Unintended Consequences of Leverage Regulation in Korea

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Abstract

During the 1997 Asian financial crisis, the Korean regulatory authorities introduced a leverage cap of 200% to address comments from International Monetary Funds (IMF). Utilizing the leverage ratio regulation as a natural experiment, we assess the effect of forced changes in capital structure on firms' behavior. The main results confirm that firms that met the threshold experienced a significant decrease in firm risk, suggesting that the regulation has achieved its intended goal. Furthermore, we find that the effect of the regulation varies with the way how firms adjust capital structure. Unlike firms that repaid debts to meet the threshold, firms that issued equity exhibit increased firm risk, decreased investment-*q* sensitivity and decreased profitability in the post-regulation period. Our research contributes to the literature by investigating real effects of capital structure, and adding new evidence on externalities from regulation.

Keywords: target leverage; capital structure; Asian financial crisis; regulation
Data Availability: Data are available from the public sources cited in the text.

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1. Introduction

The capital structure irrelevance principle of Modigliani and Miller (1958) predicts that the value of a firm and its investments does not depend on how the firm is financed. Subsequent research explores the intricate relation between capital structure and investment behavior (Whited 1992; Lang et al. 1996). However, empirically identifying the effect of capital structure on investment decision is a challenging task given the inherently endogenous relation between capital structure choice and other corporate decisions. In this paper, we provide unique evidence that capital structure affects corporate decisions by exploiting a corporate capital structure regulation in Korea during the Asian financial crisis of 1997 as a quasi-natural experiment.

The Asian financial crisis of 1997 offers a unique opportunity to examine the real effects of corporate capital structure. Following the onset of the financial crisis in late 1997, the Korean government requested for financial support from International Monetary Fund (IMF). The IMF proposed various restructuring measures for the corporate sector, among which reducing excessive debts was a top priority.[1] The IMF diagnosed that excessive debts of Korean business groups, or *chaebols*, led to a series of corporate bankruptcies and exposed a large number of firms to financial distress.[2]

To address the IMF's request, the government required *chaebol* firms to reduce their

[1] The series of the press releases for the arrangement can be found on the IMF's website (http://www.imf.org/en/Countries/KOR).

[2] See "Korea's Economic Adjustments Under the IMF-supported Program" (http://www.imf.org/en/News/Articles/2015/09/28/04/53/sp012198a)

leverage ratio, total liabilities scaled by total equity[3], to below 200% by the end of 2000.[4] *Chaebol* firms in turn had to sell their assets and repay loans, or to increase their equity capital base through equity issuance and earnings. Failure to comply with the regulation substantially restricted access to debt capital markets and prompted other regulatory interventions.[5] This sweeping regulation adopted in early 1998 was largely unexpected by firms and capital market participants. Thus, our study offers an advantage in reflecting exogenous variations in capital structure after the adoption of the leverage cap regulation and enables us to draw clearer causal effects of firms' capital structure.

We use Korean listed firms over the period 1994–2004 as our sample and examine the firms that were required to adjust their capital structure to comply with the regulation. In our sample, about 24.6% of the firms significantly increased equity issuance over the 3-year period from 1998 to 2000, while about 30.2% of the firms reduced significant amounts of debt during the same period.[6] Either through equity issuance or reduction in debt, approximately 72% of the firms in our sample managed to meet the target leverage ratio of 200% by the end of 2000.

We investigate real effects of the forced reduction in leverage ratio in three aspects: firms' risk-taking, investment decisions and operating performance. First, our results confirm that the regulation succeeded in reducing overall financial risk of Korean firms by the end of 2000. Our

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[3] The regulatory measure of the leverage ratio is total liabilities scaled by total equity. Throughout the paper, we follow this definition for consistency.

[4] By the end of 1997, six of the 30 largest *chaebols* filed for bankruptcy (Joh 2003). In early 1998, the Korean government required affiliates of the top five *chaebols*-Hyundai, Samsung, Daewoo, LG and SK-to comply with the 200% debt-equity regulation by the end of 1999 and later expanded the scope to include the top 64 business groups by the end of 2000 (Park, Song, Pae, and Park 2011). Since then, the government has explicitly set a 200% debt-equity ratio as a benchmark to assess financial health of a firm (Ministry of Strategy and Finance 2013). In addition, research institutions and business presses continue to view the 200% debt-equity ratio as the "red line" for determining the financial soundness of Korean firms.

[5] In the new classification standard adopted by banks for assessing the asset quality of a borrower with regard to its ability to repay future claims, firms with a debt-equity ratio of 200% or higher are designated as firms exhibiting "symptoms of insolvency." Once a firm is designated as exhibiting such symptoms, existing loans to the firm are reclassified as either "special mention" or "substandard" loans, increasing the amount of loan loss provision banks must set aside. Effectively, access to bank financing becomes significantly limited for affected firms.

[6] The term "significant" in this study is used to describe decreases (increases) in debt (equity) during transition period that are greater than or equal to 5% of a firm's total assets at the end of 1997. Empirical details are offered in Section 3.

main results show that the firms that met the leverage threshold are associated with a lower level of risk-taking in the post-regulation period in terms of their stock return volatility and idiosyncratic volatility. This implies that the regulation achieved its intended goal of curbing firms' excessive risk-taking.

Interestingly, we find that the risk reduction effect of the regulation is not uniform but mainly concentrated in firms that met the threshold by reducing debt (*Debt* firms). In contrast, for firms that issued equity to meet the threshold (*Equity* firms), we find no significant change in their risk-taking behavior following the regulation. Instead, we find that *Equity* firms experience higher stock return volatility, higher idiosyncratic volatility and higher earnings volatility in the post-regulation period. When we compare the sensitivity of investments to investment opportunities (Tobin's *q*) as a measure of investment efficiency, we find that the investment decisions of *Equity* firms are less responsive to *q* in the post-regulation period than those of debt-repaying firms. In addition, we find that *Equity* firms exhibit a lower level of profitability than *Debt* firms in the same period. Our results are consistent with equity holders pushing management to select excessively risky projects that lead to higher firm risk, lower investment-*q* sensitivity and lower profitability. Our empirical results are robust to variations in empirical designs and different fixed effects.

Even though endogeneity concerns regarding capital structure is minimal in our research setting, concerns remain for firms' endogenous selection of their means to meet the threshold with. That is, firms with sufficient cash flows can utilize their internal funds to reduce reliance on costly external funding and pay down debt, while firms lacking such ability are forced to issue equity in order to satisfy the threshold. Hence, firms' preference between debt repayment and equity issuance is possibly endogenous, which might hinder correct inferences for its impact on corporate decisions (Hovakimian et al. 2001; Hovakimian 2004; Weber and Yang 2018). We conduct a battery of tests to resolve this concern.

First, we compare various firm characteristics such as operating performance, risk-taking, and growth in the pre-regulation and post-regulation periods. While we find no statistically significant difference between *Equity* firms and *Debt* firms in the pre-regulation period, firm characteristics of these two groups diverge significantly after the 1997 Asian financial crisis. Second, we match *Equity* firms with *Debt* firms based on firm characteristics such as firm size, profitability, and growth. For the matched sample, we still find that after controlling for the pre-regulation period firm characteristics, equity-issuing firms are associated with higher levels of firm risk in the post-regulation period than debt-repaying firms. Lastly, we conduct Heckman (1979) two-stage analysis as an additional test. After controlling for the endogenous choice of external financing during the financial crisis, we continue to find a significantly positive association between firm risk and the decision to issue equity to meet the threshold. In sum, the above collectively indicates that the potentially endogenous selection of the means to adjust capital structure is unlikely to explain aforementioned real effects of leverage regulation.

Although the leverage regulation was intended mainly for heavily-indebted *chaebol* firms, banking institutions limited loans to both *chaebol* and *non-chaebol* firms whose leverage ratio exceeded the 200% threshold. As a result, *non-chaebol* firms were *de facto* subject to the regulation and strongly incentivized to alter capital structure and investment decisions. Thus, we further analyze whether the effects of the regulation on firm risk vary depending on the *chaebol* classification. Our results show that the increase in firm risk after issuing equity to meet the threshold is concentrated in *non-chaebol* firms. We conjecture that these results can be attributed to 1) the presence of internal capital markets among *chaebol* firms (Almeida, Kim, and Kim 2015) and/or 2) higher sensitivity of *non-chaebol* firms to peer pressure in terms of changes in capital structure, especially during a crisis period (Leary and Roberts, 2014; Chen and Ma, 2017). An additional analysis reveals that the peer effect at least partially explain why the regulatory effect is concentrated for *non-chaebol* firms who are expected more subject to

peer effects.

Our study makes several contributions to the literature on capital structure and the effects of capital structure on firm behavior. First, this study documents how changes in capital structure lead to changes in firm behavior such as risk-taking, investment and operating performance. Previous studies acknowledge empirical challenges due to the endogenous relations among various corporate policies.[7] In contrast, the policy-driven change in capital structure of Korean firms offers an opportune setting to examine the causal effect of capital structure on firms' behavior.

Next, our paper complements streams of research on target leverage ratio and external financing choice. Setting the leverage cap, the Korean government implicitly suggested that the optimal leverage ratio is below 200% regardless of firm and industry characteristics. However, the regulation is inconsistent with the notion that each firm moves its capital structure towards its own optimal level. For example, a survey by Graham and Harvey (2001) suggests that 71% of the CFOs in their survey report to have a target debt-equity ratio range with only 10% of the CFOs indicating the presence of a "strict" target debt-equity ratio. We find that the government-imposed target leverage can lead to inefficient outcomes via misguided decision-making. More importantly, we document that the manner in which leverage adjustment is achieved has significant implications for a firm's risk-taking behavior and investment. While prior studies examine the determinants of external financing choice, we provide a more nuanced evidence of how external financing choice affects the firm's risk-taking and investment decisions (Hovakimian, Opler and Titman 2001; Hovakimian, Hovakimian and Tehranian 2004).

[7] For example, recent papers have studied the optimal leverage as a function of firm-level (Byoun, 2008; Chang and Dasgupta, 2009; Hovakimian and Li, 2011; Aybar-Arias et al., 2012; Faulkender et al., 2012), industry-level (Chevalier 1995) or country-level variables (Cook and Tang, 2010; Rubio and Sogorb, 2011), as well as in relation to firms' legal and institutional environment (González and González, 2008; Öztekin and Flannery, 2012).

We also add to a growing body of research on the unintended consequences of regulations (Gao, Wu, and Zimmerman 2009). For example, we learn from the accounting literature that the institutional fit between accounting and regulation is crucial to the effective implementation of regulation (Ball et al., 2000; Ball et al., 2003; Wysocki, 2011; Christensen et al., 2013). We provide unique evidence that the target leverage regulation to curb excessive borrowing and suboptimal investment can result in unexpected side effects. Thus, our research adds to a growing body of work that calls on governments and regulators to be mindful of potentially adverse consequences of financial regulations. In doing so, we also respond to Leuz and Wysocki's (2016) call for research on the externalities of regulations. First, we document that the leverage regulation yields unintended consequences on *Equity* firms. The fact that *Equity* firms exhibit higher firm risk, lower investment-*q* sensitivity and lower profitability in the post-period implies that such firms would not have deviated from its previous capital structure in the absence of the regulation. Second, we also find that the regulatory effect, albeit unintended, is concentrated among *non-chaebol* firms. The documented regulatory costs for *Equity* firms, along with the benefits for *non-chaebol* firms, support the existence of the negative and positive externalities, respectively.

Lastly, our paper is related to a line of research on firms' balance sheet management in response to financial reporting and debt contracting incentives (Hopkins 1996; Gramlich, McNally and Thomas, 2001; Dyreng, Mayew and Schipper, 2017). The institutional setting utilized in this paper offers evidence on active management of balance sheet and capital structure to reduce adverse regulatory costs and capital market consequences (Weber and Yang 2018). We contribute to this research stream by documenting unintended consequences of regulatory compliance in terms of risk-taking behavior, investment choice and profitability.

The remainder of the paper proceeds in the following manner. Section 2 offers institutional background and our research questions. Section 3 details the sample selection

process and the empirical design. In Section 4, we provide results of the target leverage regulation's impact on firms' risk-taking, investments and operating performance. Additional analyses and robustness checks are discussed in Section 5. Section 6 concludes the paper.

2. Institutional Background and Research Questions

2.1. Institutional Background

Many of the largest Korean firms belong to diversified business groups known in the literature as *chaebols* (La Porta, Lopez-De-Silanes and Shleifer 1999; Joh 2003; Baek, Kang and Park 2004; Almeida et al. 2015). In the late 1990s, the 30 largest *chaebols* played a dominant role in all major Korean industries and operated under a weak corporate governance system characterized by a circular ownership structure (Joh 2003). Among the 30, the top four *chaebols* – Hyundai, Samsung, LG, and Daewoo – were included in the Fortune 500 largest companies in the world and were global players in industries such as shipbuilding, electronics, computer memory chips, automobiles, etc. (Gobat 1998).

In the post-Korean War period, the Korean government played a crucial role in nurturing *chaebols* to develop both economies of scale and the nation's infrastructure. The government designated industries in which *chaebols* could invest and facilitated generous bank financing through state-controlled banking institutions. The government underwrote the banking system and was ready to bail out unsuccessful *chaebol* firms. Under the protective umbrella of the government, *chaebols* expanded their businesses into massive empires and funded growth by heavily relying on bank loans. The underdeveloped capital markets also contributed to the heavy reliance on debt capital.[8] *Chaebols* had many incentives to avoid issuing equity to outside investors because controlling owners from the founding families did not want to dilute

[8] As of 1996, the stock market capitalization in Korea was only 25% of total GDP, which is relatively small compared to 67% in Japan, 108% in the US, 151% in the UK and 280% in Hong Kong (BIS 1997).

their ownership. By 1996, only about one fifth of the 819 firms affiliated with the top 30 *chaebols* were listed on the Korean Stock Exchange. As a result of these institutional factors, the leverage ratios of most *chaebol* firms were over 400% prior to the Asian financial crisis that began in late 1997 (Krueger and Yoo 2001; Gobat 1998; International Monetary Fund 1999).[9,10]

As the currency crisis unfolded into a full-scale economic crisis with some of the largest firms going bankrupt, the Korean government attempted to restore order in capital markets not only by tightening banks' lending standards, but also by curbing *chaebol* firms' excessive risk-taking behavior. Given the interconnectedness of *chaebols* through a circular ownership structure, relatively profitable firms within a *chaebol* provided an implicit financial guarantee to relatively unprofitable firms within the same business group; firms that otherwise couldn't fund their operations on a standalone basis. This financial safety net sustained the less profitable firms in *chaebols* and lowered the overall profitability of the business groups. The return on assets for the manufacturing sector dropped from 4% in the 1980s to 2% in the 1990s (Krueger and Yoo 2001). In 1992, the government attempted to reduce a *chaebol*'s exposure to financial risk by restricting the cross-debt guarantees to 200% of the equity capital of the guarantor among firms affiliated with the top 30 *chaebol*s (Gobat 1998).[11]

Following the fallout from the Asian financial crisis in late 1997, the Korean government enforced a leverage cap of 200 % on affiliates of the top five *chaebols* by the end of 1999, and later expanded the scope to most business groups in the country.[12] We summarize the timeline

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[9] In 1997, 15% of the top 30 *chaebols*' affiliates had debt-equity ratios in the excess of 500% (Gobat 1998; Park et al., 2011).

[10] The high debt burden has also resulted in high debt servicing costs. Interest expense in the manufacturing sector averaged 5-6% of total sales, roughly three times higher than those in Germany, Japan, and Taiwan.

[11] Total value of debt payments guaranteed by affiliates of the top 30 *chaebols* amounted to 70 trillion Korean Won at the end of April 1997, or 91% of their total equity capital. (Gobat 1998) The Korean government limited the use of debt guarantees in 1993 by requiring that the level of debt guarantees not exceed 200% of a guarantor's total equity capital. The limit was further strengthened to 100% in 1995. *Chaebols* were given a three-year grace period to meet the new limit.

[12] "This decisive but hasty restructuring pressure created a credit crunch for most companies, especially *chaebols*."

of the financial crisis and ensuing regulatory changes in Figure 1 and Appendix A. Although there was a debate regarding whether uniform application of 200% of leverage ratio is appropriate, the Korean government ultimately pushed ahead with the 200% rule by limiting additional borrowing for failure groups (i.e., firms that failed to meet the target) and designated these firms as exhibiting "symptoms of insolvency". Consequently, in 2002, about five years after the crisis, the Financial Supervisory Service (FSS) announced that listed Korean firms had lower debt-equity ratios, lower financial expenses, and higher profitability. Mean debt-equity ratio dropped from 368.6% before the crisis to 174.4%, "a level comparable to that found in most leading economies and a clear sign of the financial stability of domestic companies." (FSS, 2002)

Researchers are divided in their opinions of the leverage cap regulation. Kim (1999) argues that the regulation was a necessary intervention, given the dire economic situation. Because the financial crisis was caused by governmental control over business financing and overprotection of the domestic market, it was fundamentally the government's role to disentangle the ensuing crisis. Under this view, the target leverage regulation is an example of the government swiftly taking charge and restructuring the Korean economy.

Lee (2000), on the other hand, argues that the leverage regulation bolstered and further entrenched the existing government-driven economy. Restructuring *chaebol*s by bureaucratic order was inherently flawed and pushed *chaebol*s to employ various irregularities. Lee (2000) criticizes the specific 200% ratio and the uniform end-of-the-year deadline. According to Lee, the former lacks economic rationale and is only a "bureaucratic measure of strength" (pg. 15). In addition, the latter destabilizes the market and limits both the issuing of capital into the stock market and the raising of foreign capital. Lee (2000) added "As a result, rights issues were

(Lim 2012, pg. 7).

carried out under unfavorable conditions and healthy companies were sold at dirt-cheap prices, even to foreign entities, and this has become a problem. In sum, the objective was well-intentioned, but the approach was wrong." (pg. 15).

Shin and Chang (2003) have a similarly negative view of the target leverage regulation. The target debt-equity ratio did not translate into lower interest payments. For example, in 1999, expenses to sales for manufacturing firms was 6.9%, which was higher than the 1997 figure of 6.4 %. This was because firms met the target leverage through asset revaluation or asset sales, rather than through debt repayment.[13] The authors point out that the debt-equity ratio often misguides firms to make value-destroying decisions, and thus the government failed to achieve the ultimate goal of the reform, namely to reduce the financial risk of firms. The target leverage regulation also stigmatized all firms that had debt-equity ratios above 200%, regardless of their long-term prospects or short-term operating efficiency.

2.2. Optimal Leverage

Survey evidence suggests that firms have a target debt ratio and manage leverage towards that target debt ratio (Graham and Harvey 2001). The existence of the optimal capital structure is heavily debated in the prior literature. The trade-off theory contends that an optimal capital structure for each firm is determined by the benefits and costs of debt: tax benefits and free cash flow control (Jensen 1986; Stulz 1990) are examples of the former, while bankruptcy costs and agency costs stemming from conflicts of interest between shareholders and debtholders are examples of the latter (Stiglitz and Weiss, 1981). In contrast, Myers (1984) advocates a pecking order theory where firms have a financing hierarchy, in the order of internal funds, debt, and external equity. Firms choose the next type of financing only when they exhaust the previous

[13] Asset revaluation requires high transaction costs including valuation fees and transaction taxes as well as substantially higher depreciation costs in the future periods.

one. The pecking order theory holds that an optimal capital structure is non-existent, and argues that the cost of information asymmetry between the market and the managers is much more important than the costs and benefits of the trade-off theory (Lemmon and Zender 2010). Recent literature analyzes the relation between adjustment speed and leverage shocks to empirically test the competing capital structure theories (Elsas and Florysiak 2010; Huang and Ritter 2009).

Specifically, the trade-off theory offers an interesting explanation for the Asian financial crisis of 1997, which is the setting of this paper. The trade-off theory explains how institutional factors influence the optimal capital structure of a firm (Oztekin and Flannery 2012).[14] In Korea, there were several institutional factors at play prior to the introduction of the leverage regulation. First, the government-guaranteed bank lending was ready to bail out any high-profile business failures. Second, the stock market was underdeveloped. Third, *chaebols* tended to avoid the issuance of equity because it diluted the controlling family's ownership. Fourth, growth opportunities were abundant, and size was an important source of prestige in the Korean business community. The high leverage levels may have been exorbitant, but nonetheless they may have been the optimal level given the economic circumstances.

Questions persist: Did the introduction of the leverage regulation indeed create a new optimal capital structure for firms; or did it force firms to deviate from the optimum and lead to a suboptimal capital structure? For firms that failed to meet the 200% target, the government limited access to bank financing (Park et al. 2011). The financial institutions that supply capital are important institutional players that affect a firm's capital structure (Fan, Titman, and Twite 2012). The likelihood of limited access to bank financing made it costlier to maintain high leverage levels. Furthermore, the market and the government stigmatized firms that exceeded

[14] Institutional factors also affect the speed of adjustment to optimal capital structure (Oztekin and Flannery 2012).

the 200% target. For firms that failed to meet the 200% leverage target, the regulation forced them toward a suboptimal level of capital structure.

Most importantly, the uniform 200% level was damaging for firms in different sectors and competitive environments. The regulation imposed a blanket 200% target regardless of the underlying differences of the affected firms (Park et al. 2011). Instead of enforcing a drastic reduction of the leverage ratio to 200%, the Korean government could have introduced market reforms that facilitated a natural reduction in debt levels. For example, Oztekin and Flannery (2012) suggest that better accounting standards lower the information asymmetry between firms and capital market, and thus facilitate the leverage adjustment of firms. The rigidity of the regulation pressed firms to take extreme measures that deteriorate firm value. Firms opting to issue equity to meet the debt-equity ratio reflects more of a dearth of alternatives than of sound capital structure decision-making.

2.3. Influence of Capital Structure on Firm Risk and Investment

Prior literature focuses on how financing choices affect firms' risk and investment decisions. Shareholders of financially distressed firms prefer higher risks because the shareholders reap the benefits of higher risks at the expense of debtholders whose payoffs are fixed (Myers 2003; Becker and Stroemberg 2012).

The capital structure literature generally documents a negative relationship between leverage and investment. As a result of the liquidity effect, debt limits a firm's ability to finance growth. The debt overhang problem causes highly leveraged firms to underinvest (Myers 1977). This may be good news for shareholders of low-growth firms because debt effectively acts a governance mechanism preventing managers from exercising discretion over free cash flows (Jensen 1986; Stulz 1990; Bernanke, Gertler, and Gilchrist 1993; Ahn, Denis, and Denis 2006). Nonetheless, firms with good investment opportunities do not show a negative relationship

between leverage and growth (Lang et al. 1996).

Financing choices and the impact of financing choice on subsequent investments vary with firm characteristics. Jung, Kim, and Stulz (1996) find that firms are more inclined to issue equity when financing valuable growth opportunities. Chang and Song (2014) find that firms with higher R&D investments rely more on equity financing than on debt financing. Jackson, Keune and Salzsieder (2013) offer evidence that the financing source, especially for debt financing, may induce managers to make investment decisions that decrease firm value.

2.4. Research Question

In this paper, we examine whether the forced reduction in leverage ratio achieved its intended goal: improving the risk exposure of Korean firms. To investigate the changes in the risk exposure, we test the real effects of the regulation in three different aspects: firms' risk taking, investment decisions and operating performance. We first illustrate the changes in firm characteristics including firm-risk taking and operating performance between before and after the forced reduction in leverage ratio. We then observe whether firm risk, investment-*q* sensitivity, and operating performance differ for firms that meet the government-imposed target leverage ratio. Lastly, we analyze how a chosen financing method to meet the target impact the firms in above aspects. In doing so, we address the question of whether the target leverage regulation achieved its goal of improving the risk exposure of Korean firms. To estimate the different influence of debt and equity, we follow Hovakimian (2004) and differentiate between firms that reduce debt and those that issue equity to meet the target leverage ratio.[15] Our categorization differs slightly from that of Park et al. (2011), who categorize methods to reduce

[15] Hovakimian (2004) focuses on *pure* equity issuance firms, *pure* debt issuance firms, and *pure* debt reduction firms which are mutually exclusive. Since our interest is a comparison between *pure* equity issuance firms and *pure* debt reduction firms, we compare *pure* equity issuance firms and *pure* debt reduction firms in the main analyses.

the debt-equity ratio into reductions in substance and in form. Debt-equity ratio reduction in substance involves repaying debt with proceeds created through selling unprofitable assets and equity issuance. Asset revaluation and operating lease contracts are categorized as debt-equity ratio reduction in form. Debt reduction with equity issuance essentially indicates debt reduction in substance, but we follow the capital structure literature in differentiating debt financing from equity financing in this paper. Our findings show systematic differences across firms depending on the method chosen to comply with the regulation.

3. Sample Selection and Research Design

3.1. Sample Selection

Our initial sample begins with Korean listed firms over the period 1994 – 2004. To examine the effect of target leverage regulation, we divide the sample period into three subperiods. Since the Asian financial crisis officially began in Korea around the end of 1997 with the signing of a Memorandum of Understanding with the International Monetary Fund, we select fiscal years 1994 to 1997 as the pre-regulation period, 1998 to 2000 as the crisis period, and 2001 to 2004 as the post-regulation period. As the Korean government first announced the regulation requiring *chaebol* firms to reduce their leverage ratio below 200% by the end of 2000 in March 1998, we also designate the crisis period from 1998 to 2000 as the transition period. We use 4 years for both pre- and post-regulation periods to have a reasonable number of observations and a balanced panel for our analyses. As it is difficult to ascertain when firms begin to alter their behaviors prior to the regulatory deadline, we exclude the transition period as part of our analyses to better isolate the effect of the regulation.[16] Figure 1 shows a timeline for our analyses. Accounting and stock market data are obtained from the

[16] Our results are robust after including the transition period in our main analysis.

DataGuide database maintained by FnGuide, a financial information provider in Korea. We exclude firms in the financial services industry and firms with non-December fiscal year-ends. We also delete observations with total assets of less than 1 billion Korean Won.[17] Lastly, we exclude firms with negative book value of total asset or equity. The final sample consists of 2,627 firm-year observations over our sample period.[18]

3.2. Research Design

3.2.1. Firm Risk

To examine whether the target leverage regulation and firm's financing choice affect firm risk, we first estimate the following regression model:

$$\begin{aligned} FirmRisk_{i,t} = {} & \beta_0 + \beta_1 Post_{i,t} + \beta_2 Post_{i,t}*Meet_{i,t} + \beta_3 Post_{i,t}*Meet_{i,t}*Equity_{i,t} + \beta_4 Post_{i,t}*Meet_{i,t}*Debt_{i,t} \\ & + \beta_5 Post_{i,t}*Equity_{i,t} + \beta_6 Post_{i,t}*Debt_{i,t} + \beta_7 *Meet_{i,t}*Equity_{i,t} + \beta_8 *Meet_{i,t}*Debt_{i,t} + \beta_9 Meet_{i,t} \\ & + \beta_{10} Equity_{i,t} + \beta_{11} Debt_{i,t} + \beta_{12} Size_{i,t-1} + \beta_{13} MTB_{i,t-1} + \beta_{14} CFO_{i,t-1} + \beta_{15} SalesGrowth_{i,t-1} \\ & + \beta_{16} AssetGrowth_{i,t-1} + \beta_{17} Loss_{i,t-1} + \beta_{18} OperatingCycle_{i,t-1} + Year * Industry\ fixed\ effects \\ & + \varepsilon_{i,t} \end{aligned} \quad (1)$$

, where *FirmRisk* is either return volatility, idiosyncratic return volatility, or earnings volatility. Return volatility and idiosyncratic volatility are calculated using daily returns during the fiscal year. Earnings volatility is measured using standard deviation of EBITDA to total assets between year *t-2* to *t*. *Post* equals 1 for observations in the post-regulation period, and 0 otherwise. *Meet* is also an indicator variable equal to 1 if the firm reduces its debt-equity ratio below 200% by the end of 2000, and 0 otherwise.[19] We include various control variables

[17] As a robustness check, we include observations with total assets of less than 1 billion Korean Won and document qualitatively similar results.

[18] We also exclude firms whose debt-equity ratio is below 200% as of 1997. Since these firms do not need to decrease (increase) debt (equity), we cannot identify whether these firms meet or miss the target leverage (Oswald, Simpson, and Zarowin 2016).

[19] We do not differentiate meeting the target leverage firms and non-meeting firms in the pre-regulation period 1) because we cannot anticipate their behavior in the pre-period, and 2) to avoid "hindsight bias" (Hawkins and Hastie 1990).

related to firm risk. *Size* is natural logarithm of total assets. *MTB* is market-to-book ratio defined as market value of equity divided by book value of equity. *CFO* is operating cash flows scaled by lagged total assets. *SalesGrowth* is the change in sales over the fiscal year. *AssetGrowth* is the change in total assets over the fiscal year. *Loss* is an indicator variable if the firm incurs an accounting loss, and 0 otherwise. *OperatingCycle* is the sum of days in accounts receivable and inventory turnover in days (Dechow 1994). We also include year and industry fixed effects in our model to account for time-varying changes in industry conditions. Standard errors are clustered by firm to control for heteroscedasticity (Petersen 2009). Detailed definitions of the variables are provided in Appendix B.

In order to test the effects of the target leverage regulation on firm risk depending on the method of external financing, we include two different financing choice variables. *Equity* is an indicator variable equal to 1 for firms with cumulative equity issuance during the 3-year transition period is greater than 5% of their total assets in 1997 without significant reduction in debt of the same magnitude (Hovakimian 2004), and 0 to otherwise. Similarly, *Debt* is an indicator variable equal to 1 for firms with cumulative debt reduction during the 3-year transition period greater than 5% of their total assets in 1997 without significant equity issuance of the same magnitude. Since the target leverage regulation required affected firms to meet the 200% target leverage ratio by the end of 2000, we treat the three years from 1998 to 2000 as a single period and apply the 5% cutoff ratio.[20,21]

If the target leverage regulation led to a reduction in firm risk in the post-regulation period for an average firm, we expect β_2 to load with a negative coefficient. Consistent with

[20] Alternatively, we define *Equity* firms and *Debt* firms using different cutoff rates (e.g., 10% of the 1997 total assets) and still document results that are quantitatively and qualitatively similar. Section 6.1. offers more detailed explanations.

[21] Four largest *chaebols* including Hyundai, Samsung, LG, and SK were required to meet the 200% target leverage ratio by the end of 1999. For a robustness check, we exclude four largest *chaebols* from our sample and still find qualitatively similar results.

our predictions, we expect that firms meeting the regulation with significant equity issuance are associated with relatively higher firm risk in the post-regulation period and thus a positive coefficient on β_3. On the other hand, we expect that firms meeting the regulation with significant debt reduction are associated with relatively lower firm risk in the post-regulation period and thus a negative coefficient on β_4.

3.2.2. Investment-*q* Sensitivity

The main motivation behind the government regulation of corporate financial leverage following the Asian financial crisis was to curb excessive investments of *chaebol* firms who built business empires with borrowings from banks under the auspices of the government (Joh, 2003, 2004). However, whether the decline in financial leverage is indeed associated with more optimal investment decision in the post-regulation period is unclear. If firms increase the relative weight of equity capital rather than decrease that of debt capital in a given capital structure, shareholders' influence on corporate investment decision becomes more powerful compared to that of creditors, possibly leading to selection of more risky investments that transfer wealth from debt claims to equity claims (Jensen and Meckling, 1976; Myers, 1977). Thus, the change in capital structure induced by the target leverage regulation may affect managers' risk preference towards available investment projects.

We examine whether the target leverage regulation influences investment decision of affected firms. In doing so, we follow prior studies that interpret a more positive relation between investment and growth opportunities as evidence of optimal investment decision (e.g., McLean, Zhang and Zhao, 2012; Asker, Farre-Mensa and Ljungqvist, 2015; Graham, Hanlon, Shevlin and Shroff, 2017; Jayaraman and Wu 2018).

Our reduced-form model of corporate investment is as follows:

$$Capex\_R\&D_{i,t} \text{ (or } Capex_{i,t}, R\&D_{i,t}) = \beta_0 + \beta_1 Post_{i,t} + \beta_2 Post_{i,t} * Tobin's\ Q_{i,t-1} + \beta_3 Post_{i,t} * Meet_{i,t}$$

$$+ \beta_4 Post_{i,t} * Meet_{i,t} * Tobin's\ Q_{i,t-1} + \beta_5 Meet_{i,t} * Tobin's\ Q_{i,t-1} + \beta_6 Meet_{i,t} + \beta_7 Tobin's\ Q_{i,t-1}$$

$$+ \beta_8 CFO_{i,t-1} + \beta_9 Size_{i,t} + \beta_{10} SalesGrowth_{i,t-1} + \beta_{11} AssetGrowth_{i,t-1} + \beta_{12} Loss_{i,t-1}$$

$$+ \beta_{13} OperatingCycle_{i,t-1} + Year * Industry\ fixed\ effects + \varepsilon_{i,t} \quad (2)$$

In our examination of investments, we replace the dependent variable in Equation (1) with one of the following: sum of capital expenditure and R&D investment (*Capex_R&D*); capital expenditure (*Capex*); and R&D investment (*R&D*). In addition to controlling for operating cash flows in above model, we include and interact *Tobin's Q* with our key constructs on interests (*Post* and *Meet*). Specifically, we focus on the coefficient on *Post*Meet*Tobin's Q* and interpret a more positive (negative) coefficient as evidence of more (less) efficient investment decision in the post-regulation period for firms meeting the target leverage. For ease of interpretation, we estimate the model separately for full sample, equity-issuing firms (*Equity*), and debt-repaying firms (*Debt*).

3.2.3. Operating Performance

In order to examine whether the target leverage regulation and means of meeting the target have implications for post-regulation operating performance of affected firms, we replace the dependent variable in Equation (1) with one of the following measures of firm performance: earnings before interest, depreciation and amortization scaled by lagged assets (*EBITDA*); net income scaled by lagged assets (*NI*); and annual stock return (*Return*).[22]

In these test, we posit that if significant equity issuance to meet the target ratio leads to higher firm risk and less optimal investment decision in the post-regulation period, equity-issuing firms are associated with poorer operating and stock market performance in the period. On the other hand, if the regulation achieved its intended goal of lowering corporate risk-taking

[22] We group stock market returns as part of firm performance metrics to reflect the stock market's assessment of operating performance.

and incentivizing more optimal investment decision through reduction in excess debt levels, we expect that firms meeting the regulation with significant debt reduction are associated with improved firm performance in the post-regulation period. Consistent with our predictions, we expect that firms meeting the regulation with significant equity issuance are associated with relatively poorer operating performance in the post-regulation period and thus a negative coefficient on β_3. On the other hand, we expect that firms meeting the regulation with significant debt reduction are associated with relatively better operating performance in the post-regulation period and thus a positive coefficient on β_4.

4. Empirical Results

4.1. Descriptive Statistics

Table 1 shows descriptive statistics for the full sample. The mean debt-equity ratio (*Leverage*) during our sample period is 291% and higher than the required level of 200% in accordance with the regulation. Figure 2 shows the time-series of the annual median debt-equity ratio. Consistent with Joh (2004), debt-equity ratios of our sample firms continue to rise until 1997. From 1997 to 2000, we observe a significant drop in financial leverage. The debt-equity ratios do not revert to pre-regulation period levels, indicating a lasting impact of the target leverage regulation on Korean firms' capital structure even after the Asian financial crisis.

Table 1 also suggests that firms responded to the target leverage regulation in different ways. In response to the regulation, a significant number of firms increased equity issuance and/or reduced debt during the crisis period. About 24.6% of our sample firms issued equity that amounted to more than 5% of the 1997 total assets during the crisis period (*Equity)*, while about 30.2% of the firms reduced debt by a similar magnitude (*Debt)*.

Table 2 shows correlations among the variables. Consistent with our expectation, *Equity* firms are positively associated with higher return volatility (*Return Volatility*), higher

idiosyncratic volatility (*Idiosyncratic Volatility*), higher earnings volatility (*Earnings Volatility*) and lower operating performance (*EBITDA and NI)*. On the other hand, *Debt* firms are associated with lower firm risk and higher profitability. In sum, these univariate correlations raise the concern that there may be systematic differences between *Equity* firms and *Debt* firms that are related to their choice in the means of meeting the target leverage ratio. We conduct additional analyses to partially address this endogeneity issue in subsequent sections.[23]

4.2. Univariate Comparisons

In Table 3, we compare descriptive statistics for firms that issued equity (*Equity)* with those for firms that repaid debt (*Debt)* during the financial crisis. In the full sample (Panel A), we observe no significant difference of firm characteristics between *Equity* firms and *Debt* firms during the pre-regulation period. For example, the mean value of return volatility of *Equity* firm is 0.523, while that of *Debt* firms is 0.509. Neither are other firm characteristics such as *NI*, *Return*, *CFO*, and *MTB* statistically different. However, in the post-regulation period, the two groups of firms become completely different. *Equity* firms have higher return volatility, idiosyncratic volatility, and earning volatility compared to *Debt* firms. Additionally, *Equity* firms experience lower operating performance and poorer stock return. Panel A suggests that the extent to which firm risk or other firm characteristics has changed in the post-regulation period depends on the firm's financing choice.

In Panel B of Table 3, we divide the full sample into firms that met the target and firms that missed the target imposed by Korean government. For the firms that met the target leverage ratio, *Equity* firms experience higher firm risk and lower performance in the post-regulation

[23] As prior literature suggests, a firm's choice to either issue equity or reduce debt is endogenously determined (e.g., Hovakimian et al. 2001; Hovakimian 2004; Weber and Yang 2018). To mitigate the concern that unobserved firm characteristics drive firms' decision to issue equity or reduce debt, we conduct a battery of analysis in Section 5.

period compared to *Debt* firms. In the pre-regulation period there was little difference in firm characteristics between *Equity* firms and *Debt* firms. In the post-regulation period, firm characteristics significantly diverge depending on the firm's financing choice. However, we cannot say these changes were solely determined by the financing choice. For firms that missed the threshold leverage ratio, there are no significant differences between *Equity* firms and *Debt* firms in both the pre- and post-regulation period. If the divergence in firm characteristics was purely driven by the financing choice, then firms that missed the targets should show a similar pattern. Our evidence suggests that the target leverage regulation had a critical impact on firm behavior depending on firms' response to the regulation. In sum, the target leverage regulation led firms to exhibit significantly different characteristics in the post-regulation period, depending on whether and how they met the threshold leverage ratio.

4.3. Leverage Regulation and Firm Risk

Table 4 shows regression results of estimating Equation (1) where we examine the effect of the target leverage regulation on firm risk conditional on the means of meeting the target leverage. First, we examine whether the target leverage regulation is associated with changes in return volatility, idiosyncratic volatility, and earnings volatility for affected firms. In Columns (1), (4) and (7), the results show that firms are associated with higher return volatility, idiosyncratic volatility and earnings volatility in the post-regulation period with significant positive coefficients on *Post* in all three specifications. These results can be interpreted as higher stock market uncertainty affecting firm risk and firms experiencing higher operating uncertainty in the post-Asian financial crisis period. Next, we find in Columns (2), (5) and (8) that meeting the target leverage ratio is associated with lower firm risk in the post-regulation period. In particular, we document that meeting the target leverage ratio is associated with lower return volatility in the post-regulation period (β_2 = -0.046 with t-statistic of -3.22) and

lower idiosyncratic volatility in the post-regulation period (β_2 = -0.046 with t-statistic of -3.49). The results are insignificant for the earnings volatility test. On average, the results in Columns (2) and (5) indicate that the target leverage regulation is associated with lower firm-level risk in the post-regulation period and is consistent with the stated goal of the regulation.

In Columns (3), (6) and (9), we further interact *Post*Meet* with indicators for the means of meeting the target leverage regulation and interpret the coefficients on the triple interaction terms as capturing differential effects of the target leverage regulation conditional of external financing method. While we continue to find significantly negative coefficients on *Post*Meet* in Columns (3) and (6), we document significantly positive coefficients on *Post*Meet*Equity* suggesting that the effect of the target leverage regulation lowering firm risk in the post-regulation period is mitigated when significant equity issuance is used to meet the target leverage. These results are consistent with our prediction that firms that met the target leverage regulation by issuing equity are associated with relatively higher firm risk in the post-regulation period. On the other hand, we do not find any significant coefficients on *Post*Meet*Debt*.

Overall, our results suggest that although the target leverage regulation appears to successfully lower firm risk in general, the effect is observed only for debt-repaying firms (*Debt*) and not for equity-issuing firms (*Equity*). Thus, the effect of the target leverage regulation on firm risk in the post-regulation period varies across firms depending on their external financing choice.

4.4. Leverage Regulation and Investment-*q* Sensitivity

In Table 5, we show whether the target leverage regulation affects the extent to which firms optimally invest their capital relative to their investment opportunities.[24] In Columns

[24] We include other standalone variables in the regression, but only report a few variables of interest for brevity.

(1)–(3), we first examine the sum of capital expenditure and R&D investment as the dependent variable and focus on the coefficient on the triple interaction term of *Post*Meet*Tobin's Q* in the full and subsamples depending on the choice of external financing. In Column (1), we find a negative, but statistically insignificant coefficient on the triple interaction for the full sample. In Column (2) where only *Equity* firms are examined, we find a significant and negative coefficient on the triple interaction term consistent with the target leverage regulation leading to a lower sensitivity of corporate investments to investment opportunities in the post-regulation period (β_4 = -0.124 with t-statistic of -1.69). On the other hand, in Column (3), the effect of the target leverage regulation on investment-*q* sensitivity of *Debt* firms is insignificant. Collectively, these results indicate that firms that met the threshold by issuing equity made investment decisions that were less responsive to investment opportunities. This suggest that the target leverage regulation may not have achieved its goal of inducing more optimal investment behavior for firms that issued equity to meet the target.

Related literature suggests that R&D investment is characterized by greater uncertainty about future profitability and thus higher information asymmetry (Aboody and Lev 2000; Chan, Lakonishok and Sougiannis 2001). If firms increase the relative weight of equity in their capital structure to meet the target leverage, managers are more likely to make risky investments such as R&D in order to cater to shareholders' option-like payoff functions (Jensen and Meckling 1976). Following this logic, we posit that the extent to which firms optimally invest in research and development is more negatively affected by the target leverage regulation than in the case of capital expenditure. We test this conjecture by differentiating capital expenditure from R&D.

The results are presented separately for capital expenditure (Columns (4)–(6)) and R&D

The results of all variables are available upon request.

(Columns (7)–(9)) in Table 5. For capital expenditure, the coefficients on *Post*Meet*Tobin's Q* are insignificant in in all cases, but for R&D, the coefficient on *Post*Meet*Tobin's Q* for *Equity* firms is negative and significant (β_4 = -0.035 with t-statistic of -3.08). Based on these differential results, we posit that the detrimental effect of the target leverage regulation on investment efficiency is driven by firms' suboptimal investments in R&D.

Overall, the results of Table 5 are consistent with our expectation that the extent to which the target leverage regulation affects firm investment decisions depends on the financing chosen to meet the target leverage.[25] Despite the regulation's intended goal of improving firms' investment decisions, *Equity* firms made investment decisions that are less responsive to investment opportunities in the post-regulation period. In line with our earlier results on firm risk, these results highlight the unintended consequences of the target leverage regulation on firms' behavior.

4.5. Leverage Regulation and Operating Performance

The results of Table 4 and Table 5 are consistent with our expectation that the target leverage regulation achieved its intended goal mainly for firms that reduce their debt-equity ratios by repaying debt. In contrast, firms that issued equity are associated with higher firm risk and risky investment due to greater influence of equity holders. We further test the consequences of the changes in firm risk and investment behavior stemming from different financing choices. We examine whether riskier investment conducted by *Equity* firms result in

[25] We also examine whether investment-cashflow sensitivity is affected by the target leverage regulation. We interact both *Post* and *Post*Meet* with internal cashflow to test whether firms respond more strongly to internal fund following the crisis period. Untabulated results show that firms' reliance on internal cashflow was not affected by their financing choices in complying with the target. Since the interpretation of investment-cashflow sensitivity depends critically on whether firms are financially constrained to access capital markets, we find that investment-cashflow sensitivity is not an appropriate measure of optimal investment, especially when firms increase free cash flow with high equity issuance (Fazzari, Hubbard, and Petersen, 1988; Kaplan and Zingales, 1996; Chen and Chen, 2012).

lower future performance. Since *Equity* firms face greater influence of equity shareholders and engage in riskier projects which lead to suboptimal investment, we expect lower future profitability for *Equity* firms. *Debt* firms may experience higher future profitability in the post-regulation period because they engage in more sensitive investment to investment opportunity. Table 6 shows the results of our analysis. *Equity* firms that met the threshold (*Post*Meet*Equity*) exhibit lower *EBITDA* and net income (*NI*). In Column (3), the coefficient on triple interaction term of equity-issuing firms (*Post*Meet*Equity*) is negative and significant at 5% level (β_4= -0.035 with t-statistic of -2.31). Also, in Column (6), the coefficient is negative and significant on the triple interaction term of *Equity* firms (β_4= -0.041 with t-statistic of -2.05). On the other hand, the triple interaction term of *Debt* firms (*Post*Meet*Debt*) are not significant in Column (1) and (2). When we compare the stock market performance of *Equity* firms and *Debt* firms, we find that *Debt* firms that met the target leverage experience higher stock return, while *Equity* firms that met the target firms did not.[26] Surprisingly, we cannot find any evidence whether meeting the target leverage itself increased overall profitability in the post-regulation period. Rather, meeting the target leverage led to lower EBITDA in the post-regulation period (Column (2), β_2= -0.013 with t-statistic of -2.10). This result raises doubts about the effectiveness of the target leverage regulation as a public policy, and whether it was beneficial to firms at all.[27]

In sum, the results of Table 6 confirm that the target leverage regulation has unintended consequences of lowering future profitability of *Equity* firms. The lower future profitability

[26] We also repeat analysis with various performance measures (e.g., sales, cashflow from operations). Untabulated results show that firms meet the target leverage ratio with equity financing experience lower sales, lower cashflow from operations after crisis period. Overall, our results are not changed depending on performance measures.

[27] Still, the Korea government require holding companies to have debt-equity ratios below 200% in accordance with *Act on Monopoly Regulation and Fair Trade* (Article 8-2). Also, firms with debt-equity ratios higher than 200% are subject to designation of auditors by the *Act on External Audit of Stock Market Listed Companies* (Article 4-3). The aforementioned regulations reflect the government's continued view that 200% debt-equity ratio is an effective cutoff level for determining financial risk of firms.

may be attributable to higher firm risk and risky investments pressured by equity holders.

5. Additional Analyses and Robustness Checks

5.1. Endogeneity in External Financing Choice

Our main tests utilize two different financing choice variables (*Equity* and *Debt*) that are endogenously determined by other firm characteristics. In finance literature, Hovakimian (2001) argues that more profitable firms have lower leverage ratios and are more likely to issue debt than equity compared to less profitable firms. Since firms choose into alternative ways of meeting the target leverage threshold, tests of the impact of financing choice on other dimensions of corporate decision-making should account for the effect of selection bias. Initially in Section 4.2 where we examine the descriptive statistics, there seems to be no statistically significant differences in characteristics between *Equity* firms and *Debt* firms before the regulation became effective. This provides some support for the argument that the target leverage regulation imposed by the Korean government provides an opportunity to examine the impact of financing choice on corporate decisions. However, in order to further address the concern that other unobservable firm characteristics not examined in Table 3 may drive our main results, we conduct following robustness tests.

5.1.1. Matched Sample Analysis

First, we conduct matched sample analysis. We match each firm-year observation from the pre-regulation period with the closest observation in terms of net income, sales, operating cash flow, and firm size within each year and industry. After matching in the pre-regulation period, we merge them with the post-regulation firm-year observations. Firms unable to be matched in the pre-regulation period are excluded after the merge to maintain constant samples. The final matched sample consists of 632 firm-year observations from 1994 to 2004. When we compare

univariate statistics between treatment groups and control groups, we find no statistically significant differences in earnings, sales, operating cash flow, and firm size (untabulated).

In Table 7, we report the main regression results of our matched sample tests. Consistent with our conjecture in Section 4, we find that the coefficients on the triple interaction terms, *Post*Meet*Equity*, are positive and significant across all specifications (β_4= 0.168, 0.146, and 0.028 with t-statistic of 2.14, 2.02, and 1.84, respectively). On the other hand, we still find no significant coefficient on the triple interaction terms, *Post*Meet*Debt*, for *Debt* firms. In sum, the results of matched sample analysis are consistent with our main results in that the negative effect of the target leverage regulation on firm risk is reduced when significant equity issuance is used to meet the target leverage threshold.

5.1.2. Heckman (1979) Two-Stage Analysis

Along with matched sample analysis, we conduct Heckman (1979) two-stage analysis. The Heckman two-stage analysis is utilized in accounting and finance literature to partially address selection bias. In the first stage, in order to examine the characteristics affecting a firm's external financing choice in response to the target leverage regulation, we estimate a probit model of the probability of belonging to equity-issuing firms (*Equity*).[28] That is, we examine factors leading some of the targeted firms to issue significant levels of equity during the regulation period. Following prior literature, we include firms size (*Size*), market-to-book ratio (*MTB*), current year return (*Return*), operating cash flows (*CFO*), growth in sales (*SalesGrowth*), growth in total assets (*AssetGrowth*), an indicator variable for accounting loss (*Loss*), and operating cycle (*OperatingCycle*). In addition, firms with a debt-equity ratio significantly above the 200% target threshold as of 1997 are more likely engage in significant

[28] We exclude firms do not issue equity or repay debt to increase the validity of our selection model.

restructuring of capital structure. Therefore, we include the magnitude of deviation from the 200% threshold as of 1997, *Deviation from 200%*.

Panel A of Table 8 shows the results of estimating the probit regression model. First, we find that firms with higher growth opportunities rely on equity issuance, while firms with higher cash flows engage in debt reduction. We also observe that firms with higher asset growth are more likely to issue equity during the regulation period. By including the inverse Mills ratio (*IMR*) from the first stage, we estimate our main regression models in Panel B of Table 8.[29] The second-stage estimation attempts to account for endogenous selection in external financing choice.[30] We still find positive and significant coefficients across all three columns (β_4= 0.107, 0.076, and 0.018 with t-statistic of 2.85, 2.25, and 1.86, respectively).[31,32]

Overall, we acknowledge and attempt to address endogeneity concern in external financing choice by 1) examining firm characteristics of treatment and control firms in the pre-regulation period, 2) conducting our main analyses with matched samples that have similar pre-regulation period characteristics, and 3) conducting Heckman (1979) two-stage analysis.[33]

5.2. *Chaebol* and *Non-chaebol* firms

5.2.1. Comparison between *Chaebol* and *Non-chaebol* firms

The target leverage regulation was intended to curb excessive borrowings of large

[29] The inverse Mills ratio is defined as $\phi(Z_{i\gamma})/\Phi(Z_{i\gamma})$ for an equity-issuing firm (*Equity*) and $-\phi(Z_{i\gamma})/(1-\Phi(Z_{i\gamma}))$ for an debt-repaying firm (*Debt*), where ϕ and Φ are the standard normal probability density function and standard normal cumulative density function, respectively. Z include the vector of explanatory variables in Panel A of Table 8, and γ is the vector of coefficients as estimated in Panel A of Table 8.

[30] As we only include firm-year observations of equity-issuing firms (*Equity*) and debt-repaying firms (*Debt*), sample size is reduced to 1,124 firm-year observations.

[31] We include all interaction terms and standalone variables in the regression, but not report for brevity.

[32] We also re-estimate Table 6 with first-stage inverse Mills ratio (*IMR*). We still find that firms issuing equity to meet the target leverage regulation (*Post*Meet*Equity*) experience lower performance in the post-regulation period (untabulated).

[33] We also repeat our main analysis with firm fixed effect instead of industry fixed effect to control for unobservable firm characteristics that affect the decision of external financing means. Though some interaction variables and unique firm variable (e.g., *Meet*) are omitted due to firm fixed effect, the results of our main analysis still remain robust (untabulated).

chaebol firms without any explicit reference to *non-chaebol* firms. Such institutional background suggests that the decline in debt-equity ratio should be observed only in *chaebol* firms. However, Korean banks imposed the same loan restriction penalties on *non-chaebol* firms for failing to meet the 200% leverage threshold. Thus, *non-chaebol* firms were *de facto* subject to the same target leverage regulation as *chaebol* firms. When we compare the change in debt-equity ratio during the sample period between *chaebol* firms and *non-chaebol* firms, we find a similar decreasing trend in debt-equity ratio after the regulation was enforced (untabulated).[34] The banks successfully pressured not only *chaebol* firms but also *non-chaebol* firms into lowering their debt-to-equity ratio. In sum, the target leverage regulation implicitly affected *non-chaebol* firms as well as *chaebol* firms.

Almeida et al. (2015) argue that *chaebol* firms in Korea have strong internal capital markets within their business groups that allow affiliates to easily reallocate capital by transferring equity. The change in mix between the shareholders and debtholders due to the regulation may affect *chaebol* firms less because the controlling shareholders have access to reallocated capital. On the other hand, as *chaebol* firms were the main purpose of the regulation, they could be subject to increased scrutiny by the public and regulators, and thus the consequences of the regulation could be more pronounced for *chaebol* firms. We divide our sample into *chaebol* and *non-chaebol* firms and present our findings in Table 9.[35]

In Panel A, we find that only *non-chaebol* firms that issued additional equity amounting to more than 5% of total assets experienced higher return volatility after the crisis (β_2= 0.128

[34] We further divide our *non-chaebol* sample into two groups based on their total assets to reflect the fact that the Korean government targeted larger firms. *Chaebol* firms and *non-chaebol* firms show similar trends regardless of their asset size.

[35] We are unable to identify the actual list of small business groups (ranked as 31st ~ 64th groups) that are classified as *chaebols* in prior literature. Instead, we hand-collect information about 30 largest business groups from the Korea Fair Trade Commission (KFTC) website (http://www.ftc.go.kr/eng/index.do) and treat the 30 largest business groups as a proxy for *chaebol*. While this classification can be imperfect, we acknowledge that the combined sales of the 30 largest business groups represented about 90% of total GDP of Korea in 1996 and therefore the business groups we identify can be reasonably regarded as *chaebols*.

with t-statistic of 3.06). C*haebol* firms that issued additional equity did not show higher return volatility, implying that the impact of target leverage regulation is concentrated on *non-chaebol* firms. When we replace our dependent variable to idiosyncratic volatility, we find similar results (Column (3) and (4)). In addition, while *non-chaebol* firms that issued equity to meet the target exhibited lower profitability in the post-regulation period, *chaebol* firms that issued equity had even higher profitability (Panel B). We argue that, as Almeida et al. (2015) suggested, stronger internal capital markets of *chaebol* firms allowed them to react more flexibly to the regulation, while *non-chaebol* firms were not as flexible with their financing choice.[36] In addition, our results are consistent with Leary and Roberts (2014) who suggest that financial policies of smaller and financially constrained firms are more sensitive to those of larger and unconstrained firms. *Non-chaebol* firms with limited access to external financing may respond more significantly to changes in capital structure of *chaebol* firms induced by the target leverage regulation. Overall, the results of Table 9 shed light on the unintended consequences of the target leverage regulation. Although the government's intention was to restrict large *chaebol* firms' behavior, *non-chaebol* firms were more strongly affected by the regulation and experienced significant consequences depending on their financing behavior.[37]

5.2.2. Peer Effect of Leverage Regulation

In Table 9, we find that observed change in firm risk and performance attributable to external

[36] As prior literature argued, diversified firms increase their scope during times of high external capital market frictions, such as in the recent Great Recession (Matvos and Seru 2014; Matvos, Seru, and Silva 2017). In the timing of external capital market frictions, firms diversify their investment needs and cash flow across industries to respond flexibly to the market frictions. Following prior studies, we additionally divide *chaebol* sample into two groups based on their number of affiliates and re-estimate our main analysis. We find that diversified *chaebol* firms with larger number of affiliates are not affected by target leverage regulation while non-diversified *chaebol* firms experience difference consequences depending on their external financing means.

[37] We also estimate our main analyses after excluding four largest *chaebol* firms (Hyundai, Samsung, LG, and SK) from our sample due to different regulation period. Four largest *chaebol* firms are expected to reduce their debt-to-equity ratios below 200% until the end of 1999 and maintain their 200% debt-to-equity ratios during 2000. The results are not changed.

financing choice to meet the target leverage regulation was pronounced for *non-chaebol* firms. In this section, we test the peer effect in leverage among *chaebol* firms and *non-chaebol* firms. As Leary and Roberts (2014) argued, one possibility of observed results in Table 9 can be interacted between a firm's financial policy and other firms' external shock. Though *non-chaebol* firms are not directly regulated by government in terms of target leverage regulation, change in debt-equity ratio of *chaebol* firms are indirectly affect the debt-equity ratio of *non-chaebol* firms in a way of peer effect.

To test this argument, we conduct additional analysis after including peer firms' idiosyncratic return and leverage as determinants of focal firms' debt-equity ratio. For *non-chaebol* firms, we define peer firms as *chaebol* firms in the same industry in analogous fiscal year. In a similar way, for *chaebol* firms, we define peer forms as *non-chaebol* firms in the same industry and year. For each firm-year observations, we calculate idiosyncratic return following Leary and Roberts (2014), using monthly returns during past 60 months.[38] As peer firms' leverage and focal firm's leverage can be endogenously related, Leary and Roberts (2014) utilize idiosyncratic return of peer firm as an exogenous shock to the focal firm's financial policy. Following prior literature, we also include average of peer firms' idiosyncratic returns as an exogenous shock. Additionally, we include peer firms' average debt-equity ratio as a control variable in our regression analysis. Panel A of Table 10 reports our regression analysis of peer effect in leverage between *chaebol* firms and *non-chaebol* firms, respectively. Interestingly, in Column (2), we find that *non-chaebol* firms are strongly affected by idiosyncratic return of *chaebol* firms. The coefficient on *Idiosyncratic Return_Peer* is negative and significant at least

[38] Idiosyncratic returns are residual from following market, industry, peer adjusted return regression:

$$Ret_{i,j} = \alpha_0 + \beta_1 R_{m,j} + \beta_2 R_{k,j} + \beta_3 R_{p,j} + \varepsilon_{i,j} \quad (2)$$

, where $Ret_{i,j}$ is monthly return of firm *i* in month *j*, $R_{m,j}$ is market index in month *j*, $R_{k,j}$ is monthly return of industry *k* in month *j*, and $R_{p,j}$ is monthly return of peers in month *j*. We require at least 24 firm-month observations to be included in the sample.

10% level (β_2= -1.217 with t-statistic of -1.90). As idiosyncratic return of peer firms is increase, focal firm reduces their leverage due to positive exogenous shock. The results are robust after control for peer firms' average debt-equity ratio (*Leverage_Peer*) and mean value of control variables of peer firms (Column (3)). On the other hand, *chaebol* firms are not directly affect by *non-chaebol* peer firms' exogenous shock or average debt-equity ratio. The coefficients on *Idiosyncratic Return_Peer* and *Leverage_Peer* are not statistically significant which indicate the limited effect of *non-chaebol* peer firms.

Leary and Roberts (2014) and Chen and Ma (2017) argue that peer effects are more pronounced when focal firms are financially constrained. Also, Scharfstein and Stein (1990) shows that when markets are decline, managers are affected by peers' behavior. Following prior studies, we additionally test whether peer effect in financial policy is more severe in crisis period compared to non-crisis period. The results are reported in Panel B of Table 10. In Column (1), we observe negative and significant peer effect on *non-chaebol* firms' financial policy (β_2= -8.055 with t-statistic of -2.13) during crisis period. On the other hand, during non-crisis period, even for *non-chaebol* firms, we cannot observe significant coefficient on *Idiosyncratic Return_Peer* (β_2= -0.053 with t-statistic of -0.13). That is, *non-chaebol* firms are more likely to affected by *chaebol* firms' financial policy during crisis period when they experience market decline or financial constraints.

The results of Table 9 and Table 10 provide evidence that implementation of a regulation generate unintended consequences even to the non-regulated firms (e.g., *non-chaebol* firms). This unique evidence is consistent with learning from prior literature that the institutional fit between accounting and regulation is crucial to the effective implementation of a regulation (Ball et al., 2000; Ball et al., 2003; Wysocki, 2011; Christensen et al., 2013).

5.3. Robustness Checks

5.3.1. Alternative Thresholds for *Equity* firms and *Debt* firms

In our main analyses, we follow prior studies that define significant changes in equity and debt levels as those greater than 5% of total assets at the end of 1997 just prior to the announcement of the regulation (Hovakimian, 2004). Compared to prior studies, we identify equity-issuing firms and debt-repaying firms based on the cumulative amounts of equity issuance and debt reduction, respectively, over the three-year period following the announcement of the regulation. As a robustness check, we vary the definitions of *Equity* firms and *Debt* firms using two different thresholds: 10% and 15% of total assets at the end of 1997.

In untabulated tests, the results using alternative thresholds are qualitatively similar to our main results. That is, *Equity* firms who meet the target leverage (*Post*Meet*Equity*) experience higher return volatility in the period following the financial crisis. Also, we continue to document that *Equity* firms are associated with poorer operating performance in the post-regulation period. Overall, our results are robust to using alternative thresholds for identifying *Equity* and *Debt* firms.

5.3.2. Inclusion of the Crisis period and Unaffected firms

During the Asian financial crisis of 1997, firms experienced severe crashes in their performance and their stock price dropped dramatically. As dramatic change in macroeconomic condition change corporate behavior, we exclude crisis period (1998–2000) from our main analysis. As a robustness check, we repeat our main regression after including firm-year observations during the fiscal year 1998 to 2000. Untabulated results indicate that the target leverage regulation failed in reducing firm risk and resulted in distorted operating performance when firms reduced their debt-equity ratios with increase in equity, while debt-repaying firms fared better.

Also, in our main analysis, we exclude firm whose debt-equity ratio is below 200% as of 1997 since these firms do not need to decrease (increase) debt (equity) and we cannot identify whether these firms meet or miss the target. We repeat our main analysis after including these firm-year observations but still find significant results.[39] Untabulated results show that equity-issuing firms who meet the target leverage experience higher firm risk and lower operating performance after the crisis period. For example, when dependent variable is return volatility, the coefficient on the triple interaction term (*Post*Meet*Equity*) is positive and significant at 1% level (β_4=0.085 with t-statistics of 2.95). Also, regarding the firm performance (EBITDA), we find that the coefficient on the triple interaction term of equity-issuing firms (*Post*Meet*Equity*) is negative and significant at 5% level (β_4=-0.032 with t-statistics of -2.18).

In sum, we find that our results continue to be qualitatively similar to the results in our main analyses. Thus, our conclusion that target leverage regulation does not achieve its intended goal depending on the way firms respond is not sensitive to inclusion or exclusion of crisis period and non-affected firms.

6. Conclusion

Using the leverage regulation imposed by the Korean government following the Asian financial crisis of 1997 as a quasi-natural experiment, we provide unique evidence on the unintended effects of an exogenous shock to corporate capital structure on firms' behavior. The results of our analyses can be summarized as below.

First, we find that firms respond differently to an exogenous shock to capital structure depending on their firm characteristics. Firms largely choose between two ways to meet the

[39] Specifically, we classify firms into meet the target or miss the target based on debt-equity ratio as of 2000 fiscal year regardless of their debt-equity ratio of 1997. In this analysis, *Meet* is equals to one if a firm's debt-equity ratio is below 200% as of 2000 and zero otherwise. All other variables are identical to Equation (1).

leverage threshold of 200%; 24.6% of our sample firms significantly increase equity issuance and 30.2% of firms significantly reduce debt. Second, as a consequence of the target leverage regulation, affected firms on average decrease the level of risk-taking, but the firms that issue equity to comply with the leverage threshold are associated a higher level of risk-taking in the post-regulation period. Third, firms responding to the target leverage regulation make different investment decisions depending on their external financing choice to meet the threshold. Firms issuing significant amount of equity make relatively suboptimal investment decisions, especially with R&D spending. Lastly, equity-issuing firms are less profitable compared to debt-repaying firms following the crisis.

In sum, our findings provide important policy implications. In order to limit *chaebol* firms' excessive bank borrowing and empire-building incentives leading up to the Asian financial crisis in 1997, the Korean government required a uniform 200% debt-equity ratio for *chaebol* firms. However, we show that the response of affected firms instead depends on external financing choice to meet the leverage threshold. The results of this paper suggest that the benefits of the target leverage regulation in promoting corporate financial stability need to be evaluated along with the costs of unexpected consequences induced by setting a uniform leverage limit on firms without regard to industry characteristics. Also, we contribute to the ongoing debate on whether giving disadvantages to firms with a debt-equity ratio in excess of 200% is an effective regulatory stance to promote economic growth in the private sector. Our evidence highlights the importance of conducting prospective cost-benefit analyses and post-implementation reviews of new regulations on the part of regulators and policymakers (Leuz and Wysocki 2016). With the Korean government still imposing the uniform 200% debt-equity ratio requirement on state-owned companies and business presses crucifying *chaebol* firms with a debt-equity ratio in excess of 200%, it is necessary to revisit the need for considering industry characteristics, changing global environment, and the evolving nature of accounting

standards that affect calculation of corporate financial leverage.

Our analyses are subject to several limitations. First, as discussed in Section 2, firms may have optimal leverage ratios that are changing across time and unobservable to researchers. As such, we are limited in our empirical design to consider variations in the level of optimal leverage ratios around the Asian financial crisis of 1997. Second, our analyses focus on the effects of a specific corporate finance regulation around the financial crisis in Korea. Considering that the major external financing source for most Korean firms is bank debt and the Korean government has a strong influence on the largest banks in the country, the evidence in the paper may not be generalizable to other economies with different levels of capital market development and regulatory costs.

Appendix A. Summary of the Target Leverage Regulation

Date	Description
1998.01.	President-elect Kim Dae-jung meets *chaebol* owners. First mention of the 200% leverage regulation.
1998.02.	The Financial Supervisory Service (FSS) notifies 30 largest *chaebols* to sign financial structure improvement contracts by the end of February.
1998.03.	FSS deems the *chaebols*' contracts insufficient for corporate restructuring and mandates the 200% leverage regulation for the 5 largest *chaebols* by the end of '99 and for the 30 largest *chaebols* by the end of '00.
1998.03.	The 30 largest *chaebols* issue an official statement calling the leverage regulation unrealistic and unattainable.
1998.04.	The Blue House acknowledges that the uniform leverage ratio may be extreme and decides to opt for differential application.
1998.05.	Ministry of Finance and Economy and the Financial Supervisory Commission (FSC) decide to impose the 200% target leverage regulation on the 5 largest *chaebols*.
1998.11.	FSC declines requests from *chaebols* to exempt their general trading subsidiaries from the regulation based on industry-specific nature of capital structure.
1998.12.	The Blue House confirms the enforcement of the 200% leverage regulation by the end of the '99 for the 5 largest *chaebols*.
1999.03.	FSC announces policy to disregard asset revaluation as a means of lowering leverage ratio.
1999.09.	Chairman of FSC mentions that firms will eventually meet the 200% leverage ratio due to the newly applied Forward Looking Criteria (FLC) as of 2000.
1999.11.	The Blue House reiterates that the 64 largest *chaebols* must reduce their leverage ratios according to the financial structure improvement contracts.

Appendix B. Variable Definitions

Variable	Definition
Dependent Variables	
Return Volatility	Annualized standard deviation of daily return during the fiscal year.
Idiosyncratic Volatility	Annualized standard deviation of the residuals from the regression of the firm's daily stock return in year *t* on the market index (lag, lead, and contemporaneous) (Favara, Morellec, Schroth, and Valta 2017).
Earnings Volatility	Standard deviation of the ratio of EBITDA to assets between years *t-2 and t*. EBITDA is earnings before interest, taxes, and depreciation & amortization.
Capex_R&D	Sum of Capital expenditures and R&D expenses divided by lagged total assets.
Capex	Capital expenditures divided by lagged total assets.
R&D	R&D expense divided by lagged total assets.
EBITDA	Earnings before interest, taxes, and depreciation & amortization divided by lagged total assets.
NI	Return on assets (net income divided by lagged total assets).
Return	Annual stock return during the fiscal year based on monthly return.
Leverage	Debt-to-equity ratio calculated as total liabilities divided by total equity.
Other Variables	
Equity	Indicator variable equals to 1 if a firm issued equity more than 5% of total assets (1997) from 1998 to 2000 *but does not* reduce debt more than 5% of total assets (1997) from 1998 to 2000; 0 otherwise.
Debt	Indicator variable equals to 1 if a firm reduced debt more than 5% of total assets (1997) from 1998 to 2000 *but does not* issue equity more than 5% of total assets (1997) from 1998 to 2000; 0 otherwise.
Post	Indicator variable equals to 1 for the period from 2001 to 2004; 0 otherwise.
Meet	Indicator variable equals to 1 if a firm's leverage ratio is less than 200% as of 2000; 0 otherwise.
Tobin's Q	Market value of equity plus total assets minus book value of equity divided by total assets.
Size	Natural logarithm of total assets.
MTB	Market-to-book ratio defined as market value of equity divided by book value of equity.
CFO	Operating cash flow divided by lagged total assets
SalesGrowth	Annual growth rate in sales
AssetGrowth	Annual growth rate in total assets
Loss	Indicator variable equals to 1 if net income is less than zero; 0 otherwise.
OperatingCycle	Operating cycle following Dechow (1994)
Chaebol	Indicator variable equals to 1 for *chaebol* firms, 0 otherwise.
Deviation from 200%	Difference between leverage ratio at the end of 1997 and 200%
Variables used in additional analysis	
Idiosyncratic Return	*Idiosyncratic Return* is residual from following market, industry, peer *chaebol* (*non-chaebol*) adjusted return regression: $$Ret_{i,j} = \alpha_0 + \beta_1 R_{m,j} + \beta_2 R_{k,j} + \beta_3 R_{p,j} + \varepsilon_{i,j} \quad (2)$$, where $Ret_{i,j}$ is monthly return of firm *i* in month *j*, $R_{m,j}$ is market

	index in month j, $R_{k,j}$ is monthly return of industry k in month j, and $R_{p,j}$ is monthly return of peers in month j. We require at least 24 firm-month observations to calculate idiosyncratic return.
Idiosyncratic Return_Peer	Average of peer firms' *idiosyncratic return*. Peer firms are defined as *chaebol* (*non-chaebol*) firms in the same industry and year for *non-chaebol* (*chaebol*) firms.
Size_Peer	Average value of peer firms' *Size*.
MTB_Peer	Average value of peer firms' *MTB*.
CFO_Peer	Average value of peer firms' *CFO*.
SalesGrowth_Peer	Average value of peer firms' *SalesGrowth*.
AssetGrowth_Peer	Average value of peer firms' *AssetGrowth*.
Loss_Peer	Average value of peer firms' *Loss*.
OperatingCycle_Peer	Average value of peer firms' *OperatingCycle*.

References

Aboody, D., Lev, B., 2000. Information Asymmetry, R&D, and Insider Gains. *The Journal of Finance* 55, 2747-2766.

Ahn, S., Denis, D.J., Denis, D. K., 2006. Leverage and Investment in Diversified Firms. *Journal of Financial Economics* 79, 317–337.

Almeida, H., Kim, C.-S., Kim, H. B., 2015. Internal Capital Markets in Business Groups: Evidence from the Asian financial crisis. *The Journal of Finance* 70, 2539-2586.

Asker, J., Farre-Mensa, J., Ljungqvist, A., 2015. Corporate Investment and Stock Market Listing: A Puzzle? *Review of Financial Studies* 28, 342-390.

Baek, J.-S., Kang, J.-K., Park, K. S., 2004. Corporate Governance and Firm Value: Evidence from the Korean Financial Crisis. *Journal of Financial Economics* 71, 265-313.

Becker, B., Strömberg, P., 2012. Fiduciary Duties and Equity-Debtholder Conflicts. *The Review of Financial Studies*. 25, 1931–1969.

Bernanke, B. S., Gertler, M., Gilchrist, S., 1994. The Financial Accelerator and the Flight to Quality. *NBER Working Paper*.

Booth, L., Aivazian, V., Demirguc-kunt, A., 2001. Capital Structures in Developing Countries. *Journal of Finance* 56, 87–130.

Chan, L. K. C., Lakonishok, J., Sougiannis, T., 2001. The Stock Market Valuation of Research and Development Expenditures. *The Journal of Finance* 56, 2431-2456.

Chang, X., Dasgupta, S., 2009. Target Behavior and Financing: How Conclusive is the Evidence? *Journal of Finance* 64, 1767–1796.

Chang, H., Song, F. M., 2014. R&D Investment and Capital Structure. Working Paper, The University of Hong Kong.

Chava, S., Roberts, M. R., 2008. How Does Financing Impact Investment? *Journal of Finance* 63, 2085–2121.

Chen, H., 2014. Macroeconomic Conditions and the Puzzles of Credit Spreads and Capital Structure Source. *The Journal of Finance* 65, 2171-2212.

Chen, H. J., Chen, S. J., 2012. Investment-Cash Flow Sensitivity Cannot be a Good Measure of Financial Constraints: Evidence from the Time Series. *Journal of Financial Economics* 103, 393-410.

Chen, S., and Ma. H. 2017. Peer effects in decision-making: Evidence from corporate investment. China journal of accounting research 10 (2): 167–188.

Chevalier, J. A. 1995. Do LBO Supermarkets Charge More? An Empirical Analysis of the Effects of LBOs on Supermarket Pricing. *The Journal of Finance* 50, 1095-1112.

Cook, D.O., Tang, T., 2010. Macroeconomic conditions and capital structure adjustment speed. *Journal of Corporate Finance* 16, 73–87.

DeAngelo, H., DeAngelo, L., Whited, T. M., 2011. Capital Structure Dynamics and Transitory Debt. *Journal of Financial Economics* 99, 235–261.

Denis, D. J., McKeon, S. B., 2012. Debt Financing and Financial Flexibility Evidence from Proactive Leverage Increases. *Review of Financial Studies* 25, 1897–1929.

Dittmar, A., Thakor, A., 2007. Why Do Firms Issue Equity? *The Journal of Finance* 62, 1-54.

DuCharme, L. L., Malatesta, P. H., Sefcik, S. E., 2001. Earnings Management: IPO Valuation and Subsequent Performance. *Journal of Accounting, Auditing & Finance* 16, 369-396.

Dyreng, S. D., W. J. Mayew, and K. Schipper. 2017. Evidence of Manager Intervention to Avoid Working Capital Deficits. *Contemporary Accounting Research* 34 (2):697-725.

Elsas, R., Florysiak, D., 2011. Heterogeneity in the Speed of Adjustment toward Target Leverage. *International Review of Finance* 11, 181–211.

Erkens, D. H., Hung, M., Matos, P., 2012. Corporate Governance in the 2007-2008 Financial Crisis: Evidence from Financial Institutions Worldwide. *Journal of Corporate Finance* 18, 389–411.

Fan, J. P. H., Titman, S., Twite, G., 2012. An International Comparison of Capital Structure and Debt Maturity Choices. *Journal of Financial and Quantitative Analysis* 47, 23–56.

Fattouh, B., Scaramozzino, P., Harris, L., 2005. Capital Structure in South Korea: A Quantile Regression Approach. *Journal of Developing Economies* 76, 231–250.

Favara, G., Morellec, E., Schroth, E., Valta, P., 2017. Debt Enforcement, Investment, and Risk Taking Across Countries. *Journal of Financial Economics* 123, 22–41.

Fazzari, S., Hubbard, R., Petersen, B., 1988. Financing Constraints and Corporate Investment. *Brookings Papers on Economic Activity,* 141–195.

Financial Supervisory Commission, 2002. Improved Financial Structure of Domestic Companies Listed in Korea Stock Exchange and KOSDAQ Five Years after the 1997 Financial Crisis. Press Release.

Frank, M. Z., Goyal, V. K., 2008. Profits and Capital Structure. Working Paper, Hong Kong University of Science and Technology.

Gao, F., Wu, J. S., Zimmerman, J., 2009. Unintended Consequences of Granting Small Firms Exemptions from Securities Regulation: Evidence from the Sarbanes-Oxley Act. *Journal of Accounting Research* 47, 459-506.

Gobat, J., 1998, "Corporate Restructuring and Corporate Governance," mimeo, (Washington: International Monetary Fund).

Graham, J. R., Hanlon, M., Shevlin, T., AShroff, N., 2017. Tax rates and corporate decision-making. *The Review of Financial Studies* 30, 3128-3175.

Graham, J. R., Leary, M. T., 2011. A Review of Empirical Capital Structure Research and Directions for the Future. *The Annual Review of Financial Economics* 3, 309–345.

Gramlich, J. D., M. L. McAnally, and J. Thomas. 2002. Balance Sheet Management: The Case of Short-Term Obligations Reclassified as Long-Term Debt. *Journal of Accounting Research* 39 (2):283-295.

Hawkins, S. A., Hastie, R., 1990. Hindsight: Biased judgments of past events after the outcomes are known. Psychological Bulletin, 107, 311-327.

Heckman, J., 1979. Sample Selection Bias as a Specification Error. *Econometrica*, 47, 153-161.

Hopkins, P., 1996. The Effect of Financial Statement Classification of Hybrid Financial Instruments on Financial Analysts' Stock Price Judgments. *Journal of Accounting Research* 34, 33-50.

Hovakimian, A., 2006. Are Observed Capital Structures Determined by Equity Market Timing? *Journal of Financial and Quantitative Analysis* 41, 221-243.

Hovakimian, A., 2004. The Role of Target Leverage in Security Issues and Repurchases. *Journal of Business* 77, 1041–1072.

Hovakimian, A., Hovakimian, G., Tehranian, H., 2004. Determinants of Target Capital Structure: The Case of Dual Debt and Equity issues. *Journal of Financial Economics* 71, 517-540.

Hovakimian, A., Opler, T., Titman, S., 2001. The Debt-Equity Choice. *The Journal of Financial and Quantitative Analysis* 36, 1-24.

Huang, R., Ritter, J. R., 2009. Testing Theories of Capital Structure and Estimating the Speed of Adjustment. *Journal of Financial and Quantitative Analysis*. 44, 237-271.

Jackson, S. B., Keune, T. M., Salzsieder, L., 2013. Debt, Equity, and Capital Investment. *Journal of Accounting and Economics* 56, 291–310.

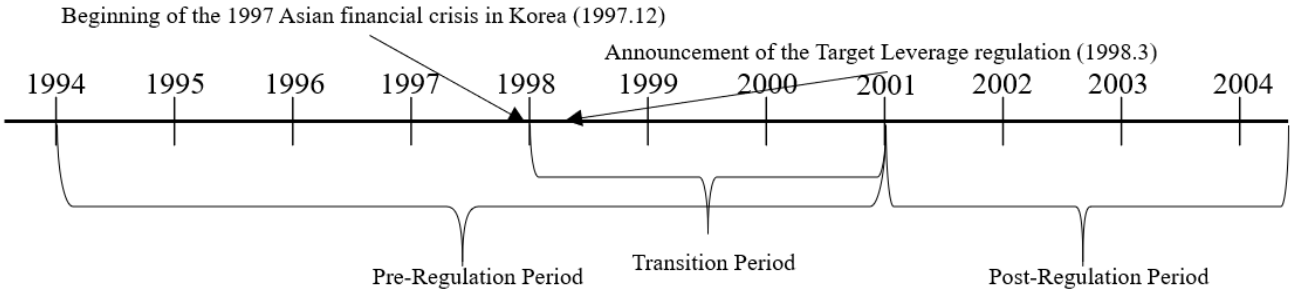
Jayaraman, S. and J. S. Wu, 2018. Is Silence Golden? Real Effects of Mandatory Disclosure. *The Review of Financial Studies*, forthcoming.

Jensen, M. C., 1986. Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers. *The American Economic Review* 76, 323-329.
Jensen, M. C., Meckling, W. H., 1976. Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure. *Journal of Financial Economics* 3, 305-360.
Joh, S. W., 2003. Corporate Governance and Firm Profitability: Evidence from Korea before the economic crisis. *Journal of Financial Economics* 68, 287-322.
Joh, S. W., 2004. The Korean Economic Crisis and Corporate Governance System. In *Governance, Regulation and Privatization in the Asia-Pacific Region,* NBER working paper 12, 129-158
Jones, J., 1991. Earnings Management during Import Relief Investigations. *Journal of Accounting Research* 29, 193-228
Jung, K., Kim, Y. C., Stulz, R. M., 1996. Timing, Investment Opportunities, Managerial Discretion, and the Security Issue Decision. *Journal of Financial Economics*. 42, 159–185.
Kaplan, S., Zingales, L., 1997. Do Investment-Cash Flow Sensitivities Provide Useful Measures of Financing Constraints? *Quarterly Journal of Economics* 112, 169–215.
Kim, D. H. 1999. IMF Bailout and Financial and Corporate Restructuring in the Republic of Korea. *The Developing Economies* 37, 460-513.
Kim, H., Heshmati, A., Aoun, D., 2006. Dynamics of Capital Structure: The Case of Korean Listed Manufacturing Companies. *Asian Economic Journal* 20, 275–302.
Kim, H., Koh, Y., 2006. An Empirical Study on the Earnings Management and Debt-Equity Ratio Reduction After the Crisis of Foreign Currency. *Korean Accounting Journal* 15, 119-144
Kisgen, D.J., 2009. Do Firms Target Credit Ratings or Leverage Levels? *Journal of Financial and Quantitative Analysis* 44, 1323-1344
Kovenock, D., Phillips, G. M., 1997. Capital Structure and Product Market Behavior: An Examination of Plant Exit and Investment Decisions. *The Review of Financial Studies* 10, 767-803
Krueger, A. O., Yoo, J., 2002. Falling Profitability, Higher Borrowing Costs, and Chaebol Finances during the Korean Crisis. *Korean Crisis and Recovery* pp.157-96.
La Porta, R., Lopez-De-Silanes, F., Shleifer A., 1999. Corporate Ownership around the World. *The Journal of Finance* 54, 471-517.
Lang, L., Ofek, E., Stulz, R., 1996. Leverage, Investment, and Firm Growth. *Journal of Financial Economics* 40, 3-29.
Leary, M. T., Roberts, M. R., 2005. Do Firms Rebalance Their Capital Structures? *The Journal of Finance* 60, 2575–2619.
Leary, M. T., Roberts, M. R., 2014. Do Peer Firms Affect Corporate Financial Policy? *The Journal of Finance* 69 (1):139-178.
Lee, P., 2000. Economic Crisis and Chaebol Reform in Korea. Working Paper, Korea University.
Leland, H. E., 1998. Agency Costs, Risk Management, and Capital Structure. *The Journal of Finance* 53, 1213–1243.
Lemmon, M. L., Zender, J. F., 2010. Debt Capacity and Tests of Capital Structure Theories. *Journal of Financial and Quantitative Analysis* 45, 1161–1187.
Leuz, C., Wysocki, P. D., 2016. The Economics of Disclosure and Financial Reporting Regulation: Evidence and Suggestions for Future Research. *Journal of Accounting Research* 54, 525-622.
Lim, K.-M., 2012. Chapter 11: Structural Fundamentals of Korean Corporations: this time was different. *Global Economic Crisis: Impacts, Transmission and Recovery*. Edited by M. Obstfeld, D. Cho and A. Mason. KDI/EWC Series on Economic Policy.

McLean, R. D., T. Zhang, Zhao, M., 2012. Why Does the Law Matter? Investor Protection and its Effects on Investment, Finance, and Growth. *The Journal of Finance* 67, 313-350.
Modigliani, F., Miller, M. H., 1958. The cost of capital, corporation finance and the theory of investment. *The American Economic Review* 48, 261-297.
Morellec, E., Nikolov, B., SchÜrhoff, N., 2012. Corporate Governance and Capital Structure Dynamics. *The Journal of Finance* 67, 803–848.
Ministry of Strategy and Finance, 2013. *Public Institution Reform Measures* [Press Release]. Retrieved October 19, 2017, from: http://english.mosf.go.kr/pc/selectTbPressCenterDtl.do?boardCd=N0001&seq=3470.
Myers, S. C, 1977. Determinants of Corporate Borrowing. *Journal of Financial Economics* 5, 147-175.
Myers, S. C., 1983. The Capital Structure Puzzle. *The Journal of Finance 39*, 575-592.
Myers, S. C., 2003. Financing of Corporations. *Handbook of the Economics of Finance* 1, 215-253.
Opler, T., 1999. The Determinants and Implications of Corporate Cash Holdings. *Journal of Financial Economics*. 52, 3-46.
Oranee, Y., Devrim, T., 2007. Why do firms issue global bonds? *Managerial Finance* 34, 23–40.
Oswand, D. R., Simpson, A. V., Zarowin, P., 2016. Capitalization vs Expensing and the Behavior of R&D Expenditures. Working Paper, New York University.
Oztekin, O, Flannery, M. J., 2012. Institutional Determinants of Capital Structure Adjustment Speeds. *Journal of Financial Economics* 103, 88–112.
Park, H., Song, I., Pae, S., Park, S., 2011. Problems in System of Uniform 200% Debt-Equity Ratio and Suggestions for System Improvement. *Korean Accounting Journal* 20, 287-328
Petersen, M. A., 2009. Estimating Standard Errors in Finance Panel Data Sets: Comparing Approaches. *The Review of Financial Studies* 22, 435-480.
Rajan, R. G., Zingales, L., 1995. What Do We Know about Capital Structure? Some Evidence from International Data. *The Journal of Finance* 50, 1421–1460.
Scharfstein D. S., Stein, J. C.,1990. Herd Behavior and Investment. *The American Economic Review* 80, 465-479.
Shin, J., Chang, H., 2003. Restructuring 'Korea Inc.': Financial Crisis, Corporate Reform, and Institutional Transition. Routledge.
Shipman, J. E., Swanquist, Q. T., Whited, R. L., 2017. Propensity Score Matching in Accounting Research. *The Accounting Review* 92, 213-244
Stiglitz, B. J. E., Weiss, A., 1981. Credit Rationing in Markets with Imperfect Information. *The American Economic Review* 71, 393–410.
Stulz, R., 1990. Managerial Discretion and Optimal Financing Policies. *Journal of Financial Economics* 26, 3–27.
Teoh, S. H., Welch, I., Wong, T. J., 1998a. Earnings Management and the Underperformance of Seasoned Equity Offerings. *Journal of Financial Economics* 50, 63-99.
Teoh, S. H., Welch, I., Wong, T. J., 1998b. Earnings Management and the Long-Term Market Performance of Initial Public Offerings. *Journal of Finance* 53, 1935-1974.
Warr, R. S., Elliott, W. B., Koëter-kant, J., Öztekin, Ö., 2012. Equity Mispricing and Leverage Adjustment Costs. *Journal of Financial and Quantitative Analysis* 47, 589-616.
Weber, D. P., Yang, Y. S., 2018. The Debt-Equity Choice When Securities Regulations are Scaled by Equity Values: Evidence from SOX 404. Working Paper, University of Connecticut.
Whited, T. M., 1992. Debt, Liquidity Constraints, and Corporate Investment: Evidence from panel data. *The Journal of Finance* 47, 1425-1460.

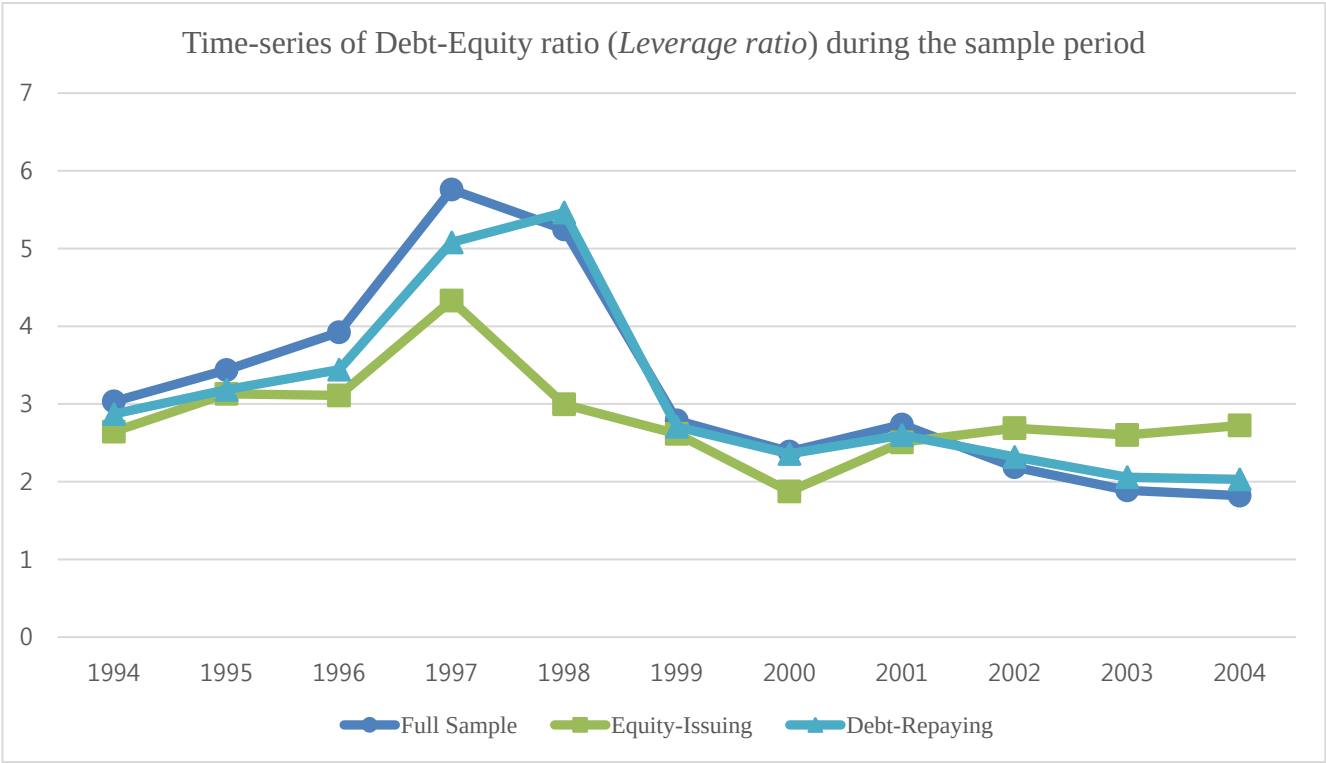
Yoo, C.-Y., Choi, T. H., Pae, J., 2017. Demand for Fair Value Accounting: The Case of the Asset Revaluation Boom in Korea during the Global Financial Crisis. *Journal of Business Finance & Accounting*, forthcoming.
Zeitun, R., Tian, G., 2007. Capital Structure and Corporate Performance: Evidence from Jordan. *Australasian Accounting Business and Finance* 1, 40-61

Figure 1. Timeline for the Pre-/Post-Regulation Periods



Notes: Figure 1 displays the timeline for the analyses of this paper. In December 1997, the Asian financial crisis officially began in Korea. In response to the concerns expressed by the IMF, the Korean government announced the target leverage regulation in the following spring of 1998.

Figure 2. Time-series of Debt-Equity Ratio during the Sample Period



Notes: In Figure 2, we depict change in debt-equity ratios of our sample firms. In Panel A, we plot the change in debt-equity ratios of full sample, firms who meet the target, and firms fail to meet the target. In Panel B, we divide the sample into four different groups based on meeting the target leverage and their financing choice during the transition period. We plot the change in debt-equity ratios of firms who meet (miss) the target with different financing choices.

Table 1. Descriptive Statistics

Variable	Obs.	Mean	Std.Dev.	Q1	Median	Q3
Leverage	2,627	2.914	4.757	0.998	1.862	3.094
Meet	2,627	0.724	0.447	0	1	1
Equity-Issuing	2,627	0.246	0.431	0	0	0
Debt-Repaying	2,627	0.302	0.459	0	0	1
Return Volatility	2,627	0.570	0.187	0.426	0.542	0.690
Idiosyncratic Volatility	2,627	0.510	0.172	0.384	0.478	0.609
Earnings Volatility	2,627	0.039	0.045	0.013	0.025	0.048
Capex_R&D	2,627	0.075	0.081	0.023	0.050	0.097
Capex	2,627	0.063	0.078	0.016	0.038	0.083
R&D	2,627	0.011	0.017	0.000	0.004	0.016
EBITDA	2,627	0.059	0.074	0.028	0.063	0.097
NI	2,627	0.007	0.115	0.002	0.017	0.046
Return	2,627	0.020	0.571	-0.343	-0.075	0.265
Size	2,627	5.187	1.552	3.971	4.961	6.149
MTB	2,627	1.053	1.022	0.440	0.806	1.326
CFO	2,627	0.038	0.105	-0.015	0.044	0.097
SalesGrowth	2,627	0.113	0.262	-0.009	0.092	0.212
AssetGrowth	2,627	0.105	0.281	-0.029	0.064	0.179
Loss	2,627	0.197	0.398	0	0	0
OperatingCycle	2,627	4.758	0.682	4.396	4.798	5.183
Chaebol	2,627	0.162	0.368	0	0	0
Deviation from 200%	2,627	3.669	8.152	0.650	1.574	3.559

Notes: Table 1 reports summary statistics. See Appendix B for the variable definitions.

Table 2: Correlation Matrix

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1) Leverage		-0.179	-0.007	0.044	0.126	0.129	0.028	-0.024	-0.010	-0.072	-0.073	-0.164	-0.118	0.048	0.320
		<0.001	0.736	0.024	<0.001	<0.001	0.151	0.215	0.592	0.000	0.000	<0.001	<0.001	0.013	<0.001
(2) Meet	-0.346		-0.025	-0.042	-0.082	-0.088	0.103	0.100	0.076	0.130	0.005	0.011	0.020	-0.060	-0.053
	<0.001		0.199	0.033	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.810	0.564	0.314	0.002	0.006
(3) Equity	-0.002	-0.025		-0.376	0.159	0.136	0.186	0.048	0.014	0.163	-0.132	-0.177	-0.033	0.030	-0.082
	0.904	0.199		<0.001	<0.001	<0.001	<0.001	0.014	0.483	<0.001	<0.001	<0.001	0.093	0.130	<0.001
(4) Debt	0.014	-0.042	-0.376		-0.118	-0.087	-0.105	-0.018	0.001	-0.089	0.108	0.115	0.005	-0.034	0.100
	0.469	0.033	<0.001		<0.001	<0.001	<0.001	0.354	0.944	<0.001	<0.001	<0.001	0.805	0.078	<0.001
(5) Return Volatility	0.046	-0.088	0.174	-0.124		0.962	0.352	-0.137	-0.150	0.022	-0.324	-0.249	-0.030	-0.182	0.071
	0.018	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001	0.258	<0.001	<0.001	0.126	<0.001	0.000
(6) Idiosyncratic Volatility	0.046	-0.091	0.160	-0.097	0.959	1.000	0.306	-0.154	-0.156	-0.035	-0.322	-0.227	0.000	-0.240	0.075
	0.017	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	0.069	<0.001	<0.001	0.981	<0.001	0.000
(7) Earnings Volatility	-0.133	0.081	0.141	-0.069	0.353			0.055	0.003	0.235	-0.301	-0.333	-0.036	-0.135	0.023
	<0.001	<0.001	<0.001	0.000	<0.001	0.349		0.004	0.861	<0.001	<0.001	<0.001	0.067	<0.001	0.239
(8) Capex_R&D	0.052	0.115	0.033	0.011	-0.202	<0.001	-0.019		0.976	0.309	0.162	0.079	-0.026	0.069	-0.064
	0.008	<0.001	0.093	0.557	<0.001	-0.222	0.324		<0.001	<0.001	<0.001	<0.001	0.183	0.000	0.001
(9) Capex	0.084	0.077	-0.021	0.029	-0.234	<0.001	-0.080	0.935		0.099	0.160	0.090	-0.026	0.061	-0.050
	<0.001	<0.001	0.282	0.142	<0.001	-0.239	<0.001	<0.001		<0.001	<0.001	<0.001	0.180	0.002	0.011
(10) R&D	-0.117	0.131	0.104	-0.027	-0.057	<0.001	0.069	0.400	0.146		0.050	-0.033	0.004	0.056	-0.080
	<0.001	<0.001	<0.001	0.166	0.004	-0.118	0.000	<0.001	<0.001		0.010	0.088	0.839	0.004	<0.001
(11) EBITDA	-0.003	0.030	-0.106	0.106	-0.281	<0.001	-0.164	0.225	0.232			0.637	0.232	0.108	-0.038
	0.861	0.123	<0.001	<0.001	<0.001	-0.287	<0.001	<0.001	<0.001	0.073		<0.001	<0.001	<0.001	0.053
(12) NI	-0.367	0.113	-0.111	0.075	-0.239	<0.001	-0.086	0.127	0.143	0.000	0.637		0.229	0.067	-0.047
	<0.001	<0.001	<0.001	0.000	<0.001	-0.215	<0.001	<0.001	<0.001	0.015	<0.001		<0.001	0.001	0.017
(13) Return	-0.226	0.046	-0.046	0.019	-0.131	<0.001	-0.070	0.005	0.014	0.430	0.250	0.356		0.082	-0.034
	<0.001	0.017	0.019	0.323	<0.001	-0.087	0.000	0.802	0.479	0.014	<0.001	<0.001		<0.001	0.080
(14) Chaebol	0.125	-0.060	0.030	-0.034	-0.188	<0.001	-0.164	0.089	0.088	0.462	0.095	0.035	0.079		0.018
	<0.001	0.002	0.130	0.078	<0.001	-0.260	<0.001	<0.001	<0.001	0.103	<0.001	0.073	<0.001		0.347
(15) Deviation from 200%	0.267	-0.229	-0.096	0.057	0.053	<0.001	0.017	-0.118	-0.086	<0.001	-0.025	-0.097	-0.040	0.126	
	<0.001	<0.001	<0.001	0.004	0.007	0.046	0.371	<0.001	<0.001	-0.147	0.208	<0.001	0.042	<0.001	

Notes: Table 2 reports Pearson / Spearman correlation among variables used in main analysis. See Appendix B for the variable definitions.

Table 3. Univariate Comparison

Panel A: *Equity-Issuing* and *Debt-Repaying* firms

Variable		Full Sample			
		(1) Equity	(2) Debt	Diff.	
Leverage	Pre-Period	3.494	4.934	1.440**	(2.53)
	Post-Period	2.628	1.882	-0.746***	(-2.59)
Return Volatility	Pre-Period	0.523	0.509	-0.014	(-0.94)
	Post-Period	0.659	0.558	-0.101***	(-7.96)
Idiosyncratic Volatility	Pre-Period	0.468	0.460	-0.008	(-0.60)
	Post-Period	0.581	0.508	-0.073***	(-6.25)
Earnings Volatility	Pre-Period	0.028	0.026	-0.002	(-0.67)
	Post-Period	0.064	0.037	-0.027***	(-7.43)
NI	Pre-Period	0.013	0.008	0.005	(1.25)
	Post-Period	-0.044	0.042	-0.086***	(-9.28)
Return	Pre-Period	-0.085	-0.142	0.057	(1.18)
	Post-Period	0.013	0.156	-0.143***	(3.67)
Cashflow	Pre-Period	0.031	0.022	0.009	(0.93)
	Post-Period	0.024	0.062	-0.038***	(-5.38)
SalesGrowth	Pre-Period	0.191	0.153	0.038*	(1.94)
	Post-Period	0.079	0.057	0.022	(1.09)
MTB	Pre-Period	1.418	1.281	0.137	(0.98)
	Post-Period	2.270	0.751	1.519*	(1.67)

Panel B: Condition on meeting the target firms

Variable		*Meet the Target*				*Miss the Target*			
		Equity	Debt	Diff.		Equity	Debt	Diff.	
Leverage	Pre-Period	3.389	4.469	1.080	(1.58)	3.680	5.994	2.314***	(2.84)
	Post-Period	2.103	1.201	-0.902***	(-3.19)	4.031	3.447	-0.584	(-0.85)
Return Volatility	Pre-Period	0.502	0.523	0.0121	(1.16)	0.523	0.527	0.004	(0.14)
	Post-Period	0.664	0.517	-0.147***	(-10.06)	0.646	0.651	0.005	(0.23)
Idiosyncratic Volatility	Pre-Period	0.452	0.469	0.017	(1.13)	0.466	0.479	0.013	(0.61)
	Post-Period	0.583	0.469	-0.114***	(-8.53)	0.575	0.597	0.022	(1.00)
Earnings Volatility	Pre-Period	0.026	0.029	0.003	(1.18)	0.024	0.027	0.003	(0.64)
	Post-Period	0.072	0.036	0.036***	(-7.99)	0.040	0.038	-0.002	(-0.46)
NI	Pre-Period	0.013	0.011	0.002	(0.49)	0.013	0.002	0.011*	(-1.91)
	Post-Period	-0.055	0.051	-0.106***	(-9.18)	-0.015	0.021	-0.036***	(2.96)
Return	Pre-Period	-0.068	-0.137	0.069	(1.15)	-0.115	-0.155	0.040	(0.46)
	Post-Period	-0.010	0.179	-0.189***	(4.30)	0.075	0.101	-0.026	(0.33)
Cashflow	Pre-Period	0.034	0.034	0.000	(0.09)	0.026	-0.006	0.032**	(2.36)
	Post-Period	0.017	0.068	-0.051***	(-6.01)	0.044	0.047	-0.003	(-0.20)
SalesGrowth	Pre-Period	0.175	0.156	0.019	(0.73)	0.221	0.145	0.076**	(2.40)
	Post-Period	0.078	0.071	0.007	(0.25)	0.086	0.025	0.061*	(1.75)

MTB	Pre-Period	1.435	1.279	0.156	(0.83)	1.387	1.287	0.100	(0.42)
	Post-Period	1.520	0.705	0.815***	(3.94)	4.270	0.856	3.414	(1.04)

Notes: This table presents the univariate comparison of equity-issuing firms (*Equity*) and debt-repaying firms (*Debt*). In Panel A, we provide comparison of *Equity* firms and *Debt* firms during the sample period, while Panel B provide comparison between *Equity* and *Debt* firms conditioning on the meeting the target leverage as of 2000. All variables are defined in Appendix B.

Table 4. Leverage Regulation Effect on Firm Risk

Dep.Variable =	*Return Volatility*			*Idiosyncratic Volatility*			*Earnings Volatility*		
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**
Intercept	0.510***	0.527***	0.521***	0.567***	0.586***	0.577***	0.022*	0.019	0.019
	(12.87)	(13.33)	(12.73)	(15.54)	(16.20)	(15.43)	(1.88)	(1.57)	(1.58)
Post	0.482***	0.523***	0.528***	0.280***	0.322***	0.330***	0.223***	0.218***	0.212***
	(12.18)	(13.06)	(12.28)	(7.95)	(9.06)	(8.35)	(10.56)	(10.24)	(9.97)
Post*Meet		***-0.046******	***-0.073******		***-0.046******	***-0.071******		***0.005***	***0.001***
		(-3.22)	***(-3.15)***		***(-3.49)***	***(-3.19)***		***(1.54)***	***(0.28)***
Post*Meet*Equity			***0.103******			***0.086******			***0.015****
			(3.02)			***(2.67)***			***(1.70)***
Post*Meet*Debt			***-0.007***			***0.001***			***-0.000***
			(-0.21)			***(0.04)***			***(-0.03)***
*Post*Equity*			-0.057**			-0.053*			0.001
			(-2.01)			(-1.93)			(0.09)
*Post*Debt*			-0.030			-0.024			-0.000
			(-1.07)			(-0.93)			(-0.01)
*Meet*Equity*			-0.022			-0.023			-0.002
			(-1.01)			(-1.09)			(-0.26)
*Meet*Debt*			-0.007			-0.012			-0.004
			(-0.38)			(-0.71)			(-0.85)
Meet		-0.008	-0.001		-0.011	-0.001		0.003	0.004
		(-0.96)	(-0.08)		(-1.32)	(-0.10)		(1.18)	(1.17)
Equity-Issue			0.014			0.016			-0.002
			(0.82)			(0.91)			(-0.42)
Debt-Repay			0.005			0.010			0.002
			(0.32)			(0.68)			(0.69)
Size	-0.023***	-0.025***	-0.024***	-0.035***	-0.037***	-0.036***	-0.004***	-0.004***	-0.004***
	(-7.74)	(-8.12)	(-7.72)	(-13.02)	(-13.40)	(-13.04)	(-4.84)	(-4.42)	(-4.12)
MTB	0.013***	0.011***	0.009**	0.009***	0.007**	0.006	0.005***	0.005***	0.005***
	(3.65)	(2.97)	(2.52)	(2.73)	(1.98)	(1.61)	(3.93)	(4.20)	(3.96)
CFO	-0.179***	-0.172***	-0.153***	-0.127***	-0.120***	-0.108***	-0.019	-0.020	-0.017
	(-5.50)	(-5.31)	(-4.80)	(-4.30)	(-4.10)	(-3.73)	(-1.32)	(-1.42)	(-1.22)
SalesGrowth	0.003	0.005	-0.002	-0.004	-0.003	-0.006	0.001	0.001	-0.000
	(0.26)	(0.36)	(-0.12)	(-0.34)	(-0.24)	(-0.59)	(0.22)	(0.19)	(-0.01)
AssetGrowth	-0.031**	-0.025*	-0.031**	-0.052***	-0.046***	-0.050***	0.036***	0.035***	0.034***
	(-2.35)	(-1.91)	(-2.35)	(-4.47)	(-3.94)	(-4.28)	(4.70)	(4.61)	(4.37)
Loss	0.119***	0.113***	0.110***	0.111***	0.105***	0.103***	0.019***	0.020***	0.019***

	(12.76)	(12.01)	(11.81)	(13.08)	(12.35)	(12.32)	(7.24)	(7.37)	(7.10)
OperatingCycle	0.006	0.006	0.006	0.004	0.005	0.005	0.002	0.002	0.002
	(0.89)	(0.99)	(1.00)	(0.69)	(0.81)	(0.79)	(1.21)	(1.17)	(1.01)
Year×Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	2,627	2,627	2,627	2,627	2,627	2,627	2,627	2,627	2,627
Adjusted R^2	0.466	0.475	0.484	0.455	0.467	0.472	0.299	0.302	0.308

Notes: This table presents the test results for the hypothesis whether the target leverage regulation achieved its intended goal of reducing firm risk in Korea after Asian financial crisis. In all regression, year and industry indicators are included. Coefficient estimates are presented in cells, and t-statistics area reported in parentheses. Standard errors are clustered at the firm-level (Petersen, 2009). *, **, *** indicate two-tailed significance at the 10%, 5%, and 1% levels, respectively. All variables are defined in Appendix B.

Table 5. Leverage Regulation Effect on Investment

Dep.Variable =	*Capex+R&D*			*Capex*			*R&D*		
	(1) Full Sample	***(2) Equity-Issuing***	***(3) Debt-Repaying***	***(4) Full Sample***	***(5) Equity-Issuing***	***(6) Debt-Repaying***	***(7) Full Sample***	***(8) Equity-Issuing***	***(9) Debt-Repaying***
Intercept	0.035	0.057	0.150***	0.053	0.068	0.146***	-0.015*	-0.011	0.004
	(0.75)	(0.71)	(3.00)	(1.23)	(0.95)	(3.07)	(-1.90)	(-0.63)	(0.35)
Post	-0.114**	-0.167*	-0.075	-0.109**	-0.120	-0.081	-0.008	-0.047***	0.007
	(-2.20)	(-1.89)	(-1.47)	(-2.30)	(-1.44)	(-1.43)	(-0.89)	(-3.05)	(0.39)
*Post*Tobin's Q*	0.000	0.096	-0.002	-0.005	0.058	0.000	0.007	0.037***	-0.002
	(0.01)	(1.41)	(-0.04)	(-0.12)	(0.92)	(0.01)	(1.03)	(4.24)	(-0.50)
*Post*Meet*	0.075	0.131	0.072	0.068	0.086	0.065	0.009	0.046***	0.004
	(1.43)	(1.58)	(1.30)	(1.41)	(1.10)	(1.18)	(1.18)	(3.57)	(0.52)
Post*Meet*Tobin's Q	***-0.067***	***-0.124****	***-0.071***	***-0.065***	***-0.091***	***-0.066***	***-0.003***	***-0.035******	***-0.002***
	(-1.33)	***(-1.69)***	***(-1.36)***	***(-1.44)***	***(-1.33)***	***(-1.27)***	***(-0.43)***	***(-3.08)***	***(-0.25)***
*Meet*Tobin's Q*	0.057	0.064	0.078	0.052	0.056	0.067	0.006	0.008	0.009
	(1.20)	(0.91)	(1.58)	(1.19)	(0.86)	(1.34)	(1.03)	(0.89)	(1.47)
Meet	-0.051	-0.052	-0.072	-0.047	-0.042	-0.065	-0.005	-0.010	-0.004
	(-1.01)	(-0.65)	(-1.33)	(-1.00)	(-0.56)	(-1.21)	(-0.82)	(-0.82)	(-0.71)
Tobin's Q	0.042	0.002	0.016	0.036	0.002	0.012	0.004	0.000	0.004
	(1.05)	(0.02)	(0.50)	(1.00)	(0.03)	(0.37)	(0.78)	(0.01)	(1.47)
CFO	0.142***	0.118***	0.166***	0.131***	0.103***	0.161***	0.012**	0.016*	0.004
	(7.05)	(3.67)	(4.35)	(7.05)	(3.36)	(4.32)	(2.24)	(1.73)	(0.68)
Other Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year×Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	2,627	647	793	2,627	647	793	2,627	647	793
Adjusted R^2	0.212	0.245	0.270	0.217	0.259	0.276	0.112	0.067	0.130

Notes: This table presents the test results for the hypothesis whether the target leverage regulation is related to the optimal investment depending on external financing means. In each test, we use three different subsamples including (i) full sample, (ii) equity-issuing firms, and (iii) debt-repaying firms. In all regression, year and industry indicators are included. Coefficient estimates are presented in cells, and t-statistics area reported in parentheses. Standard errors are clustered at the firm-level (Petersen, 2009). *, **, *** indicate two-tailed significance at the 10%, 5%, and 1% levels, respectively. All variables are defined in Appendix B.

Table 6. Leverage Regulation Effect on Firm Performance

Dep.Variable =	*EBITDA*				*NI*			*Return*	
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**
Intercept	-0.015	-0.019	-0.023	-0.022	-0.026	-0.035	0.442***	0.419***	0.358***
	(-0.68)	(-0.84)	(-1.01)	(-0.78)	(-0.93)	(-1.25)	(4.37)	(4.01)	(3.29)
Post	-0.058**	-0.048**	-0.037	-0.146***	-0.145***	-0.116**	0.495***	0.544***	0.661***
	(-2.44)	(-1.98)	(-1.49)	(-3.14)	(-3.12)	(-2.44)	(3.53)	(3.77)	(4.29)
Post*Meet		***-0.013****	***-0.009***		***-0.002***	***0.001***		***-0.065***	***-0.142****
		(-2.10)	***(-0.94)***		***(-0.22)***	***(0.11)***		***(-1.28)***	***(-1.78)***
Post*Meet*Equity			***-0.035****			***-0.041****			***0.028***
			(-2.31)			***(-2.05)***			***(0.19)***
Post*Meet*Debt			***0.012***			***0.019***			***0.191****
			(0.94)			***(1.20)***			***(1.77)***
Post*Equity			0.008			-0.026*			-0.164
			(0.76)			(-1.83)			(-1.29)
Post*Debt			-0.016			-0.003			-0.109
			(-1.43)			(-0.24)			(-1.16)
Meet*Equity			0.012			0.005			-0.035
			(1.06)			(0.57)			(-0.35)
Meet*Debt			-0.011			-0.010			-0.105*
			(-1.24)			(-1.46)			(-1.83)
Meet		0.007	0.009		0.005	0.008		0.040	0.091**
		(1.64)	(1.51)		(1.42)	(1.52)		(1.31)	(2.09)
Equity-Issue			-0.003			0.011*			0.108
			(-0.40)			(1.80)			(1.37)
Debt-Repay			0.017***			0.011**			0.053
			(2.66)			(2.23)			(1.08)
Other Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year×Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	2,627	2,627	2,627	2,627	2,627	2,627	2,627	2,627	2,627
Adjusted R^2	0.253	0.254	0.260	0.166	0.165	0.187	0.285	0.285	0.287

Notes: This table presents the test results for the hypothesis whether the target leverage regulation is related to operating performance after financial crisis. In all regression, year and industry indicators are included. Coefficient estimates are presented in cells, and t-statistics area reported in parentheses. Standard errors are clustered at the firm-level (Petersen, 2009). *, **, *** indicate two-tailed significance at the 10%, 5%, and 1% levels, respectively. All variables are defined in Appendix B.

Table 7. Matched Sample Analyses

Dep.Variable =	***(1) Return Volatility***	***(2) Idiosyncratic Volatility***	***(3) Earnings Volatility***
Intercept	0.547***	0.594***	0.049**
	(5.28)	(5.81)	(2.57)
Post	0.019	0.004	-0.009
	(0.32)	(0.08)	(-0.86)
Post*Meet	***-0.159****	***-0.154*****	***0.001***
	(-2.43)	***(-2.66)***	***(0.08)***
Post*Meet*Equity	***0.168****	***0.146****	***0.028****
	(2.14)	***(2.02)***	***(1.84)***
Post*Meet*Debt	***0.001***	***0.033***	***-0.004***
	(0.02)	***(0.47)***	***(-0.30)***
*Post*Equity*	-0.122*	-0.109*	-0.009
	(-1.93)	(-1.96)	(-0.79)
*Post*Debt*	-0.040	-0.059	0.002
	(-0.61)	(-0.98)	(0.19)
*Meet*Equity*	-0.014	-0.011	-0.002
	(-0.35)	(-0.27)	(-0.19)
*Meet*Debt*	-0.042	-0.046	0.003
	(-1.25)	(-1.48)	(0.69)
Meet	0.010	0.007	0.002
	(0.37)	(0.26)	(0.58)
Equity-Issue	0.025	0.017	0.002
	(0.81)	(0.54)	(0.26)
Debt-Repay	0.024	0.028	0.001
	(0.78)	(1.06)	(0.42)
Size	-0.028***	-0.037***	-0.005***
	(-4.07)	(-5.47)	(-4.23)
MTB	-0.007	-0.009	0.003**
	(-0.98)	(-1.23)	(2.19)
CFO	-0.108	-0.091	-0.038**
	(-1.61)	(-1.37)	(-2.07)
SalesGrowth	0.055	0.047	-0.022
	(1.49)	(1.42)	(-1.60)
AssetGrowth	-0.058*	-0.058*	0.007
	(-1.95)	(-1.94)	(1.04)
Loss	0.112***	0.109***	0.011**
	(5.00)	(5.33)	(2.45)
OperatingCycle	0.006	0.004	-0.002
	(0.38)	(0.23)	(-0.64)
Year×Industry	Yes	Yes	Yes
Obs.	632	632	632
Adjusted R^2	0.559	0.532	0.204

Notes: This table presents the results of our main analysis using matched sample. We matched our sample based on characteristics of pre-regulation period including *NI*, sales, *CFO*, and *Size* within year and industry. In all regression, year and industry indicators are included. Coefficient estimates are presented in cells, and t-statistics area reported in parentheses. Standard errors are clustered at the firm-level (Petersen, 2009). *, **, *** indicate two-tailed significance at the 10%, 5%, and 1% levels, respectively. All variables are defined in Appendix B.

Table 8. Heckman (1979) Two-Stage Analysis

Panel A: First-Stage Regression (Equity-Issuing / Debt-Repaying choice model)

Dep. Variable=	***Pr(Equity-Issuing)***
Intercept	-1.039
	(-0.97)
Deviation from 200%	-0.038
	(-1.48)
Size	0.063
	(0.82)
MTB	0.772***
	(4.72)
Return	-0.089
	(-1.33)
CFO	-2.658**
	(-2.13)
SalesGrowth	0.108
	(0.34)
AssetGrowth	1.287***
	(2.75)
Loss	-0.133
	(-0.71)
OperatingCycle	-0.063
	(-0.33)
Year×Industry FE	Yes
SE Clustering	Firm
Obs.	464
Pseudo R^2	0.256

Panel B: Second-Stage Regression

Dep.Variable =	***(1) Return Volatility***	***(2) Idiosyncratic Volatility***	***(3) Earnings Volatility***
Intercept	0.543***	0.580***	0.051**
	(9.55)	(11.00)	(2.30)
Post	0.279***	0.220***	0.006
	(7.65)	(5.07)	(0.39)
Post*Meet	***-0.085******	***-0.074******	***0.004***
	(-3.67)	***(-3.59)***	***(0.69)***
Post*Meet*Equity	***0.107******	***0.076****	***0.018****
	(2.85)	***(2.25)***	***(1.86)***
IMR	-0.002	0.011	-0.005
	(-0.16)	(0.85)	(-1.38)
Other Interactions	Yes	Yes	Yes
Other Controls	Yes	Yes	Yes
Year×Industry	Yes	Yes	Yes
Obs.	1,124	1,124	1,124
Adjusted R^2	0.518	0.505	0.195

Notes: Table 8 shows the results of Heckman (1979) two-stage analysis. In Panel A, we estimate probit regression of probability of issuing equity during crisis period. In Panel B, we include inverse Mills ratio (*IMR*) of Panel A as an additional control variable to control for selection bias and re-estimate our main analysis. In all regression, year and

industry indicators are included. Coefficient estimates are presented in cells, and t-statistics area reported in parentheses. Standard errors are clustered at the firm-level (Petersen, 2009). *, **, *** indicate two-tailed significance at the 10%, 5%, and 1% levels, respectively. For brevity, the coefficients on control variables are not presented in Panel B. All variables are defined in Appendix B.

Table 9. Leverage Regulation Effects on *Chaebol* and *Non-Chaebol* Firms

Panel A: Firm Risk

Dep.Variable =	***Return Volatility***		***Idiosyncratic Volatility***		***Earnings Volatility***	
	(1) Chaebol	***(2) Non-Chaebol***	***(3) Chaebol***	***(4) Non-Chaebol***	***(5) Chaebol***	***(6) Non-Chaebol***
Intercept	0.468***	0.497***	0.475***	0.558***	0.008	0.017
	(7.06)	(9.99)	(7.58)	(12.15)	(0.44)	(1.24)
Post	-0.033	0.555***	-0.017	0.353***	-0.007	0.214***
	(-1.35)	(11.84)	(-0.74)	(8.11)	(-0.78)	(9.14)
Post*Meet	***0.013***	***-0.085******	***0.008***	***-0.086******	***0.012****	***-0.000***
	(0.46)	***(-2.95)***	***(0.29)***	***(-3.13)***	***(1.77)***	***(-0.06)***
Post*Meet*Equity	***-0.047***	***0.128******	***-0.042***	***0.115******	***-0.014***	***0.018***
	(-0.93)	***(3.06)***	***(-0.79)***	***(2.95)***	***(-1.50)***	***(1.59)***
Post*Meet*Debt	***0.048***	***-0.002***	***0.044***	***0.012***	***-0.009***	***0.003***
	(0.35)	***(-0.04)***	***(0.39)***	***(0.35)***	***(-0.86)***	***(0.37)***
Other Interactions	Yes	Yes	Yes	Yes	Yes	Yes
Other Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year×Industry	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	425	2,202	425	2,202	425	2,202
Adjusted R^2	0.581	0.471	0.497	0.445	0.0674	0.326

Panel B: Performance

Dep.Variable =	***EBITDA***		***NI***		***Return***	
	(1) Chaebol	***(2) Non-Chaebol***	***(3) Chaebol***	***(4) Non-Chaebol***	***(5) Chaebol***	***(6) Non-Chaebol***
Intercept	0.011	-0.017	-0.019	-0.025	0.574*	0.410***
	(0.21)	(-0.70)	(-0.49)	(-0.80)	(1.98)	(3.27)
Post	-0.015	-0.029	0.010	-0.116**	0.034	0.635***
	(-1.02)	(-1.03)	(0.71)	(-2.19)	(0.24)	(3.72)
Post*Meet	***-0.028***	***-0.008***	***-0.011***	***0.002***	***-0.167***	***-0.138***
	(-1.51)	***(-0.74)***	***(-0.58)***	***(0.12)***	***(-1.07)***	***(-1.55)***
Post*Meet*Equity	***0.044****	***-0.054******	***0.025***	***-0.052****	***0.231***	***0.091***
	(1.80)	***(-2.89)***	***(0.86)***	***(-2.31)***	***(1.02)***	***(0.56)***
Post*Meet*Debt	***0.008***	***0.013***	***0.039***	***0.018***	***-0.148***	***0.158***

	(0.28)	***(0.85)***	***(1.44)***	***(0.98)***	***(-0.72)***	***(1.36)***
Other Interactions	Yes	Yes	Yes	Yes	Yes	Yes
Other Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year×Industry	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	425	2,202	425	2,202	425	2,202
Adjusted R^2	0.298	0.260	0.270	0.194	0.426	0.276

Notes: This table presents the results of main analyses after dividing sample into two different groups: *chaebol* firms and *non-chaebol* firms. In all regression, year and industry indicators are included. Coefficient estimates are presented in cells, and t-statistics area reported in parentheses. Standard errors are clustered at the firm-level (Petersen, 2009). *, **, *** indicate two-tailed significance at the 10%, 5%, and 1% levels, respectively. For brevity, the coefficients on control variables are not presented. All variables are defined in Appendix B.

Table 10. Peer Effect in Financial Policy between *Chaebol* and *Non-Chaebol* Firms

Panel A: Full Sample Period

Dep.Variable =	***Leverage***					
	Non-Chaebol Firms			***Chaebol Firms***		
Intercept	2.371	-5.141	-5.729	-48.897	-7.444	-3.688
	(1.08)	(-1.09)	(-1.06)	(-1.16)	(-0.25)	(-0.13)
Idiosyncratic Return	***-0.624****	***-0.613****	***-0.619****	***1.069***	***0.801***	***0.733***
	(-1.99)	***(-2.03)***	***(-2.04)***	***(1.25)***	***(1.01)***	***(0.96)***
Idiosyncratic Return_Peer		***-1.217****	***-1.212****		***-0.492***	***-0.607***
		(-1.90)	***(-1.89)***		***(-0.33)***	***(-0.39)***
Leverage	***0.153*****	***0.154*****	***0.154*****	***0.804****	***0.767****	***0.780****
	(6.60)	***(6.50)***	***(6.55)***	***(1.84)***	***(1.75)***	***(1.75)***
Leverage_Peer			***0.037***			***-0.248***
			(0.38)			***(-1.23)***
Size	0.134	0.139	0.135	-0.838	-1.101	-1.094
	(0.90)	(0.93)	(0.92)	(-0.75)	(-0.89)	(-0.88)
MTB	0.114	0.116	0.122	-0.458	-0.404	-0.452
	(0.35)	(0.36)	(0.38)	(-0.65)	(-0.53)	(-0.58)
CFO	-5.050*	-5.381*	-5.371*	10.561	8.460	8.425
	(-1.84)	(-1.91)	(-1.90)	(1.01)	(0.84)	(0.84)
SalesGrowth	-0.654	-0.683	-0.642	-4.576	-4.887	-4.756
	(-1.03)	(-1.11)	(-1.00)	(-1.29)	(-1.29)	(-1.28)
AssetGrowth	-0.828	-0.703	-0.699	-1.160	-1.215	-1.243
	(-1.22)	(-1.01)	(-1.00)	(-0.84)	(-0.87)	(-0.89)
Loss	2.566***	2.429***	2.420***	2.284	2.134	2.234
	(4.41)	(4.32)	(4.31)	(0.84)	(0.74)	(0.78)
OperatingCycle	-0.162	-0.138	-0.119	11.347	12.030	12.101
	(-0.58)	(-0.48)	(-0.39)	(1.28)	(1.28)	(1.28)
Peer firm control variables	No	No	Yes	No	No	Yes
Year×Industry	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	1,869	1,859	1,859	484	484	484
Adjusted R^2	0.186	0.194	0.194	0.253	0.240	0.238

Panel B: Crisis versus Non-Crisis period

Dep.Variable = Leverage	***Crisis***		***Non-Crisis***	
	(1) Non-Chaebol	***(2) Chaebol***	***(3) Non-Chaebol***	***(4) Chaebol***
Intercept	2.980	-74.281	-5.657	(3.242)
	(0.12)	(-0.75)	(-1.13)	(0.10)
Idiosyncratic Return	***-1.110****	***0.878***	***-0.276****	***0.516***
	(-1.65)	***(0.62)***	***(-1.89)***	***(0.51)***
Idiosyncratic Return_Peer	***-8.055****	***3.481***	***-0.053***	***-1.485***
	(-2.13)	***(0.94)***	***(-0.13)***	***(-0.53)***
Leverage	***0.144*****	***1.423***	***0.111*****	***0.532***
	(7.37)	***(1.64)***	***(4.91)***	***(1.24)***
Leverage_Peer	***-0.353****	***-1.081***	***0.025***	***-0.191***
	(-1.69)	***(-1.52)***	***-0.71***	***(-0.81)***
Control variables	Yes	Yes	Yes	Yes
Peer firm control variables	Yes	Yes	Yes	Yes
Year×Industry	Yes	Yes	Yes	Yes
Obs.	391	115	1,468	369
Adjusted R^2	0.230	0.304	0.161	0.237

Notes: In this table, we present the results of peer effect in financial policy among *chaebol* and *non-chaebol* firms. In Panel A, we provide the results of full sample period. Panel B shows the results of crisis period and non-crisis period, respectively. In all regression, year and industry indicators are included. Coefficient estimates are presented in cells, and t-statistics area reported in

parentheses. Standard errors are clustered at the firm-level (Petersen, 2009). *, **, *** indicate two-tailed significance at the 10%, 5%, and 1% levels, respectively. For brevity, the coefficients on control variables and peer firms' control variables are not presented. All variables are defined in Appendix B.