ORIGINAL ARTICLE

Avoiding inheritance taxes in family firms

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Abstract

This article documents a novel way to transfer control in family firms while avoiding inheritance taxes: intragroup mergers. I provide evidence that avoiding inheritance taxes is the motivation behind intragroup mergers in Korea. In 1999, Korea initiated a tax reform that bumped up personal inheritance taxes by 25 percentage points. In the posttax-reform period, I find that family firms increase stock-for-stock intragroup mergers involving targets owned by heirs. Specifically, firms with heavy inheritance taxes acquire affiliates owned by heirs, who then convert private target shares into acquirer shares while avoiding inheritance taxes.

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 how, in practice, family firms indirectly transfer control to heirs through intragroup mergers.[2] When controlling families transfer their control through direct ownership inheritance, heirs must pay an inheritance tax. This is generally what we expect when talking about transferring control in family firms. However, because of the heavy inheritance taxes, heirs are exposed to ownership dilution risk. Thus, controlling families are incentivized to minimize inheritance taxes to ensure that the heirs maintain sufficient control over the entire business group. A common strategy to avoid heavy inheritance taxes is for family firms to acquire smaller affiliates owned by heirs. Then, the heirs convert the target shares into acquirer shares. Through this stock-for-stock intragroup merger,[3] heirs obtain large controlling stakes in a key strategic firm owned by the controlling family while avoiding the 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), https://www.wsj.com/articles/samsung-heir-lee-jae-yong-convicted-of-bribery-1503642785.

[2] The intragroup merger between two Samsung group affiliates is detailed in Appendix B.

[3] Because heirs' shares are converted into acquirers' shares, any intragroup merger that uses cash as payment should be irrelevant.

Family firms comprise more than 80% of firms worldwide,[4] and succession largely determines their fate. Only 30% of family firms last into a second generation, 12% into a third, and 3% into a fourth generation or beyond.[5] Given the importance of succession in family firms, it has attracted significant attention in the recent literature.[6] However, there is scant evidence documenting the effect of personal inheritance tax on family succession and its implications for control-transfer processes in family firms. I fill this gap by studying one way to transfer control: intragroup mergers.

Using a natural experiment, I provide causal evidence that avoiding inheritance taxes is the motivation behind intragroup mergers. This natural experiment exploits Korea's major tax reform initiative undertaken in 1999, which suddenly increased the maximum personal inheritance tax rate by 25 percentage points. Exploiting this unexpected increase in inheritance taxes and using a difference-in-differences (DiD) estimation, I examine how firms respond to the tax change when transferring control shares. Specifically, I compare how firms with high and low expected tax burdens before the 1999 tax reform use intragroup mergers to transfer control shares after the tax reform. My findings shed light on (a) the inheritance tax-saving benefits of controlling families, (b) the transaction costs of intragroup mergers, and (c) the way the overall ownership structure of family firms is rebalanced.

The final data comprise 2,422 firm-year observations from the 24 largest Korean chaebols[7] from 1997 to 2004 (sample years). I use Korean chaebol data because Korean chaebols have reported highly detailed interfirm ownership information among their affiliates to the Korean Fair Trade Commission (KFTC) since the mid-1990s. Public access to this type of information is limited in most countries but is available in Korea.[8] Given that family ownership is prevalent around the world, my results have important implications for many countries in addition to Korea.[9]

I first document that the number of stock-for-stock intragroup mergers increases with personal tax burdens. Next, using the 1999 tax reform, I estimate the causal effect of the expected inheritance taxes on intragroup mergers. The results show that the difference in intragroup mergers between firms with high and low personal inheritance taxes is 2.3 times more likely to increase after the tax shock. I also find that among firms with high tax burdens, stock-for-stock intragroup mergers are concentrated in (a) central firms,[10] (b) firms located in the upper layer of the pyramid,[11] and (c) firms within a circular ownership chain, that is, firms where heirs can consolidate their indirect control over the entire business group. This result highlights that the ownership network of group affiliates determines which firms with heavy inheritance taxes initiate intragroup mergers. However, this result does not hold for non-intragroup mergers.

[4]Chase Peterson-Withorn, "New Report Reveals the 500 Largest Family-Owned Companies in the World," *Forbes* (April 20, 2015), https://www.forbes.com/sites/chasewithorn/2015/04/20/new-report-reveals-the-500-largest-family-owned-companies-in-the-world/#6eccd1423602.

[5]Family Business Alliance, http://www.fbagr.org/index.php?option=com_content&view=article&id=117&Itemid=75 (accessed June 2014).

[6]Pérez-González (2006) and Bennedsen, Nielsen, Pérez-González, and Wolfenzon (2007) document that family chief executive officers (CEOs) perform worse than nonfamily CEOs. Mehrotra, Morck, Shim, and Wiwattanakantang (2013) also show that firms run by nonbiological heirs outperform firms run by either biological heirs or professional managers. 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.

[7]Family-owned large business conglomerates in Korea are generally called "chaebols."

[8]KFTC requires only select Korean chaebols to divulge their ownership status information. Because of limited access to ownership data, the sample does not include smaller business groups.

[9]The literature shows that controlling families siphon resources out of member firms for their private benefit (Johnson, La Porta, Lopez-de-Silanes, & Shleifer, 2000). Similar tax-saving tactics likely benefit controlling families in other institutional contexts. For example, Asian casino king Stanley Ho implemented similar intragroup transactions to avoid inheritance taxes.

[10]These companies are connected to many other member firms in the ownership network. Therefore, the controlling family can indirectly control affiliated firms through strategic firms in a pyramidal business group. Following Almeida, Park, Subrahmanyam, and Wolfenzon (2012), the centrality of firm i is measured as the average percentage difference in the control rights of the controlling family across all group member firms except the firm itself after excluding a specific firm i from the group. In this article, I refer to firms with a high centrality value as "central firms."

[11]The upper layer of the pyramid is an indicator that equals 1 if a firm's position is smaller than the average of all chaebol firms, and 0 otherwise. Position refers to the distance between the controlling family and a firm in the group. A value of 1 indicates that the firm is directly controlled by the founding family. In a simple pyramid structure with two firms, firm i in the upper layer (Chain 1) has a position value of 1, and firm j in the lower layer (Chain 2) has a position value of 2. In this case, the position of firm i can be measured by the weighted average of Chains 1 and 2, whose importance is weighted by the cash flow the family receives. Cash flow comprises direct cash flow from firm i and indirect cash flow from firm j through Chain 2. Group firms that are directly owned by the controlling family have a low position value, whereas those that are indirectly owned have a high position value. See Almeida et al. (2012) for additional details about ownership metrics.

Next, I test whether a reduction in personal taxes decreases intragroup merger activities. I find that intragroup mergers are rarely pursued by firms that have heavy inheritance taxes and are indirectly owned by private foundations exempt from gift taxes. A difference-in-difference-in-differences (DiDiD) estimation of Korea's 1999 tax reform confirms that unusual surges in stock-for-stock intragroup mergers occur primarily because firms aim to avoid inheritance taxes through intragroup mergers.[12] I find that this sudden increase in intragroup mergers after the tax reform is not prompted by the Asian financial crisis. In other words, it is not due to the sudden drop in Korea's capital market value during the precrisis era or postcrisis restructuring.

Furthermore, I investigate ownership reallocation by identifying target firm characteristics in relation to intragroup mergers. I find that heirs of chaebol families receive large dividends from their private firms in which they have large ownership stakes. These firms become the targets of intragroup mergers. Heirs can take these dividends because they have substantial voting rights, which they use to determine corporate policies in target merger firms. Because heirs own only their target firms that are merged with central firms, they prefer short-term wealth gains over long-term investment commitments. However, this behavior is not necessarily found in male relatives in the current chair's generation, for whom succession process has officially ended. Overall, these results suggest that to avoid inheritance taxes, heirs first prefer to own private firms where they can cash out corporate resources quickly and then reallocate their ownership to central firms through intragroup mergers.

Although controlling-family heirs are likely to benefit from this reshuffling, the ownership network becomes more distorted as central firms expand their boundaries with additional circular shareholding links. Minority shareholders suffer losses from these tax-motivated mergers, which have few operational synergies. For instance, the 2-day cumulative abnormal return (CAR) drops 32.3% more when an intragroup merger is announced than when a non-intragroup merger is announced. Overall, this evidence supports the tunneling view of business groups discussed in the literature (e.g., Johnson et al. 2000).

This article is related to several strands of literature, including studies on the effect of taxes on firms. Early studies emphasize the effects of corporate income taxes on the right-hand side of the balance sheet, such as capital structure (Miller, 1988; Modigliani & Miller, 1958, 1963) and dividend policy (Auerbach, 1979; Bradford, 1981; King, 1974). Recent studies explore topics such as the effects of tax reforms on organizational forms (Desai & Hines, 1999; Desai, Foley, & Hines, 2004) and the effects of inheritance laws on investment decisions (Ellul, Pagano, & Panunzi, 2010; Tsoutsoura, 2015). My article connects these two recent topics by exploring ownership networks among group affiliates. Ownership networks are a key component of the inheritance tax channels through which firms with heavy inheritance taxes initiate intragroup mergers, which in turn cause distortions in the ownership network.

My findings also contribute to the literature on tunneling in emerging markets. Tunneling is more prevalent in emerging economies, where controlling shareholders exercise their discretionary power to extract private benefits by transferring assets and profits out of firms (Johnson et al., 2000). The literature documents tunneling in business groups under a pyramidal ownership structure by highlighting conflicts of interest between controlling shareholders and minority shareholders (Almeida & Wolfenzon, 2006a, 2006b; Bae, Kang, & Kim, 2002; Bertrand, Mehta, & Mullainathan, 2002; Chang, 2003). Recent studies introduce several forms of tunneling practices and their consequences (Cheung, Rau, & Stouraitis, 2006; Jian & Wong, 2010; Jiang, Lee, & Yue, 2010). In such cases, minority shareholders suffer losses from negative firm outcomes. I explore a form of tunneling in which intragroup merger activities aim to avoid inheritance taxes but result in negative market consequences. Similar tax-saving schemes employed by controlling families for their own benefit likely crop up in many other institutional contexts.

This article is organized as follows: Section 2 introduces the institutional background of inheritance tax reform. Section 3 describes the data and sample summary statistics. Section 4 discusses the main results. Section 5 concludes.

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[12] An example of avoiding inheritance taxes through intragroup mergers in pyramids is detailed in Appendix C.

TABLE 1 Time-series variation in the succession tax rate

Tax rate	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%

Note. SME, Small and medium enterprise. 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%, which prompted strong psychological resistance among taxpayers, resulting in tax evasion. To address this, the government gradually reduced the inheritance and gift tax rate to 67% in 1980 and 40% in 1996, the lowest in history, while maintaining the business premium tax rate at 10%. The inheritance tax rate was capped at 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 initiated tax reforms, laying out policy guidelines for preventing tax-free inheritance of wealth. Accordingly, in 2000 it applied a maximum succession tax rate of 80%, 50% of which comes from the succession tax rate and 30% from the business premium tax rate. This is the highest among Organisation for Economic Co-operation and Development economies.

2 | INSTITUTIONAL BACKGROUND

Korea's inheritance tax laws and gift tax laws were first legislated in March and April 1950, respectively. In November 1952, gift tax law was incorporated into inheritance tax law. When the Inheritance Tax Act was first crafted, a progressive taxation system was in place, with 15 tax brackets and tax rates ranging from 20% to 90%. In the 1970s, the highest marginal tax rate dropped a little but was still high at 75%. These high tax rates prompted strong resistance from taxpayers, resulting in tax evasion. Over time, as the Korean economy became sophisticated, the inheritance laws were amended. In the 1980s, tax brackets decreased and tax rates were cut, and 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%.[13] Then, in 1996, the name of the law was officially changed to the Inheritance Tax and Gift Tax Act. As shown in Table 1, in 1997–1999 the inheritance tax rate was capped at 55%, with 45% contributed by the inheritance tax and 10% by the business premium tax.

However, after the 1997–1998 Asian financial crisis, the overall trend of decreasing inheritance tax rates came to a halt. On Korea's Independence Day, August, 15, 1999, not long after the first repayment of the International Monetary Fund (IMF) Supplemental Reserve Facility (SRF) in December 1998, President Kim Dae Jung announced special tax reform initiatives. He laid out policy guidelines to prevent the tax-free inheritance of wealth. The tax reform initiative, driven by the president himself, led to the adoption of a higher inheritance tax rate at the beginning of 2000.

Accordingly, the tax bracket subject to the marginal tax rate dropped from 5 billion Korean Republic won (KRW) to 3 billion KRW, and the maximum inheritance tax rate jumped to 80% (50% from the inheritance tax rate and 30% from the business premium tax rate). This is one of the highest inheritance tax rates among Organisation for Economic Co-operation and Development (OECD) economies. 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 irregular succession practices to include recapitalization or capital reduction. It also streamlined the securities evaluation system, as the share of financial assets among total inherited or donated property was steadily increasing. In 2003, to expand the scope of inheritance and gift taxes, the government shifted the tax regime from a negative system to a positive system.

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[13] The premium tax is imposed on the largest shareholders in addition to the inheritance tax. Thus, the inheritance tax law in Korea imposes higher taxes for shares with management rights.
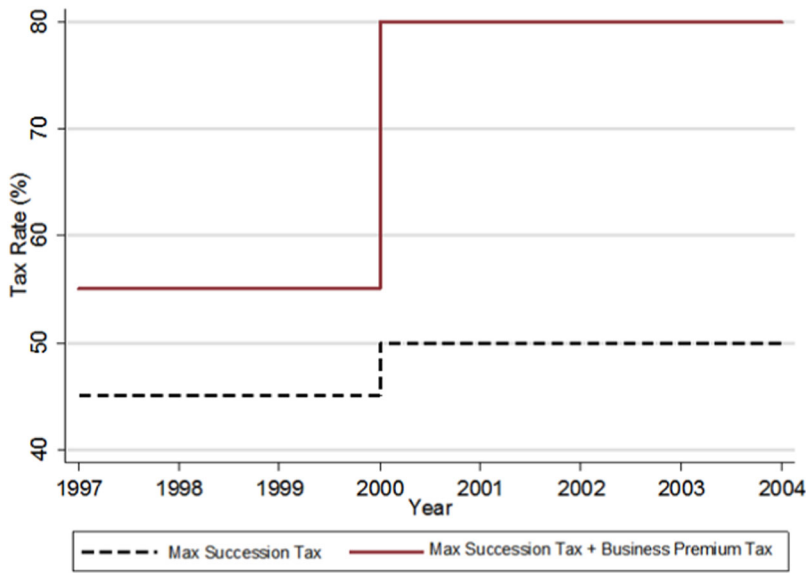
FIGURE 1 Tax reform and the maximum succession tax rate [Color figure can be viewed at wileyonlinelibrary.com]
Note. This figure summarizes the maximum succession tax rate and business premium tax rate in Korea before and after tax reforms. The solid line represents the cap of the succession tax rate, and the gap between the solid 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 to 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 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

As shown in Figure 1, the tax reform of 1999 applies a new tax rate that is 25 percentage points higher than that of the pre-reform period. If firms had anticipated the increase and had time to prepare, family firms would have implemented business succession and family wealth inheritance 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 was only 3.5 months. I find only four cases in which family ownership decreased during this period. The results are robust after excluding these firms. Therefore, the early inheritance of ownership immediately before this temporal shock is not a concern. Overall, this tax shock was an unexpected and inheritance tax-specific shock.

3 | DATA

The main sample of our study consists of 2,422 firm-year observations from the 24 largest business groups (controlled by 16 chaebol families) from 1997 to 2004 based on the KFTC classification standards.[14] Since the mid-1990s, the KFTC has required leading Korean chaebols to report highly detailed ownership status information. Public access to this sort of information is limited in most countries but is available in South Korea. This type of aggregated firm-level ownership data helps identify the concentration of control in each chaebol. However, KFTC ownership data are

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

available for only a few select Korean chaebols of a certain size. Because of this limited access to ownership data, I focus on the 24 largest Korean chaebols. 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 have direct ownership in only 533 (479 public and 54 private) of the 2,422 firm-year observations, reflecting the common exploitation of Korean chaebols' uniquely deep pyramidal structure. I retrieve merger and acquisition (M&A) data from Thomson Reuters SDC Platinum, and firms' financial and market data from Data Guide Pro, a database managed by the leading Korean financial data provider, FnGuide.[15] Total assets controlled by these chaebols represent more than 56% of the nominal gross domestic product (GDP) of the Korean economy at the end of the sample year (778.4 trillion KRW).

To further convey the structure of chaebols, I build family trees[16] 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).[17] Information about 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 Act on External Audit of Stock Companies, any public or private company obligated to have an external audit is legally mandated to submit a complete annual report containing ownership information such as the chairperson's relatives (spouses, blood relatives within third cousins, and relatives by marriage within first cousins), and subsidiaries or foundations that are practically governed by the family.

Panel A of Table 2 describes the characteristics of 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's generation is passed to the next generation in a corresponding year.[18] The average succession tax burden for each firm is 2.32 billion KRW (1.93 million U.S. dollars [USD]), and the maximum tax burden is 571.95 billion KRW (480 million USD).[19] During the sample period, approximately 11% of chaebol firms initiate mergers, 26% of which are stock-for-stock intragroup transactions among affiliates in the same business group. All measures for mergers are based on the acquiring firms. The financial characteristics of sample firms are comparable to those observed in previous studies of Korean chaebol firms (Almeida, Park, Subrahmanyam, & Wolfenzon, 2012; Bae et al., 2002). Panel A also reports that 48.4% of the 2,422 firm-year observations are publicly listed firms, and the sample mean firm age is 24.566 years.

Panel B of Table 2 summarizes ownership variables, such as *Centrality*, *Position*, *Loop*,[20] *Cash-flow rights*, *Voting rights*, and *Discrepancy*, to better understand the pyramidal structures of Korean business groups. The maximum centrality of a group is 45.333%, which suggests that a chaebol family's control across all group firms could decrease by that amount after I exclude a specific firm from the group. The average centrality of public firms (4.396) is 6.6 times higher than that of private firms (0.671), suggesting that highly central firms are public firms in pyramidal business groups. Public firms have an average position 1.946 away from the controlling family, whereas private firms have an average position of 2.310. These average positions imply that public firms are more likely than private firms to be directly owned by the controlling family. In addition, 52.8% of public firms are inside circular ownership chains, whereas most private firms (79.1%) are outside these chains. These ownership metrics confirm that there is typically a highly concentrated control

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[15] The information in this database is approximately equivalent to the information reported by the Center for Research in Security Prices (CRSP) and Compustat for U.S. firms.

[16] A family tree includes founders, their siblings, their spouses, and all direct and indirect (via marriage) descendants of the founders and their siblings and spouses. The founder's generation is coded as generation 1, the following generation as 2, and so on. I allocate a unique ID to each member in the family tree and collect detailed information about birth order, gender, direct or indirect (via marriage) descendants, marital status, presence (dead or living), and personal background.

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

[18] *Succession tax burden = Total fraction of ownership held by current chair generation × Total equity value × Tax rate* in 10 billion KRW. *Total equity value* refers to market value for public companies and Max [[(total asset − total debt) × 2 + [[(NIt − 3) × 1 + (NIt − 2) × 2 + (NIt − 1) × 3]/6]/10%]/5] or total assets] 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 inheritance tax rate and business premium tax rate imposed on the largest shareholders.

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

[20] *Loop* is an indicator that equals one if a firm is in a circular ownership chain, and zero otherwise.

TABLE 2 Summary statistics

Variables	Number of firms	Mean	SD	Minimum	Median	Maximum
Panel A. Financial characteristics						
Succession tax burden	2,422	0.232	2.835	0.000	0.000	57.195
Number of total mergers	2,422	0.110	0.621	0.000	0.000	13.000
Number of stock-for-stock intragroup mergers	2,422	0.028	0.265	0.000	0.000	7.000
Total merger transactions	2,422	7.215	85.509	0.000	0.000	2,903.407
Stock-for-stock intragroup merger transactions	2,422	3.979	75.574	0.000	0.000	2,903.407
Log of total assets	2,422	12.425	2.035	7.434	12.349	18.326
Log of sales	2,422	5.285	0.947	1.186	5.304	7.914
Leverage	2,422	3.307	9.597	0.000	1.633	279.464
ROA	2,422	0.059	0.090	−0.605	0.051	0.852
Payout ratio	1,607	0.095	0.476	0.000	0.000	1.978
Public firm (dummy)	2,422	0.484	0.500	0.000	0.000	1.000
Firm age	2,422	24.566	15.854	1.000	21.000	75.000
Panel B. Ownership structure						
Centrality (%)	1,667	2.661	5.599	0.000	0.000	45.333
Public	891	4.396	6.880	0.000	1.035	45.333
Private	776	0.671	2.372	0.000	0.000	18.077
Position	1,667	2.116	0.845	1.000	2.009	5.310
Public	891	1.946	0.827	1.000	1.982	5.310
Private	776	2.310	0.824	1.000	2.166	4.644
Loop	1,667	0.379	0.500	0.000	0.000	1.000
Public	891	0.528	0.500	0.000	1.000	1.000
Private	776	0.209	0.407	0.000	0.000	1.000
Panel C. Ownership structure change						
Centrality (%)	1,667	2.661	5.5999	0.000	0.000	45.333
Pretax-reform period	497	2.948	6.078	0.000	0.059	45.333
Posttax-reform period	1,169	2.539	5.380	0.000	0.000	39.471
Difference (post−pre)		−0.409		$t = -1.364\,(p = .173)$		
Position	1,667	2.116	0.845	1.000	2.009	5.310
Pretax-reform period	497	2.010	0.842	1.000	2.000	5.310
Posttax-reform period	1,169	2.161	0.842	1.000	2.033	5.046
Difference (post−pre)		0.151		$t = 3.340\,(p = .001)$		
Loop	1,667	0.379	0.500	0.000	0.000	1.000
Pretax-reform period	497	0.475	0.500	0.000	0.000	1.000
Posttax-reform period	1,169	0.339	0.473	0.000	0.000	1.000
Difference (post−pre)		−0.136		$t = -5.278\,(p = .000)$		
Cash-flow rights (%)	1,667	17.154	17.450	0.000	11.698	100
Pretax-reform period	497	15.528	17.216	0.001	9.076	100
Posttax-reform period	1,169	17.846	17.510	0.000	12.495	100
Difference (post−pre)		2.318		$t = 2.484\,(p = .013)$		

(Continues)

TABLE 2 (Continued)

Variables	Number of firms	Mean	SD	Minimum	Median	Maximum
Panel C. Ownership structure change						
Voting rights (%)	1,667	57.440	30.283	0.000	50.411	100
Pretax-reform period	497	43.932	28.988	0.000	33.000	100
Posttax-reform period	1,169	63.183	28.979	0.000	60.400	100
Difference (post−pre)		19.251		$t = 12.404$ ($p = .000$)		
Discrepancy (%)	1,667	40.286	28.736	0.000	37.133	100
Pretax-reform period	497	28.405	26.882	0.000	18.005	100
Posttax-reform period	1,169	45.337	28.011	0.000	43.523	98.43
Difference (post−pre)		16.932		$t = 11.424$ ($p = .000$)		
Panel D. Correlation						

		1	2	3	4	5	6	7	8	9
1.	*Succession tax burden*	1.000								
2.	*Number of intragroup mergers*	0.082	1.000							
3.	*Centrality*	0.234	0.280	1.000						
4.	*Position*	−0.132	−0.115	−0.363	1.000					
5.	*Loop*	0.081	0.069	0.169	−0.173	1.000				
6.	*ROA*	−0.016	0.032	−0.037	−0.057	−0.033	1.000			
7.	*Log of total assets*	0.168	0.227	0.450	−0.153	0.425	−0.119	1.000		
8.	*Leverage*	0.014	0.003	0.055	−0.061	0.066	−0.176	0.154	1.000	
9.	*Payout ratio*	0.032	0.004	0.046	0.018	0.049	0.049	0.036	−0.045	1.000

Note. 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 as designated by the Korean Fair Trade Commission (KFTC). Analysis is based on data compiled as of the year-end of the corresponding year. Variables are defined in Appendix A.

structure in chaebols (Almeida et al., 2012), where owning a small stake in one or two key central firms allows the owner of the stake to be the ultimate controller of the entire business group.

Panel C of Table 2 reports changes in ownership structures before and after the tax reform. In 2001, an amendment to the Monopoly Regulation and Fair Trade Act (MRFTA) limited equity investment in group affiliates to 25%. Because of this limit, centrality and circular ownership chains decreased while position significantly increased during the posttax-reform period.[21] However, ultimate cash-flow rights (17.846%), voting rights (63.183%), and discrepancy (45.337%) during the posttax-reform period are significantly higher than those (15.528%, 43.932%, and 28.405%, respectively) during the pretax-reform period. These results imply that despite the equity investment regulation, controlling families increased their control over business groups via intragroup mergers. These mergers, in turn, contributed to a more distorted ownership structure that widened the discrepancy between cash-flow rights and voting rights.

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[21] The results in Panel C of Table 2 are mainly driven not by inheritance tax reform but by the regulatory reform of the MRFTA. The MRFTA is beyond the scope of this article. However, Panel B provides a comprehensive look at ownership structure changes in Korean chaebol firms during the sample period. The amendment of the MRFTA took effect at the beginning of 2001, a period that overlaps with the posttax-reform period. This amendment set a ceiling on firms' shareholding in other group affiliates within large chaebol groups that have total consolidated assets of 5 trillion KRW or higher. Affiliated firms under these large conglomerates were not allowed to invest in group affiliates' equity shares above 25% of the investing firm's net assets. This regulatory reform led to an increase in controlling families' direct ownership over group affiliates as they reduced their indirect ownership through (circular) equity investments made during the pretax-reform period. Consequently, this equity investment ceiling significantly decreased firms' centrality and circular ownership chains while increasing their position.

TABLE 3 Family involvement in ownership

Variables	N	Mean	SD	Minimum	Median	Maximum
Panel A. Current chair generation						
Total number of members with ownership in current chair generation	128	10.805	5.987	2.000	12.000	21.000
Number of male family members with ownership	128	7.258	4.265	1.000	7.000	15.000
Number of female family members with ownership	128	1.578	1.995	0.000	0.500	7.000
Number of married male members with ownership	128	1.125	1.679	0.000	0.000	6.000
Number of married female members with ownership	128	0.844	1.239	0.000	0.000	5.000
Total fraction of ownership by current chair generation	128	0.624	0.225	0.159	0.631	1.000
Fraction of family ownership held by male family members	128	0.529	0.271	0.001	0.527	1.000
Fraction of family ownership held by female family members	128	0.047	0.138	0.000	0.000	0.832
Fraction of family ownership held by married male members	128	0.030	0.081	0.000	0.000	0.572
Fraction of family ownership held by married female members	128	0.017	0.048	0.000	0.000	0.239
Panel B. Current chair + 1 generation						
Total number of members with ownership in current chair + 1 generation	128	7.063	8.662	0.000	4.000	26.000
Number of sons with ownership	128	4.383	5.672	0.000	2.000	19.000
Number of daughters with ownership	128	1.992	2.312	0.000	1.500	8.000
Number of sons-in-law with ownership	128	0.313	0.849	0.000	0.000	3.000
Number of daughters-in-law with ownership	128	0.375	1.458	0.000	0.000	6.000
Total fraction of ownership held by current chair + 1 generation	128	0.230	0.260	0.000	0.070	0.840
Fraction of family ownership held by sons	128	0.200	0.250	0.000	0.010	0.730
Fraction of family ownership held by daughters	128	0.030	0.050	0.000	0.010	0.270
Fraction of family ownership held by sons-in-law	128	0.002	0.007	0.000	0.000	0.030
Fraction of family ownership held by daughters-in-law	128	0.001	0.003	0.000	0.000	0.010

Note. 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 D of Table 2 summarizes the results of a univariate analysis of my main variables for the 2,422 sample family firms. The number of intragroup mergers is positively correlated with succession tax burden (0.082), centrality (0.234), and loop (0.081) but negatively related to position (−0.132). These results suggest that intragroup mergers are more likely to increase in firms with high succession tax burdens and central firms located in the upper layers of the pyramid in circular ownership chains. These correlations are largely in line with my hypothesis.

Table 3 presents the equity ownership involvement for different family members. Panel A reports the equity ownership involvement for the current chair's generation, and Panel B for the following generation (i.e., current chair + 1 generation). To avoid succession taxes during transfer of control in business groups, firms that have high tax burdens and are owned by the current chair's generation acquire the affiliates owned by the current chair + 1 generation. Thus, I expect that heirs convert target shares to acquirer shares to avoid inheritance taxes. I report statistics for the current chair's generation and those for the current chair + 1 generation separately. This is because an ownership share of the current chair's generation, which is to be passed to the current chair + 1 generation, is only relevant as a measure of succession tax burden in acquiring firms. In addition, by distinguishing between the ownership shares of the two

generations, we can better analyze the characteristics of firms targeted in stock-for-stock intragroup mergers. We predict that the heirs have high ownership stakes in those target firms.

In Table 3, the number of observations is 128 chaebol family years, and each chaebol family variable is computed as the arithmetic average across business groups. The analysis is based on data compiled as of the year-end during the sample period. I find that on average, 10.805 family members hold 62.4% of family ownership positions in the current chair generation, whereas 7.063 family members hold 23.0% of the entire family ownership in the current chair + 1 generation. For the current chair generation, 7.258 male family members on average hold 52.9% of the total ownership, whereas 1.578 daughters hold just 4.7%. In-laws in the current chair generation rarely hold ownership positions. For the current chair + 1 generation, a similar pattern of predominance by male heirs is observed. Variable definitions are detailed in Appendix A.

4 | RESULTS

4.1 | Succession tax burden and intragroup mergers

In Table 4, I test how the personal inheritance tax affects stock-for-stock intragroup mergers. As shown in Column 1 of Panel A, using the Tobit model, I regress each firm's *Number of stock-for-stock intragroup mergers*[22] on the *Succession tax burden* variable. I control for each firm's size (log of total assets), financial leverage (debt-to-equity ratio), and number of affiliates. I then cluster the standard errors at the business group level because deciding whether to go ahead with an intragroup merger is a group-level decision. All estimates include industry (two-digit Standard Industrial Classification [SIC]) and year indicator variables.[23] The estimated effect of the personal inheritance tax burden is both economically and statistically significant. The results in Column 1 imply that for every 213 billion KRW (177 million USD) increase in the personal inheritance tax of an affiliate, Korean chaebols initiate one additional intragroup merger (1 = 0.047 × 21.3). Column 2 reports the results of an identification test. I count the number of non-intragroup mergers, which are irrelevant to inheritance tax avoidance as heirs do not own the target firms in those mergers. I find that the estimated effect on non-intragroup mergers is negative (−0.001) and not statistically significant.

I expect that to maximize their control over the entire business group, heirs reallocate their ownership to the central firms located in the upper layer of the pyramid in circular ownership chains. Columns 3–5 in Panel A of Table 4 extend the baseline model from Column 1 to test the characteristics of acquirers. The right-hand-side (RHS) variable, *Succession tax burden*, is now split into two parts using the following dummy variables: (a) *High centrality* versus *Low centrality*, (b) *Upper layer of pyramid* versus *Lower layer of pyramid*, and (c) *Loop* versus *No loop*. All explanatory variables are standardized to have a mean of 0 and a standard deviation of 1 so that their point estimates directly represent their economic significance.

Column 3 in Panel A of Table 4 shows that an intragroup merger is mainly driven by central firms. *Succession tax burden × High centrality* (0.135) is positive and significant at the 1% level, whereas *Succession tax burden × Low centrality* (−0.254) is negative and significant at the 10% level. The coefficient equality test indicates that the difference between these two estimates is significant at the 1% level (*F*-statistic = 6.830). Column 4 shows that an intragroup merger is more likely to occur in firms directly owned by a controlling family. *Succession tax burden × Upper layer of pyramid* (0.133) is positive and significant at the 1% level, whereas *Succession tax burden × Lower layer of pyramid* (−0.065) is negative and significant at the 1% level. Column 5 shows the effect of the inheritance tax on circular ownership. *Succession tax*

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[22] The argument in this article applies only to stock-for-stock intragroup mergers. I exclude cash mergers when counting the total number of intragroup mergers. There may be a concern that intragroup mergers trade at nonmarket prices in chaebol groups. Unfortunately, because 24 of 42 target firms in our sample are private, market prices are not fully observable.

[23] I cannot include both industry and firm fixed effects in Panel A of Table 4 because of collinearity. In Panel B, I report results with firm fixed effects. All results in Panels A and B are consistent with both firm and industry fixed effects. In addition, although Korean chaebols are now diversified, the central firms in each business group specialize in certain industries under government initiatives enacted during the centrally planned economic era of the 1960s. Including a group dummy in addition to industry fixed effects does not explain additional within-group variation.

TABLE 4 Succession tax burden and intragroup mergers

Variables	Dependent variable: *Number of stock-for-stock mergers*				
	Intragroup	Non-intragroup	Intragroup mergers		
	(1)	(2)	(3)	(4)	(5)
Panel A. Tobit (Market value of equity)					
Succession tax burden	0.047***	−0.001			
	[0.002]	[0.003]			
Succession tax burden × High centrality			0.135***		
			[0.009]		
Succession tax burden × Low centrality			−0.254*		
			[0.154]		
Succession tax burden × Upper layer of pyramid				0.133***	
				[0.009]	
Succession tax burden × Lower layer of pyramid				−0.065***	
				[0.017]	
Succession tax burden × Loop					0.117***
					[0.009]
Succession tax burden × No loop					0.070***
					[0.005]
Coefficient equality (*F*-test)			6.830***	352.900***	31.450***
			(.009)	(.000)	(.000)
Industry fixed effect	Yes	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes
Observations	2,422	2,422	2,422	2,422	2,422
Panel B. Tobit (Book value of equity)					
Succession tax burden	0.0213***	−0.249***			
	[0.002]	[0.009]			
Succession tax burden × High centrality			0.063***		
			[0.007]		
Succession tax burden × Low centrality			−270.800***		
			[0.486]		
Succession tax burden × Upper layer of pyramid				0.066***	
				[0.006]	
Succession tax burden × Lower layer of pyramid				−105.198***	
				[0.742]	
Succession tax burden × Loop					0.039***
					[0.003]
Succession tax burden × No Loop					−0.027***
					[0.003]
Coefficient equality (*F*-test)			3.0×10^{50}***	19,806.890***	3,073.410***
			(.000)	(.000)	(.000)

(Continues)

TABLE 4 (Continued)

Variables	Dependent variable: *Number of stock-for-stock mergers*				
	Intragroup Non-intragroup		Intragroup mergers		
	(1)	(2)	(3)	(4)	(5)
Panel B. Tobit (Book value of equity)					
Firm 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

Note. Each column in this table reports the coefficients from a Tobit regression with heteroskedasticity-robust standard errors. In Panel A, *Succession tax burden* is based on the market value of equity. In Panel B, *Succession tax burden* is based on the book value of equity. Standard errors are clustered at the business group level and reported in square brackets under the coefficient estimates. Coefficient equality reports *F*-statistics for the coefficients of the decomposed variables, with *p*-values in parentheses. In Columns 3–5, all explanatory variables are standardized so that their point estimates represent the economic magnitude of their effects. Controls include *Log of total assets* (in millions of KRW), *Leverage ratio*, and *Number of group affiliates*. In Panel A, all estimates include industry (Standard Industrial Classification [SIC] two-digit code) and year indicator variables. In Panel B, all estimates include firm and year indicator variables. Variables are defined in Appendix A.
***Significant at the 0.01 level.
*Significant at the 0.10 level.

burden × *Loop* (0.117) is positive and significant at the 1% level, which is larger than *Succession tax burden* × *No loop* (0.070), also significant at the 1% level (*F*-statistic = 31.450). This result indicates that the ownership network of group affiliates determines which firms with heavy personal inheritance taxes initiate intragroup mergers.

One of the main concerns lies in the construction of a key independent variable, *Succession tax burden*, which is measured by multiplying the total equity value by the controlling shareholders' ownership and the succession tax rate. However, the total equity value can be affected by factors such as firm-specific characteristics and macroeconomic conditions, and thus varies over time. This fluctuation in the total equity value is likely to affect the frequency of intragroup mergers. For example, during the Asian financial crisis, firms' total equity value dropped significantly, which motivated controlling shareholders to pass their ownership to heirs via intragroup mergers. In this case, the increased frequency of intragroup mergers is mainly due to the change in the market value of equity during the crisis rather than to the change in inheritance tax rates. To minimize this concern, I repeat the analyses from Column 1 to 5 in Panel A of Table 4 by measuring *Succession tax burden* based on the book value of equity, which is unaffected by changes in market conditions. I report the results in Panel B. All estimates include firm and year indicator variables.[24] I find a similarly significant increase in intragroup mergers when measuring the succession tax burden based on the book value of equity.

Overall, the results in Table 4 reveal that a high inheritance tax burden leads to stock-for-stock intragroup mergers in pyramidal business groups. This implies that unusual surges in intragroup mergers are motivated by a desire to avoid the inheritance tax through an alternative succession mechanism.[25]

4.2 | Effect of tax reform on intragroup mergers

Is there a causal relation between high personal inheritance taxes and stock-for-stock intragroup mergers? To answer this question, I examine the 1999 tax reform in Korea. Factoring in this exogenous event that raised the inheritance

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[24]I cannot include both industry and firm fixed effects in the regression because of collinearity. However, the results in Tables 4–6 are consistent with both firm and industry fixed effects.

[25]The motivation behind intragroup mergers may simply be to cement the power of the new heir rather than to circumvent tax law. I test this by substituting the succession tax burden variable with ownership by the current chair's generation or ownership by the heirs. I find no significant correlation with intragroup mergers.
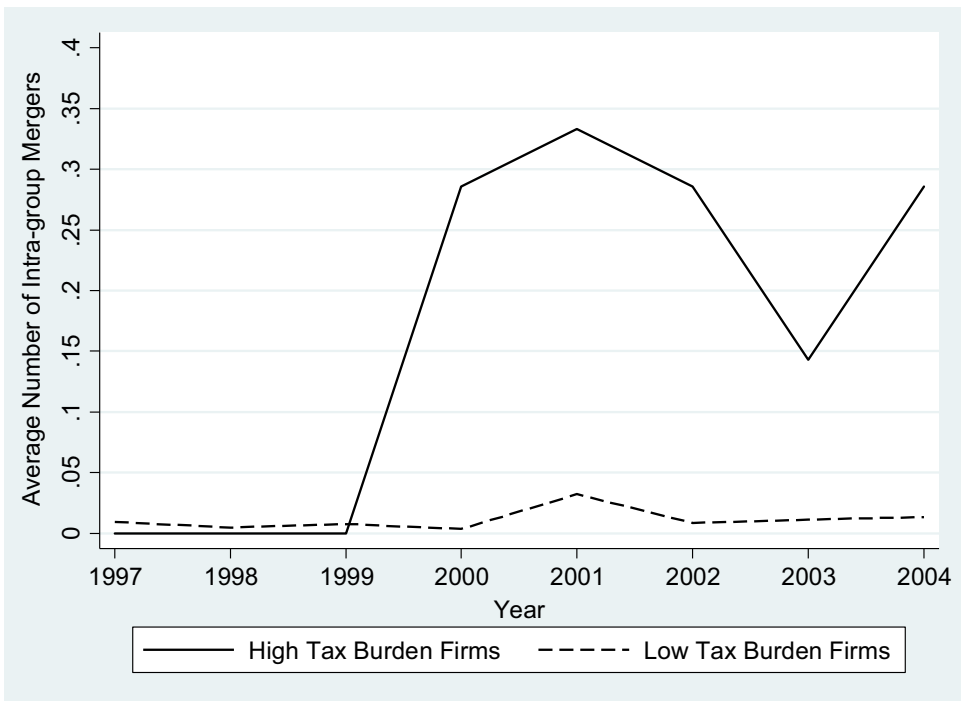
FIGURE 2 Trends of stock-for-stock intragroup mergers [Color figure can be viewed at wileyonlinelibrary.com] *Note.* This figure summarizes chronological changes in the average number of stock-for-stock intragroup mergers around the 1999 inheritance tax reform in Korea. There is no notable difference between high- and low-tax-burden firms before 1999. Right after the tax reform, high-tax-burden firms suddenly engage in more stock-for-stock intragroup mergers, whereas low-tax-burden firms remain stable

tax by 25 percentage points, I use DiD to estimate the causal effect of the personal inheritance tax on the frequency of intragroup mergers. The pretax-reform period spans 1997–1999, and the posttax-reform period spans 2000–2004. The treatment group, high succession tax burden, is composed of firms whose succession burden is greater than that of the top 10% of directly owned chaebol firms during the pretax-reform period. I choose the top 10% as a treatment group because they always have the top tax burden. This ensures that the treatment group and control group do not switch during the 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, the equity value, the ownership fraction of the current chair's generation, or the timing of the intragroup merger announcement. Only the ownership difference determines the treatment and control groups. Thus, there is no selection bias. Figure 2 summarizes the changes in the average number of stock-for-stock intragroup mergers around the 1999 inheritance tax reform. There is no notable difference between high- and low-tax-burden firms before the tax reform. However, right after the tax reform, high-tax-burden firms engage in more stock-for-stock intragroup mergers, whereas low-tax-burden firms remain at pretax-reform levels.

In Column 1 of Panel A in Table 5, I regress each firm's *Number of stock-for-stock intragroup mergers* on the interaction term *High succession tax burden × Post*. I find a positive point estimate of 1.162, significant at the 1% level. The coefficients imply that the difference in intragroup merger activities between high- and low-tax-burden firms is 2.3 times (2.3 = (1.162 + 0.915)/0.915) larger during the posttax-reform period. These are economically significant effects that suggest that high-tax-burden firms expand their boundaries via intragroup mergers during the posttax-reform period because the tax-saving benefits from increased boundaries cover the transaction costs.

In Columns 2–4 of Panel A in Table 5, I repeat the conditional analysis from Column 3 to 5 in Table 4. Using this additional layer of differences, I run a difference-in-differences and decompose (DiD-D) regression. The RHS variable,

TABLE 5 Effect of tax reform on intragroup mergers

| Variables | Dependent variable: *Number of stock-for-stock intragroup mergers* | | | |
	(1)	(2)	(3)	(4)
Panel A. Tobit (Market value of equity)				
High succession tax burden × Post	1.162***			
	[0.130]			
High succession tax burden × Post × High centrality		0.212***		
		[0.002]		
High succession tax burden × Post × Low centrality		0.043*		
		[0.024]		
High succession tax burden × Post × Upper layer of pyramid			0.301***	
			[0.004]	
High succession tax burden × Post × Lower layer of pyramid			−0.013	
			[0.025]	
High succession tax burden × Post × Loop				0.115***
				[0.017]
High succession tax burden × Post × No loop				0.078***
				[0.011]
High succession tax burden	0.915***	0.149***	0.153***	0.146***
	[0.124]	[0.024]	[0.035]	[0.031]
Post	−1.868***	−0.798***	−0.831***	−0.851***
	[0.112]	[0.043]	[0.043]	[0.041]
Coefficient equality (*F*-test)		50.730***	196.570***	10.550***
		(.000)	(.000)	(.000)
Industry fixed effect	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
Observations	2,422	2,422	2,422	2,422
Panel B. Tobit (Book value of equity)				
High succession tax burden × Post	0.155***			
	[0.014]			
High succession tax burden × Post × High centrality		0.147***		
		[0.006]		
High succession tax burden × Post × Low centrality		−0.010***		
		[0.003]		
High succession tax burden × Post × Upper layer of pyramid			0.198***	
			[0.005]	
High succession tax burden × Post × Lower layer of pyramid			−0.569	
			[0.500]	
High succession tax burden × Post × Loop				0.117***
				[0.012]

(Continues)

TABLE 5 (Continued)

Variables	Dependent variable: *Number of stock-for-stock intragroup mergers*			
	(1)	(2)	(3)	(4)
Panel B. Tobit (Book value of equity)				
High succession tax burden $\times$ Post $\times$ No loop				−0.054***
				[0.018]
High succession tax burden	12.203***	0.026***	−0.201***	0.204***
	[0.016]	[0.005]	[0.012]	[0.038]
Post	−0.787***	−0.496***	−0.537***	−0.880***
	[0.044]	[0.039]	[0.038]	[0.038]
Coefficient equality (*F*-test)		4.600**	2.310	275.040***
		(.032)	(.129)	(.000)
Firm fixed effect	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
Observations	2,422	2,422	2,422	2,422
Panel C. OLS				
High succession tax burden $\times$ Post	0.235***			
	[0.067]			
High succession tax burden $\times$ Post $\times$ High centrality		0.032***		
		[0.006]		
High succession tax burden $\times$ Post $\times$ Low centrality		0.013*		
		[0.007]		
High succession tax burden $\times$ Post $\times$ Upper layer of pyramid			0.034***	
			[0.006]	
High succession tax burden $\times$ Post $\times$ Lower layer of pyramid			0.010	
			[0.007]	
High succession tax burden $\times$ Post $\times$ Loop				0.024***
				[0.007]
High succession tax burden $\times$ Post $\times$ No loop				0.015***
				[0.006]
High succession tax burden	0.005	0.001	0.001	0.001
	[0.051]	[0.008]	[0.008]	[0.008]
Post	−0.022	−0.010	−0.010	−0.010
	[0.028]	[0.013]	[0.013]	[0.013]
Coefficient equality (*F*-test)		6.340***	10.480***	1.120
		(.012)	(.001)	(.291)
Industry fixed effect	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes

(Continues)

TABLE 5 (Continued)

Variables	Dependent variable: *Number of stock-for-stock intragroup mergers*			
	(1)	**(2)**	**(3)**	**(4)**
Panel B. Tobit (Book value of equity)				
Observations	2,422	2,422	2,422	2,422
R^2	.070	.075	.076	.070

Note. Each column in Panels A and B reports the coefficients from a Tobit regression. In Panel A, *Succession tax burden* is based on the market value of equity. In Panel B, *Succession tax burden* is based on the book value of equity. Each column in Panel C reports the coefficients from an ordinary least squares (OLS) regression. Standard errors are clustered at the business group level and reported in square brackets under the coefficient estimates. Coefficient equality reports *F*-statistics for the coefficients of the decomposed variables, with *p*-values in parentheses. In Columns 2–4, all explanatory variables are standardized so that their point estimates represent the economic magnitude of their effects. Controls include *Log of total assets* (in millions of KRW), *Leverage ratio*, and *Number of group affiliates*. All estimates in Panels A and C include industry (Standard Industrial Classification [SIC] two-digit code) and year indicator variables. All estimates in Panel B include firm and year indicator variables. Variables are defined in Appendix A.
***Significant at the 0.01 level.
**Significant at the 0.05 level.
*Significant at the 0.10 level.

High succession tax burden × *Post*, is now split into two parts using the following dummy variables: (a) *High centrality* versus *Low centrality*, (b) *Upper layer of pyramid* versus *Lower layer of pyramid*, and (c) *Loop* versus *No loop*. All DiD-D tests for centrality, layer position, and loop confirm the earlier findings in Table 4. The DiD-D effect of *High succession tax burden* × *Post* × *High centrality* (0.212) is significant at the 1% level. The economic magnitude of intragroup mergers is almost five times as large in *High centrality* (4.9 = 0.212/0.043) as in *Low centrality* (*F*-statistic = 50.730). This result highlights the effects of a personal inheritance tax on stock-for-stock intragroup mergers in Korean chaebols.

To ease concerns raised by measuring the succession tax burden by market value of equity (which can be affected by changes in market conditions), I repeat the analyses from Column 1 to 4 in Panel A of Table 5 but measure *High succession tax burden* using the book value of equity. I report the results in Panel B. Other empirical specifications, including firm fixed effects, remain the same as in Panel B of Table 4. The results in Panel B of Table 5 are in line with those of Panel A. However, the nonlinear model does not capture the treatment effect when the interaction term is interpreted in a DiD model. In Panel C, I repeat the analyses from Column 1 to 4 in Panel A using a linear specification. The estimated marginal effects of the succession tax burden are smaller than those in Panel A because the probability that a firm will initiate an intragroup merger is much lower than 1. The findings in Panels B and C together confirm that the 1999 tax reform, which exogenously increased the inheritance tax burden, resulted in significant intragroup mergers. This effect is likely causal.

4.3 | Private foundations and tax burden reduction

To further identify causal evidence that a high inheritance tax burden leads to intragroup mergers in pyramidal business groups, I test whether a reduction in the tax burden decreases stock-for-stock intragroup mergers. The inheritance tax burden is reduced through indirect shareholding by industry foundations (Thomsen, 1999; Villalonga & Amit, 2009). As charitable entities, private foundations, which are often governed by heirs who serve as board members, are exempt from gift taxation. Thus, I expect that a firm owned by a private foundation has a reduced tax burden, resulting in decreased motivation for heirs to initiate intragroup mergers.

To examine the effects of private foundations, I employ DiDiD analysis. In Column 1 of Panel A in Table 6, I extend the DiD model of Table 5 by interacting the RHS variable, *High succession tax burden* × *Post*, with *Foundation*. *Foundation* is an indicator that equals 1 if a firm is owned by a private foundation, and 0 otherwise. The point estimate of the interaction term (−14.793) implies that the incentive to initiate an intragroup merger drops by a net 97.3%

TABLE 6 Private foundations and tax burden reduction

Variables	Dependent variable: *Number of stock-for-stock intragroup mergers*			
	(1)	(2)	(3)	(4)
Panel A. Tobit (Market value of equity)				
High succession tax burden × Post	15.206***	1.936***	1.875***	1.890***
	[0.223]	[0.038]	[0.038]	[0.028]
High succession tax burden × Post × Foundation	−14.793***			
	[0.264]			
High succession tax burden × Post × Foundation × High centrality		−1.442***		
		[0.037]		
High succession tax burden × Post × Foundation × Low centrality		−0.643***		
		[0.004]		
High succession tax burden × Post × Foundation × Upper layer of pyramid			−1.363***	
			[0.036]	
High succession tax burden × Post × Foundation × Lower layer of pyramid			−0.669***	
			[0.004]	
High succession tax burden × Post × Foundation × Loop				−1.309***
				[0.019]
High succession tax burden × Post × Foundation × No loop				−0.859***
				[0.012]
High succession tax burden × Foundation	13.235***	1.936***	1.857***	1.873***
	[0.244]	[0.045]	[0.045]	[0.033]
Post × Foundation	0.062	0.021***	0.020	0.017
	[0.116]	[0.041]	[0.042]	[0.026]
High succession tax burden	0.836***	0.304***	0.299***	0.229***
	[0.115]	[0.050]	[0.050]	[0.035]
Post	−1.712***	−0.802***	−0.788***	−0.776***
	[0.120]	[0.050]	[0.050]	[0.051]
Foundation	−12.423***	−2.153***	−2.075***	−2.078***
	[0.221]	[0.050]	[0.049]	[0.038]
Coefficient equality (*F*-test)		538.100***	425.660***	1,850.030***
		(.000)	(.000)	(.000)
Industry fixed effect	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes
Controls	No	Yes	Yes	Yes
Observations	2,422	2,422	2,422	2,422
Panel B. Tobit (Book value of equity)				
High succession tax burden × Post	9.836***	1.194***	1.565***	1.248***
	[0.075]	[0.010]	[0.010]	[0.008]
High succession tax burden × Post × Foundation	−8.803***			
	[0.082]			

(Continues)

TABLE 6   (Continued)

Variables	Dependent variable: *Number of stock-for-stock intragroup mergers*			
	(1)	(2)	(3)	(4)
Panel B. Tobit (Book value of equity)				
High succession tax burden × Post × Foundation × High centrality		−0.760***		
		[0.008]		
High succession tax burden × Post × Foundation × Low centrality		−0.792		
		[0.625]		
High succession tax burden × Post × Foundation × Upper layer of pyramid			−1.164***	
			[0.009]	
High succession tax burden × Post × Foundation × Lower layer of pyramid			−0.169***	
			[0.004]	
High succession tax burden × Post × Foundation × Loop				−0.584***
				[0.008]
High succession tax burden × Post × Foundation × No loop				−0.549***
				[0.005]
High succession tax burden × Foundation	−2.797***	−0.337***	0.130***	−0.834***
	[0.074]	[0.010]	[0.008]	[0.007]
Post × Foundation	−0.153***	−0.041***	0.133***	−0.041***
	[0.049]	[0.020]	[0.023]	[0.020]
High succession tax burden	1.511***	0.471***	0.068***	0.663***
	[0.030]	[0.011]	[0.010]	[0.011]
Post	−0.833***	−0.387***	−0.477***	−0.502***
	[0.058]	[0.051]	[0.058]	[0.050]
Foundation	1.003***	0.091***	0.003***	0.311***
	[0.073]	[0.012]	[0.009]	[0.009]
Coefficient equality (*F*-test)		0.000	58,045.310***	13.280***
		(.959)	(.000)	(.000)
Firm fixed effect	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes
Controls	No	Yes	Yes	Yes
Observations	2,422	2,422	2,422	2,422
Panel C. OLS				
High succession tax burden × Post	0.576***	0.069***	0.069***	0.069***
	[0.122]	[0.015]	[0.015]	[0.015]
High succession tax burden × Post × Foundation	−0.544***			
	[0.148]			
High succession tax burden × Post × Foundation × High centrality		−0.047***		
		[0.014]		
High succession tax burden × Post × Foundation × Low centrality		−0.030***		
		[0.009]		

(Continues)

TABLE 6 (Continued)

Variables	Dependent variable: *Number of stock-for-stock intragroup mergers*			
	(1)	(2)	(3)	(4)
Panel C. OLS				
High succession tax burden × Post × Foundation × Upper layer of pyramid			−0.045***	
			[0.013]	
High succession tax burden × Post × Foundation × Lower layer of pyramid			−0.033***	
			[0.009]	
High succession tax burden × Post × Foundation × Loop				−0.051***
				[0.013]
High succession tax burden × Post × Foundation × No loop				−0.023*
				[0.009]
High succession tax burden × Foundation	0.105	0.014	0.014	0.014
	[0.111]	[0.015]	[0.015]	[0.015]
Post × Foundation	0.086***	0.024***	0.024***	0.024***
	[0.033]	[0.009]	[0.009]	[0.009]
High succession tax burden	0.006	0.002	0.002	0.002
	[0.027]	[0.009]	[0.009]	[0.009]
Post	−0.033	−0.015	−0.015	−0.015
	[0.029]	[0.013]	[0.013]	[0.013]
Foundation	−0.063	−0.010	−0.010	−0.010
	[0.092]	[0.015]	[0.015]	[0.015]
Coefficient equality (*F*-test)		3.500*	1.800	11.140***
		(.061)	(.179)	(.001)
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^2	.082	.082	.082	.083

Note. Each column in Panels A and B reports the coefficients from a Tobit regression. In Panel A, *Succession tax burden* is based on the market value of equity. In Panel B, *Succession tax burden* is based on the book value of equity. Each column in Panel C reports the coefficients from an ordinary least squares (OLS) regression. Standard errors are clustered at the business group level and reported in square brackets under the coefficient estimates. Coefficient equality reports *F*-statistics for the coefficients of the decomposed variables, with *p*-values in parentheses. In Columns 2–4, all explanatory variables are standardized so that their point estimates represent the economic magnitude of their effects. Controls include *Log of total assets* (in millions of KRW), *Leverage ratio*, and *Number of group affiliates*. All estimates in Panels A and C include industry (Standard Industrial Classification [SIC] two-digit code) and year indicator variables. All estimates in Panel B include firm and year indicator variables. Variables are defined in Appendix A.

(0.973 = −14.793/15.206) when the firm is owned by a private foundation. The interaction effect is significant at the 1% level.

In Columns 2–4 of Panel A in Table 6, I repeat the same conditional analysis as in Columns 2–4 of Table 5. The RHS variable, *High succession tax burden × Post × Foundation*, is now split into two parts using the following dummy variables: (a) *High centrality* versus *Low centrality*, (B) *Upper layer of pyramid* versus *Lower layer of pyramid*, and (c) *Loop* versus *No loop*. All explanatory variables are standardized to have a mean of 0 and a standard deviation of 1 so that their point

estimates directly represent their economic significance. The results of tests for centrality, layer position, and loop confirm the findings in Tables 4 and 5. An intragroup merger is less likely to occur in central firms that are located in the upper layer of the pyramid in circular ownership chains if the marginal benefit of tax avoidance decreases. In Column 2 of Panel A in Table 6, the effect of *High succession tax burden × Post × Foundation × High centrality* (−1.442) is significant at the 1% level, and its economic magnitude is more than twice (2.2 = −1.4421/−0.643) as large as *High succession tax burden × Post × Foundation × Low centrality* (F-statistic = 538.100).

In Panel B of Table 6, I repeat the analyses from Column 1 to 4 in Panel A by measuring *High succession tax burden* based on the book value of equity. Other empirical specifications, including firm fixed effects, are the same as in Panel B of Tables 4 and 5. In Panel B of Table 6, the results support the causal evidence that a reduced tax burden via a private foundation decreases intragroup mergers. However, the Tobit model does not capture the treatment effect when we interpret the interaction term in a DiDiD model. In Panel C, I repeat the analyses from Column 1 to 4 in Panel A using an ordinary least squares (OLS) model, and I find results similar to those in Panels A and B. The causal evidence from Tables 5 and 6 highlights that intragroup mergers are primarily intended to avoid inheritance taxes during ownership succession.

4.4 | Target firms

In Table 7, I identify the characteristics of target firms in stock-for-stock intragroup mergers.[26] Heirs in the chair + 1 generation initially cash out corporate resources from their private firms (the targets of intragroup mergers) in which they already have high ownership stakes. They can take advantage of this pecuniary benefit because they have substantial managerial discretion over the dividend policy of the target private firm. Thus, they prefer short-term wealth gains over long-term investment commitments. Eventually, to maximize control, heirs in the chair + 1 generation reallocate their funds to accumulate stakes in other strategically important firms within the business group. This behavior, however, is not necessarily expected for male relatives in the current chair's generation who have already accumulated shares in those key firms.

Panel A of Table 7 provides results of the analysis of private target firms. The ownership stake and managerial discretion over dividend policy are measured by the fraction of ownership held by members of the current chair + 1 generation (C + 1) or the current chair's generation (C) (Columns 1 and 2) and the 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 research and development (R&D) ratio (Column 5) as a proxy for long-term investment commitments. I create an indicator for target private firms and test whether heirs pursue short-term pecuniary benefits in those private firms. Based on an OLS regression, other empirical specifications are the same as in the previous regression analyses.

Columns 1 and 3 of Panel A in Table 7 show that target private firms have a positive correlation with the family ownership fraction in the current chair + 1 generation (9.749) and voting rights (8.853), and those estimates are significant at the 5% level. However, in Column 2, I find a negative, insignificant point estimate (−6.503) for the ownership fraction in the current chair's generation. In Columns 4 and 5, target private firms have a positive point estimate (7.034) with the dividend payout ratio but a negative point estimate (−12.080) with the long-term R&D ratio. Those estimates are statistically significant at the 10% and 1% levels, respectively. This result implies that in target private firms where the current chair + 1 generation's ownership (on average 9.7% higher than the other chaebol firms) and voting rights (on average 8.9% higher than the other firms) are highly concentrated, dividends are 7.0% higher than the dividends of other chaebol firms. Heirs also avoid long-term investment commitments when an intragroup merger is anticipated.

However, the results for private target firms might not necessarily be echoed in public target firms, where there is relatively strong governance and protection for minority shareholders. In Panel B of Table 7, I conduct a falsification test for verification by investigating public target firms. I do not find results similar to those in Panel A. Together, the

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[26] Among the 42 target firms of stock-for-stock intragroup mergers, 24 are private and 18 are public.

TABLE 7 Characteristics of target firms

	Dependent variable				
Variables	Total fraction of ownership held by current chair + 1 generation (×100) (1)	Total fraction of ownership held by current chair generation (×100) (2)	Voting rights (×100) (3)	Payout ratio (×100) (4)	Long-term R&D ratio (×100) (5)
Panel A. Private target					
Private target firm	9.749**	−6.503	8.853**	7.034*	−12.080***
	[4.261]	[7.138]	[3.723]	[3.961]	[2.666]
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^2	0.066	0.185	0.357	0.008	0.149
Panel B. Public target					
Public target firm	−1.034	18.210	−15.169***	10.831	23.833*
	[0.630]	[15.587]	[2.547]	[14.945]	[11.623]
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^2	.032	.188	.358	.008	.153

Note. Each column reports coefficients from an ordinary least squares (OLS) regression with heteroskedasticity-robust standard errors. Standard errors are clustered at the business group level. The standard errors are reported in square brackets under the coefficient estimates. *Private target firm* is an indicator that equals 1 if the target firm in a stock-for-stock intragroup merger is not listed on the KOSPI or KOSDAQ exchange, and 0 otherwise. *Public target firm* is an indicator that equals 1 if the target firm in a stock-for-stock intragroup merger is listed on the KOSPI or KOSDAQ exchange, and 0 otherwise. Among the 42 target firms in stock-for-stock intragroup mergers, 24 are private firms and 18 are public firms. Controls include *Log of total assets* (in millions of KRW), *Leverage ratio*, and *Number of group affiliates*. All estimates include industry (Standard Industrial Classification [SIC] two-digit code) and year indicator variables.
***Significant at the 0.01 level.
**Significant at the 0.05 level.
*Significant at the 0.10 level.

results in Table 7 and previous tables show that intragroup mergers help heirs consolidate control by reallocating their ownership to central firms from private target firms.

4.5 | Returns on intragroup merger announcements

Finally, I provide evidence of tunneling by examining the stock market's response to stock-for-stock intragroup merger announcements during the sample period. If an intragroup merger is intended only to meet the controlling family's need to increase heirs' ownership stake without paying the inheritance tax, the acquiring firm's investors will grow frustrated with the negative synergy gains and consequent losses from the merger. Minority shareholders will exit their stocks upon the announcement of a tax-motivated intragroup merger with no synergy value and sustained losses, whereas the controlling family reaps the profits.

The merger data I use to test the financial market's response to an intragroup merger are based on the announcement of the first merger that occurs in a firm in a given year. The event date is the day a firm initially announces an

intragroup 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 identify the abnormal returns by subtracting alpha plus beta times the market return from daily stock returns. Panel A of Table 8 reports the results of the univariate analysis, providing median merger event CARs for various subsamples. In parentheses, I report the *p*-values for a signed-rank test for the medians of the full sample and of the postcrisis subsample. Thus, in the postcrisis subsample, I exclude 1997–1998 to avoid the recession triggered by the Asian financial crisis.

In Column 4 of Table 8 for the postcrisis subsample, *CAR[0, 1]* reports the mean CAR for the event day and the following day. The point estimates of *Stock-for-stock intragroup merger* and *Non-intragroup merger* are −1.746 and −1.182 and are significant at the 5% and 10% levels, respectively. This result indicates that in response to the announcement of a stock-for-stock intragroup merger, the 2-day CAR, *CAR[0, 1]*, drops 32.3% more than it does in response to the announcement of a non-intragroup merger. The difference test reports that the difference in *CAR[0, 1]* between *Stock-for-stock intragroup merger* and *Non-intragroup merger* is −0.564, which is significant at the 10% level. Overall, the results suggest that minority shareholder losses are significant in tax-motivated intragroup mergers. The 4-day CAR, *CAR[0, 3]*, drops 52.8% more than the average for total mergers, and this trend weakens afterward. Results for the full sample are similar to the postcrisis sample, but negative and significant results are found only for stock-for-stock intragroup mergers.

Panel B of Table 8 reports the results of a multivariate analysis of 41 firm-year observations in which stock-for-stock intragroup mergers are initiated. To further test whether CARs are more negative for mergers aimed at reducing inheritance taxes, I create an indicator, *High chairman age*, which equals 1 if the age of a controlling shareholder is higher than average for all chaebol groups, and 0 otherwise. Based on an OLS regression, other empirical specifications are the same as in the previous regression analyses. In Columns 1–3, I find that high chairman age has a negative correlation with the variables *CAR[0, 1]*, *CAR[0, 2]*, and *CAR[0, 3]* (−3.147, −3.550, and −4.693, respectively), significant at the 1% level. These results indicate that in response to the announcement of a stock-for-stock intragroup merger, the 2-day CAR of firms with high chairman age drops on average 3.15% points more than that of firms with low chairman age. This result is economically significant considering the 2-day event window. However, certain unobservable unique firm characteristics may be correlated with firm value, that is, CARs. In Columns 4–6, I repeat the analyses from Column 1 to 3 by including the firm fixed effect. I find similar significant results.

The results in Table 8 show that minority shareholders sustain losses from intragroup mergers with few operational synergies, particularly when the controlling family aims to avoid inheritance tax through these mergers. Overall, these findings offer new evidence for the tunneling hypothesis.

4.6 | Robustness test: Alternative period

One important concern is the implication of the Asian financial crisis, which led to a sudden shrinkage in Korea's capital market[27] and postcrisis restructuring. The KOSPI Index, after dropping to one third of its precrisis level, was still recovering until early 1999, when the average personal inheritance tax burden was reduced. If a chaebol heir suddenly inherited the ownership of a business group during the Asian financial crisis, at a time when the inheritance tax burden was reduced, an intragroup merger was less likely to occur. Also, during the Asian financial crisis, the market responses of individual firms to this macroeconomic shock may have varied greatly. To alleviate this concern, in Columns 1–3 of Table 9, I rerun my baseline analyses from the first columns of Tables 4 and 5, and 6, 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 did not lead to a pattern of decreasing intragroup mergers during the pretax-reform period.

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

TABLE 8 Intragroup merger announcement returns

Variables	Dependent variable					
	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. Univariate analysis						
Full sample						
Stock-for-stock intragroup mergers (A)	0.898	−0.152	0.736	−1.398	−1.893**	−3.012**
	(.380)	(.926)	(.525)	(.121)	(.025)	(.019)
Non-intragroup mergers (B)	−0.575	−0.128	0.063	−0.399	−0.783	−0.927
	(.743)	(.495)	(.786)	(.523)	(.472)	(.578)
Total mergers	−0.183	−0.091	0.406	−0.394	−0.796	−1.066
	(.838)	(.813)	(.596)	(.587)	(.140)	(.122)
Difference (A−B)	1.473	−0.024	0.673	−0.999	−1.109	−2.085*
	(.322)	(.511)	(.618)	(.290)	(.259)	(.073)
Post Asian crisis						
Stock-for-stock intragroup mergers (A)	0.682	−0.426	−0.602	−1.746**	−1.539**	−2.796**
	(.740)	(.478)	(.391)	(.011)	(.025)	(.017)
Non-intragroup mergers (B)	−0.519	−0.334	−0.199*	−1.182*	−0.999	−1.457
	(.288)	(.160)	(.053)	(.069)	(.186)	(.127)
Total mergers	−0.271	−0.238	−0.001	−1.334**	−1.202**	−1.830***
	(.413)	(.185)	(.106)	(.011)	(.025)	(.006)
Difference (A−B)	1.201	−0.092	−0.403	−0.564*	−0.540	−1.339
	(.542)	(.652)	(.772)	(.068)	(.315)	(.167)
Panel B. Multivariate analysis						
High chairman age (indicator)	−3.147***	−3.550***	−4.693***	−0.036	−5.437**	−5.155*
	[1.180]	[1.316]	[1.706]	[2.553]	[2.496]	[2.999]
Industry fixed effect	Yes	Yes	Yes	No	No	No
Firm fixed effect	No	No	No	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	41	41	41	41	41	41
R^2	.492	.502	.463	.667	.749	.757

Note. Each column reports the median of merger event cumulative abnormal returns (CARs) expressed in percentage terms for given subsamples. Panel A reports the results of univariate analysis. In Panel A, *p*-values for a simple signed-rank test (against a null hypothesis of zero median) are reported in parentheses under the coefficient estimates for stock-for-stock intragroup mergers, non-intragroup mergers, and total mergers. Difference reports the difference in CARs between coefficients of stock-for-stock intragroup mergers and non-intragroup mergers, with *p*-values in parentheses. Panel B reports the results of multivariate analysis. In Panel B, the sample consists of 41 firm-year observations that initiated the stock-for-stock intragroup mergers. Each column reports coefficients from an ordinary least squares (OLS) regression with heteroskedasticity-robust standard errors. Standard errors are clustered at the business group level. The standard errors are reported in square brackets under the coefficient estimates. Controls include *Log of total assets* (in millions of KRW), *Leverage ratio*, and *Number of group affiliates*. All estimates in Columns 1–3 of Panel B include industry (Standard Industrial Classification [SIC] two-digit code) and year indicator variables. All estimates in Columns 4–6 of Panel B include firm and year indicator variables. In Panels A and B, for each event the CAR is calculated over the trading window using a market model. First, returns are regressed 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 intragroup merger. I include only the first announcement if a firm has multiple intragroup mergers in a given year. For example, the dependent variable *CAR[0, 1]* reports CAR information for the event day and following day.

***Significant at the 0.01 level.
**Significant at the 0.05 level.
*Significant at the 0.10 level.

TABLE 9 Robustness test: Alternative period

	Dependent variable: *Number of stock-for-stock intragroup mergers*				
	Market shrinkage			Restructuring effect	
Variables	(1)	(2)	(3)	(4)	(5)
Panel A. Alternative periods					
Succession tax burden	0.443***				
	[0.002]				
High succession tax burden × Post		0.529***	14.550***		2.144***
		[0.115]	[0.255]		[0.052]
High succession tax burden × Post × Foundation			−14.467***		
			[0.213]		
High succession tax burden × Post × Early post				0.235***	
				[0.014]	
High succession tax burden × Post × Late Post				0.310***	
				[0.037]	
High succession tax burden × Post × Foundation × Early post					−1.909***
					[0.018]
High succession tax burden × Post × Foundation × Late post					−2.326***
					[0.045]
High succession tax burden × Foundation			13.049***		3.754***
			[0.279]		[0.065]
Post × Foundation			−0.309***		3.868***
			[0.118]		[0.116]
High succession tax burden		−1.817***	1.130***	−1.882***	−4.561***
		[0.113]	[0.125]	[0.065]	[0.147]
Post		1.398***	−1.513***	0.016	−2.201***
		[0.181]	[0.120]	[0.052]	[0.058]
Foundation			−11.847***		−2.257***
			[0.242]		[0.067]
Coefficient equality (*F*-test)				8.090***	216.790***
				(.005)	(.000)
Industry fixed effect	Yes	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes
Observations	2,089	2,089	2,089	2,338	2,338
Panel B. Robustness check					
Succession tax burden	0.035***			0.037***	
	[0.002]			[0.003]	
High succession tax burden × Post		0.982***	15.180***	1.219***	15.479***
		[0.127]	[0.209]	[0.124]	[0.231]

(Continues)

TABLE 9 (Continued)

Variables	Market shrinkage			Restructuring effect		
	(1)	(2)	(3)	(4)	(5)	
Panel B. Robustness check						
High succession tax burden × Post × Foundation			−15.095***			−14.994***
			[0.239]			[0.254]
High succession tax burden × Foundation			13.251***			14.639***
			[0.218]			[0.241]
Post × Foundation			0.288***			0.167
			[0.119]			[0.107]
High succession tax burden			0.837***			−0.340***
			[0.117]			[0.115]
Post		0.499***	0.451***		−0.929***	−1.036***
		[0.116]	[0.125]		[0.100]	[0.108]
Foundation		1.208***	−12.159***		0.333**	−13.663***
		[0.153]	[0.204]		[0.162]	[0.230]
Industry fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effect	No	No	No	Yes	Yes	Yes
KOSPI Index	Yes	Yes	Yes	No	No	No
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Additional control	No	No	No	Yes	Yes	Yes
Observations	2,422	2,422	2,422	1,667	1,667	1,667

Note. In Columns 1–3 of Panel A, I exclude 1997–1998 to avoid the effects of sudden market shrinkage during the Asian financial crisis. In Columns 4 and 5, I exclude all mergers initiated by firms that are not owned by the current chair generation to test the postcrisis restructuring effect. In Columns 1–3 of Panel B, I replace year fixed effect with annual average KOSPI Index. In Columns 4–6 of Panel B, regressions include additional controls: controlling shareholder's cash-flow rights, voting rights, Tobin's *q*, return on assets, and private target indicator. Each column in Panels A and B reports the coefficients from a Tobit regression. Errors are clustered at the business group level and reported in square brackets under the coefficient estimates. Controls include *Log of total assets* (in millions of KRW), *Leverage ratio*, and *Number of group affiliates*. All estimates include industry (Standard Industrial Classification [SIC] two-digit code) and year indicator variables. Variables are defined in Appendix A.
***Significant at the 0.01 level.
**Significant at the 0.05 level.

Another important concern is the postcrisis restructuring effect. Because the postcrisis period (1999–2001),[28] when restructuring efforts were active, overlapped with the posttax-reform period (2000–2004), these confounding factors may have affected my results. If the rise in intragroup mergers during the posttax-reform period is mainly driven by business group restructuring, the restructuring effect should be stronger in the early posttax-reform period (2000–2001) than in the later period (2002–2004). To distinguish between the effect of business restructuring and the inheritance tax burden on intragroup mergers, in Columns 4 and 5 of Table 9, I split the *Post* dummy into two parts: *Early post* (2000–2001) versus *Late post* (2002–2004). All explanatory variables are standardized to have a mean of 0 and a standard deviation of 1, so that their point estimates directly represent their economic significance. In Column 4 of Panel A, the effect of *High inheritance tax burden × Post × Late post* (0.310) is significant at the 1% level, and its economic

[28]After the first repayment of the IMF 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.

magnitude is significantly larger than *High inheritance tax burden × Post × Early post* (*F*-statistic = 8.090). Column 5 shows a result similar to the DiDiD estimations. The results are robust to potential confounding factors, suggesting that the postcrisis restructuring efforts were not focused on mergers among group affiliates.

In Panel B of Table 9, I conduct an additional robustness check. To further isolate the succession tax effect from the financial-crisis-induced effect, in Columns 1–3, I replace year fixed effects with the annual average KOSPI Index. To alleviate the omitted variable bias concern, in Columns 4–6, the regression includes additional controls: firm ownership structure (controlling shareholders' cash-flow rights and voting rights), growth opportunities (Tobin's *q*), performance (return on assets), and merger-specific characteristics (private target indicator). All results are consistent with the baseline results.

5 | CONCLUSION

Transfer of control is an important issue in any organization. In this article, I identify a novel way family firms transfer control to heirs. Specifically, I find that they use intragroup mergers to transfer control while avoiding inheritance taxes. Thus, intragroup mergers reshape firm boundaries: high-tax-burden firms initiate intragroup mergers after the tax reform in Korea because the tax-saving benefits from increased boundaries exceed relevant transaction costs. The major costs of undergoing intragroup mergers are the negative market response to tax-motivated intragroup mergers and the resulting distortions in ownership structure among group affiliates.

Although the heirs of controlling families benefit from personal tax savings, minority shareholders suffer losses from these tax-motivated intragroup mergers, which create few operating synergies. The literature shows that controlling families in business groups use both investment and financing decisions to siphon resources out of member firms for their private benefit (Bae et al., 2002; Baek, Kang, & Lee, 2006; Bertrand et al., 2002). My findings suggest that intragroup mergers are an additional way family owners avoid heavy inheritance taxes, supporting the tunneling view of business groups.

My work raises important questions about the best tax policies for reducing the costs of tax-minimizing succession vehicles. Because the shock from a personal inheritance tax distorts the ownership structure among affiliates, business groups with distorted ownership may be more vulnerable to business and operational risks. Identifying the costs of distortions that result from a personal tax shock on the ownership structure of family firms is an important area for future research.

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APPENDIX A: VARIABLE DEFINITIONS

Variables related to succession taxes

Succession tax burden: Maximum expected tax payment if the ownership of the current chair's generation is inherited by the next generation in a corresponding year, calculated as *Ownership fraction of current chair generation × Total equity value × Tax rate* (in 10 billion KRW).

Total equity value: 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: Sum of the inheritance tax rate and business premium tax rate imposed on the largest shareholders. The inheritance tax law in Korea imposes higher taxes for shares with management rights.

Pre: Year dummy that equals 1 before the tax reform (1997–1999), and 0 otherwise.

Post: Year dummy that equals 1 after the tax reform (2000–2004), and 0 otherwise.

Early post: Year dummy that equals 1 for the first 2 years after the tax reform (2000–2001), and 0 otherwise.

Late post: Year dummy that has a value of 1 for the 3 years following the early postperiod (2002-2004), and 0 otherwise.

Foundation: Indicator that equals 1 if a firm is owned by a private foundation, and 0 otherwise.

Firm characteristics variables

Number of stock-for-stock intragroup mergers: Total number of mergers and acquisitions between two affiliates in a business group in a given year after excluding cash mergers.

Stock-for-stock intragroup merger transactions: Total amount of M&A transactions in millions of USD between two affiliates in a business group in a given year after excluding cash mergers.

Number of total mergers: Total number of M&A transactions in a given year.

Total merger transactions: Total amount of M&A transactions in millions of USD in a given year.

Log of total assets: Logarithm of total assets of each firm in millions of KRW.

Log of sales: Logarithm of total sales of each firm in millions of KRW.

Leverage ratio: Debt ratio, calculated as total debt divided by total equity.

ROA: Ratio of earnings before interest and tax (EBIT) divided by total assets.

Payout ratio: Ratio of a firm's net dividends paid divided by its net income.

Long-term R&D ratio: Ratio of a firm's long-term R&D investment divided by its total R&D investment. Long-term R&D expenses include only 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: Indicator variable that equals 1 if a firm is listed on the KOSPI or KOSDAQ exchange, and 0 otherwise.

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

Number of group affiliates: Total number of firms that are controlled by a controlling owner within a business group.

Ownership structure variables

Centrality: 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 they are connected to many other member firms in the ownership network. See Almeida et al. (2012) for more details on ownership metrics.

High centrality: Indicator that equals 1 if a firm's centrality is greater than the average of all chaebol firms, and 0 otherwise.

Low centrality: Indicator that equals 1 if a firm's centrality is lower than the average of all chaebol firms, and 0 otherwise.

Position: Distance between the controlling family and a firm in the group. A value of 1 indicates that the firm is directly controlled by the founding family. In a simple pyramid structure with two firms, firm *i* in the upper layer (Chain 1) has a position value of 1, and firm *j* in the lower layer (Chain 2) has a position value of 2. In this case, the position of firm *i* can be measured by the weighted average of Chains 1 and 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, whereas indirectly owned affiliates have a high position value. See Almeida et al. (2012) for more details on ownership metrics.

Upper layer of pyramid: Indicator that equals 1 if a firm's position is less than the average of all chaebol firms, and 0 otherwise.

Lower layer of pyramid: Indicator that equals 1 if a firm's position is greater than or equal to the average of all chaebol firms, and 0 otherwise.

Loop: Indicator that equals 1 if a firm is in a circular ownership chain, and 0 otherwise.

No loop: Indicator that equals 1 if a firm is not in a circular ownership chain, and 0 otherwise.

Cash-flow rights: Sum of direct and indirect equity ownership held by the founding family after excluding treasury stocks and cross-shareholdings.

Voting rights: 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 nonprofit organizations.

Discrepancy: Difference between cash-flow rights and voting rights.

Family involvement variables

(Current chair's generation)

Total number of members with ownership: 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, married female] family members with ownership: Total number of male [female, married male, 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: 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, married female] family members: Ratio of ownership held by male [female, married male, 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, daughters-in-law] with ownership: Total number of sons [daughters, sons-in-law, 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: 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, daughters-in-law]: Ratio of ownership held by sons [daughters, sons-in-law, daughters-in-law] of the current chair and the chair's siblings divided by the entire ownership held by family members.

High chairman age: Indicator that equals 1 if the age of a controlling shareholder of a business group is higher than the average age of all the chaebol groups, and 0 otherwise.

APPENDIX B: MERGER BETWEEN CHEIL INDUSTRIES AND SAMSUNG C&T

Figure B1 shows how the intragroup 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
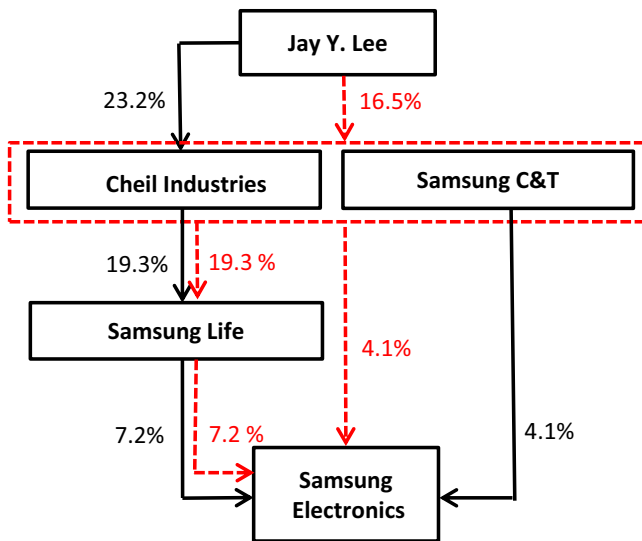
FIGURE B1   Merger between Cheil Industries and Samsung C&T [Color figure can be viewed at wileyonlinelibrary.com]
Note. This figure shows how the intragroup merger of two Samsung affiliates, Cheil Industries and Samsung C&T, increases Jay Y. Lee's control over Samsung Electronics, the conglomerate's flagship unit, through indirect stake holdings without Lee ever paying inheritance tax. The solid lines represent the premerger ownership flow, and the dotted lines represent the postmerger ownership flow. The dotted box represents the new firm created from the intragroup merger. This figure originates from the *Wall Street Journal* (May 26, 2015)

Lee ever paying inheritance tax. The solid lines represent the premerger ownership flow, and the dotted lines represent the postmerger ownership flow. The dotted box represents the new firm created from the intragroup merger. This figure originates from the *Wall Street Journal.*[29]

An anecdote describing an intragroup merger within the Samsung Group illustrates how intragroup 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 firm, creating a new company with annual revenue of 31 billion USD. Before the merger, the heir apparent, Lee, controlled Samsung Electronics, the group's crown jewel, mainly through Cheil Industries, in which he held a 23.2% stake.[30] 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 intragroup merger, Lee became the largest shareholder in the newly created company, with a 16.5% stake. This merger allowed Lee to achieve an 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. Instead of an intragroup merger, if Lee had tried to inherit his father's ownership stake in Samsung Electronics directly, he would have had to pay 2.8 billion USD (=$165 billion USD [market value of Samsung Electronics at the end of 2014] × 3.4% [Lee's share] × 50% [inheritance tax rate]) in inheritance tax.

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[29]Min-Jeong Lee and Jonathan Cheng, "Samsung Heir Apparent Jay Y Consolidates Power with Merger," *Wall Street Journal* (May 26, 2015), https://www.wsj.com/articles/samsung-heir-apparent-consolidates-power-with-merger-of-two-major-firms-1432603589.

[30]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.

APPENDIX C: INHERITANCE TAX AVOIDANCE THROUGH INTRAGROUP MERGER IN PYRAMIDS

Figure C1 shows examples of inheritance tax avoidance through stock-for-stock intragroup mergers in pyramidal business groups. The solid arrows represent the ownership flow of a business group, and the dotted arrows represent the newly created postmerger ownership flow. The dotted box represents the new firm created from the intragroup merger. This figure, describing the pyramid structure, originates from Almeida et al. (2012).

In Figure C1, 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
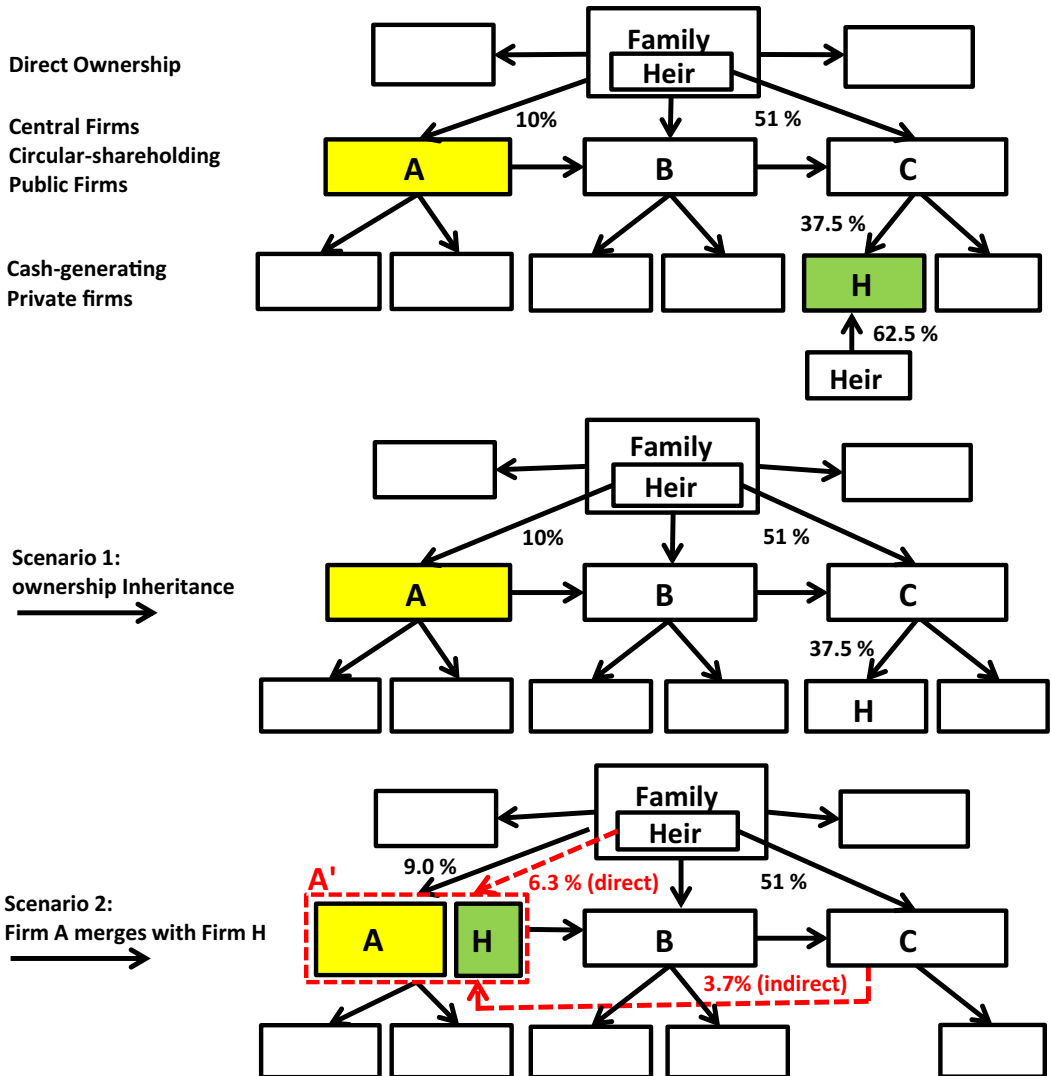

FIGURE C1 Inheritance tax avoidance through intragroup merger in pyramids [Color figure can be viewed at wileyonlinelibrary.com]

Note. This figure shows examples of inheritance tax avoidance through stock-for-stock intragroup mergers in pyramidal business groups. The solid arrows represent the ownership flow of a business group, and the dotted arrows represent the newly created postmerger ownership flow. The dotted box represents the new firm created from the intragroup merger. This figure, describing the pyramid structure, originates from Almeida et al. (2012).

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 $\times$ 10% $\times$ 70%) by selling his/her 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 $\times$ 62.5%/$1.112 billion $\times$ 100) is directly owned and 3.7% ($112 million $\times$ 37.5%/$1.112 billion $\times$ 100) is an indirect ownership stake through Firm C. Firm H does not exist anymore, but the heir consolidates his/her power through additional circular shareholding (A′→B→C→A′), and the controlling family maintains a 9% ownership stake ($1 billion $\times$ 10% /$1.112 billion $\times$ 100) in Firm A′. The heir who already has enough shares to control the entire business group avoids inheritance taxes because he/she does not need to inherit the 9% remaining ownership. The controlling family also benefits when they sell their remaining equity because of the different tax rates between the capital gains tax rate and the inheritance tax rate.