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How inheritance law affects family firm performance: Evidence from a natural experiment

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ABSTRACT

We argue that changes in the inheritance system affect incentives leading to sibling rivalry among descendants and therefore have a material impact on family firm performance. Using South Korea's 1991 inheritance law reform that stipulates the equal distribution of a deceased person's property to descendants, we find that the performance and operating growth rate in family firms show significant enhancement compared with those of nonfamily firms. Moreover, the positive effects are greater for family firms that undergo a business succession with multiple sons and married daughters. Overall, our results suggest that changing to equal bequests of inheritance has a positive effect on firm value by providing better-aligned incentives to heirs in family firms. We conclude our paper by discussing the implications of our findings for current generations in family firms.

1. Introduction

Family firms are significant worldwide and comprise a large portion of the global economy. La Porta et al., 1999 document that one-third of publicly listed international firms are controlled by families. One of the features that distinguishes family firms from nonfamily firms is continuity. In other words, family firms ensure continuity of management and ownership by succeeding generations, which makes them legally subject to inheritance law. However, only 30% of family firms survive until the second generation, while 12% survive into a third generation.[1] Due to this low survival rate of family firms through generations, family firm's performance around the succession period has garnered attention in recent literature. One of the concerns is that sibling rivalry undermines firm performance during the succession period (Bertrand and Schoar, 2006, Bertrand et al., 2008). Additionally, the descendants selected as heirs tend to underperform because they are more likely to be less talented than their founders or professional CEOs.[2] Despite the firm's performance around the succession process being studied from many angles, detailed evidence that can link inheritance law and family firm performance is missing in the literature. Our research tries to fill this gap by studying the impact of inheritance law on family firm's performance and growth.

Particularly, we examine how changes in inheritance law would affect the operating growth rate and profitability of family firms. To identify a causal relationship of inheritance law and firm performance, we exploit South Korea's 1991 inheritance law reform that mandated an equal distribution of the family estate to all descendants regardless of their birth order, gender, or marital status. We

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

[2] Literature shows that nepotism hurts family firm's performance after business successions (Smith and Amoako-Adu, 1999, Anderson et al., 2003, Burkart et al., 2003, Bertrand and Schoar, 2006, Pérez-González, 2006, Villalonga and Amit, 2006, Bennedsen et al., 2007, Bloom and Van Reenen, 2007, Caselli and Gennaioli, 2013).

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note that inheritance law might be highly correlated with the severity of sibling rivalry stemming from the succession environment, whereas it could determine the incentives for sibling competition. We hypothesize that changes in inheritance law that mandate the bequeathal of a minimal stake to the noncontrolling heirs could mitigate sibling rivalry.

Using a sample of 2050 firms in the 30 largest South Korean business groups in the period from 1983 to 2000 and employing a difference-in-differences (DiD) approach, we find economically significant evidence that the 1991 inheritance law reform in South Korea is positively related to the growth and performance of family firms. More specifically, we observe that, in the wake of the regulatory reform in inheritance law with an equal distribution to all descendants, family firms record a 20.0-percentage-point higher sales growth rate, 218.9-percentage-point higher operating income growth rate, and 2.9-percentage-point higher ROA than non-family firms. Our findings are significant in both univariate and multivariate level DiD and robust to alternative time periods, excluding the 1997–1998 Asian financial crisis.

To further verify the positive causal linkage between the change in inheritance law and firm growth and performance, we utilize a difference-in-difference-in-differences (DiDiD) estimation with the succession timing and family composition.[3] The results confirm that the 1991 inheritance reform results in a higher operating growth rate and profitability in family firms, particularly for family firms that undertook business succession after the inheritance law reform. We also check that change in leadership to next-generation descendants does not derive this result. In addition, we find that the effect of the legal reform is greater for firms with multiple sons and married daughters, but not significant for firms with only single daughters, implying that the diminished sibling rivalry is the primary cause of the improved performance.[4] We further conduct a falsification test for verification by investigating half-brothers, who are immune to inheritance law changes. Overall, the results highlight the significance of the 1991 inheritance law reform in setting a legal environment where an equal distribution of a family estate among descendants reduces incentives for sibling rivalry, thereby allowing family firms to focus on growth and higher profitability.

This paper is related to several lines of the literature. First, our work contributes to the vast literature on the performance of family firms worldwide. Researchers have reported heterogeneity in the performance of family firms in different countries. Anderson and Reeb (2003) find stronger performance in family firms than in nonfamily firms from the Standard & Poor's 500 firms in the United States. Maury (2006) and Sraer and Thesmar (2007) report the high profitability of family firms in European countries, while Cronqvist and Cronqvist and Nilsson (2003) derive the opposite results from a sample of Swedish family firms. Family firms' performance varies not only among developed markets but also emerging markets. For example, family firms perform better than nonfamily firms in India, Indonesia, and Taiwan, but worse in Argentina (Khanna and Palepu, 2000; Khanna and Rivkin, 2001). Our results from South Korean family firms suggest that their performance can vary *within* a jurisdiction when the legal environment changes. In our sample, family firms underperform more than nonfamily firms before the 1991 inheritance law reform but outperform them after the reform. These results indicate that the performance of family firms can be improved if the firms are provided with adequate incentives.

This paper also adds value to the literature on family firm performance regarding the institutional changes in succession. Tsoutsoura (2015) empirically shows that low-succession taxes harm the performance of family firms because the owners are likely to transfer the companies to their heirs rather than hire professional managers. Yeh and Liao (2019) also examine the performance of family firms in Taiwan after the reduction of the succession tax rate. Ellul et al. (2010) propose the strictness of inheritance law as another factor that shapes the performance of family firms around successions. Noncontrolling heirs may divert cash flows from firms under the inheritance law to force an equal distribution. Our work contributes to the literature by highlighting the positive side of the equal inheritance, in contrast to Ellul et al. (2010) who focus on its adverse impacts. Inheritance law demanding an equal distribution among sons and daughters improves family firm performance by reducing incentives for sibling rivalry.

This paper is also in line with law and finance literature. Since La Porta et al., 1998 published their seminal paper, researchers have examined how different legal systems around the world may characterize multitudinous environments in corporate financing and governance in different countries. Efficient legal systems foster external financing for the growth of firms (Demirgüç-Kunt and Maksimovic, 1998). For example, the protection of property rights enables the growth of firms by encouraging their investment (Johnson et al., 2002; Claessens and Laeven, 2003). The deregulation in the financial sector promotes financing to firms that rely on external financing and thus leads to firm growth (Jayaratne and Strahan, 1996; Bertrand et al., 2007). Strengthened securities law facilitates the performance of firms by ensuring investor protection (Agrawal, 2013; Atanasov, Black, Ciccotello, and Gyoshev, 2010). Pension system reform created large institutional investors, enhancing the market value of public companies through effective governance (Giannetti and Laeven, 2008). Our work contributes to the literature by revealing that the protection of noncontrolling heirs' rights in management improves the governance of family firms.

This paper is organized as follows. Section II introduces the institutional background on changes in South Korea's inheritance law and develops testable hypotheses. Section III contains a description of the data and sample summary statistics. Section IV discusses the main results, placebo tests, and robustness tests. Section V concludes the paper.

[3] Technically, we divide our DiD estimates into two parts to isolate any common effects of the 1991 inheritance law reform within family firms.

[4] Before the 1991 reform in South Korea, the succession followed rules similar to agnatic primogeniture. Only the selected son, most often the eldest one, took over the entire business group. The sons with weaker claims had a motivation for sibling rivalry to win their elder brother, while daughters were excluded from the succession. However, the husbands of married daughters might influence the succession in family firms indirectly. For example, competent sons-in-laws participating in the firm management were likely to influence and stimulate sons in succession competition by raising the bar for a potential successor. Evidence from Japan supports this conjecture (Mehrotra et al., 2013).

2. Institutional background and hypothesis development

As of January 1991, South Korea's new inheritance law took effect. This law stipulates an equal distribution of a family estate to all descendants regardless of gender, birth order, or marital status. While the new law encourages a fair distribution, it does not require an even distribution by each category (e.g., controlling shares, cash, etc.). That is, if one heir inherits more controlling shares, other heirs may be compensated through in-kind monetary compensation. An example of asset compensation is the spinning off of noncore businesses to daughters. For example, the Shinsegae and Hansol groups are leading examples of business groups led by the daughters of the Samsung family.[5]

The Korean inheritance system has gradually changed from the primogeniture to equal inheritance regardless of gender and seniority. Table 1 shows the major changes in Korean inheritance law over time. First legislated in 1950, when the patriarchal Family Head System was in place, the eldest son was entitled to the entire family estate, with his wife eligible for the inheritance through family-head succession in the case of his absence. After 1961, the law was amended to bequeath specific proportions of the estate to each family member: 1.5 to the eldest son, 1 to other sons, 0.5 to unmarried daughters, and 0.25 to married daughters. The law still preferred sons to daughters and unmarried to married daughters, as the unmarried daughters would remain on the deceased father's family registry. In 1978, the law was again revised to adjust the proportion to be claimed by unmarried daughters to the same level as their brothers, so that 1.5 went to the eldest son, 1 to the remaining sons, 1 to unmarried daughters, and 0.25 to married daughters.[6] However, over time, opposition to the amendment grew due to a societal shift of gender equality norms, forcing the government to find a more equitable system of distributing a family's estate, resulting in the current inheritance law, which was announced in January 1990 and took effect in January 1991; it requires an equal distribution of a family estate among all children regardless of their gender, birth order, or marital status.

How does this new inheritance law affect a family firm's growth and performance? To answer this question, we need to ascertain how the legal reform on inheritance affects incentives toward sibling rivalry. We argue that an equal distribution among descendants will affect incentives by mitigating the severity of sibling rivalry for taking larger shares, which would ultimately lead to an increase in a family firm's value, growth, or performance.

According to inheritance law, descendants are required to inherit only the designated shares of total bequests from their parents. Hence, to receive larger shares than required by inheritance law, descendants should guarantee additional fractions of the family estate (for example, controlling shares of the entire family business) before inheritance occurs. In Korean culture, sibling rivalry primarily involves males who are direct bloodline heirs, with a strict preference for the eldest sons who are legally required to inherit the most shares. Accordingly, sons who are not the eldest and are legally required to inherit fewer shares are motivated to engage in a fierce succession battle because only the selected successor would have all the control over the entire family business, which was the origin of sibling rivalry before the inheritance law reform took effect in 1991.

Prior to an owner's death, their descendants—as potential successors to the owners—usually assume crucial roles in the firm's management. For this reason, severe rivalry among descendants would negatively affect firm value by causing unnecessary internal troubles or inefficiencies inside the firm (Bertrand and Schoar, 2006; Davis and Harveston, 2001). If family estates are unequally distributed, descendants who are required to receive smaller shares have incentives to fiercely compete to receive a larger portion of the fortune before their inheritance. Those descendants who lose the competition inherit only a small fraction of the remaining fortune, while those who win the inter-sibling competition can inherit much larger shares of family estates. As long as the descendants can guarantee sufficiently large incremental increases in their expected payoffs as a result of winning the competition, those descendants are willing to compete fiercely with their siblings even if the competition greatly damages firm values. This is because incremental increases in descendants' expected payoffs can fully compensate for the deteriorated firm values. Thus, when the unequal distribution of inheritance is adopted, we observe the misalignment of incentives between the firm's existing owner and the descendants who are meant to receive small shares of the remaining bequests.

However, if the equal distribution is employed in inheritance, incremental increases in descendants' expected payoffs as a result of winning the sibling competition will be limited for the non-eldest descendants. An equal distribution ensures that each descendant is guaranteed at least an equal fraction of the remaining stakes, even without winning the competition, although winners can still obtain larger shares of family estates before their inheritance. Because severe sibling competition destroys a firm's value, descendants can face reduced payoffs after this occurs. Thus, under the equal distribution of bequests, descendants' incentives to fiercely compete with siblings will be weakened, which is more likely to lead to an improvement in firm values. That is, the agency cost due to incentive misalignment between the existing firm's owner and its descendants is saved by adopting an equal distribution. We employ examples and discuss this issue in more detail in the Appendix.

Lee et al. (2017) provide direct evidence that the 1991 Korean inheritance law reduces sibling rivalries by showing that cash flow volatility (risk-taking) decreases before and after the succession becomes much weaker following the inheritance law change. This

[5] See Table 2: 30 Largest Business Groups and Succession History. Shinsegae group led by Lee, Myung Hee and Hansol group led by Lee, In Hee were spun off from Samsung group in 1997 and 1991, respectively.

[6] For example, a family has 6 descendants consisting of 3 sons, 2 married daughters and 1 unmarried daughter, and all the family estates are distributed to these descendants. Immediately before the 1991 inheritance law reform, the first son received 30% (1.5/5) of the total family estate (5 = 1.5 + 1 + 1 + 1 + 0.25 + 0.25). The second and third son and the unmarried daughter received 20% (1/5) each. Finally, the two married daughters received 5% (0.25/5) each by inheritance. However, after passage of the 1991 inheritance law reform, everyone received an equal distribution of 16.6% (1/6) of the total bequests (6 = 1 + 1 + 1 + 1 + 1 + 1).

Table 1
Inheritance law change in Korea.

Period	Propositions of the estate to each family member			
	First son	Other sons	Unmarried daughter	Married daughter
1950–1960	1	0	0	0
1961–1977	1.5	1	0.5	0.25
1978–1990	1.5	1	1	0.25
After 1991	1	1	1	1

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

paper also shows the weaker performance consequences of the sibling rivalries, that is, the evidence of "race to the bottom" phenomena. Based on this empirical evidence from the literature on Korean chaebols, we hypothesize below how the 1991 inheritance law amendment in South Korea that obliges the bequeathal of an equal stake to non-controlling heirs affects family firms in terms of their growth and performance. Furthermore, following the details of changes in the law, we hypothesize how succession timing and family composition, such as the number of sons' and daughters' marital status, affect our expected outcomes.

H1. The 1991 inheritance law reform benefits the growth and performance of family firms over nonfamily firms.

H2. Within family firms, the benefit of 1991 inheritance law reform is greater for family firms that undertook the succession process after 1991 than for those who completed the process before 1991.

H3. Within family firms, the benefit of 1991 inheritance law reform is greater for family firms with multiple sons than for those with only one son.

H4. Within family firms, the benefit of the 1991 inheritance law reform is greater for family firms with married daughters than for those without married daughters.

3. Data

The main sample of our study consists of 2050 family and nonfamily firms from 30 large Korean business groups designated by the Korean Fair Trade Commission (KFTC) from 1983 to 2000 (hereafter "sample years").[7] Since the 1991 inheritance law was first announced in January 1990 and implemented on the first day of January in 1991, we exclude the endogenous year of 1990. Therefore, the period prior to the reform comprises seven years from 1983 to 1989, and the post-reform period is 10 years from 1991 to 2000. We collect a firm's financial data using Data Guide Pro, a database managed by the leading Korean financial data provider, FnGuide, which provides Korean firms' financial data from the early 1980s. The total amount of assets controlled by all family firms in our sample represents > 70% of the nominal GDP of the Korean economy as of 2000.[8] In addition, we build family trees of chaebol families based on a publication by the Institute for Participatory Society, *The Chaebol of Korea: The Management Structure and Personal Network of Korean Chaebol* (2005), which provides family tree snapshots of the 30 largest Korean chaebols in early 2000. We manually obtain the daughter's marriage year information that the book does not fully cover from Korean news articles.

Table 2 provides an overview of the largest 30 business groups and their succession history during the sample years. Among the 30 business groups, firms belonging to the first 23 business groups are controlled by the founding families ("family firms"), whereas controlling shareholders of firms that belong to the remaining seven business groups are not families but corporate entities ("nonfamily firms"). Specifically, the firms in the 30 business groups are classified into four types as follows:

(1) Six business groups whose succession process was completed before the 1991 inheritance law reform (hereafter "family firms with succession before 1991");
(2) Six business groups that undertook inter-generation succession between 1991 and 2000 (hereafter "family firms with succession after 1991");
(3) Eleven business groups who experienced no intergeneration succession during or before the sample years (hereafter "family firms

[7] Due to limitations of family tree information, which is only available up to early 2000, our sample period could not be extended beyond the year of 2000.
[8] The nominal GDP of the Korean economy as of 2000 is $561.6 billion (Source: IRBD).

Table 2
The 30 largest business groups and succession history.

Group			Chairperson and Succession			
Type	No.	Name	Founder (1st generation)	Chairs in 2nd generation	Chairs in 3rd generation	Year of Succession
Family with succession before 1991 Inheritance Law Reform	1	Samsung	Lee, Byung Chul (1938)	Lee, Gun Hee (1987)		1987
	2	Kumho	Park, In Cheon (1946)	Park, Sung Yong (1984) Park, Jung Gu (1996)		1984
	3	Hanhwa	Kim, Jong Hee (1952)	Kim, Seung Yeon (1981)		1981
	4	Hyosung	Cho, Hong Jae (1966)	Cho, Suk Rae (1981)		1981
	5	Dongyang	Lee, Yang Gu (1957)	Hyun, Jae Hyun (1989)		1981
	6	Taihan Elect	Sul, Kyung Dong (1942)	Sul, Won Ryang (1972)		
Family with succession between 1991 and 2000	7	Hyundai	Chung, Ju Young (1950)	Chung, Mong Hun (1998)		1998
	8	LG	Goo, In Hoi (1947)	Goo, Ja Kyung (1970)	Goo, Bon Moo (1995)	1995
	9	SK	Choi, Jong Gun (1953) Choi, Jong Hyun (1973)	Choi, Tae Won (1998)		1998
	10	Daelim	Lee, Jae Jun (1939)	Lee, Jun Yong (1993)		1993
	11	Kolon	Lee, Won Man (1957)	Lee, Dong Chan (1977)	Lee, Woung Yeul (1996)	1996
	12	Youngpoong	Jang, Byung Hee (1949)	Jang, Hyung Jin (1993)		1993
Family without succession during sample years	13	Shinsegae		Lee, Myung Hee (spin off from Samsung, 1997)		
	14	CJ		Lee, Meng Hee (spin off from Samsung, 1996)		
	15	Hansol		Lee, In Hee (spin off from Samsung, 1991)		
	16	Hyundai Motors		Chung, Mong Goo (spin off from Hyundai, 2000)		
	17	Hyundai Heavy Industry		Chung, Mong Joon (spin off from Hyundai, 2000)		
	18	Hyundai Development		Chung, Mong Gyu (spin off from Hyundai, 1999)		
	19	KCC		Chung, Mong Jin (spin off from Hyundai, 2000)		
	20	Hyundai Department		Chung, Mong Gun (spin off from Hyundai, 1999)		
	21	Lotte	Shin, Kyuk ho (1966)			
	22	Hanjin	Joh, Joong Hoon (1945)			
	23	Dongbu	Kim, Jun Ki (1969)			
Non-family	24	POSCO				
	25	NH				
	26	KT				
	27	KEPCO				
	28	KOGAS				
	29	KEC				
	30	SH				

The sample consists of the 30 large Korean business groups, designated by the Korean Fair Trade Commission (KFTC), from 1983 to 2000. Among the 30 business groups, firms belonging to the first 23 business groups are controlled by the founding families ("family firms"), whereas controlling shareholders of firms belonging to the remaining seven business groups are not families but corporate entities ("nonfamily firms"). Specifically, the firms in the 30 business groups are classified into four types: (1) six business groups with succession processes that completed inter-generation succession before the 1991 inheritance law reform ("family firms with succession before 1991"), (2) six business groups that proceeded to undergo inter-generation succession between 1991 and 2000 ("family firms with succession after 1991"), (3) eleven business groups that experienced no intergeneration succession during the sample years or before ("family firms without succession), and (4) seven nonfamily firms. Among the family firms without succession, the Shinsegae (1997), CJ (1996), and Hansol (1991) groups spun off from the Samsung Group, and Hyundai motors (2000), Hyundai Heavy Industry (2000), Hyundai Development (1999), KCC (2000), and Hyundai Department (1999) spun off from the Hyundai Group during the sample years. Those eight business groups are separately classified by the KFTC.

without succession");
(4) Seven nonfamily business groups (hereafter "nonfamily firms").

Among family firms without succession, the Shinsegae (1997), CJ (1996), and Hansol (1991) groups are spin offs from the Samsung Group, while Hyundai motors (2000), Hyundai Heavy Industry (2000), Hyundai Development (1999), KCC (2000), and Hyundai Department (1999) are spin offs from the Hyundai Group during the sample years. For the eight business groups that are separately classified by the KFTC, their sample data are available from the year of their spin off.

We could not expand our sample to small size business groups due to the limitation of family tree information, which is only available for the top 30 business groups. In addition, owning a handful of group affiliates within their business groups, the seven nonfamily business groups have a very different ownership structure from chaebol family firms, which consist of a large number of affiliate firms. Consequently, the sample size of nonfamily firms is relatively small in comparison to family firms.

Table 3 summarizes the financial characteristics of our sample firms (Panel A) and the overview of the composition of 23 chaebol families in our sample (Panel B). Firm financial variables are defined as the-end-of-the-year value during our sample period. *Sales Growth* refers to the ratio of the difference in subtracting prior year net sales from current year net sales divided by the prior year net sales. *Operating Income Growth* refers to the ratio of the difference obtained by subtracting the prior year net operating income from the current year operating income divided by the prior year net sales. The median sales growth in our sample is 16%, and the median operating income growth is −15%. This result implies that during the period of the 1980s and the early 1990s, when the Korean economy experienced two-digit rapid economic growth,[9] external growth of Korean firms through sales increases resulted in growing operating inefficiency. Our sample largely covers firms with chaebol family controlling shareholders during our sample years; thus, the financial characteristics of sample firms are similar to those reported in prior literature focusing on large chaebol firms in Korea (e.g., Bae et al., 2002; Baek et al., 2006; Almeida et al., 2011, among others). The average *ROA* and *Leverage* ratios are 7% and 3.86, respectively. Eighty-two percent of our sample firms are public (*Listed*), and their average firm age (*Firm age*) is 25.99 years.

Panel B of Table 3 shows a snapshot of the family composition in 23 chaebol families. The sample consists of 354 family-year observations of family firms based on their size from 1983 to 2000. The average family in our sample has 13.69 members; there is substantial cross-sectional variation in family size due to the variation in the number of family generations. The majority of the current chairs belong to the second generation, and the average numbers of male and female family members are 6.78 and 6.92, respectively. For the current chair's following generation, there are, on average, 3.33 sons, 1.73 daughters, 1.50 sons-in-law, and 2.49 daughters-in-law. We observe that 45% of families have founders present during the sample years.

In Panels C and D of Table 3, we summarize the correlation among the main variables for the sample family firms before and after the 1991 inheritance law reform, respectively. We find that the family firm (dummy) is negatively correlated with sales growth (−0.08), operating income growth (−0.001), and ROA (−0.05) before the 1991 inheritance law was enacted (see Table 3, Panel C), while the family firm is positively correlated with sales growth (0.03), operating income growth (0.09), and ROA (0.01) after the passage of the 1991 inheritance law (see Table 3, Panel D). These results suggest that family firms are more likely to have a higher operating growth rate and profitability in the wake of the 1991 inheritance law reform. These correlations are largely in line with our predictions.

4. Results

4.1. Univariate difference-in-differences analysis

Table 4 reports the average value of sales growth, operating income growth, and ROA of family firms and nonfamily firms before and after the 1991 inheritance law reform, as well as the univariate DiD estimates of the growth and performance measures. Table 4 shows statistically significant positive DiD estimates of 0.20058 (20.058 percentage points) for *sales growth*, 5.85119 (585.119 percentage points) for *operating growth*, and 0.02892 (2.892 percentage points) for *ROA*, respectively, at the 10% level. The univariate DiD estimates of all three measures of growth and profitability suggest the beneficial impact of the 1991 inheritance law reform, supporting H1.

As mentioned in Section 3, during the 1980s and early 1990s, the Korean economy experienced a two-digit explosive economic growth. However, such external growth of Korean firms resulted in operating inefficiency. In Table 4, we can observe that in comparison to nonfamily firms, family firms show a significant positive increase in sales growth after enforcement of the 1991 inheritance law reform, while no significant changes are observed in annual demeaned sales growth of nonfamily firms. In contrast to family firms, nonfamily firms show a deeper downward trend in operating income growth and ROA after the legal change. Nonfamily firm's performance may have deteriorated since the post-reform period overlaps with the Asian financial crisis. To avoid the effects of sudden market shrinkage during the Asian financial crisis, we later conduct a robustness test by excluding the 1997–1998 period, and the results are consistent with our main analysis. In summary, these results suggest that family firms benefited more from the reform as they were able to experience external growth with less operating inefficiency.

[9] The average economic growth rate during the sample period is 9.1%, after excluding Asian financial crisis years. The growth rate for each year is as follows: 13.2% (1983), 10.4% (1984), 7.7% (1985), 11.2% (1986), 12.5% (1987), 11.9% (1988), 7.0% (1989), 9.8% (1990), 10.4% (1991), 6.2% (1992), 6.8% (1993), 9.2% (1994), 9.6% (1995), 7.6% (1996), 5.9% (1997), −5.5% (1998), 11.3% (1999), 8.9% (2000)

4.2. Multivariate difference-in-differences panel regression results

Sibling rivalry deteriorates a family firm's growth and performance. The 1991 inheritance law reform in Korea exogenously introduced an equal payoff to all children that could mitigate incentives for sibling rivalry in family firms. Using this event as a quasi-natural experiment, we test our main hypothesis H1 to ascertain whether the 1991 reform had a positive effect on the growth and performance of family firms. In Columns 1, 2, and 3 of Table 5, we regress each firm's growth rate and performance, measured by (1) *Sales Growth*, (2) *Operating Income Growth*, and (3) *ROA*, on the interaction term *Family Firm* × *Post*, respectively, while we control for standalone terms in the same regression. Controls include the natural logarithms of total assets, leverage, firm age, R&D/Total Assets, and listed. All models control for year and industry fixed effects, and standard errors are clustered at the business group level because family composition and succession decisions are made at the business group level.

The *Family Firm* indicator captures the difference between family firms and nonfamily firms during the pre-reform period (1983–1989). The results show that sales growth, operating income growth, and ROA have no significant difference between family firms and nonfamily firms during the pre-reform period. The sum of the *Family Firm* indicator and the interaction term, *Family Firm* × *Post*, captures the difference between family firms and nonfamily firms during the post-reform period (1991–2000). When examining the post-reform period, the sum of the *Family Firm* indicator and the interaction term is positive and statistically significant for sales growth, operating income growth, and ROA at the 5%, 5%, and 1% level, respectively. In summary, we observe that after inheritance law reform—which stipulates an equal distribution of a family estate among all children regardless of their birth order, gender, or marital status—family firms have a 20.0-percentage-point higher sales growth rate, 218.9-percentage-point higher operating income

Table 3
Summary statistics.

Panel A: Financial characteristics	Number of firms	Mean	Std. Dev	Min	Median	Max
Sales growth	2050	0.25	0.53	−0.70	0.16	4.04
Operating income growth	2050	−0.34	16.51	−589.81	−0.15	204.37
ROA	2050	0.07	0.07	−0.67	0.07	0.85
Log of total assets	2050	12.63	1.70	7.45	12.61	16.82
Log of sales	2046	12.46	1.70	6.51	12.48	16.48
Leverage	2050	3.86	4.99	0.03	2.45	35.30
Firm age	2050	25.99	13.69	1	24	71
R&D/total assets	2050	0.002	0.01	0.000	0.000	0.096
Listed	2050	0.82	0.38	0	1	1

Panel B: Family	N	Mean	Std. Dev	Min	Median	Max
Family size	354	13.69	15.55	0	9	64
Current chair generation	354	1.68	0.78	0	2	3
Current chair tenure (years)	354	15.94	15.25	0	12	55
Number of male family members	354	6.78	7.84	0	4	32
Number of female family members	354	6.92	7.81	0	5	32
Number of sons	354	3.33	2.21	0	3	8
Number of daughters	354	1.73	1.60	0	1	5
Number of sons-in-law	354	1.50	1.60	0	1	5
Number of daughters-in-law	354	2.49	2.32	0	2	8
Founder dead	354	0.55	0.50	0	1	1

Panel C: Correlation before 1991		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1)	Family firm	1.00								
(2)	Sales growth	−0.08	1.00							
(3)	Operating income growth	−0.001	0.03	1.00						
(4)	ROA	−0.05	0.15	0.11	1.00					
(5)	Log of total assets	−0.18	−0.08	−0.09	−0.23	1.00				
(6)	Leverage	0.04	0.05	0.08	−0.27	0.04	1.00			
(7)	Firm age	0.03	−0.18	0.04	−0.16	0.30	0.15	1.00		
(8)	R&D/total assets	0.06	0.02	0.01	0.07	−0.03	−0.05	−0.09	1.00	
(9)	Listed	0.10	−0.05	0.05	−0.16	0.24	0.05	0.19	0.03	1.00

Panel D: Correlation after 1991		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1)	Family firm	1.00								
(2)	Sales growth	0.03	1.00							
(3)	Operating income growth	0.09	0.01	1.00						
(4)	ROA	0.01	0.04	0.07	1.00					
(5)	Log of total assets	0.01	−0.10	0.04	−0.08	1.00				

(*continued on next page*)

Table 3 (*continued*)

Panel D: Correlation after 1991		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(6)	Leverage	0.12	−0.04	−0.13	−0.19	0.06	1.00			
(7)	Firm age	0.14	−0.23	0.04	−0.15	0.48	0.06	1.00		
(8)	R&D/total assets	−0.09	0.03	0.02	0.23	−0.03	−0.08	−0.05	1.00	
(9)	Listed	0.10	−0.06	0.07	−0.03	0.45	0.07	0.38	0.02	1.00

The sample consists of 2050 firm-year observations of Korea's top 30 business groups based on their size from 1983 to 2000. We exclude the endogenous year of 1990 since the 1991 inheritance law was first announced in January 1990 and implemented on the first day of January in 1991. The list of these business groups is designated by the Korean Fair Trade Commission (KFTC). In Panel B, the number of observations is 354 chaebol family-years, and each chaebol family variable is computed as the arithmetic average across business groups. Our analysis is based on the data compiled as an end-of-year value for each year of interest.

Panel A: Sales Growth refers to the ratio of the difference in subtracting prior year net sales from current year net sales divided by the prior year net sales. Operating Income Growth refers to the ratio of the difference in subtracting prior year net operating income from current year operating income divided by the prior year operating income. ROA refers to the ratio of a firm's earnings before interest and tax (EBIT) divided by its total assets. Log of Total Assets refers to the logarithm of a firm's total assets in millions of KRW. Log of Sales refers to the logarithm of a firm's total sales in millions of KRW. Leverage refers to a debt ratio calculated as a firm's total debt divided by its total equity. Firm Age is the age of a firm in a business group as of the corresponding year. Listed is an indicator variable that equals one if a firm is listed on the KOSPI or KOSDAQ exchange, and zero otherwise.

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

Panel C and Panel D: Panel C and Panel D reports correlations for the sample firms before and after the 1991 inheritance law reform, respectively, among the main variables summarized in Panel A.

growth rate, and 2.9-percentage-point higher ROA than nonfamily firms. We find these results are largely consistent with H1.

4.3. Effects of succession timing

In this section, we test our main hypothesis H2 to see whether family firms that experienced succession after 1991 are more likely to benefit from the inheritance law reform than family firms that went through succession before 1991 or family firms without succession.

Table 4
Effect of inheritance law reform on family firm growth – univariate difference-in-differences analysis.

	Group	Pre1991	Post1991	Differences	*t*-test	Difference-in-Differences (DiD)
Sales growth	Family firm	0.20188 (0.012) $N = 668$	0.26679 (0.016) $N = 1380$	0.06491***	3.12	0.20058*
	Non-family firm	0.35216 (0.125) $N = 26$	0.21648 (0.057) $N = 143$	−0.13567	−0.98	
Operating income growth	Family firm	−0.50938 (0.310) $N = 668$	0.06071 (0.294) $N = 1380$	0.57010	1.33	5.85119*
	Non-family firm	−0.27330 (0.209) $N = 26$	−5.55439 (4.273) $N = 143$	−5.28109	−1.23	
ROA	Family firm	0.07996 (0.002) $N = 668$	0.06353 (0.002) $N = 1380$	−0.01643***	5.19	0.02892*
	Non-family firm	0.09774 (0.015) $N = 26$	0.05239 (0.008) $N = 143$	−0.04535**	2.51	

The sample consists of 2050 firm-year observations of Korea's top 30 business groups based on their size from 1983 to 2000. We exclude the endogenous year of 1990 since the 1991 inheritance law was first announced in January 1990 and implemented on the first day of January in 1991. Therefore, the pre-reform period encompasses 7 years from 1983 to 1989 and the post-reform period consists of 10 years from 1991 to 2000. This table introduces a basic empirical strategy for univariate Difference-in-Differences analysis of the average value of (i) Sales Growth, (ii) Operating Income Growth and (iii) ROA. We collapse data into single data points (based on averages) of treated and control groups both before and after the 1991 inheritance law reform. The results show two data points per firm, one data point for the pre-reform period and one for the post-reform period. The treated group includes the family firm, while the control group includes nonfamily firms. Standard errors are presented in parentheses in the second row, and the number of observations is reported in the third row for each group. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

Table 5
Effect of inheritance law reform on family firm growth – multivariate difference-in-differences panel regression.

Variables	Dependent variable		
	Sales growth	Operating income growth	ROA
	(1)	(2)	(3)
Family firm × Post	0.22209**	1.92725**	0.04148***
	[0.093]	[0.750]	[0.011]
Family firm	−0.02200	0.26192	−0.01259
	[0.083]	[1.807]	[0.015]
Post	−0.29410***	−1.98163	−0.06778***
	[0.101]	[1.878]	[0.013]
Log (Total asset)	0.01076	−0.14847	−0.00244
	[0.019]	[0.596]	[0.003]
Leverage	−0.00329	−0.04462	−0.00179***
	[0.003]	[0.045]	[0.000]
Firm age	−0.00503**	0.02249**	−0.00061*
	[0.002]	[0.010]	[0.000]
R&D/total assets	2.41065	4.29139	0.78848*
	[3.770]	[39.384]	[0.403]
Listed	−0.06895	2.71910	−0.00059
	[0.093]	[1.828]	[0.012]
Observations	2050	2050	2050
R-squared	0.359	0.686	0.450
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes

The sample consists of 2050 firm-year observations of Korea's top 30 business groups based on their size from 1983 to 2000. We exclude the endogenous year of 1990 since the 1991 inheritance law was first announced in January 1990 and implemented on the first day of January in 1991. Therefore, the pre-reform period encompasses 7 years from 1983 to 1989, and the post-reform period consists of 10 years from 1991 to 2000. Each column reports the coefficients from an OLS regression with heteroscedasticity-robust standard errors. Standard errors are clustered at the business group level and reported in square brackets under the coefficient estimates. The dependent variable used in Columns 1 to 3 are sales growth, operating income growth, and ROA, respectively. Family Firm refers to an indicator that has a value of one if a firm is controlled by a founding family, and zero otherwise. Post refers to an indicator that has a value of one for the period from 1991 to the end of the sample years. Controls include the log of total assets (millions of KRW), leverage ratio, firm age, R&D/Total Assets, and Listed. All estimates include industry (SIC-4 digit) and year indicator variables. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

Panel A of Table 6 reports the results. We use a DiDiD specification in this test. For convenience, we denote it as a DiDiD, but this is not strictly accurate. To be technically exact, we separate our DiD estimate into two parts. We perform this separation to isolate any common effects of the 1991 inheritance law reform within family firms. In Table 6, we decompose our baseline difference-in-differences estimate into two parts, *Succession After 1991* and *No Succession After 1991* dummies, and we examine the group that mainly drives our baseline findings in Table 5. To facilitate economic interpretation of our results, all explanatory variables are standardized to have a mean of zero and a standard deviation of one, so their point estimates directly represent their economic significance.

In Column 1, we find that when families experience inter-generation succession after the inheritance law reform in 1991, sales growth is significantly higher in the post-reform period (0.11544 with a *p-value* of 5%). We also find a much weaker trend of sales growth for families who experienced inter-generation succession before the regulatory change in family law or families who did not experience succession during the sample period (0.07257 with a *p-value* of 10%). The Coefficient equality test indicates that the difference between these two estimates is statistically significant at the 5% level with an *F-statistic* of 6.71. In Column 2, we repeat the same analysis as in Column 1 with operating income growth. The point estimate of *Family Firm* × *Post* × *Succession After 1991* is 1.12679, which is statistically significant at the 1% level. However, the point estimate (0.30798) of *Family Firm* × *Post* × *No Succession* is statistically insignificant. The difference between these two estimates is statistically significant at the 1% level with an *F-statistic* of 9.32. In Column 3, the ROA shows a similar result with sales growth in Column 1. The point estimate of *Family Firm* × *Post* × *Succession After 1991* is 0.02138, which is statistically significant at the 1% level. The point estimate of *Family Firm* × *Post* × *No Succession After 1991* is 0.01401, which is statistically significant at the 1% level. The economic magnitude of the ROA in *No Succession After 1991* is almost half the magnitude of that in the *Succession After 1991* (*F-statistic* of 4.16). The results are largely in line with our above predictions. Thus, we find that family firms who undertook the succession process after 1991 had a larger positive effect on the firm's growth and performance due to the 1991 inheritance law reform than those who completed the process before

1991.

An important concern regarding the timing of succession is the effect of changes in leadership. One may argue that selected descendants as heirs underperform because they are not as talented as their founders (Burkart et al., 2003; and Caselli and Gennaioli 2013). In Panel B of Table 6, we replace *Succession After 1991* and *No Succession After 1991* with *Founder Chairman* and *Descendent Chairman* and repeat the same regression as in Panel A of Table 6. We do not find any significant difference between family firms with a founder as a current chairman and firms with a second- or third-generation-descendent-chairman for all three measures of sales growth, operating income growth, and ROA. Overall, the results rule out the possibility that changes in leadership to the succeeding generation lead to a low growth rate and performance in family firms with succession before 1991.

4.4. Family composition – effects of multiple sons

From Tables 7 to 9, following the details of the changes in the 1991 reform, we report the correlations between family

Table 6
The effects of succession timing.

Panel A: The effects of succession period	Dependent variable		
	Sales growth	Operating income growth	ROA
Variables	(1)	(2)	(3)
Family firm × Post × Succession after 1991	0.11544**	1.12679***	0.02138***
	[0.046]	[0.381]	[0.006]
Family firm × Post × No succession after 1991	0.07257*	0.30798	0.01401***
	[0.036]	[0.282]	[0.004]
Family firm	−0.00461	0.10981	−0.00316
	[0.022]	[0.481]	[0.004]
Post	−0.13827***	−0.97990	−0.03172***
	[0.047]	[0.851]	[0.006]
Log (Total asset)	0.02233	−0.12272	−0.00355
	[0.032]	[0.978]	[0.006]
Leverage	−0.01597	−0.20982	−0.00879***
	[0.013]	[0.226]	[0.002]
Firm age	−0.06956**	0.27038**	−0.00841*
	[0.030]	[0.113]	[0.004]
R&D/Total assets	0.01475	0.07774	0.00454*
	[0.021]	[0.215]	[0.002]
Listed	−0.02816	1.01037	−0.00044
	[0.037]	[0.716]	[0.005]
Coefficient equality (F-test)	6.71**	9.32***	4.16*
	(0.015)	(0.004)	(0.051)
Observations	2050	2050	2050
R-squared	0.360	0.687	0.451
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes

Panel B: The Effects of Leadership	Dependent variable		
	Sales Growth	Operating Income Growth	ROA
Variables	(1)	(2)	(3)
Family firm × Post × Founder chairman	0.09006**	1.12797**	0.01866***
	[0.040]	[0.438]	[0.005]
Family firm × Post × Descendent chairman	0.10976**	0.74766**	0.01941***
	[0.046]	[0.302]	[0.006]
Family firm	−0.00585	0.07188	−0.00333
	[0.022]	[0.478]	[0.004]
Post	−0.13625***	−0.98102	−0.03175***
	[0.047]	[0.831]	[0.006]
Log (Total Asset)	0.01819	−0.19137	−0.00385
	[0.033]	[0.939]	[0.005]
Leverage	−0.01632	−0.21093	−0.00879***
	[0.013]	[0.220]	[0.002]
Firm age	−0.06846**	0.29851**	−0.00828*
	[0.029]	[0.121]	[0.004]

(*continued on next page*)

Table 6 (*continued*)

Panel B: The Effects of Leadership	Dependent variable		
	Sales Growth	Operating Income Growth	ROA
Variables	(1)	(2)	(3)
R&D/total assets	0.01299	0.06496	0.00449*
	[0.021]	[0.191]	[0.002]
Listed	−0.02679	1.06035	−0.00021
	[0.036]	[0.722]	[0.005]
Coefficient equality (F-test)	1.14	0.86	0.07
	(0.294)	(0.361)	(0.793)
Observations	2050	2050	2050
R-squared	0.359	0.687	0.451
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes

The sample consists of 2050 firm-year observations of Korea's top 30 business groups based on their size from 1983 to 2000. We exclude the endogenous year of 1990 since the 1991 inheritance law was first announced in January 1990 and implemented on the first day of January in 1991. Therefore, the pre-reform period encompasses 7 years from 1983 to 1989, and the post-reform period consists of 10 years from 1991 to 2000. Each column reports the coefficients from an OLS regression with heteroscedasticity-robust standard errors. Standard errors are clustered at the business group level and reported in square brackets under the coefficient estimates. The Coefficient equality reports the F statistics for the coefficients of the decomposed variables, with *p*-values in rounded brackets. The dependent variable used in Columns 1 to 3 are sales growth, operating income growth, and ROA, respectively. In Panel A, Succession After1991 refers to an indicator that has a value of one if a firm proceeds with inter-generation succession between 1991 and 2000, and zero otherwise. No Succession After 1991 refers to an indicator that has a value of one if a firm completed inter-generation succession before the 1991 inheritance law reform or if a firm did not undergo inter-generation succession during the sample period, and zero otherwise. In Panel B, Founder Chairman refers to an indicator that has a value of one if a current chairman is the founder, and zero otherwise. Descendent Chairman refers to an indicator that has a value of one if a current chairman is a second or third generation descendent. Family Firm refers to an indicator that has a value of one if a firm is controlled by a founding family, and zero otherwise. Post refers to an indicator that has a value of one for the period from 1991 to the end of the sample years. Controls include the log of total assets (millions of KRW), leverage ratio, firm age, R&D/Total Assets, and Listed. All estimates include industry (SIC-4 digit) and year indicator variables. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

compositions and firm growth and profitability. In Table 7, we test our main hypothesis H3 to see whether the effect of the legal reform is greater for families with multiple sons than for those with only one son. In Korean culture, before the 1991 reform, sibling rivalry was primarily between males, specifically the direct bloodline heirs, with a strict preference for the eldest sons. In this respect, the less favored sons had strong incentives to engage in severe competition because only the selected successor would have control over the entire family business. However, the 1991 inheritance law reform introduced an equal monetary payoff to all sons, leading to diminished incentives for fierce sibling rivalry. Therefore, we assume the effect of the inheritance law change should be stronger for families with multiple sons.

To examine the effect of multiple sons, in Panel A of Table 7, we divide the right-hand side (RHS) variable, *Family Firm* × *Post* in our baseline model of Table 5, into two, using the following dummy variables: *Number of Sons* ≥ *2* vs. *Number of Sons* < *2*. Based on OLS regression, other empirical specifications are the same as in previous regression analyses. In Column 1, for sales growth, the point estimate of *Family Firm* × *Post* × *Number of Sons* ≥ *2* is 0.10925, which is statistically significant at the 5% level. The point estimate of *Family Firm* × *Post* × *Number of Sons* < *2* is 0.06191, which is statistically significant at the 5% level. The difference between these two estimates is statistically significant at the 10% level with an *F-statistic* of 3.01. In column 2, for operating income growth, the point estimate of *Family Firm* × *Post* × *Number of Sons* ≥ *2* is 1.01540, which is statistically significant at the 5% level. The point estimate of *Family Firm* × *Post* × *Number of Sons* < *2* is 0.28912, which is statistically insignificant. In column 3, for ROA, the point estimate of *Family Firm* × *Post* × *Number of Sons* ≥ *2* is 0.02182 and is statistically significant at the 1% level. The point estimate of *Family Firm* × *Post* × *Number of Sons* < *2* is 0.00634, which is statistically significant at the 5% level. The difference between these two estimates is statistically significant at the 1% level with an *F-statistic* of 12.25. The results support our H3 that the benefit of the 1991 inheritance law reform is greater for family firms with multiple sons than for those with only one son.

Panel B of Table 7 shows the results of an identification test of sibling rivalry stories. We count the number of daughters, which are irrelevant to sibling rivalry in the Korean cultural environment where sibling rivalry is primarily among male heirs. We replace *Number of Sons* ≥ *(<) 2* with *Number of Daughters* ≥ *(<) 2* and repeat the same regression as in Panel A of Table 7. We do not find any significant difference between families with multiple daughters and families with only one or no daughters for all three measures of sales growth, operating income growth, and ROA. Overall, the results obtained for multiple sons and daughters are largely consistent with our above predictions, implying that the 1991 inheritance law reform in South Korea reduced incentives for sibling

rivalry, leading to a higher growth rate and performance for family firms with multiple sons but not necessarily for family firms with daughters.

4.5. Family composition – effects of married daughters

Before the 1991 inheritance law reform, married daughters were considered outsiders from their father's family registry in South Korea, and therefore the proportion of a family estate claimed by married daughters was the smallest. For example, during the period between 1978 and 1990, the law designated the following proportions of the estate to each descendant: 1.5 went to the eldest son, 1

Table 7
Multiple sons.

Panel A: Sons	Dependent variable		
	Sales growth	Operating income growth	ROA
Variables	(1)	(2)	(3)
Family firm × Post × Number of sons ≥2	0.10925**	1.01540**	0.02182***
	[0.046]	[0.412]	[0.006]
Family Firm × Post × Number of sons < 2	0.06191**	0.28912	0.00634**
	[0.028]	[0.214]	[0.003]
Family firm	−0.00562	0.05966	−0.00355
	[0.023]	[0.490]	[0.004]
Post	−0.13746***	−0.87149	−0.03044***
	[0.047]	[0.906]	[0.006]
Log (total asset)	0.01889	−0.27768	−0.00468
	[0.033]	[1.034]	[0.006]
Leverage	−0.01635	−0.21859	−0.00879***
	[0.013]	[0.226]	[0.002]
Firm age	−0.06769**	0.27048	−0.00899**
	[0.029]	[0.178]	[0.004]
R&D/total assets	0.01340	0.00944	0.00399*
	[0.021]	[0.224]	[0.002]
Listed	−0.02780	1.10236	0.00074
	[0.037]	[0.740]	[0.005]
Coefficient equality (F-test)	3.01*	2.78	12.25***
	(0.093)	(0.106)	(0.001)
Observations	2050	2050	2050
R-squared	0.359	0.686	0.453
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes

Panel B: Daughters	Dependent variable		
	Sales growth	Operating income growth	ROA
Variables	(1)	(2)	(3)
Family firm × Post × Number of daughters ≥2	0.11273**	0.93145**	0.01959***
	[0.045]	[0.424]	[0.005]
Family firm × Post × Number of daughters < 2	0.09252**	0.85179**	0.01880***
	[0.044]	[0.394]	[0.005]
Family firm	−0.00633	0.06763	−0.00336
	[0.022]	[0.478]	[0.004]
Post	−0.13447***	−0.91172	−0.03137***
	[0.047]	[0.875]	[0.006]
Log (Total asset)	0.01458	−0.26757	−0.00429
	[0.034]	[1.024]	[0.006]
Leverage	−0.01674	−0.22246	−0.00885***
	[0.014]	[0.225]	[0.002]
Firm age	−0.06551**	0.31739**	−0.00814*
	[0.030]	[0.125]	[0.004]
R&D/Total assets	0.01369	0.02557	0.00430*
	[0.021]	[0.216]	[0.002]
Listed	−0.02622	1.05803	−0.00021
	[0.036]	[0.714]	[0.005]

(continued on next page)

Table 7 (*continued*)

Panel B: Daughters	Dependent variable		
	Sales growth	Operating income growth	ROA
Variables	(1)	(2)	(3)
Coefficient Equality (F-test)	1.81 (0.189)	0.04 (0.852)	0.17 (0.681)
Observations	2050	2050	2050
R-squared	0.360	0.686	0.450
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes

The sample consists of 2050 firm-year observations of Korea's top 30 business groups based on their size from 1983 to 2000. We exclude the endogenous year of 1990 since the 1991 inheritance law was first announced in January 1990 and implemented on the first day of January in 1991. Therefore, the pre-reform period encompasses 7 years from 1983 to 1989, and the post-reform period consists of 10 years from 1991 to 2000. Each column reports the coefficients from an OLS regression with heteroscedasticity-robust standard errors. Standard errors are clustered at the business group level and reported in square brackets under the coefficient estimates. The Coefficient equality reports the F statistics for the coefficients of the decomposed variables, with *p*-values in rounded brackets. The dependent variable used in Columns 1 to 3 is the sales growth, operating income growth, and ROA, respectively. Family Firm refers to an indicator that has a value of one if a firm is controlled by a founding family, and zero otherwise. Number of Sons (Daughters) ≥ 2 refers to an indicator that has a value of one if the total number of sons (daughters) of the current chair is greater than or equal to two, and zero otherwise. Number of Sons (Daughters) < 2 refers to an indicator that has a value of one if the total number of sons (daughters) of the current chair is smaller than two, and zero otherwise. Post refers to an indicator that has a value of one for the period from 1991 to the end of the sample years. Controls include the log of total assets (millions of KRW), leverage ratio, firm age, R&D/Total Assets, and Listed. All estimates include industry (SIC-4 digit) and year indicator variables. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

to the remaining sons, 1 to unmarried daughters, and 0.25 to married daughters (see Table 1 for more details on inheritance proportions before 1991). However, with the 1991 inheritance law reform, married daughters are now eligible to receive equal proportions of the estate. Although married daughters do not directly participate in sibling rivalry for succession, competent sons-in-law participate in the management of Korean chaebol firms and therefore indirectly influence succession.[10] This raises the bar for a potential successor, who has previously conducted the race to the bottom (Bertrand and Schoar, 2006, and Davis and Harveston, 2001), and motivates sons in succession competition toward better performance. Therefore, the effect on firm performance and growth due to a change in inheritance law that requires bequeathing equal proportions to all descendants would be an empirical issue. In this section, we focus particularly on married daughters due to the highest difference in ownership between before and after the 1991 inheritance law reform and test the impact of the reform for firms with married daughters.

In Table 8, we test our main hypothesis H4 to see whether the effect of the 1991 inheritance law reform is greater for family firms with than for those without married daughters. To examine the reform's effect on firms with married daughters, the RHS variable, *Family Firm* × *Post* in our baseline model of Table 5, is now separated into two using the following indicators: *Married Daughter* vs. *No Married Daughter*. *Married Daughter* refers to an indicator that has a value of one if the total number of the current chair's married daughters is greater than or equal to one before 1991, and zero otherwise. *No Married Daughter* indicator has a value of one if the total number of the current chair's married daughters is zero before 1991, and zero otherwise. Other empirical specifications are the same as in previous regression analyses.

In Column 1, for sales growth, the point estimate of *Family Firm* × *Post* × *Married Daughter* is 0.11376, which is statistically significant at the 5% level. The point estimate of *Family Firm* × *Post* × *No Married Daughter* is 0.06906, which is statistically significant at the 10% level. The difference between these two estimates is statistically significant at the 5% level with an *F-statistic* of 4.99. This result suggests that for family firms with married daughters, the 1991 inheritance law reform had a more positive effect on firm's sales growth than for family firms without a married daughter. In Column 2, the point estimate of *Family Firm* × *Post* × *Married Daughters* is 1.06209 for operating income growth, which is statistically significant at the 5% level. The point estimate of *Family Firm* × *Post* × *No Married Daughter* is 0.37442, which is statistically significant at the 10% level. The difference between these two estimates is statistically significant at the 1% level with an *F-statistic* of 8.47. In Column 3, the point estimate of *Family Firm* × *Post* × *Married Daughters* is 0.02123 for ROA, which is statistically significant at the 1% level. The point estimate of *Family Firm* × *Post* × *No Married Daughter* is 0.01293, which is statistically significant at the 1% level. The difference between these two estimates is statistically significant at the 1% level with an *F-statistic* of 9.94. These results show that changing the inheritance proportion to an equal proportion for married daughters has a more positive effect on sales growth, operating income, and ROA, vindicating the positive

[10] In our sample, in terms of bachelor's degrees, we observe that 64% of the sons-in-law in our sample graduated from one of the top five universities in Korea, whereas only 45% of the sons graduated from those top domestic institutions. Among those top five universities, all sons-in-law graduated from public schools, while 81% of sons graduated from private schools. When we compare their MBA degrees, 36% of the sons-in-law compared to only 22% of the sons received their MBA degrees from one of the top 10 MBA programs, based on the FT Global Rankings in 2000. In addition, 21% of sons-in-law compared to only 2% of sons obtained a PhD degree.

Table 8
Married daughter.

	Dependent variable		
	Sales growth	Operating income growth	ROA
Variables	(1)	(2)	(3)
Family firm × Post × Married daughter	0.11376**	1.06209**	0.02123***
	[0.047]	[0.398]	[0.006]
Family firm × Post × No married daughter	0.06906*	0.37442*	0.01293***
	[0.034]	[0.198]	[0.004]
Family firm	−0.00620	0.05652	−0.00341
	[0.022]	[0.486]	[0.004]
Post	−0.13439***	−0.84678	−0.03107***
	[0.047]	[0.889]	[0.006]
Log (Total asset)	0.01633	−0.32568	−0.00453
	[0.034]	[1.032]	[0.006]
Leverage	−0.01654	−0.22953	−0.00888***
	[0.013]	[0.221]	[0.002]
Firm Age	−0.06730**	0.34818***	−0.00803*
	[0.030]	[0.125]	[0.004]
R&D/Total assets	0.01369	0.04457	0.00439*
	[0.021]	[0.213]	[0.002]
Listed	−0.02571	1.09415	−0.00003
	[0.036]	[0.721]	[0.005]
Coefficient equality (F-test)	4.99**	8.47***	9.94***
	(0.033)	(0.007)	(0.003)
Observations	2050	2050	2050
R-squared	0.359	0.686	0.450
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes

The sample consists of 2050 firm-year observations of Korea's top 30 business groups based on their size from 1983 to 2000. We exclude the endogenous year of 1990 since the 1991 inheritance law was first announced in January 1990 and implemented on the first day of January in 1991. Therefore, the pre-reform period encompasses 7 years from 1983 to 1989, and the post-reform period consists of 10 years from 1991 to 2000. Each column reports the coefficients from an OLS regression with heteroscedasticity-robust standard errors. Standard errors are clustered at the business group level and reported in square brackets under the coefficient estimates. The Coefficient equality reports the F statistics for the coefficients of the decomposed variables, with *p*-values in rounded brackets. The dependent variables used in Columns 1 to 3 are sales growth, operating income growth, and ROA, respectively. Family Firm refers to an indicator that has a value of one if a firm is controlled by a founding family, and zero otherwise. Married Daughter refers to an indicator that has a value of one if before 1991 the total number of married daughters of the current chair is greater than or equal to one, and zero otherwise. No Married Daughter refers to an indicator that has a value of one if before 1991 the total number of married daughter of the current chair is zero, and zero otherwise. Post refers to an indicator that has a value of one for the period from 1991 to the end of the sample years. Controls include the log of total assets (millions of KRW), leverage ratio, firm age, R&D/Total Assets, and Listed. All estimates include industry (SIC-4 digit) and year indicator variables. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

externality of legal empowerment on married daughters by indirectly influencing the mode of succession in family firms through their husband.

4.6. Placebo test – half brothers

We further conduct a placebo test to confirm that a change in incentives for less favored candidates to succeed a family business is attributable to changes in family law, thereby resulting in high growth and profitability in family firms. In Table 9, we investigate half-brothers, who are immune to inheritance law changes. We divide our baseline DiD estimate in Table 5 into two parts, *Half Brother* and *No Half Brother*. *Half Brother* is associated with family firms where the founder of a business group has children with different mothers, whereas *No Half Brother* refers to family firms where the founder of a business group does not have children with different mothers.

Table 9 shows the results of the placebo test. We do not find any significant difference between *Half Brother* and *No Half Brother* for all three growth and performance measures of *Sales Growth, Operating Income Growth,* and *ROA*. In Column 1, the point estimate of *Family Firm* × *Post* × *Half Brother* is 0.09376 for sales growth, which is statistically significant at the 5% level. The point estimate of *Family Firm* × *Post* × *No Half Brother* is 0.10599, which is statistically significant at the 5% level. However, the difference between these two estimates is not statistically significant, with an *F-statistic* of 0.46. The results are the same in Columns 2 and 3. In Column 2

Table 9
Placebo test – half-brother.

	Dependent variable		
	Sales growth	Operating income growth	ROA
Variables	(1)	(2)	(3)
Family firm × Post × Half brother	0.09376**	0.93434*	0.01670***
	[0.038]	[0.486]	[0.005]
Family firm × Post × No half brother	0.10599**	0.85145**	0.02025***
	[0.046]	[0.371]	[0.006]
Family firm	−0.00456	0.10137	−0.00324
	[0.022]	[0.456]	[0.004]
Post	−0.13804***	−0.95976	−0.03157***
	[0.047]	[0.823]	[0.006]
Log (Total asset)	0.01920	−0.23198	−0.00409
	[0.033]	[0.968]	[0.005]
Leverage	−0.01582	−0.20875	−0.00880***
	[0.013]	[0.229]	[0.002]
Firm age	−0.06803**	0.31721**	−0.00821*
	[0.029]	[0.145]	[0.004]
R&D/total assets	0.01353	0.03410	0.00432*
	[0.020]	[0.206]	[0.002]
Listed	−0.02780	1.03037	−0.00031
	[0.036]	[0.691]	[0.005]
Coefficient equality (F-test)	0.46	0.02	1.76
	(0.504)	(0.876)	(0.195)
Observations	2050	2050	2050
R-squared	0.359	0.686	0.450
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes

The sample consists of 2050 firm-year observations of Korea's top 30 business groups based on their size from 1983 to 2000. We exclude the endogenous year of 1990 since the 1991 inheritance law was first announced in January 1990 and implemented on the first day of January in 1991. Therefore, the pre-reform period encompasses 7 years from 1983 to 1989, and the post-reform period consists of 10 years from 1991 to 2000. Each column reports the coefficients from an OLS regression with heteroscedasticity-robust standard errors. Standard errors are clustered at the business group level and reported in square brackets under the coefficient estimates. The Coefficient equality reports the F statistics for the coefficients of the decomposed variables, with *p*-values in rounded brackets. The dependent variables used in Columns 1 to 3 are sales growth, operating income growth, and ROA, respectively. Family Firm refers to an indicator that has a value of one if a firm is controlled by a founding family, and zero otherwise. Half-brother is an indicator that has a value of one if the founder of a business group has children with different mothers, and zero otherwise. No half-brother is an indicator that has a value of one if the founder of a business group does not have children with different mothers, and zero otherwise. Post refers to an indicator that has a value of one for the period from 1991 to the end of the sample years. Controls include the log of total assets (millions of KRW), leverage ratio, firm age, R&D/Total Assets, and Listed. All estimates include industry (SIC-4 digit) and year indicator variables. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

(3), the point estimate of *Family Firm* × *Post* × *Half Brother* is 0.93434 (0.01670) for operating income growth (ROA), which is statistically significant at the 10% (1%) level. The point estimate of *Family Firm* × *Post* × *No Half Brother* is 0.85145 (0.02025), which is statistically significant at the 5% (1%) level. The difference between these two estimates is statistically insignificant with an *F-statistic* of 0.02 (1.76). Overall, the results confirm that half-brothers are not relevant to inheritance law changes.

Altogether, the results listed in Table 9 and previous tables highlight the significance of the 1991 inheritance law reform in creating a legal environment where an equal distribution of a family estate among descendants reduces incentives for sibling rivalry, thereby allowing family firms to focus on their growth and hence higher profitability.

4.7. Robustness test – Asian financial crisis effect

In this section, we undertake general robustness checks of our key results that are reported in Table 10. One concern in our sample period is the Asian financial crisis period, which occurred between 1997 and 1998 and led to a sudden shrinkage of Korea's capital market.[11] During the Asian financial crisis period, the Korea Composite Stock Price Index (KOSPI) plummeted to one-third of its pre-crisis level and did not recover to the pre-crisis level until early 1999. This sudden shrinkage of the capital market may have distorted the 1991 inheritance law reform effects on firm growth and performance since market responses to this macroeconomic shock vary

[11] KOSPI Index: 651.22 (1996.12), 376.31(1997.12), 280.00 (1998.6), 562.45 (1998.12), 1028.07 (1999.12).

Table 10
Robustness test - asian financial crisis effect.

	Dependent variable					
	Sales growth	Operating income growth	ROA	Sales growth	Operating income growth	ROA
Variables	(1)	(2)	(3)	(4)	(5)	(6)
Family firm × Post	0.27388***	2.15428**	0.04710***			
	[0.082]	[1.030]	[0.011]			
Family firm × Post × Succession after 1991				0.13732***	1.17405**	0.02513***
				[0.042]	[0.564]	[0.006]
Family firm × Post × No succession after 1991				0.06660**	0.19344	0.00610**
				[0.030]	[0.228]	[0.003]
Family firm	−0.11320	0.24071	−0.01630	−0.03008	0.04393	−0.00463
	[0.133]	[2.174]	[0.014]	[0.035]	[0.590]	[0.004]
Post	−0.37216***	−2.04071	−0.07493***	−0.17286***	−0.87554	−0.03368***
	[0.099]	[2.085]	[0.014]	[0.044]	[1.014]	[0.006]
Log (Total asset)	0.01564	−0.21527	−0.00232	0.02596	−0.40713	−0.00465
	[0.025]	[0.721]	[0.003]	[0.043]	[1.239]	[0.006]
Leverage	−0.00389	−0.01194	−0.00175***	−0.01885	−0.06562	−0.00860***
	[0.003]	[0.052]	[0.001]	[0.015]	[0.255]	[0.003]
Firm age	−0.00530**	0.02809*	−0.00056*	−0.07213**	0.32465	−0.00853*
	[0.002]	[0.014]	[0.000]	[0.028]	[0.229]	[0.004]
R&D/Total assets	1.73339	18.85074	0.76746	0.00905	0.07787	0.00372
	[4.801]	[36.939]	[0.540]	[0.025]	[0.212]	[0.003]
Listed	−0.08412	2.86875	−0.00056	−0.03356	1.25829	0.00121
	[0.097]	[2.099]	[0.012]	[0.041]	[0.902]	[0.005]
Coefficient equality (F-test)				8.13***	7.77***	4.28**
				(0.008)	(0.009)	(0.047)
Observations	1680	1680	1680	1680	1680	1680
R-squared	0.426	0.698	0.485	0.426	0.698	0.490
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

We exclude the period of 1997–1998 to avoid the effects of sudden market shrinkage during the Asian financial crisis, and the results are robust to the potential confounding factor, which is the implication of the Asian financial crisis. The sample consists of 1680 firm-year observations of Korea's top 30 business groups based on their size from 1983 to 2000. To match the pre and post period, we exclude the endogenous year of 1990 and 1991. Therefore, both the pre- and post-reform periods are balanced as 7 years. Each column reports the coefficients from an OLS regression with heteroscedasticity-robust standard errors. Standard errors are clustered at the business group level and reported in square brackets under the coefficient estimates. The Coefficient equality reports the F statistics for the coefficients of the decomposed variables, with p-values in rounded brackets. The dependent variable used in Columns 1 to 6 are sales growth, operating income growth, and ROA. Family Firm refers to an indicator that has a value of one if a firm is controlled by a founding family, and zero otherwise. Succession After1991 refers to an indicator that has a value of one if a firm undergoes inter-generation succession between 1991 and 2000, and zero otherwise. No Succession After 1991 refers to an indicator that has value of one if a firm has completed inter-generation succession before 1991 inheritance law reform or if a firm does not undergo inter-generation succession during the sample period, and zero otherwise. Post refers to an indicator that has a value of one for the period from 1991 to the end of the sample years. Controls include the log of total assets (millions of KRW), leverage ratio, firm age, R&D/Total Assets, and Listed. All estimates include industry (SIC-4 digit) and year indicator variables. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

from firm to firm.

To identify cleaner effects of the 1991 inheritance law reform, we exclude the period of 1997–1998 from the sample years to prevent the effects of sudden market shrinkage caused by the Asian financial crisis from contaminating our study. To match the pre- and post-reform period, we exclude the endogenous years of 1990 and 1991. Therefore, both the pre- and post-reform periods are balanced at seven years. Using this better-balanced sample, we show the robustness of our results. In Columns 1 to 3 in Table 10, using this balanced sample before and after the inheritance law change, we rerun the baseline analysis from Columns 1 to 3 of Table 5. In Columns 4 to 6 of Table 10, we also repeat the analysis on the effects of succession timing in Columns 1 to 3 of Table 6. As shown in Table 10, the results are similar to those of the baseline regression. These results suggest that the results are robust to the potential confounding factor, which is the implication of the Asian financial crisis.

Table 11
Robustness test – globalization effect.

	Dependent variable					
	Sales growth	Operating income growth	ROA	Sales growth	Operating income growth	ROA
Variables	(1)	(2)	(3)	(4)	(5)	(6)
Family firm × Post crisis	0.08347	2.16796	0.00091			
	[0.115]	[1.317]	[0.008]			
Family firm × Post crisis × Number of sons ≥2				0.03755	1.11579	0.00204
				[0.057]	[0.696]	[0.004]
Family firm × Post crisis × Number of sons < 2				0.02811	0.29700	0.00204
				[0.029]	[0.232]	[0.004]
Family firm	0.19960*	0.71254	0.02209	0.05799*	0.19954	0.00618
	[0.114]	[2.002]	[0.024]	[0.033]	[0.582]	[0.007]
Post crisis	−0.16954	−0.15496	−0.00168	−0.08543	−0.06779	−0.00053
	[0.119]	[1.394]	[0.006]	[0.060]	[0.698]	[0.003]
Log (Total asset)	0.02940	−0.34460	−0.00220	0.05227	−0.61414	−0.00412
	[0.028]	[0.850]	[0.004]	[0.049]	[1.502]	[0.007]
Leverage	−0.00516	−0.06393	−0.00139***	−0.02695	−0.32485	−0.00699***
	[0.003]	[0.061]	[0.000]	[0.017]	[0.318]	[0.003]
Firm age	−0.00556*	0.02594	−0.00074**	−0.07757*	0.35035	−0.01102**
	[0.003]	[0.017]	[0.000]	[0.045]	[0.259]	[0.004]
R&D/Total assets	3.40534	14.85881	0.80454	0.02234	0.07920	0.00460
	[4.478]	[38.237]	[0.670]	[0.028]	[0.253]	[0.004]
Listed	−0.13491	2.93571	−0.00133	−0.05968	1.28318	0.00041
	[0.109]	[1.814]	[0.012]	[0.047]	[0.804]	[0.005]
Coefficient equality (F-test)				0.05	1.79	2.16
				(0.825)	(0.191)	(0.152)
Observations	1388	1388	1388	1388	1388	1388
R-squared	0.434	0.716	0.485	0.434	0.717	0.489
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

We replace the Post variable used in the previous tables with Post Crisis to examine the globalization effect after the Asian financial crisis, and the results are robust to the potential confounding factor, which is the effect of globalization after the Asian financial crisis. The sample consists of 1388 firm-year observations of Korea's top 30 business groups based on their size from 1991 to 2000. We exclude the endogenous year of 1997 when the Korean government was first supported by the IMF Supplemental Reserve Facility (SRF) from the baseline database, since it served as a momentum that Korean economy was fully opened to global market afterwards, we compare before and after Asian financial crisis period, to assess whether these globalization effects have led to an increase in the operating growth rate and performance of Korean chaebols. Each column reports the coefficients from an OLS regression with heteroscedasticity-robust standard errors. Standard errors are clustered at the business group level and reported in square brackets under the coefficient estimates. The Coefficient equality reports the F statistics for the coefficients of the decomposed variables, with p-values in rounded brackets. The dependent variable used in Columns 1 to 6 are the sales growth, operating income growth, and ROA. Family Firm refers to an indicator that has a value of one if a firm is controlled by a founding family, and zero otherwise. Post Crisis refers to an indicator that has a value of one for the period after 1997 to the end of the sample years. Number of Sons ≥2 refers to an indicator that has a value of one if the total number of sons of the current chair is greater than or equal to two, and zero otherwise. Number of Sons < 2 refers to an indicator that has a value of one if the total number of sons of the current chair is less than two, and zero otherwise. Controls include the log of total assets (millions of KRW), leverage ratio, firm age, R&D/Total Assets, and Listed. All estimates include industry (SIC-4 digit) and year indicator variables. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

4.8. Robustness test – globalization effect

Another important concern is the globalization effect. South Korea obtained a massive loan from the International Monetary Fund (IMF) to turn its wobbly economy around during the Asian financial crisis period and was fully open to the global markets since that time. For instance, based on its trade liberalization policy, the Korean government abolished export restraints and regulations that had been in place to protect infant domestic industries. As a result, the portion of exports and imports in Korea's GDP sharply increased from 57% during the period between 1991 and 1996 to approximately 70% after the post-financial crisis period from 1998 to 2001.[12] In addition, following the agreement with the IMF, South Korea fully opened its economy to foreign investors, with the exception of a few sectors such as culture and military, and allowed foreigners to acquire land. Similarly, to promote foreign investment, South Korea lifted regulations on total equity investment for foreign-invested enterprises, enabling them to obtain stocks or

[12] Korea Development Institute (KDI) report (2007), "10 years after Economic Crisis: Evaluation and Challenges."

stakes from other companies exceeding 40% of their net asset. One may argue that these confounding factors have led to an increase in operating growth rates and the performance of South Korean family firms.

To alleviate this concern, in Table 11 we rerun the baseline analyses of Table 5 and Panel A of Table 7 by comparing the periods before and after the Asian financial crisis period. We replace the *post* variable used in the previous tables to *Post Crisis*. *Post Crisis* refers to an indicator that has a value of one for the period after 1997 to the end of the sample years to capture the globalization effect. To exclude the effect of 1991 inheritance law reform, we exclude the period before the 1991 inheritance law reform from the baseline database. After excluding the endogenous year of 1997, the sample consists of 1388 firm-year observations from 1991 to 2000. As shown in Table 11, we do not find any significant difference between family firms and nonfamily firms for all three measures of sales growth, operating income growth, and ROA for the periods before and after the globalization effect, which suggests that the results are robust to the potential confounding factor, the effect of globalization after the Asian financial crisis.

5. Conclusions

We study whether inheritance law reform for an equal distribution of a family estate among all descendants regardless of birth order, gender, or marital status improves the growth and performance of family firms. We observe a significantly higher operating growth rate and performance enhancement in family firms compared with nonfamily firms in the time period following the regulatory reform. To further verify the causal linkage between the legal change and its impact on firm operations, we test succession timing and family composition. The results confirm that the effect is greater for family firms that undertook the succession process after the 1991 inheritance law reform. In addition, growth rate and performance significantly improved in family firms with multiple sons and married daughters, but not in firms without daughters. This result implies that the legal empowerment of married daughters indirectly influences the mode of succession in family firms through their husband. Finally, the result is robust to a placebo test investigating half-brothers who are immune to inheritance law changes, confirming that the increase in growth rate and profitability are mainly driven by the 1991 inheritance law reform.

Given the positive impact of the 1991 inheritance law reform on family firm growth and performance, this study has significant implications for investors, managers, and policy-makers. The potential heirs of the controlling family have strong incentives to win against their siblings during the succession period; however, their interests may conflict with minority shareholders who would bear the cost of poor corporate governance due to sibling rivalry.[13] Furthermore, the economy suffers reduced productivity as invested funds are allocated less efficiently. We provide novel insights into the positive policy implications of the inheritance law reform that stipulates equal distribution of the property to all descendants to reduce succession cost, thereby enhancing the value of family firms. The implications of this study are not limited to a specific region. Any jurisdiction with a system of inequitable distribution of the family estate among descendants has incentives for legal reform to improve the performance of family firms.

Our paper selects one piece of environmental changes and documents how the 1991 law reform enhanced family firms' performance by mitigating sibling rivalry. We mainly focus on the succession from a first to a second generation of South Korean chaebols due to limited family tree data. However, as South Korean chaebols have been succeeded to their third or fourth generations, the environment around family firms succession underwent a great transformation. This transformation includes a decrease in the number of descendants due to demographic changes, expanded participation of daughters in management, and intensified regulations related to firm governance and minority shareholder protection, while the industry composition of family firms continues to change. Such environmental changes may have affected decisions concerning how to distribute properties among descendants, and inheritance in these changing environments may have created new types of sibling conflicts among descendants. In this respect, this paper raises important questions for future studies: Does the evolving environment change the patterns of sibling competitions? How does the change influence family firms' performance and growth? Is there an effective policy tool that mitigates new types of value-destroying sibling rivalry in family firms?

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Appendix A. Inheritance of family estates and the value of the family firm

We handle the relationship between the inheritance method of family estates and family firm's value by employing numerical examples. For simplicity, we assume that there are two descendants (A and B). The current owner can select one of the following two inheritance methods, by which the remaining family estates are distributed to the two descendants: “unequal distribution” and “equal distribution.” Two descendants can choose one of the following two strategies to maximize their payoffs from family estates: “severe rivalry” and “cooperation.” First, we see how the descendants' choices affect the firm's value. If both descendants decide to cooperate

[13] Nyshka Chandran, “Vicious South Korean family feud exposes chaebol peril” (CNBC Aug 5, 2015). This news coverage pays attention to the recent, brutal succession battle between two sons of the Lotte Group, the fourth-largest Korean chaebol, the market capitalization of which amounts to $96 billion. This ongoing succession infighting is costly to their minority shareholders: the group's largest company, Lotte Shopping, lost 8% of its market capitalization in just over a week following media announcement of the family feud.

under the current owner's leadership, the firm's value attains its optimal level, which is called V. Conversely, if one descendant deviates to the severe rivalry, the firm's value is discounted to δV, where δ is a discount factor and $0.25 < \delta < 1$. The value discount is related to operational inefficiencies generated by the sibling rivalry. If both descendants deviate to severe rivalry, the firm's value is discounted more to $\delta^2 V$. We can summarize the results using the diagram below.

		B	
	Firm Value	Severe rivalry	Cooperation
A	Severe rivalry	$\delta^2 V$	δV
	Cooperation	δV	V

Next, we move on to each descendant's payoff. First, we adopt an "unequal distribution." Under this method, we assume descendant A inherits 75% of the bequests (firm value) and descendant B acquire 25% of the fortunes if nobody wins the competition. No descendants win the competition if both A and B select the same option – severe rivalry or cooperation. However, if only one descendant chooses severe rivalry, this descendant wins the competition and acquires all shares of the family estates. The other descendant, who select cooperation, will lose the competition and inherit nothing because no bequests remain after the competition. According to the payoff diagram below, regardless of the decision made by descendant A, "severe rivalry" is always optimal for descendant B because this choice generates higher payoffs to descendant B. This is because $\frac{1}{4}\delta^2 V > 0$ (when descendant A selects severe rivalry) and $\delta V > \frac{1}{4}V$ (when descendant A selects cooperation). "Severe rivalry" is also optimal for descendant A. When descendant B chooses severe rivalry, descendant A's payoff from severe rivalry ($\frac{3}{4}\delta^2 V$) is bigger than that from cooperation (0). In contrast, when descendant B chooses the cooperation option, descendant A's payoff from severe rivalry (δV) is bigger than that from the cooperation ($\frac{3}{4}V$) under the condition of $\delta > \frac{3}{4}$. However, descendant A knows that severe rivalry is always optimal for the counterparty, and descendant A should choose the severe rivalry. Consequently, the equilibrium is that both descendants select "severe rivalry." At this point, the equilibrium firm value ($\delta^2 V$) is sub-optimal.

	"Unequal distribution"	B	
	Payoff (A, B)	Severe rivalry	Cooperation
A	Severe rivalry	$(\frac{3}{4}\delta^2 V, \frac{1}{4}\delta^2 V)$	$(\delta V, 0)$
	Cooperation	$(0, \delta V)$	$(\frac{3}{4}V, \frac{1}{4}V)$

As the next step, we adopt "equal distribution." Under this method, if nobody wins the competition, two descendants inherit half of the bequests (firm value). This case occurs when both descendants select the same option (severe rivalry or cooperation). If only one of the two descendants selects severe rivalry, this descendant wins the competition and obtains the entire fortune, as in the previous case. Thus, if the counterparty selects severe rivalry, the descendant's optimal decision should also be "severe rivalry" because $\frac{1}{2}\delta^2 V > 0$. For this reason, it is still an equilibrium that both descendants select "severe rivalry" as described in the previous scenario under the "unequal distribution" method. However, we can find another equilibrium under this "equal distribution" scenario. If the counterparty selects cooperation, the optimal decision of the descendant will depend on δ, which ranges from 0.25 to 1 by our assumption. If $\delta > 0.5$, severe rivalry is still optimal even when the counterparty decides to cooperate. In contrast, if $\delta < 0.5$, the cooperation option becomes optimal to the descendant as long as the counterparty chooses cooperation. Thus, under the "equal distribution," if the severe sibling rivalry is expected to destroy the family firm's value to a substantial degree ($\delta < 0.5$), it becomes another equilibrium in which both descendants select the "cooperation" option. This is not an equilibrium under the scenario of "unequal distribution." In this new equilibrium, the firm's value approaches its optimal level (V).

	"Equal distribution"	B	
	Payoff (A, B)	Severe rivalry	Cooperation
A	Severe rivalry	$(\frac{1}{2}\delta^2 V, \frac{1}{2}\delta^2 V)$	$(\delta V, 0)$
	Cooperation	$(0, \delta V)$	$(\frac{1}{2}V, \frac{1}{2}V)$

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