P) - \frac{c}{2}\mu_2^2$ over μ_2 and σ_2, where $P = \Pr(k \cdot Y_1 > Y_2) = \Phi\left(\frac{k \cdot \mu_1 - \mu_2}{\sqrt{(k^2 \cdot \sigma_1^2 + \sigma_2^2)}}\right)$ and Φ is the c.d.f of a standard normal distribution. From the first order condition (FOC), $\mu_1 = \frac{k}{c\sqrt{(k^2 \cdot \sigma_1^2 + \sigma_2^2)}} \cdot W \cdot \phi\left(\frac{k \cdot \mu_1 - \mu_2}{\sqrt{(k^2 \cdot \sigma_1^2 + \sigma_2^2)}}\right)$ and $\mu_2 = \frac{1}{c\sqrt{(k^2 \cdot \sigma_1^2 + \sigma_2^2)}} \cdot W \cdot \phi\left(\frac{k \cdot \mu_1 - \mu_2}{\sqrt{(k^2 \cdot \sigma_1^2 + \sigma_2^2)}}\right)$, where ϕ is the p.d.f. of a standard normal distribution. The FOC implies $\mu_1 = k\mu_2$.

Proposition 1: When risk-taking is unlimited (i.e., $\sigma_i \in [0, \infty]$ for $\forall i = 1,2$), for a finite $k \geq 1$, excessive risk-taking ($\sigma_1 = \sigma_2 = \infty$) with no effort ($\mu_1 = \mu_2 = 0$) is a unique Nash equilibrium.

Proof. In a symmetric tournament ($k = 1$), see the proof in Hvide (2002). For an asymmetric tournament with a finite $k > 1$, son 1, the leader, tries to exert more effort (μ_1) and minimize the risk (σ_1) to ensure his current leading status in the succession game. However, the best response of the laggard son 2 is to increase his risk to infinite with no effort, thereby nullifying any disadvantage in his initial wealth. Given this best response of son 2, which effectively equalizes the winning probability of each son to ½ irrespective of son 1's effort, son 1's best response is also zero effort ($\mu_1 = 0$) with infinite risk-taking ($\sigma_1 = \sigma_2 = \infty$). It should be noted that zero effort with finite risk-taking by son 1 doesn't lead to a Nash

equilibrium, as it induces an incentive for son 2 to increase his effort from zero while reducing his risk to further improve his winning probability from ½. ■

Proposition 1 stylizes the underlying intuition of **H1**, the lazy, excessively risky equilibrium in the succession tournament. When effort is costly and when the tournament outcome is eventually random due to the opponent's noisy signaling strategy, both sons do not work hard but rather increase the noise in their performance signals to win the tournament by luck. From the FOC, this intuition becomes clear as $\frac{\partial \mu_i}{\partial \sigma_j} < 0$ for $\forall\, i, j \in \{1,2\}$. In terms of performance efficiency, this equilibrium is inferior to the one with the first best level effort of each son, i.e., $\mu_1 = \mu_2 = \frac{1}{c} > 0$, where the sons maximize their net outputs without tournament concerns.

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