경영학박사 학위논문

Essays on Corporate Finance

기업재무에 관한 연구

2021년 8월

서울대학교 대학원

경영학부 경영학 전공

최 윤 영

Essays on Corporate Finance

지도교수 김 우 진

이 논문을 경영학 박사 학위논문으로 제출함
2021년 7월

서울대학교 대학원
경영학과 경영학 전공
최 윤 영

최윤영의 경영학 박사 학위논문을 인준함
2021년 7월

위 원 장 이 종 섭
부위원장 최 동 범
위 원 김 우 진
위 원 강 형 구
위 원 정 진 영

Abstract

Essays on Corporate Finance

Yoonyoung Choy

Department of Finance

College of Business Administration

Seoul National University

This thesis consists of two essays in corporate finance: distress resolution under concentrated equity ownership and the effect of the amount of analyst coverage on corporate innovation. The first essay examines the distress resolution mechanism under concentrated equity ownership and concentrated bank debt. Using a comprehensive sample of private and public Korean firms that entered distress between 2000 and 2019, we find that distress resolution is more likely when private placements of new equities are accompanied by a change in control. This effect is more pronounced when a large business-group-member firm is taken over. These findings suggest that equity capital injection and monitoring by the new controlling shareholder may be the key determinants of distress resolution under poor investor protection, which further explains why concentration of ownership may persist over time under such an environment.

The second essay examines whether analyst coverage affects firm innovation in an economy characterized by family-controlled business groups. Using a sample of Korean publicly traded firms from 2010 to 2018, the second essay finds that an increase in analyst coverage leads covered firms to cut not only R&D, but also investments in corporate venture capital. The reduction in innovation efforts also occurs when analysts are from other brokerages affiliated with chaebols (family-controlled large business group). These findings suggest that, when the information environment is less transparent, unlike in the U.S., analyst coverage in Korea may function more as a "pressure" mechanism than an "information" mechanism.

Keywords: Distress resolution, Control transfer, Ownership concentration, Private placement, Corporate venture capital, Financial analysts, Innovation

Student Number: 2014-30173

Contents

List of Tables and Figures

Chapter 1. Distress Resolution and Ownership Concentration: The Case of Bank-oriented Economies

Chapter 2. Does Analyst Coverage Encourage Firm Innovation? Evidence from Korea

Chapter 1

Distress Resolution and Ownership Concentration: The Case of Bank-oriented Economies

1.1 Introduction

As the number of corporate bankruptcy filings has been significantly increased, bankruptcy regulation has become an essential part of an economy. Given the characteristics of corporate financial structure, bankruptcy procedures vary across the world. Some developed countries—where a substantial amount of corporate debt is dependent on public debt (*i.e.*, corporate bonds)—have legislations that are supportive of the existing management as well as to the firm continuing as an ongoing entity (Senbet and Wang, 2010), akin to Chapter 11 in the U.S.

Theoretically, Gertner and Scharfstein (1991) pay attention to the key difference between public and bank debt: Bank debt is usually held either by one bank or banking syndicates, whereas public debt is diffusely held. Such heavy dependence on the public debt of distressed U.S. firms may result in a coordination problem in the out-of-court workout process. They show that Chapter 11 provides debtors with automatic stay and convenient voting procedure, which can mitigate the coordination problem and increase investment.

However, bank-oriented countries, including Korea, Indonesia, Thailand, and Sweden, have bankruptcy proceedings that work as a disciplining tool for managers, and enable the transfer of corporate control (Claessens et al., 1999), akin to the Reorganization Act in

Korea before 2006. The difference between Chapter 11 and receivership in Korea result from two features: *First*, Korean firms are highly dependent on bilateral bank loans. Owing to their concentrated nature, coordination failures are less likely to arise in Korean firms, enabling more frequent private workout. *Second*, both secured and unsecured debt are mostly held by banks, and debtor and creditor relations are often intimately influenced by the government, which seeks to maintain economic stability and industrial growth by preventing contentious debt collection. As a result, it is hard to find active creditors to participate restructuring in Korea (Nam and Oh, 2000).

With the absence of active (bank) creditors, it is important to see what facilitates restructuring of distressed firms with bilateral bank loans. However, the research is mostly focused on large and public firms with diffusely held ownership (or public loans) within the conventional U.S. or U.K. setting. We know little about how concentrated ownership affects corporate governance in emerging economies. Motivated by this, this study aims to find what determines the successful resolution of financial distress when there is no internal mechanism (or there are no active creditors) that function(s) as a meaningful disciplining device for corporate restructuring. We also do not fully understand how ownership changes as a consequence of financial distress and why concentrated ownership persists when firms are dependent on bank loans. Similarly, there is little evidence on how creditors or other entities take control of the bankrupt firms when those firms are highly dependent on bank loans.

Based on a sample of 12,601 public and private firms that experienced financial distress between 2000 and 2019 in Korea, this paper shows related evidence on these issues. *First*, the novel dataset that covers both private and public firms provides important information about distressed firms in an emerging market setting: Firms with successful resolution are more likely to change their largest shareholder and go through private placement than firms remaining in distress. There is an increase in the ownership from old

to new largest shareholder, and the ownership of new largest shareholder of out-of-distress firms (34.5%) is statistically different from firms that remain in distress (25.0%). Private placement rate, obtained as the rate of the number of new equities issued scaled by the number of all outstanding common stocks before the placement, is statistically different between out-of-distress (17.0%) and remain-in-distress (13.8%) firms as well. By comparing identities of private placement targets with the largest shareholder, we also confirm that the targets become the largest shareholder of a distressed firm. Overall, it implies that ownership gets more concentrated with large controlling shareholders when a firm is financially distressed, and the increased blockholdings are not driven by the consolidation of existing blocks, but by private equity placements, which differs from previous studies (Gilson, 1990).

Second, multivariate results suggest that distress resolution is more likely when new equities are issued and a change in control occurs. Here, we highlight that firms undergoing one or the other have a lower likelihood of survival. Only firms that take both ways are more likely to bring about a successful resolution. By applying a Cox hazard regression as a robustness test, the hazard ratio shows that a firm group undergoing both private placement and control transfer has 1.8 times higher chances of successful resolution than a comparison group. However, control transfer or private placement alone reduces the chances of resolution by 18.9% and 99.3%, respectively, since their respective hazard rates are lower than 1, *that is*, 0.811 and 0.007, respectively.

Third, control transfer accompanied by equity capital injection is also important for operational efficiency. Estimated by return on assets (ROA) and operating cash flow return as the long-term performance measure (Megginson et al., 2004), firms with both private placement and control transfer are more likely to construct better ROA and long-term performance. Again, firms undergoing either control transfer or private placement have

negative ROA and operating cash flow return, affirming that only both ways work for successful resolution.

Finally, we also perform several cross-sectional analyses as well as robustness tests to confirm the following: The benefits from concentrated ownership are pronounced when distressed firms are group affiliated. By applying a stricter measure for financial distress (*i.e.*, full-scale capital erosion) as well as the Korea Exchange (KRX) watchlist owing to capital impairment, our main result remains valid. The benefit from concentrated ownership accompanied by equity capital injection is also valid when we take the industry ripple effect arising from a firm's financial distress. We exploit endogeneity by applying propensity score matching (PSM). Endogeneity can occur if successful firms are likely to receive equity capital injection as well as control transfer. If this is the case, the effect of private placement and the change in the largest shareholder is merely an outcome variable, which necessitates applying PSM as a robustness test. The result shows that the positive effect of private placement and control transfer on successful resolution remains when applying PSM. The comparison between firms with private placement or with control transfer and firms without either of the two shows that firms undergoing either of the two are not necessarily as successful as other competitors. Additionally, the control transfer accompanied by private placement lowers the likelihood of dissolution as well as the failure to deal with financial distress. Firms with control transfer related to private placement are more likely to resolve their financial distress when control transfer is accompanied by equity capital injection, which further supports our main argument.

Overall, these findings suggest that monitoring by the new controlling shareholder may be an important factor in the distress resolution process, which may explain why concentration of ownership persists over time under poor investor protection.

This study contributes to the related literature on reorganization of financially distressed firms. Previous studies focus on what determines firm incentives to undergo

private out-of-court workout instead of costly formal bankruptcy. To our knowledge, this is the first study that suggests what determines successful distress resolution when the internal governance mechanism is not in place. Using a novel dataset that investigates financially distressed private and public firms, this study provides new empirical insight on how control transfers driven by private equity placements relates to bankruptcy outcomes. Our empirical evidence advocates that concentrated ownership creates benefits for distress resolution from new shareholders' monitoring effort. Unlike as suggested by the traditional literature on corporate governance, where the presence of large shareholders creates an incentive to extract private benefits (Shleifer and Vishny, 1997; La Porta et al., 1997; Hope, 2013), the advantage of concentrated ownership is that shareholders can directly monitor managers via concentrated ownership. We believe that this study provides new empirical results on such a monitoring aspect of concentrated ownership on debt restructuring and firm performance.

Lastly, the result in this study has another implication for the recent monitoring trends around the world. While the potential for external entities, the so-called "vulture" investors, to affect debt restructurings and discipline incumbent managers is very developed in the U.S. (Hotchkiss and Mooradian, 1997), emerging markets are still coming to terms with the concept of vulture funds. We imply that concentrated shareholders play a vulture-like monitoring role in those markets. Owing to the bank loan dependency in Korea, even if such bank creditors become a distressed firm's stakeholders by debt-to-equity swaps, government-controlled financing results in banks' weak monitoring and supervision over their debtors. As a result, the control transfer to other entities is inevitable for efficient monitoring and restructuring. Given that controlling shareholders and bank loan dependencies are also prevalent in many economies, the documented evidence is applicable beyond the specific context in this study.

The remaining sections are constructed as follows. Section 2 explains the institutional setting. Section 3 reviews the literature and the contributions of current the study. Section 4 describes the sample construction and methodology Section 5 presents the main empirical findings, while section 6 concludes.

1.2 Institutional Background

In this section, we compare Chapter 11 in the U.S. and Reorganization Act in Korea. Empirical studies, including Gilson et al. (1990), show that firms with public debt are more likely to use Chapter 11. For instance, companies filing Chapter 11 bankruptcies have been some of the largest U.S. corporations, including Lehman Brothers, Delta Airlines, and US Airways (Bracewell and Giuliani, 2012). The automatic stay provision provided the stagnant *In re Continental Airlines*, *Inc.* with significant advantages in 1990, including that the creditor repossessed aircraft equipment without losing the state of the automatic stay (Mathiesen, 1995). The case of US Airways in 2002 is another example of a Chapter 11 filing. By distributing a disclosure statement to creditors, the debtors requested creditors' votes to accept the reorganization plan before the Chapter 11 protection. After several weeks of negotiations between the two parties, the plan was accepted by more than 95% of creditors. Therefore, the indebted firm was able to start restructuring under Chapter 11 and successfully emerged in seven months. In contrast to reorganization procedures in many other countries, existing management remains in control during Chapter 11 filings. These managers renegotiate with creditors and make a plan of reorganization. At the same time, existing creditors have their debt claims modified once the court approves the firm's reorganization plan which also allows those creditors to become new shareholders of the restructuring firm.

Notwithstanding the debtor-friendly characteristics, Chapter 11 cannot be a panacea, rarely seen in other emerging countries that still heavily rely on the banking sector. Such bank-oriented countries include Korea, Indonesia, Thailand, and Sweden, where the bankruptcy proceedings work as a device to discipline managers and facilitate the corporate control transfer (Claessens et al., 1999). For instance, Ssangyong Motor Co., South Korean third-largest carmaker at the time, has painful history, starting from Korea's financial crisis in 1997 when many companies went out of business. Ssangyong Group, South Korean sixth-largest conglomerate and the largest shareholder of Ssangyong Motor at the time, sold Ssangyong Motor to Daewoo group in 1997. In 1999, Daewoo, Korea's third-largest industrial group at the time, was declared bankrupt. Control was then transferred to creditor banks, and China's SAIC Motor Corporation took control of Ssangyong Motor, buying 48.9% of the carmaker from bank creditors for $536.3 million (590.9 billion won) in 2004. In 2011, SAIC decided to give up, and Ssangyong Motor was put under court receivership. The carmaker switched the largest shareholder four times until Mahindra & Mahindra of India bought 70.0% of Ssangyong for 4.2 trillion won ($378.0 million) in 2010. In 2011, Ssangyong Motor broke out from receivership and began pursuing the long-term development plan as a part of the global strategy of Mahindra. (Lee, 2011).

As seen in the case of Ssangyong motors, the bankruptcy proceedings work as a disciplining device on managers who are responsible for their firm's difficult situation and to help the prompt control transfer in many emerging countries, since it is difficult to find active (bank) creditors to monitor firms' restructuring efforts.

1.3 Literature Review

This paper contributes to a strand of literature on concentrated ownership. The research does recognize the governance implication of concentrated ownership, some of

which are expected to be beneficial to firm performance while others are detrimental to firm value (see Holderness, 2003; Filatotchev et al., 2001; Shleifer and Vishny, 1997, for a discussion).

One side of the literature focuses on the incentive effects related to concentrated ownership. For instance, Jensen and Meckling (1976) emphasize that unaffiliated block-ownership may be useful in monitoring managers, which eventually enhances the value of minority shareholders as well. Sometimes firms' undiversified blockholders play an important monitoring role (Filatotchev et al., 2001). Shareholders with concentrated ownership may be inclined to prevent the self-serving behavior of managers to protect their own interests (Filatotchev et al., 2001; La Porta et al., 1999; Maug, 1998; McConnell and Servaes, 1990). In addition, concentrated ownership induces more efficient monitoring by mitigating the incentives of managers to misreport (Burns et al., 2010).

On the other hand, some other studies indicate that concentrated ownership may create entrenchment effects (Foley and Greenwood, 2010; Helwege et al., 2007; Claessens et al., 2000; McConnell and Servaes, 1990; Mikkelson and Partch, 1989; Morck et al., 1988). Opportunistic blockholders often expropriate minority shareholders, leading to higher value discount in firms with concentrated ownership (Morck et al., 1988; Bennedsen and Nielson, 2010). In particular, when stock market is liquid, a firm's idiosyncratic risk negatively affects blockholders' subjective value of investment, resulting in their collusion with managers or conflicts with minority shareholders (Maug, 1998; Young et al., 2008). Gibbs (1993) and Pound (1988) show that unaffiliated blockholders are mostly passive, so they usually support managers in taking growth-related strategies, and that they can even vote for managers to protect their own interests (Filatotchev et al., 2001).

However, most research is focused on large and public firms with diffusely held ownership (or public loans) within the conventional Western economic background, and we know little about how concentrated ownership affects corporate governance in emerging

countries. We believe that this study relates to countries where minority shareholders are poorly protected and where expropriation by the controlling counterparts is expected.

This study also relates to the literature that emphasizes the monitoring role in distressed firm restructuring. Specifically, Hotchkiss and Mooradian (1997) explain that vulture investors in the U.S. play an important role by disciplining incumbent managers of restructuring firms. The role of vulture investors in reorganization of firms can be largely seen in many cases in the U.S. We also relate the monitoring role, which is largely done by vulture funds in the U.S. to monitoring efforts by some other factors in an emerging market setting, if any.

The literature on bankruptcy regulation concerns about two types of systems: debtor-oriented system (*e.g.*, the U.S. Chapter 11) and creditor-oriented systems (*e.g.*, Reorganization Act in Korea before 2006), and there is wide debate on their efficiency (Aguiar-Díaz and Ruiz-Mallorquí, 2015). In debtor-friendly systems, viable firms are unlikely to be liquidated, but inefficiency can occur since non-profitable firms continue to survive. In this respect, some researchers argue that one of shortcomings of debtor-friendly systems include the continuation of unprofitable firms (Hotchkiss, 1995). Gennaioli and Rossi (2010) show that the creditor-oriented system offers judicial incentives to help corporate restructuring efficiently, preventing inefficient application of judicial discretion.

Several studies exploit a major bankruptcy reform in Korea, the Unified Bankruptcy Act of 2005 (UBA), to explore the role of different aspects of the two bankruptcy-related legislation. Korea has a unique history of both management stay and receivership: Under the receivership system before 2006, incumbent managers were replaced by a trustee appointed by a court who sold the firm to new entities. After the UBA, incumbent management remains in control during bankruptcy proceedings. Ko (2006) argues that the new reform in 2006 may result in the exoneration of poor management, since there is no proper governance mechanism in Korea. On the other hand, Schoenherr (2017) finds that

pre-reform receivership makes firms become less leveraged, avoid risky investment, and reduce innovation. However, evaluating bankruptcy legislation should be based not only on the type of system, but also on firm characteristics, such as the degree of concentrated ownership and (public) debt dependency (Thorburn, 2000), and this study aims to fill this gap.

1.4 Data and Methodology

1.4.1 Sample Construction

Our sample consists of publicly traded and externally audited firms in Korea from 2000 to 2019, available on DataguidePro, our primary local dataset comparable to Compustat and IBES combined. To assemble financially distressed data, we first obtain 450,434 public and private firm-year observations between 2000 and 2019 from DataguidePro. Then, we extract financially distressed firm-year observations as well as firm-level data, following our main financial distress measure (*Distress50*), as shown below (Kim et al., 2019):

$$Distress50(=1)_{i,t} = cumulative\ loss > \frac{paid\text{-}in\ capital}{2} \quad (1)$$

where a financially distressed firm is defined as a firm with *Distress50* value of 1. If the measure in Equation (1) is 0, a firm is not financially distressed. If Equation (1) changes to 0 from 1, then a firm's distress is said to be successfully resolved. As a robustness test, we later apply stronger variables for distress measure (*i.e.*, full-scale capital erosion), which is a dummy variable that equals 1 if book equity is negative and 0 otherwise, to make sure that our main result is still valid.

Then, we arrange the data into each consecutive distress period for a firm to define an "out-of-distress" period. The out-of-distress period is defined to be the closest year when *Distress50* changes to 0 from 1. If a firm continues to be distressed till 2019 or there is no

data available to calculate *Distress50* for the relevant period, we leave the out-of-distress period as unknown. Based on the out-of-distress period, we construct a resolution dummy (*DistressResolution)* that equals 1 when a firm successfully resolves financial distress and 0 otherwise, *that is, DistressResolution* becomes 1 when *Distress50* changes to 0 from 1, and it remains 0 when *Distress50* does not change. For instance, Heungkuk Fire & Marine Insurance, a South Korean company specialized in the insurance business, has two distress periods in 2007 and 2010. Hence, the relevant out-of-distress period will be 2008 and 2010, respectively, since the firm's *Distress50* turns out to be 0 in those years. There would be two firm-year observations for Heungkuk in 2007, and 2010, respectively. Once we obtain the firm-year observations, the firm-level data are also obtained by extracting the earliest distress event for each firm. For Heungkuk, the relevant firm-level data only refer to the data for 2007. This leaves us the sample of 74,981 distressed firm-year observations, which accounts for 16.65% of the total observations.

We manually collect ownership and private placement data for each firm and year level from the Data Analysis, Retrieval and Transfer System (DART) database, which is a disclosure platform similar to EDGAR in the U.S. We limit out sample to December year-end companies; if both private placement and control transfer take place after December, such events are not taken into account.

First, for the change of control, we refer to the ownership data of business report or a statement of audit for the three-year rolling period. The information we need at time *t* includes the name of the largest shareholders as well as the percentage of their shareholdings between time *t-1* and *t+1*. Throughout this study, "old largest shareholder" refers to the largest shareholder at time *t-1* and "new largest shareholder" refers to the largest shareholder at time *t+1*. For instance, the first distress period of Heungkuk is from 2007 to 2008 (out-of-distress period), and hence the relevant stockholders' information would be 54.40% held by Taekwang Industry in 2006, 66.41% held by Taekwang Industry

in 2007, and 59.75% held by Taekwang Industry in 2008. By comparing the identity of the largest shareholder during the three-year rolling period, we construct a change of control dummy (*ChgDummy*) that equals 1 when the old largest shareholder's name is identical to the new largest shareholder's and 0 otherwise. For the case of Heungkuk in 2007, *ChgDummy* becomes 0, since there is no change for the name of the largest shareholder. We do not take into account the control transfer to an affiliated person or company, since the conveyance to the affiliated parties is not a "true" transfer of ownership. Lastly, if there is a control transfer between the two discrete distress events for a firm, we do not take the transfer into account, since we are interested in the effect of control transfer on distress resolution.

Second, we refer to the report for private placement in DART database during distress period of each firm to get the data for private placements. If the report classifies its private placement as allotment to the third party, we construct a private placement rate (*PPRate*), calculated as the number of new common stock issued, divided by number of common stocks issued before the private placement. Again, if there is any private placement to affiliated parties, we do not take it into account, as in the case for control transfer.

If there are consecutive distress periods, we also apply the three-year rolling period as well: For instance, Hyundai Engineering & Construction, Korea's leading construction company since 1947, was financially distressed between 2000 and 2002, and successfully resolved distress in 2003. The company has a *ChgDummy* of 1 for 2000, 2001, and 2002, while the relevant *DistressResolution* values are 0, 0, and 1, respectively. For the firm-level analyses, the relevant *ChgDummy* and *DistressResolution* values are 1 if at least one change of control or resolution takes place during the entire distress period. As for the firm-level of Hyundai Engineering & Construction, all of the two dummy variables are 1, since there is at least one dummy variable that takes the value of 1. Finally, all control variables as well as *PPRate* from the beginning of the distress period are used for the firm-level analyses.

For the case of Hyundai Engineering & Construction, control variables from 2000 are used for the firm-level analyses.

Table 1 provides the firm-level characteristics for our data. We classify distressed firms into three categories: out-of-distress, remain-in-distress, and unidentified firms. As mentioned, out-of-distress firms are firms whose *Distress50* value changes to 0 from 1 and remain-in-distress firms are firms whose *Distress50* value remains 0 till the end of the relevant distress period. Since there are firms whose data are unavailable, their *Distress50* cannot be calculated; unidentified firms are firms that have a blank *Distress50* measure till 2019, which is the end period of our sample. For instance, if a firm's distress period is between 2014 and 2016, but if it has no data available to calculate *Distress50* between 2017 and 2019, this firm falls into this category. Excluding unidentified firms from the baseline regression leaves us with a final sample of 61,812 distressed firm-year observations and 12,601 distressed firms.

However, it is important to see why these unidentified firms have no data available to measure *Distress50* till 2019. To see why these firms' distress measure cannot be obtained, we break those firms down into three categories based on DART: 1) firms that are merged and disclosed the decision on the takeover; 2) firms that disclosed the report for dissolution in DART; and 3) other firms without any relevant information. Out of 13,169 firms, the majority (7,350 firms) went out of business (55.81%), 1,118 firms disappeared out of mergers and acquisitions (8.49%), and the rest (4,701 firms) were without any relevant information (35.7%). Using this information, we also analyze the effect of control transfer and private placement on firm liquidation separately as a robustness test.

According to Table 1, out of 25,770 distressed firms, 9,715 are out-of-distress firms, 2,886 are remain-in-distress firms, and the remaining 13,169 are unidentified. On average, distressed firms spend around 2.26 years in their distress period; firms spend around 2.29 years to resolve from financial distress; and firms remain to in distress for 1.94 years. A

subsequent number of distressed firms go through the change in the largest shareholder as well as the private placement, and each sub-category of distressed firms is statistically significantly different, except for private placements between remain-in-distress firms and unidentified firms. Table 1 also provides us with the change in control between old and new largest shareholders. There is increase in the ownership of the largest shareholder from old to new largest shareholder, and the ownership of new largest shareholders of our-of-distress firms is statistically significantly different from their remain-in-distress counterparts. Lastly, panel C shows that private placement is statistically different between out-of-distress firms and remain-in-distress firms as well.

[Table 1]

In Table 2, we also show candidates who receive stock shares as a result of private placement. Table 2 presents the identities of private placement target. This information is important, since it provides us with some implications about what those targets actually do after entering their distressed firms. Private placement target is based on the private placement notice available in DART database, which identifies the relationship between the relevant targets and a firm. The target is categorized as expected largest shareholder and others without cash inflow (owing to debt–equity (DE) swap) and with cash inflows. Moreover, an individual target has an additional management/employee category under private placement notice. Out of 21,618 private placement targets, individuals (54.4%) take more than half of the private placement targets. Banks mostly turn out to be investors with cash inflows (44.8%). The majority of non-financial firms is also investors with cash inflows (48.5%). Individuals are mostly creditors (44.3%) of distressed firms. Additionally, we also investigate if those private placement targets become the largest shareholder. If the private placement target is identical to the largest shareholder throughout three-year time period after private placement, we assume that the target becomes the largest shareholder. Specifically, creditors out of debt–equity swap become the largest shareholder for all three

categories, and the expected largest shareholder becomes the largest shareholder during three-year time period after the private placement takes place. Overall, Table 2 provides important information, that is, private placement targets become the largest shareholder.

[Table 2]

We additionally show the identities of the new largest shareholder during the relevant distress period in Table 3. This information is also relevant, since it provides us with not only the identities of new owners, classified as bank, non-financial firms, and individuals, but also with whether the new corporate owner is from the same business group. The information about the control transfer and respective new largest shareholder is based on the statement of audit available in DART database, which identifies the rate of shareholdings by dominant shareholders as well as their identities. The new largest shareholder is categorized as individuals, banks, and non-financial firms as in Table 2. Banks and individuals are re-classified as either foreign or domestic, and non-financial firms are classified as whether they belong to the same business group as the relevant distressed firm, based on the list of large business groups designated by the Korea Fair Trade Commission (KFTC) every year. Panel A shows the identities of the largest shareholder during the first distress period of firms. If a firm undergoes a single distress, the relevant information goes into this category. Domestic financial institutions (22.9%) and domestic citizens (36.1%) are the dominant type of new largest shareholders. Especially, 21.3% of non-financial institutions are from large business groups, *that is*, distressed firms are somewhat benefiting from their business group peers to get out of financial distress. On the other hand, panel B displays the identities of the largest shareholder changed during the last distress period. The difference between panels A and B is that the support from the same business group peers increase to 27.1%, which surpasses the relevant ratio of domestic financial institutions (24.6%). The dominant type of the

largest shareholder in panel B becomes domestic citizens (27.2%) and non-financial institutions from the same business group (27.1%), *that is*, the support from the business group networks seems to sustain throughout the entire distress period.

[Table 3]

1.4.2 Methodology

We use ordinary least squares (OLS) to examine the effect of concentrated equity ownership and concentrated bank debt on operation efficiency as follows:

$$Y_{i,t+1} = \alpha + \beta_1 ChgDummy_{(i,t)} + \beta_2 PPRate_{(i,t)} + \beta_3 PPRate_{(i,t)} \cdot ChgDummy_{(i,t)} + \gamma X_{(i,t)} + \delta_i + \mu_t + \varepsilon_{(i,t)} \quad (2)$$

where subindex *i* and *t* represent firm and year throughout this study, respectively. The dependent variable $Y_{i,t+1}$ stands for four variables: (1) *DistressResolution* that equals 1 when a firm successfully restructures its debt and 0 otherwise; (2) return-on-asset (*ROA*), calculated as the net income scaled by the book value of total assets; (3) a dummy for non-administrative issues (*NoAdDummy*) that equals 1 when a firm designated as administrative issues (*i.e.*, Korea Exchange (KRX) watchlist) successfully turns around and 0 otherwise; and (4) operating cash flow return (*CFReturn*), defined as sales less cost of goods sold, minus administrative and selling expenses, plus goodwill amortization and depreciation all divided by total asset (Megginson et al., 2004). The fourth dependent variable is to get the long-term performance of a firm affected by concentrated ownership, so only *CFReturn* is measured at *t+1* (Year 1), *t+2* (Year 2) and *t+3* (Year 3), whereas other dependent variables are only measured at time *t+1*. *DistressResolution* and *ROA* are used in our main result, while *NoAdDummy* and *CFReturn* are used for our sub-sample analysis and robustness tests, respectively.

The main independent variable is $PPRate_{(i,t)}$ and $ChgDummy_{(i,t)}$, which represents rate of stocks issued owing to a private placement, and a dummy that equals 1 when the old largest shareholder's name is identical to the new largest shareholder's and 0 otherwise, respectively. β_1 captures the direct effect of control transfer, and β_2 captures the direct effect of private placements. Our key coefficient of interest is β_3, since the coefficient captures the effect from private placements of new equities accompanied by a change in control. If positive, β_3 has different sign from β_1 and β_2, and we can say that concentrated ownership accompanied by control transfer works as a monitoring mechanism to successfully resolve financial distress.

Following Foley and Greenwood (2010) and other literature on concentrated ownership, the remaining control variables in $X_{(i,t)}$ are asset turnover (*AssetTurnover*), size (*Size*); a firm's net property, plant, and equipment, scaled by assets, (*PPE*); a firm's earnings before interest, taxes, and depreciation, deflated by sales, (*EBITDA*); R&D ratio *(R&D)*; R&D dummy that equals 1 for firms that report positive levels of R&D and 0 otherwise (*RDDummy*); and total debt-to-asset ratio (*Debt*). It is also possible that a firm may be affected by the difficulties from overall industry-level. To take the industry effect into account, we take sales growth (*SalesGrowth*) deviated from the industry-level sales growth at the two-digit Korean Standard Industrial Classification (KSIC) code. The appendix provides the detailed definitions of all control variables as well. δ_i and μ_t represent firm and year fixed effects, respectively. When we perform the firm-level analysis, we do not use firm and year-fixed effects.

Using Equation (2), we also perform the public firm sub-sample analysis. *First*, based on Gilson (1989, 1990), we obtain the sample of firms with three-year cumulative unadjusted stock returns in the bottom 5% of publicly traded companies in the Korean stock market. Stock returns are obtained from the DataguidePro daily return data. A separate

ranking is obtained each year from 2000 to 2019, resulting in a total sample of 2,233 firm-year observations and 1,212 firms. Using this subsample, the dependent variables are *DistressResolution* and *ROA*, which we use to analyze whether Gilson's (1989, 1990) classification results in the same result as in our main counterpart.

Second, we also consider subsamples of listed companies designated as "Administrative Issue" or KRX watchlist. Any listed company is designated as KRX watchlist if concerned company falls under the delisting criteria. Such criteria include, for example, deterioration of financial conditions, limited share distribution, and lack of liquidity ratio, which the details are described under "Korea Exchange (KRX) Listing Regulations (KRX, 2011)." If a company meets those criteria, KRX starts to designate, as an "investment alert issue," stocks of a company that requires attention for investment, so that investors are fully informed of the company prior to making investment decisions. By referring to the "investment alert issue," the list of firms designated as administrative issues are manually collected from the Korea Investor's Network for Disclosure database. We only focus on firms selected as administrative issues out of capital impairment, since we believe that these are firms experiencing financial distress. The second classification leaves us a total sub-sample of 1,798 firm-year observations and 976 firms. The dependent variable becomes *NoAdDummy* as well as *ROA*, since we are now interested in the situation when a firm is no longer an administrative issue.

In the cross-sectional analyses, we divide our sample into two groups and interact them with the key variable of interest, $PPRate_{(i,t)} \cdot ChgDummy_{(i,t)}$, in Equation (3) as follows:

$$Y_{i,t+1} = \alpha + \beta_1 CharDummy + \beta_2 ChgDummy_{(i,t)} + \beta_3 PPRate_{(i,t)} + \beta_4 CharDummy \cdot ChgDummy_{(i,t)} + \beta_5 CharDummy \cdot PPRate_{(i,t)} + \beta_6 ChgDummy_{(i,t)} \cdot PPRate_{(i,t)} + \beta_7 CharDummy \cdot ChgDummy_{(i,t)} \cdot$$

$$PPRate_{(i,t)} + \gamma X_{(i,t)} + \delta_i + \mu_t + \varepsilon_{(i,t)} \quad (3)$$

where *CharDummy* represents two distinct cross-sectional dimensions, *namely*, business group-affiliation (*GA*) and a dummy for dept-equity swap (*SwapDummy*). Based on the list of large business groups designated by the KFTC every year, we identify firms into group-affiliated and non-group-affiliated categories, and define *GA* as a dummy variable that equals 1 when a firm is from a large business group and 0 otherwise.

Another *CharDummy* is a *SwapDummy* that equals 1 if a private placement to the third party takes place owing to the debt–equity swap. Since large amount of private placement to financial institutions is to transform loans into shares of stock or equity, this private placement should be taken as different from the placement to the third party as a means of control transfer. Here, our key coefficient of interest is β_7, which measures how private placements of new equities accompanied by control transfer affects successful distress outcome in each sub-group*; that is*, if β_7 is statistically positively significant, it implies that the effect of private placements accompanied by control transfer is more pronounced when a firm is from a large business group, and a private placement results from debt–equity swap.

Later, we also perform several robustness tests: *First*, we apply Cox regression (or proportional hazards regression) to make sure that our main result is still valid. According to Bugnard et al. (1994), the Cox model allows studies of time intervals without division into classes. In addition, the parameters of the hazard regression can be easily clarified, since those parameters are the logarithms of the relative risks of independent variable, and the relevant equation is as follows:

$$h(t) = h_0(t)exp^{\beta X} \quad (4)$$

where $h(t)$ is the expected hazard during interval *t* (*SurvivalProb*); $h_0(t)$ is the baseline (or the start of distress) survival function during interval *t* and represents the hazard when

all of the independent variables are equal to 0; β is a vector of coefficients; and X is a vector of covariates. The survivor function during interval *t* in Equation (4) is equal to the probability of surviving to time t (*e.g.*, in this study the probability of successful resolution, *SurvivalProb*). To obtain *SurvivalProb*, the relevant time-to-event is defined as the difference between initial distress period and out-of-distress period. Moreover, event code is for when a firm successfully resolves, whereas censor code is for firms with unsuccessful restructuring.

We perform the same analyses without private placements targets being banks. We perform this robustness test because banks put their money to the distressed debtor, not only because they try to help firm restructure, but also because spillover effect of the firm's difficulty on the relevant industry is significant. In the latter case, since the bank is highly regulated under government's control in Korea, and thus banks are forced to raise capital to those firms to minimize the related industry-wide spillover, this capital injection should be taken about separately.

Third, there may be endogeneity issues. Endogeneity can occur if successful firms are likely to get equity capital injection as well as control transfer. If this is the case, the effect of private placement and the change in the largest shareholder is merely outcome variable, which necessitates applying PSM as a robustness test. If successful firms are more likely to go through both private placement and control transfer, the positive signal can take place when the market receives such news from the relevant distressed, *that is*, the possibility of a signaling effect exists that allows a firm's successful resolution instead of monitoring effect to arise from concentrated ownership accompanied by equity capital infusion. The logic behind the signaling effect is that firms that are more likely to success are more likely to go through private placement as well as control transfer. To make sure if successful firms are likely to engage in private placement as well as control transfer, we compare firms with private placement (and with control transfer) with those without private placement (and

without control transfer). If there is no significant difference between the two, then the result may indicate that the signaling effect is less likely.

Lastly, the change in the largest shareholder results from other reasons than private placement. If this is the case, it is important to see if such an "unrelated" change in the largest shareholder has different effect on distress resolution. To clarify this issue, we define "related" control transfer as the new largest shareholder being identical to the private placement target; "unrelated" control transfer is the new largest shareholder different from the private placement target. We then re-do the split-sample analysis. By doing this robustness test, we can see how a "related" change in the largest shareholder differs from "unrelated" change in terms of their effect on resolution, if any.

Table 4 presents summary statistics of our variables. The average *DistressResolution* is 34.2% in our sample and the average *ROA* is negative 23.7%. *ChgDummy* implies that around 68.0% of firm-year observations went through control transfer; *PPRate* implies that, on average, 15.4% of new stocks are issued to private placement targets.

[Table 4]

1.5 Findings

1.5.1. Baseline Results

Table 5 shows the main results for distress resolution and ownership concentration. As discussed in section 1, concentration ownership works as a controlling mechanism to result in successful resolution with equity capital injection, since not only the change in the largest shareholding, but also private placement causes a firm to resolve from its financial distress. Here, we highlight that firms undergoing one or the other have lower likelihood to survive. Only firms that take both ways are more likely to bring about a successful resolution. The control variables are also in good shape, since firms with R&D investments

are, owing to its cost, less likely to recover from financial distress. From the perspective of firm level, we find that the change of the largest shareholder accompanied by the private placement are necessary for a firm to resolve from its financial distress. The control transfer accompanied by equity capital injection is also important for operational efficiency, measured by *ROA*; hence, in a country under poor investor protection, concentrated ownership is important for a (financially distressed) firm, since it works as a monitoring mechanism instead.

[Table 5]

1.5.2. Cross-sectional analysis

Table 6 shows the results for firms that belongs to the large business group designated under KFTC. It shows that our main result is pronounced when a large business member firm is taken over, *that is*, the monitoring effect of control transfer accompanied by equity capital injection strengthens when a target firm is from a large business group. As a result, successful resolution from financial distress is possible when a group-affiliated firm enjoys the benefit from concentrated ownership. The fact that the effect of control transfer, along with equity capital injection, also is positive to *ROA* is somewhat different from previous studies, which tend to connect concentrated ownership to less profitability (Joh, 2003). Here, we are adding to some different insights on concentrated ownership when a group-affiliated firm is financially distressed and show how control transfer and equity capital injection positively affects its restructuring outcome.

[Table 6]

The second sub-sample analysis in Table 7 compares the two classifications under Gilson (1989, 1990) and KRX designation as administrative issues. As mentioned, Gilson

(1989, 1990) uses the sample of the bottom 5% from three-year cumulative unadjusted stock returns; it is worth investigating if Gilson's classification results in our main argument. However, the result from *DistressResolution* and *ROA* is relatively weak, since the successful resolution is possible when the control transfer is accompanied by equity capital injection at the 10% significance level. Its effect on *ROA* turns out to be insignificant. On the other hand, when we apply our analysis to the sample of firms designated as KRX watchlist owing to capital impairment, it follows our main result relatively well, since the monitoring effect from concentrated ownership yields to the successful resolution, and *ROA* turns out to be significantly positive only when control transfer accompanied by equity capital injection takes place.

[Table 7]

So, does it undermine rather "weak" empirical support under Gilson's classification? To answer this question, we compare the Korean data with the U.S. data by analyzing the one-year forward return of each return decile. It turns out that only 12.4% of Korean stocks from the bottom 5% adheres to the last in the next period, whereas more than 80.0% of the U.S. bottom stocks remain in the bottom group. Only 342 firms from the two classifications are overlapped. When we analyze the 10^{th} decile return group by transition matrix, the probability of the member stocks remaining in the 9^{th} and 10^{th} decile group is only 7.7% in Korea. In the U.S., the relevant probability was 25.1%. On the other hand, the probability that 10^{th} decile group stock moves up to the 4^{th} and 5^{th} decile group member is 38% for Korea, but only 21.7% for the U.S. Hence, we argue that Gilson's classification is better designed for the U.S. type of data, since the method is suitable for firms that remain in the bottom group of return for a certain amount of time.

1.5.3. Robustness Tests

In this section, we perform several robustness tests. *First*, Table 8 shows the result by applying Cox hazard regression to make sure that our main result is still valid. In the Cox regression model, the measure of effect is the risk or probability of undergoing the event of interest, given that the relevant firm has survived up to a specific time. It shows that our main result that concentration ownership works as a controlling mechanism for successful resolution, since the direct effect of control transfer and private placement leads to lower resolution likelihood, but the control transfer accompanied by equity capital injection is significantly positive for a firm's likelihood to successfully resolve. Hazard ratios from three coefficients of interest also indicate that a firm group undergoing both private placement and control transfer has 1.8 times higher chances of successful resolution than a comparison group. However, control transfer or private placement alone reduces the chances of resolution by 18.9% and 99.3%, respectively, since their respective hazard rates are lower than 1, which are 0.811 and 0.007.

[Table 8]

In Table 9, we perform the same analyses without private placements targets being banks. We perform this robustness test without financials because banks put their money to the distressed debtor, not only because they try to help firm restructure, but also because spillover effect of the firm's difficulty on the relevant industry is significant. In the latter case, since the bank is highly regulated under government's control in Korea, and thus banks are forced to raise capital to those firms to minimize the related industry-wide spillover, this capital injection should be taken about separately. As a result, Table 9 shows that even if we exclude the private placement to financials, it does not change our main result, *that is*, the effect of concentrated ownership accompanied by equity capital injection is valid when we take the industry ripple effect out of a firm's financial distress.

[Table 9]

In Table 10, as explained in the previous section, we apply stronger variable for

distress as in Kim et al. (2019), *that is*, we apply a dummy variable which equals to 1 if book equity is negative and 0 otherwise instead to make sure that our main result is still valid (*i.e.*, full-scale capital erosion). Table 10 supports our main result, since concentration ownership accompanied by equity capital injection works as a controlling mechanism for successful resolution, *that is*, the change in the largest shareholding followed by private placement causes a firm to resolve from its financial distress. From the perspective on firm level, we find that the change of the largest shareholder accompanied by the private placement is necessary for a firm to resolve from its financial distress. Moreover, control transfer accompanied by control transfer is also important for operational efficiency, measured by *ROA*. Hence, in a country under poor investor protection and the absence of active (bank) creditors, concentrated ownership is sometimes important for a (financially distressed) firm, since it work as a monitoring mechanism instead.

[Table 10]

Table 11 shows the long-term performance of firms that go through private placement and control transfer. This is done to observe the long-term effect of concentrated ownership accompanied by control transfer and to show that the effect from control transfer accompanied by private placement is not a mere mechanical outcome. Here, the dependent variable is "operating cash flow return (*CFReturn*)," defined as sales less the cost of goods sold, minus selling and administrative expenses, plus depreciation and goodwill amortization all divided by total asset measured at time *t+1* (*Year 1*), *t+2* (*Year 2*) and *t+3* (*Year 3*) (Megginson et al., 2004). It turns out that the effect of control transfer accompanied by private placement positively affects long-term performance of distressed firms up to three years.

[Table 11]

Table 12 shows the relationship between distress resolution and ownership concentration considering debt–equity swap. Our data show that a large amount of private

placement for financial institutions are issued for the debt–equity swap. In this sense, it is important to see if such private placement affects financial resolution, since private placement out of the exchange offer is different from equity capital injection. To see this, we follow Equation (3), and the result is shown in Table 12. The debt–equity swap is statistically different from equity capital injection, *that is*, private placement out of debt–equity swap, accompanied by control transfer, lowers the likelihood to successfully resolve financial distress when we compare the coefficient of *ChgDummy*PPRate* and *SwapDummy*ChgDummy*PPRate*. The result is consistent when we analyze the KRX watchlist because of capital impairment instead. Moreover, private placement owing to the debt–equity swap significantly lowers operational efficiency. Overall, control transfer accompanied by equity capital injection works as a monitoring mechanism to successfully resolve financial distress.

[Table 12]

Table 13 presents the result from PSM as well as the main result using the matched data. The PSM method exploits the endogeneity issue. Endogeneity can occur if successful firms are likely to get equity capital injection as well as control transfer. If this is the case, the effect of private placement and the change in the largest shareholder is merely outcome variable, which necessitates applying PSM as a robustness test. The result in Panel A shows that standardized differences of all control variables after matching are smaller than the number before matching, and that there is a significance reduction in bias for all variables after matching. Panel B shows that the positive effect of control transfer accompanied by private placement on successful resolution remains when applying PSM. Overall, exploiting the selection bias by the PSM method further strengthens our main result.

[Table 13]

Table 14 compares firm characteristics based on private placements and control transfer. If a more successful firm is more likely to go through either private placements or

control transfer, the market will perceive it as positive signal that the firm is more likely to emerge from bankruptcy, which supports signaling effect rather than monitoring story. If that is the case, we have to make sure if successful firm is likely to undergo either private placements or control transfer, as in Table 14. The result shows that firms going through private placements (or control transfer) are not necessarily more successful competitors. Specifically, both firms with private placement and with control transfer are statistically smaller in *Size*, have lower *PPE* and *EBITDA, that is*, firms going through private placements and control transfer are not necessarily more successful than other competitors, which does not support signaling effect.

[Table 14]

Table 15 shows the result for the effect of control transfer and private placement on firms' dissolution. As mentioned in Section 1.4, 7,350 firms went out of business (55.81% out of 13,169 unidentified firms), and it is important to see if control transfer accompanied by equity capital injection has any impact on dissolution. The result from multinomial logit regression shows that the control transfer accompanied by private placement lowers the likelihood of dissolution as well as the failure to resolve financial distress, which further supports our main result.

[Table 15]

In Table 16, we re-do the analysis to clarify whether control transfer that is not related to private placement has any effect on the firm's likelihood to successfully resolve. Since control transfer can be made through other reasons, it is important to clarify this issue. To see if control transfer is related to private placement, we define the related control transfer as the new largest shareholder being identical to the target for private placement. The result shows that distressed firms with "related" change in the largest shareholder enjoy the benefit from control transfer accompanied by private placement, while firms undergoing

one or the other have lower likelihood to survive. Unrelated change in the largest shareholder leads to firm's higher likelihood to survive, but the combined effect of control transfer and private placement is insignificant. Operational efficiency, measured by ROA, does not increase for firms with unrelated change in the largest shareholder. Both types of firms show that control transfer accompanied by equity capital injection is important for a firm's successful resolution, which further supports our main argument.

[Table 16]

1.6 Conclusion

This study presents new evidence on concentrated ownership accompanied by control transfer under poor investor protection. Based on a broad sample of private and public firms that experienced financial distress between 2000 and 2019, the results of this study suggest that distress resolution is more likely when new equities are issued and a change in control occurs. Although firms undergoing one or the other have lower likelihood to survive, only firms that take both ways are more likely to bring about a successful resolution as well as the firm performance. Moreover, the benefits from concentrated ownership are pronounced when distressed firms are group affiliated. Additional robustness tests further increase the validity of our result. Specifically, applying Cox hazard regression and different measure for financial distress (*i.e.*, KRX watchlist and full-scale capital erosion) does not change our main result; long-term effect of equity capital injection and control transfer exists; the benefit from concentrated ownership accompanied by equity capital injection is also valid when we take the industry ripple effect out of a firm's financial distress; exploiting endogeneity by PSM method does not change our main result as well. These findings suggest that monitoring by the new controlling shareholder may be an important factor in

the distress resolution process, which may explain why concentration of ownership persists over time under poor investor protection.

This study contributes to the growing literature on reorganization of financially distressed firms. While previous studies mostly focus on whether companies are more likely to undergo private out-of-court workout instead of through costly formal bankruptcy, this is the first study that suggests what determines successful distress resolution when the internal governance mechanism is not in place. Using a novel dataset covering financially distressed private and public firms, this study offers new empirical insight regarding how control transfers driven by private equity placements relates to bankruptcy outcomes. Moreover, our empirical evidence advocates that concentrated ownership creates benefits for distress resolution from new shareholders' monitoring effort.

An important question is whether the results in this study are relevant beyond the Korean context. Given that concentrated ownership is common phenomenon around the world, it seems that the documented results are also applicable to countries with concentrated ownership. Concentrated ownership is typically seen in many emerging countries but also can be seen in developed countries (La Porta et al., 1999; Claessens et al., 2000; Faccio and Lang 2002). The strong presence of vulture funds in the U.S. implies that the monitoring effect from creditors is also becoming important in developed countries. The difference from developed countries is that, since emerging countries are highly dependent on concentrated bank loan, such a monitoring role is done by new shareholders with concentrated ownership. In this sense, such monitoring role of concentrated ownership (in emerging economies) is an important consideration in a large number of firms worldwide, implying that the documented evidence is applicable beyond the context examined in this study.

Lastly, understanding resolution mechanism cannot be only measured at the firm level, given that such legislation results not only from corporate financial structure, but also from

country-level factors including the degree of rigidity in the labor market, which we leave for future research.

References

Aguiar-Díaz, I., and M. V. Ruiz-Mallorquí, 2015, Causes and resolution of bankruptcy: The efficiency of the law, *The Spanish Review of Financial Economics* 13(2), pp. 71-80.

Bennedsen, M., and K. M. Nielsen, 2010, Incentive and entrenchment effects in European ownership, *Journal of Banking & Finance* 34(9), pp. 2212-2229.

Bracewell, J. S., R. Giuliani, 2012, Chapter 11 of the United States Bankruptcy Code: Background and summary.

Bugnard, F., C. Ducrot, and D. Calavas, 1994, Advantages and inconveniences of the Cox model compared with the logistic model: application to a study of risk factors of nursing cow infertility, *Veterinary Research* 25(2), pp. 134-139.

Burns, N., S. Kedia, S., and M. Lipson, 2010, Institutional ownership and monitoring: Evidence from financial misreporting, *Journal of Corporate Finance* 16(4), pp. 443-455.

Claessens, S., S. Djankov, and L. H. Lang, 2000, The separation of ownership and control in East Asian corporations, *Journal of Financial Economics* 58(1), pp. 81-112.

Claessens, S., S. Djankov, and D. Klingebiel, 1999, How to accelerate corporate and financial sector restructuring in East Asia.

Davies, J. R., D. Hillier, and P. McColgan, 2005, Ownership structure, managerial behavior and corporate value, *Journal of Corporate Finance* 11(4), pp.645-660.

Espen, B. E., 2011, *Handbook of Empirical Corporate Finance: Empirical Corporate Finance*.

Faccio, M., and L. H. Lang, 2002, The ultimate ownership of Western European corporations, *Journal of Financial Economics* 65(3), pp. 365-395.

Filatotchev, I., R. Kapelyushnikov, N. Dyomina, and S. Aukutsionek, 2001, The effects of ownership concentration on investment and performance in privatized firms in Russia, *Managerial and Decision Economics* 22(6), pp. 299-313.

Foley, C. F., and R. Greenwood, 2010, The evolution of corporate ownership after IPO: The impact of investor protection, *The Review of Financial Studies* 23(3), pp. 1231-1260.

Gennaioli, N., and S. Rossi, 2010, Judicial discretion in corporate bankruptcy, *The Review of Financial Studies* 23(11), pp. 4078-4114.

Gertner, R., and D. Scharfstein, 1991, A theory of workouts and the effects of reorganization law, *The Journal of Finance* 46(4), pp. 1189-1222.

Gibbs, P. A., 1993, Determinants of corporate restructuring: The relative importance of corporate governance, takeover threat, and free cash flow, *Strategic Management Journal* 14(S1), pp. 51-68.

Gilson, S. C., 1989, Management turnover and financial distress, *Journal of Financial Economics* 25(2), pp. 241-262.

Gilson, S. C., 1990, Bankruptcy, boards, banks, and blockholders: Evidence on changes in corporate ownership and control when firms default, *Journal of Financial Economics* 27(2), pp. 355-387.

Gilson, S. C., K. John, K., and L. H. Lang, 1990, Troubled debt restructurings: An empirical study of private reorganization of firms in default, *Journal of Financial Economics* 27(2), pp. 315-353.

Helwege, J., C. Pirinsky, and R. M. Stulz, 2007, Why do firms become widely held? An analysis of the dynamics of corporate ownership, *The Journal of Finance* 62(3), pp. 995-1028.

Holderness, C. G., 2003, A survey of blockholders and corporate control, *Economic policy Review* 9(1).

Hope, O. K., 2013, Large shareholders and accounting research, *China Journal of Accounting Research* 6(1), pp. 3-20.

Hoskisson, R. E., R. A. Johnson, and D. D. Moesel, 1994, Corporate divestiture intensity in restructuring firms: Effects of governance, strategy, and performance, *Academy of Management Journal* 37(5), pp. 1207-1251.

Hotchkiss, E. S., 1995, Postbankruptcy performance and management turnover, *The Journal of Finance* 50(1), pp. 3-21.

Hotchkiss, E. S., and R. M. Mooradian, 1997, Vulture investors and the market for control of distressed firms, *Journal of Financial Economics* 43(3), pp. 401-432.

Jensen, M. C., and W. H. Meckling, 1976, Theory of the firm: Managerial behavior, agency costs and ownership structure, *Journal of Financial Economics* 3(4), pp. 305-360.

Joh, S. W., 2003, Corporate governance and firm profitability: evidence from Korea before the economic crisis, *Journal of Financial Economics* 68(2), pp. 287-322.

Kim, W., Y. Ko, Y., and S. F. Wang, 2019, Debt restructuring through equity

issues, *Journal of Banking & Finance* 106, pp. 341-356.

Ko, H., 2006, Korea's Newly Enacted Unified Bankruptcy Act: The Role Of The New Act In Facilitating (Or Discouraging) The Transfer Of Corporate Control, *UCLA Pac. Basin LJ* 24, pp. 201.

Korea Exchange (KRX), 2011, Introduction to Trading at KRX Stock Market.

La Porta, R., F. Lopez-de-Silanes, A. Shleifer, and R. W. Vishny, 1997, Legal determinants of external finance, *The Journal of Finance* 52(3), pp. 1131-1150.

La Porta, R., F. Lopez-de-Silanes, and A. Shleifer, 1999, Corporate ownership around the world, *The Journal of Finance* 54(2), pp. 471-517.

Lee, Yoolim, 2011, Mahindra, with Ssangyong in hand, aims to become 'global cult brand', *Automotive News*, Retrieved from http://www.autonews.com.

Maher, M., and T. Andersson, 2000, Corporate governance: effects on firm performance and economic growth, *Available at SSRN 218490*.

Maug, E., 1998, Large shareholders as monitors: Is there a trade-off between liquidity and control?, *The Journal of Finance* 53(1), pp. 65-98.

Mathiesen, M. C., 1995, Bankruptcy of Airlines: Causes, Complaints, and Changes, *J. Air L. & Com.* 61, pp. 1017.

McConnell, J. J., and H. Servaes, 1990, Additional evidence on equity ownership and corporate value, *Journal of Financial Economics* 27(2), pp. 595-612.

Megginson, W. L., A. Morgan, and L. Nail, 2004, The determinants of positive long-term performance in strategic mergers: Corporate focus and cash, *Journal of Banking & Finance* 28(3), pp. 523-552.

Mikkelson, W. H., and M. M. Partch, 1989, Managers' voting rights and corporate control, *Journal of Financial Economics* 25(2), pp. 263-290.

Morck, R., A. Shleifer, A., and R. W. Vishny, 1988, Management ownership and market valuation: An empirical analysis, *Journal of Financial Economics* 20, pp. 293-315.

Nam, I., and S. Oh, 2000, *Bankruptcy of Large Firms and Exit Mechanisms in Korea* (No. 2000-01), KDI Research Monograph.

Pound, J., 1988, Proxy contests and the efficiency of shareholder oversight, *Journal of Financial Economics* 20, pp. 237-265.

Roe, M. J., 1990, Political and legal restraints on ownership and control of public companies, *Journal of Financial Economics* 27(1), pp. 7-41.

Schoenherr, D., 2017, *Managers' personal bankruptcy costs and risk-taking*, Working paper.

Senbet, L. W., and T. Y. Wang, 2010, Corporate financial distress and bankruptcy: A survey, *Foundations and Trends in Finance* 5(4).

Shleifer, A., and L. H. Summers, 1988, Breach of trust in hostile takeovers, In *Corporate Takeovers: Causes and Consequences* (pp. 33-68). University of Chicago Press.

Shleifer, A., and R. W. Vishny, 1997, A survey of corporate governance, *The Journal of Finance* 52(2), pp. 737-783.

Thorburn, K. S., 2000, Bankruptcy auctions: costs, debt recovery, and firm survival, *Journal of Financial Economics* 58(3), pp. 337-368.

Young, M. N., M. W. Peng, D. Ahlstrom, G. D. Bruton and Y. Jiang, 2008, Corporate governance in emerging economies: A review of the principal–principal

perspective, *Journal of Management Studies* 45(1), pp. 196-220.

<Appendix> Definition of variables

Name	Descriptions
Distress50	A dummy variable which equals one if the cumulative losses exceed half of paid-capital and zero otherwise.
DistressResolution	A dummy variable that equals one when a firm successfully restructures its debt (i.e., its *Distress50* turns changes from 1 to 0), and zero otherwise.
NoAdDummy	A dummy variable that equals one when a firm designated as administrative issues by KRX successfully turns around and zero otherwise.
ROA	Net income scaled by the book value of total assets
ChgDummy	A dummy variable that equals one when the change in the largest shareholder between time t-1 and time t+1 occurs and zero otherwise.
PPRate	Rate of common stocks issued due to private placement, calculated as
SwapDummy	A dummy variable that equals one if a private placement to the third party takes place due to the debt-equity swap.
AssetTurnover	Sales scaled by total assets
Size	Log of total assets
PPE	PP&E scaled by total assets
EBITDA	Earnings before interest scaled by total assets
R&D	R&D expense scaled by total assets
RDDummy	A dummy variable equal to one for firms that report positive levels of R&D and zero otherwise.
Leverage	Total debt scaled by total assets
GA	A dummy variable that equals to one when a firm is from a large business group and 0 otherwise, based on the list of large business groups designated by the Korea Fair Trade Commission (KFTC) every year
SalesGrowth	Firm's deviation from the industry-average sales growth based on two-digit Korean Standard Industrial Classification (KSIC) code
SurvivalProb	The probability of successful resolution, calculated from Cox regression $h(t) = h_0(t)exp^{\beta X}$ during interval *t*, defined as the difference between initial distress period.
CFReturn	The return of sales less cost of goods sold, less selling and administrative expenses, plus depreciation and goodwill amortization all deflated by total asset

<Table 1> Firm-level characteristics by distress outcome, change in control and private placement

This table presents firm-level characteristics by distress outcome, change in control and private placement. Out of all distressed firms, out-of-distress-firms (Column A) refers to firms of which *Distress50* (a dummy variable which equals one if the cumulative losses exceed half of paid-capital and zero otherwise) changes to 0 from 1; Remain-in-distress firms (Column B) refers to firms of which *Distress50* remains to be 1; Unidentified firms (Column C) reports firms of which data is not available till the end of our sample period, so we cannot identify if a firm is financially resolved. Panel A reports characteristics based on distress outcome; Panel B reports shareholders' ownership; Panel C reports average private placement, calculated as number of new equities issued divided by number of all common stocks outstanding before the placement, for each category. We also report t-statistics to see if column A, B and C are statistically significantly different.

	All distressed firms	Out of distress A	Remain in distress B	Unidentified C	A-B	A-C	B-C
	Mean	Mean	Mean	Mean	t-value	t-value	t-value
Panel A. Distress outcome (N = 25,770)							
N	25,770	9,715	2,886	13,169			
Time spent in distress (Year)	2.26	2.29	1.94	2.55	8.94	-18.23	-26.24
Median time spent in distress (Year)	1	1	1	1			
Firms that change their largest shareholder (%)	67.95	78.73	64.75	60.36	23.24	20.61	4.09
Firms that private placements take place (%)	32.83	50.38	24.52	23.60	41.92	25.56	-0.49
Number of changes in the largest shareholder	2.20	2.19	1.78	2.64	15.55	-9.06	-20.34
Panel B. Change in control (N = 17,918)							
Old shareholders' ownership (%)	20.05	20.29	19.80		1.62		
New shareholders' ownership (%)	29.74	34.45	25.03		24.41		
Panel C. Private Placement (N = 8,833)							
Average private placement (%)	15.39	16.96	13.82		5.89		

<Table 2>. Identities of private placement targets

This table presents identities of private placement targets, obtained from private placements report in DART. If the private placement is classified as "placement to the third party", we use the data to see if the target is either bank or non-financial firms or individuals in Panel A. If there are multiple targets, we refer to the targets with largest placement of number of stocks. Since the report has information about what relationship the target holds with a distressed firm, we also use the item to see what each target is doing after entering their distressed firms in Panel B, categorized as expected largest shareholder, others which result from debt-equity (DE) swap and from investment with cash inflow (and from management or employee relationships). The last column in Panel B reports the number of each target identical to the largest shareholder.

Panel A. Identities of private placement targets

Targets	N	Rate
Bank	6,853	0.317
Non-financial firm	3,005	0.139
Individuals	11,760	0.544
N	21,618	1.000

Panel B. Each target's relationship with a firm

Targets		Relationship	N	Rate	No. identical to the largest shareholder
Banks	Expected largest shareholder		788	0.115	788
	Others	With cash inflow	3,070	0.448	2,522
		Without cash inflow (DE swap)	2,995	0.437	2,995
Non-financial firms	Expected largest shareholder		1,058	0.352	625
	Others	With cash inflow	1,457	0.485	1,410
		Without cash inflow (DE swap)	490	0.163	490
Individuals	Expected largest shareholder		2,152	0.183	2,152
	Others	With cash inflow	3,246	0.276	3,246
		Without cash inflow (DE swap)	5,210	0.443	5,210
		Management / Employee	1,152	0.098	900
N			21,618		20,338

<Table 3> Identities of the new largest shareholder

This table presents identities of control transfer, obtained from a statement of audit in DART. By referring to the information about the largest shareholder, we use the data to see if the target is either bank or non-financial firms or individuals. In Panel A, it shows the identities of the largest shareholder during a firm's first distress period, whereas Panel B shows the information about the new shareholder during a firm's last distress period. In both panels, banks and individuals are re-classified as either foreign or domestic, and non-financial firms are categorized as whether it belongs to the same business group as the relevant distressed firm or not, based on the list of large business groups designated by the Korea Fair Trade Commission (KFTC) every year.

Largest shareholder		Relationship	N	Rate
Panel A. First Distress				
Bank	Foreign		1,245	0.033
	Domestic		8,727	0.229
Non-Financial	Same business group		6,236	0.164
	Others	Different business group	1,870	0.049
		Others	5,611	0.148
Individual	Foreign		625	0.016
	Domestic		13,717	0.361
Total			38,031	1.000
Panel B. Last Distress				
Bank	Foreign		1,797	0.158
	Domestic		2,798	0.246
Non-Financial	Same business group		3,082	0.271
	Others	Different business group	102	0.009
		Others	398	0.035
Individual	Foreign		101	0.009
	Domestic		3,095	0.272
Total			11,373	1.000

<Table 4> Descriptive statistics

This table reports the summary statistics, including number of observations, mean, standard deviation, 25th percentile, median, and the 75th percentile of variables used in the analyses. The data corresponds to Korean public and private for the period 2000-2019. All variable definitions are described in the Appendix.

Variable	N	Mean	Std Dev	p25	Median	p75
Dependent variables						
DistressResolution	61,812	0.342	0.474	0.000	0.000	1.000
ROA	61,812	-0.237	2.852	-0.277	-0.115	-0.011
NoAdDummy	2,130	0.377	0.485	0.000	0.000	1.000
CFReturn	61,812	-0.026	0.127	-0.009	0.000	0.021
Measure of transfer of control						
ChgDummy	61,812	0.680	0.460	0.000	1.000	1.000
Measure of equity private placement						
PPRate	61,812	0.154	16.759	0.000	0.125	0.270
Measure of debt-equity (DE) swap						
SwapDummy	61,812	0.110	0.317	0.000	0.000	1.000
Control variables						
AssetTurnover	61,812	1.013	1.020	0.393	0.794	1.213
Size	61,812	18.377	1.485	17.237	18.852	19.277
PPE	61,812	0.290	0.199	0.123	0.280	0.429
EBITDA	61,812	-0.072	15.329	-0.043	-0.213	0.463
R&D	61,812	0.018	0.073	0.000	0.002	0.017
RDDummy	61,812	0.643	0.479	0.000	1.000	1.000
Leverage	61,812	0.468	0.528	0.270	0.452	0.620
SalesGrowth	61,812	-0.267	0.520	-0.273	-0.254	-0.167

<Table 5> Distress resolution and ownership concentration

This table shows OLS estimation results of the effect of control transfer (*ChgDummy*) accompanied by private placement (*PPRate*) on distress resolution. *DistressResolution* is a dummy variable that equals one when a firm successfully restructures its debt and zero otherwise. *ROA* is net income scaled by the book value of total assets. When doing firm-year as well as firm-level analysis, we include the following control variables; *AssetTurnover, Size, PPE, EBITDA, R&D, RDDummy, Leverage* and *SalesGrowth*. Standard errors are in parentheses, and ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively. All variable definitions are provided in the Appendix.

Dependent variable	*DistressResolution*		*ROA*
	Firm-Year Obs.	Firm-Level	Firm-Year Obs.
ChgDummy	-0.0532***	-0.0540***	-0.4520***
	(0.0046)	(0.0123)	(0.0337)
PPRate	-0.1934***	-0.3160***	-0.2490***
	(0.0083)	(0.0228)	(0.0613)
*ChgDummy*PPRate*	0.5111***	0.7157***	0.4614***
	(0.0092)	(0.0257)	(0.0685)
AssetTurnover	0.0463	-0.0016	-0.2090
	(0.0818)	(0.2405)	(0.6064)
Size	-0.0025**	-0.0014	0.0005
	(0.0010)	(0.0030)	(0.0074)
PPE	-0.0124	0.0032	-0.0253
	(0.0083)	(0.0252)	(0.0617)
EBITDA	0.0019**	0.0075***	0.0138**
	(0.0007)	(0.0021)	(0.0055)
R&D	-0.1059***	0.0921	0.1266
	(0.0399)	(0.1168)	(0.2959)
RDDummy	-0.0006	-0.0030	0.0089
	(0.0035)	(0.0106)	(0.0260)
Leverage	0.0009	0.0041	0.0229
	(0.0057)	(0.0121)	(0.0424)
SalesGrowth	0.0003	0.0005	-0.0004
	(0.0003)	(0.0001)	(0.0002)
R-Squared	0.67	0.16	0.38
No. Obs.	61,812	12,601	61,812
Year FE	YES	NO	YES
Firm FE	YES	NO	YES

<Table 6> Group-affiliated firms' distress resolution through ownership concentration
This table shows OLS estimation results of the effect of control transfer (*ChgDummy*) accompanied by private placement (*PPRate*) on distress resolution when a firm belongs to a large business group, measured by *GA*, a dummy variable that equals to one when a firm is from a large business group and 0 otherwise, based on the list of large business groups designated by the Korea Fair Trade Commission (KFTC) every year. *DistressResolution* is a dummy variable that equals one when a firm successfully restructures its debt and zero otherwise. *ROA* is net income scaled by the book value of total assets. When doing firm-year as well as firm-level analysis, we include the following control variables; *AssetTurnover, Size, PPE, EBITDA, R&D, RDDummy, Leverage* and *SalesGrowth*. Standard errors are in parentheses, and ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively. All variable definitions are provided in the Appendix.

Dependent variable	*DistressResolution*		*ROA*
	Firm-Year Obs.	Firm-Level	Firm-Year Obs.
GA	0.0609*	0.0387	0.4264*
	(0.0326)	(0.0894)	(0.2419)
ChgDummy	-0.0525***	-0.0532***	0.4569***
	(0.0046)	(0.0124)	(0.0340)
PPRate	-0.1968***	-0.3196***	-0.2655***
	(0.0084)	(0.0233)	(0.0626)
*GA*ChgDummy*	-0.0652*	-0.0540	-0.4533*
	(0.0361)	(0.0998)	(0.2681)
GA PPRate*	0.0053	0.0357	-0.0833
	(0.0452)	(0.1267)	(0.3358)
ChgDummy PPRate*	0.5012***	0.7006***	0.4114***
	(0.0094)	(0.0263)	(0.0700)
*GA*ChgDummy* PPRate*	0.1486***	0.2082	0.8546**
	(0.0490)	(0.1383)	(0.3641)
AssetTurnover	0.0427	0.0048	-0.2284
	(0.0816)	(0.2398)	(0.6060)
Size	-0.0024**	-0.0014	0.0011
	(0.0010)	(0.0029)	(0.0074)
PPE	-0.0126	0.0029	-0.0262
	(0.0083)	(0.0252)	(0.0617)
EBITDA	0.0020***	0.0074***	0.0143***
	(0.0007)	(0.0021)	(0.0055)
R&D	-0.1090***	0.0647	0.1117
	(0.0007)	(0.1166)	(0.2957)
RDDummy	-0.0007	-0.0030	0.0086
	(0.0035)	(0.0106)	(0.0260)
Leverage	0.0014	0.0040	0.0256
	(0.0057)	(0.0120)	(0.0423)
SalesGrowth	0.0004	0.0005	-0.0003
	(0.0003)	(0.0001)	(0.0002)
R-Squared	0.68	0.17	0.38
No. Obs.	61,812	12,601	61,812
Year FE	YES	NO	YES
Firm FE	YES	NO	YES

<Table 7> Public firm sub-sample analysis

This table shows OLS estimation results of the effect of control transfer (*ChgDummy*) accompanied by private placement (*PPRate*) on distress resolution for public-firms comparing Gilson(1989,1990)'s classification and KRX watchlist. *DistressResolution* is a dummy variable that equals one when a firm successfully restructures its debt and zero otherwise. *ROA* is net income scaled by the book value of total assets. *NoAdDummy* is a dummy variable that equals one when a firm designated as administrative issues by KRX successfully turns around and zero otherwise. When doing the analyses, we include the following control variables; *AssetTurnover, Size, PPE, EBITDA, R&D, RDDummy*, *Leverage* and *SalesGrowth*. Standard errors are in parentheses, and ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively. All variable definitions are provided in the Appendix.

	Gilson's (1989, 1990) classification		KRX watchlist due to capital impairment	
Dependent variable	*DistressResolution*	*ROA*	*NoAdDummy*	*ROA*
	Firm-Year Obs.	Firm-Year Obs.	Firm-Year Obs.	Firm-Year Obs.
ChgDummy	-0.0443*	1.4995	-0.9378***	-28.9382***
	(0.0262)	(1.6057)	(0.0669)	(4.8342)
PPRate	-0.0364**	-0.0671	-0.7502***	-25.2708***
	(0.0180)	(1.1067)	(0.0637)	(4.6044)
*ChgDummy**	0.0593*	-1.1745	1.8239***	52.7318***
PPRate	(0.0310)	(1.9041)	(0.0698)	(5.0421)
AssetTurnover	-0.0003	-0.0099	0.0021	-0.0541
	(0.0004)	(0.0226)	(0.0019)	(0.1379)
Size	-0.0136	4.7646***	-0.0099	-2.5055
	(0.0138)	(0.8493)	(0.0319)	(2.3008)
PPE	-0.0729	0.8663	0.1943	10.1426
	(0.0767)	(4.7112)	(0.1315)	(9.4945)
EBITDA	0.0200	7.0141***	-0.0189	-2.1779*
	(0.0152)	(0.9336)	(0.0165)	(1.1946)
R&D	0.6185	-1.4772***	-0.9200	1.2248
	(0.5061)	(0.0311)	(1.8047)	(1.3034)
RDDummy	-0.0073	-1.1689	-0.0491	-3.6629
	(0.0208)	(1.2770)	(0.0505)	(3.6475)
Leverage	0.0800**	-28.0891***	-0.0131	-0.6492
	(0.0327)	(2.0049)	(0.0146)	(1.0553)
SalesGrowth	-0.0004	0.0087	0.0003	-0.0428
	(0.0002)	(0.0129)	(0.0007)	(0.0482)
R-Squared	0.69	0.75	0.87	0.84
No. Obs.	2,233	2,233	1,798	1,798
Year FE	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES

<Table 8> Distress Resolution and Ownership Concentration using Cox regression
This table shows Cox regression estimation results of the effect of control transfer (*ChgDummy*) accompanied by private placement (*PPRate*) on distress resolution. *SurvivalProb* is the probability of successful resolution, calculated from $h(t) = h_0(t)exp^{\beta X}$ during interval *t*, defined as the difference between initial distress period. When doing this firm-level analysis, we include the following control variables; *AssetTurnover, Size, PPE, EBITDA, R&D, RDDummy, Leverage* and *SalesGrowth*. Standard errors are in parentheses, and ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively. All variable definitions are provided in the Appendix.

Dependent variable	*SurvivalProb*	
	Firm-level	Hazard Ratio
ChgDummy	-0.2100***	0.811
	(0.0296)	
PPRate	-4.9457***	0.007
	(0.5764)	
*ChgDummy*PPRate*	0.5862***	1.797
	(0.0577)	
AssetTurnover	0.7617	2.142
	(0.5225)	
Size	-0.0281***	0.972
	(0.0066)	
PPE	0.0891*	1.093
	(0.0540)	
EBITDA	0.0045	1.005
	(0.0048)	
R&D	-0.3014	0.740
	(0.2772)	
RDDummy	0.0166	1.017
	(0.0227)	
Leverage	0.0138	1.014
	(0.0329)	
SalesGrowth	-0.0009***	0.999
	(0.0002)	
LR test		401.28***
-2 LOG L		320,959.5
AIC		320,981.5
No. Obs.		12,601

<Table 9> Distress resolution and ownership concentration without financials

This table shows OLS estimation results of the effect of control transfer (*ChgDummy*) accompanied by private placement (*PPRate*) on distress resolution when we exclude private placements to financials. *DistressResolution* is a dummy variable that equals one when a firm successfully restructures its debt and zero otherwise. *ROA* is net income scaled by the book value of total assets. When doing firm-year as well as firm-level analysis, we include the following control variables; *AssetTurnover, Size, PPE, EBITDA, R&D, RDDummy, Leverage* and *sales growth*. Standard errors are in parentheses, and ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively. All variable definitions are provided in the Appendix.

Dependent variable	*DistressResolution*		*ROA*
	Firm-Year Obs.	Firm-Level	Firm-Year Obs.
ChgDummy	-0.0749***	-0.1184***	-0.5506***
	(0.0045)	(0.0119)	(0.0282)
PPRate	-0.0035***	-0.0058***	-0.0047**
	(0.0003)	(0.0009)	(0.0020)
*ChgDummy*PPRate*	0.0044***	0.0065***	0.0069***
	(0.0004)	(0.0011)	(0.0024)
AssetTurnover	0.0333	0.0491	0.3480
	(0.0922)	(0.2702)	(0.5783)
Size	-0.0027**	-0.0035	0.0013
	(0.0011)	(0.0033)	(0.0071)
PPE	-0.0208**	-0.0034	-0.0084
	(0.0094)	(0.0282)	(0.0589)
EBITDA	0.0023***	0.0084***	0.0171***
	(0.0008)	(0.0023)	(0.0053)
R&D	-0.1011**	0.0894	0.2058
	(0.0458)	(0.1403)	(0.2869)
RDDummy	0.0021	0.0006	0.0173
	(0.0040)	(0.0120)	(0.0248)
Leverage	0.0037	0.0140	0.0106
	(0.0067)	(0.0130)	(0.0425)
SalesGrowth	0.0004	-0.0008	0.0002
	(0.0003)	(0.0001)	(0.0002)
R-Squared	0.64	0.03	0.42
No. Obs.	54,589	7,572	54,589
Year FE	YES	NO	YES
Firm FE	YES	NO	YES

<Table 10> Distress resolution and ownership concentration with other distress variable
This table shows OLS estimation results of the effect of control transfer (*ChgDummy*) accompanied by private placement (*PPRate*) on distress resolution when we apply different measure for financial distress. Distress measure is now a dummy variable equal to one if book equity is negative and zero otherwise. *DistressResolution* is a dummy variable that equals one when a firm successfully restructures its debt and its distress measure changes from 0 to 1 and zero otherwise. *ROA* is net income scaled by the book value of total assets. When doing firm-year as well as firm-level analysis, we include the following control variables; *AssetTurnover, Size, PPE, EBITDA, R&D, RDDummy, Leverage* and *SalesGrowth*. Standard errors are in parentheses, and ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively. All variable definitions are provided in the Appendix.

Dependent variable	*DistressResolution*		*ROA*
	Firm-Year Obs.	Firm-Level	Firm-Year Obs.
ChgDummy	-0.0506***	-0.1223***	-0.5204***
	(0.0053)	(0.0138)	(0.0242)
PPRate	-0.1990***	-0.0054***	-0.0051***
	(0.0096)	(0.0010)	(0.0017)
*ChgDummy*PPRate*	0.5114***	0.0116***	0.0089***
	(0.0107)	(0.0011)	(0.0018)
AssetTurnover	0.0490	0.0677	0.1443
	(0.0951)	(0.3098)	(0.4894)
Size	-0.0024**	-0.0036	0.0020
	(0.0012)	(0.0038)	(0.0060)
PPE	-0.0126	0.0120	-0.0205
	(0.0097)	(0.0322)	(0.0499)
EBITDA	0.0016*	0.0081***	0.0013
	(0.0009)	(0.0027)	(0.0045)
R&D	-0.1278***	0.0202	0.0428
	(0.0451)	(0.1485)	(0.2322)
RDDummy	-0.0003	-0.0047	-0.0066
	(0.0041)	(0.0136)	(0.0210)
Leverage	0.0048	0.0087	-0.0076
	(0.0069)	(0.0169)	(0.0357)
SalesGrowth	0.0006	0.0004	0.0003
	(0.0003)	(0.0002)	(0.0002)
R-Squared	0.68	0.07	0.53
No. Obs.	20,898	2,126	20,898
Year FE	YES	NO	YES
Firm FE	YES	NO	YES

<Table 11> Ownership concentration and long-term performance
This table shows OLS estimation results of the long-term effect of control transfer (*ChgDummy*) accompanied by private placement (*PPRate*) on distress resolution. Based on Megginson et al. (2004), the long-term performance is measured by operating cash flow return (*CFReturn*) defined as sales less cost of goods sold, less selling and administrative expenses, plus depreciation and goodwill amortization all deflated by total asset, measured at *t+1* (Year 1), *t+2* (Year 2) and *t+3* (Year 3). *DistressResolution* is a dummy variable that equals one when a firm successfully restructures its debt and zero otherwise. *ROA* is net income scaled by the book value of total assets. When doing firm-year as well as firm-level analysis, we include the following control variables; *AssetTurnover, Size, PPE, EBITDA, R&D, RDDummy, Leverage* and *SalesGrowth*. Standard errors are in parentheses, and ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively. All variable definitions are provided in the Appendix.

Dependent variable	*CFReturn (Year 1)*	*CFReturn (Year 2)*	*CFReturn (Year 3)*
ChgDummy	-0.0159***	-0.0139***	-0.0046
	(0.0020)	(0.0024)	(0.0029)
PPRate	-0.0134***	-0.0081*	-0.0120**
	(0.0036)	(0.0043)	(0.0053)
*ChgDummy*PPRate*	0.0144***	0.0126***	0.0158***
	(0.0040)	(0.0048)	(0.0059)
AssetTurnover	-0.0262	0.0087	-0.0208
	(0.0356)	(0.0423)	(0.0509)
Size	-0.0008*	0.0003	0.0009
	(0.0004)	(0.0005)	(0.0006)
PPE	0.0050	0.0006	0.0040
	(0.0036)	(0.0043)	(0.0052)
EBITDA	0.0001	0.0002	-0.0003
	(0.0003)	(0.0004)	(0.0005)
R&D	0.0054	0.0279	-0.0086
	(0.0177)	(0.0209)	(0.0262)
RDDummy	0.0006	0.0006	-0.0041*
	(0.0015)	(0.0018)	(0.0022)
Leverage	-0.0001	0.0025	0.0011
	(0.0025)	(0.0029)	(0.0033)
SalesGrowth	-0.0005	0.0007	-0.0002
	(0.0001)	(0.0002)	(0.0002)
R-Squared	0.41	0.37	0.33
No. Obs.	47,252	30,779	21,025
Year FE	YES	YES	YES
Firm FE	YES	YES	YES

<Table 12> The relationship between distress resolution and ownership concentration considering debt-equity swap

This table shows OLS estimation results of the effect of control transfer (*ChgDummy*) accompanied by private placement (*PPRate*) on distress resolution, considering debt-equity swap. *SwapDummy* is a dummy variable that equals one if a private placement to the third party takes place due to the debt-equity swap and zero otherwise. *DistressResolution* is a dummy variable that equals one when a firm successfully restructures its debt and zero otherwise. *NoAdDummy* is a dummy variable that equals one when a firm designated as administrative issues by KRX successfully turns around and zero otherwise. *ROA* is net income scaled by the book value of total assets. When doing firm-year as well as firm-level analysis, we include the following control variables; *AssetTurnover, Size, PPE, EBITDA, R&D, RDDummy, Leverage* and *SalesGrowth*. Standard errors are in parentheses, and ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively. All variable definitions are provided in the Appendix.

	Total external audit firms			KRX watchlist due to capital impairment	
Dependent Var.	*DistressResolution*		*ROA*	*NoAdDummy*	*ROA*
	Firm-year obs.	Firm-level obs.	Firm-year obs.	Firm-year obs.	Firm-year obs.
SwapDummy	-0.0027	0.0350	-0.9117***	-0.0988	-4.2188
	(0.0158)	(0.0455)	(0.1170)	(0.0833)	(6.0245)
ChgDummy	-0.0518	-0.0104	1.5719***	-0.0244	-5.1139
	(0.0347)	(0.0977)	(0.2567)	(0.0654)	(4.7282)
PPRate	-0.1979***	-0.3191***	-0.2942***	-0.7535***	-25.5581***
	(0.0085)	(0.0236)	(0.0628)	(0.0637)	(4.6054)
SwapDummy PPRate*	0.0707**	0.0208	1.2455***	0.2037**	12.1121*
	(0.0329)	(0.0915)	(0.2434)	(0.0960)	(6.9384)
ChgDummy PPRate*	0.5152***	0.7180***	0.4471***	1.8142***	52.5854***
	(0.0094)	(0.0264)	(0.0699)	(0.0701)	(5.0679)
*SwapDummy*ChgDummy* PPRate*	-0.0532***	-0.0533***	-0.4348***	-0.9283***	-28.3932***
	(0.0046)	(0.0123)	(0.0337)	(0.0669)	(4.8401)
AssetTurnover	0.0455	0.0015	-0.1842	0.0020	-0.0602
	(0.0818)	(0.2405)	(0.6050)	(0.0019)	(0.1379)
Size	-0.0025**	-0.0014	0.0008	-0.0114	-2.6439
	(0.0010)	(0.0030)	(0.0074)	(0.0319)	(2.3047)
PPE	-0.0124	0.0029	-0.0218	0.1953	9.8735
	(0.0083)	(0.0252)	(0.0616)	(0.1314)	(9.4969)
EBITDA	0.0019**	0.0074***	0.0145***	-0.0214	-2.3710**
	(0.0007)	(0.0021)	(0.0055)	(0.0166)	(1.1982)

(continued)

Dependent Var.	Total external audit firms			KRX watchlist due to capital impairment	
	DistressResolution		*ROA*	*NoAdDummy*	*ROA*
	Firm-year obs.	Firm-level obs.	Firm-year obs.	Firm-year obs.	Firm-year obs.
R&D	-0.1057***	0.0924	0.1642	-0.8524	123.8376
	(0.0399)	(0.1169)	(0.2952)	(1.8034)	(130.3899)
RDDummy	-0.0007	-0.0031	0.0072	-0.0536	-3.8808
	(0.0035)	(0.0106)	(0.0259)	(0.0505)	(3.6513)
Leverage	0.0009	0.0040	0.0231	-0.0153	-0.8252
	(0.0057)	(0.0121)	(0.0422)	(0.0146)	(1.0583)
SalesGrowth	0.0003	0.0005	-0.0002	0.0003	-0.0430
	(0.0003)	(0.0001)	(0.0002)	(0.0007)	(0.0481)
R-Squared	0.68	0.16	0.38	0.87	0.84
No. Obs.	61,812	12,601	61,812	1,798	1,798
Year FE	YES	NO	YES	YES	YES
Firm FE	YES	NO	YES	YES	YES

<Table 13> Propensity score matching
This table shows OLS estimation results of the effect of control transfer (*ChgDummy*) accompanied by private placement (*PPRate*) on distress resolution, after applying the propensity score matching method. Panel A reports the result from propensity score matching, and Panel B shows estimation results on the matched data. Treated group refers to firms with both private placement and control transfer, whereas control group is firms without the two activities. *DistressResolution* is a dummy variable that equals one when a firm successfully restructures its debt and zero otherwise. *ROA* is net income scaled by the book value of total assets. When doing firm-year as well as firm-level analysis, we include the following control variables; *AssetTurnover, Size, PPE, EBITDA, R&D, RDDummy, Leverage* and *SalesGrowth*. Standard errors are in parentheses, and ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively. All variable definitions are provided in the Appendix.

Panel A. Propensity score matching

Variable	Unmatched(U) Matched(M)	Mean		%Reduction in bias	Standardized difference
		Treated	Control		
AssetTurnover	U	0.0131	0.0130		0.0012
	M	0.0130	0.0131	55.36	-0.0005
Size	U	18.5377	18.7355		-0.1142
	M	18.5376	18.5402	98.71	-0.0015
PPE	U	0.2923	0.3004		-0.0410
	M	0.2924	0.2922	98.10	0.0008
EBITDA	U	-0.0876	-0.0665		-0.0090
	M	-0.0874	-0.0908	84.60	0.0014
RD	U	0.0179	0.0155		0.0535
	M	0.0180	0.0182	89.52	-0.0056
RDDummy	U	0.6716	0.6487		0.0484
	M	0.6715	0.6711	97.91	0.0010
Debt	U	0.4560	0.4664		-0.0348
	M	0.4562	0.4564	96.16	-0.0013
SalesGrowth	U	-0.2726	-0.2753		0.0049
	M	-0.3056	-0.2723	87.44	-0.0006
No. Obs	U	18,629	21,598		
	M	17,482	17,482		

(continued)

Panel B. Estimation results after matching			
Dependent Variable	*DistressResolution*		*ROA*
	Firm-year Obs.	Firm-level	Firm-Year Obs.
ChgDummy	-0.4628***	-0.4367***	-0.5466***
	(0.0048)	(0.0099)	(0.0301)
PPRate	0.0003	-0.0005	-0.0042**
	(0.0003)	(0.0007)	(0.0021)
ChgDummy	0.0058***	0.0070***	0.0079***
**PPRate*	(0.0004)	(0.0008)	(0.0023)
AssetTurnover	0.0268	-0.2766	-0.2049
	(0.0967)	(0.2171)	(0.6067)
Size	0.0002	-0.0071***	0.0009
	(0.0012)	(0.0027)	(0.0740)
PPE	0.0121	-0.0241	-0.0253
	(0.0098)	(0.0228)	(0.0618)
EBITDA	-0.0001	-0.0006	0.0140**
	(0.0009	(0.0019)	(0.0055)
R&D	0.0069	-0.1464	0.1432
	(0.0472)	(0.1055)	(0.2960)
RDDummy	-0.0016	0.0223**	0.0101
	(0.0041)	(0.0096)	(0.0260)
Leverage	-0.0064	0.0142	0.0230
	(0.0068)	(0.0109)	(0.0424)
SalesGrowth	0.0005	-0.0001	-0.0004
	(0.0003)	(0.0001)	(0.0002)
R-Squared	0.53	0.27	0.38
No. Obs.	34,964	6,804	34,964
Year FE	YES	NO	YES
Firm FE	YES	NO	YES

<Table 14> Firm characteristics based on private placements and control transfer
This table compares firm characteristics based on private placements and control transfer. Panel A compares firms with private placements and those without private placements; Panel B compares firms with control transfer and those without control transfers along with t-statistics. Firm characteristics include *AssetTurnover, Size, PPE, EBITDA, R&D*, and *Debt*. Variable definitions are all provided in Appendix.

	Mean		t-value
Panel A. Private placement			
	Firms without private placements	Firms with private placements	
AssetTurnover	0.0132	0.0131	0.02
Size	18.6891	18.4695	16.07
PPE	0.2947	0.2862	5.53
EBITDA	-0.0538	-0.1069	2.93
RD	0.0167	0.0199	-6.92
Debt	0.4651	0.4604	1.37
No. Obs.	36,235	25,577	
Panel B. Control Transfer			
	Firms without control transfer	Firms with control transfer	
AssetTurnover	0.0131	0.0131	0.18
Size	18.6621	18.5935	4.85
PPE	0.2938	0.2871	4.24
EBITDA	-0.1525	-0.3800	6.08
RD	0.0197	0.0170	4.99
Debt	0.4714	0.4601	3.15
No. Obs.	38,310	23,502	

<Table 15> The effect of control transfer and private placement on dissolution
This table presents multinomial logit regression results for the effect of control transfer (*ChgDummy*) and private placement (*PPRate*) on firm's dissolution and out-of-distress likelihood. Baseline for multinomial logit regression is firms that remain in distress. Firms that remain in distress are firms with *Distress50* value of 1; Dissolved firms are firms that disclosed the report for dissolution in DART (Dissolution); Out-of-distress firms are firms with *Distress50* changing from 1 to 0 (Out-of-distress). We include the following control variables; *AssetTurnover, Size, PPE, EBITDA, R&D, RDDummy, Leverage* and *SalesGrowth*. Standard errors are in parentheses, and ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively. All variable definitions are provided in the Appendix. Standard errors are in parentheses, and ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

	Dissolution	Out-of-distress
ChgDummy	0.0976***	-0.2394***
	(0.0214)	(0.0267)
PPRate	0.2948***	-4.8549***
	(0.0370)	(0.4090)
*ChgDummy*PPRate*	-1.0166***	5.8611***
	(0.0439)	(0.4097)
AssetTurnover	-0.1083	-0.2427
	(0.4454)	(0.5014)
Size	0.0034	-0.0073
	(0.0053)	(0.0061)
PPE	0.0429	0.0088
	(0.0453)	(0.0512)
EBITDA	-0.0043	0.0106**
	(0.0039)	(0.0048)
R&D	0.2214	-0.5121*
	(0.2055)	(0.2798)
RDDummy	0.0187	-0.0017
	(0.0191)	(0.0217)
Leverage	0.0100	-0.0429
	(0.0282)	(0.0381)
SalesGrowth	0.0004	0.0001
	(0.0005)	(0.0007)
No. of Obs	73,150	
R-squared	0.10	
Year FE	YES	
Firm FE	YES	

<Table 16> The related change of the largest shareholder with respect to private placement
This table presents the result for firms with control transfer that is related to private placement and other firms with control transfer that is unrelated to private placement. The first two columns show the result for related control transfer (Related), meaning that firms' new largest shareholder is identical to the private placement target, while the last two columns represent the result for unrelated control transfer (Unrelated). We include the following control variables; *AssetTurnover, Size, PPE, EBITDA, R&D, RDDummy, Leverage* and *SalesGrowth*. Standard errors are in parentheses, and ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

	Related		Unrelated	
Dependent variable	*ResolutionDummy*	*ROA*	*ResolutionDummy*	*ROA*
ChgDummy	-0.0754***	-0.5208***	0.0817***	-0.6354***
	(0.0047)	(0.0211)	(0.0096)	(0.1254)
PPRate	-0.0034***	-0.0052***	-0.0044***	-0.0004
	(0.0003)	(0.0015)	(0.0007)	(0.0092)
*ChgDummy*PPRate*	0.0070***	0.0087***	0.0002	0.0053
	(0.0004)	(0.0016)	(0.0007)	(0.0098)
AssetTurnover	0.0626	0.1858	0.0383	-1.6629
	(0.0950)	(0.4218)	(0.1966)	(2.5700)
Size	-0.0026**	0.0015	-0.0019	-0.0016
	(0.0011)	(0.0050)	(0.0024)	(0.0310)
PPE	-0.0095	-0.0447	-0.0365*	0.0559
	(0.0097)	(0.0429)	(0.0199)	(0.2607)
EBITDA	0.0014	-0.0003	0.0044**	0.0677***
	(0.0009)	(0.0039)	(0.0017)	(0.0225)
R&D	-0.1090**	-0.0834	0.0589	0.9644
	(0.0472)	(0.2096)	(0.0892)	(1.1668)
RDDummy	-0.0032	0.0076	0.0249***	0.0194
	(0.0041)	(0.0181)	(0.0084)	(0.1096)
Leverage	0.0040	0.0044	-0.0177	0.1040
	(0.0065)	(0.0288)	(0.0151)	(0.1978)
SalesGrowth	0.0001	0.0006	-0.0003	-0.0009
	(0.0009)	(0.0004)	(0.0005)	(0.0007)
R-Squared	0.56	0.18	0.66	0.59
No. Obs.	49,159	49,159	12,653	12,653
Year FE	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES

Chapter 2

Does Analyst Coverage Encourage Firm Innovation? Evidence From Korea

2.1 Introduction

A literature has focused on the factors and outcomes of firm innovation. Recently, the literature has presented two conflicting views on analyst coverage and its effect on firms' innovation strategy. Specifically, He and Tian (2013) support the so-called "pressure effect" of analyst coverage on managers to exceed analysts' earnings forecasts, thereby inducing managers to cut long-term expenses including innovation. Conversely, Guo et al. (2019) confirm the existence of the "information effect," which makes the opposite prediction—analyst coverage can mitigate managerial myopia and increase a CEO's incentive to innovate by reducing information asymmetry.

Motivated by this, this study investigates whether such information and pressure effects of analyst coverage on firm innovation exist in an emerging market where analysts may be subject to additional layers of agency problem. Our analyses focus on Korea, which is characterized by family-controlled business groups, often referred to as chaebols (Kim et al., 2019). As most chaebols are conglomerates, in that they run many lines of different businesses, and some are engaged in stock brokerage business and as such have their own securities firms as member companies. This may induce business group-affiliated analysts to issue more positive estimates for member companies within the same group (Mantecon and Altintig, 2012). The existence of group-affiliated analysts may either exacerbate the pressure effect by forcing managers to meet even higher earnings forecasts with a positive

bias or mitigate it by allowing managers to largely ignore non-arm's length forecasts, which clearly deserves attention in Korean market.

In addition to the presence of chaebols, there are innovative Korean start-ups that grow into competitive giants over a short period of time. For instance, Naver was established with only seven engineers in 1998 and stands out as domestic premier portal space, clearly substituting Google or Yahoo in 2003. Therefore, investigating Korean market is relevant in the sense that it is one of the most up-to-date markets for innovative startups, rarely seen in other economies. Overall, these market features may yield different consequences and final outcomes of firm innovation compared to developed markets, which we believe is worth an investigation.

Following Guo et al. (2019), we consider three different channels in which information and pressure effects take place differently: research and development (R&D) expenditures, acquisitions, and corporate venture capital (CVC) investment. R&D and acquisitions have long been thought to be internal and external source of innovation, but few studies point out that CVC can add benefits not only to invested ventures, but also to corporate investors (Dushnitsky and Lenox, 2006). Especially, since CVC is relatively rare in emerging market, the way in which CVC affects an investing firm's innovation performance is not as certain. At the same time, Korean market is vertically as well as horizontally integrated. Hence, CVC is an important channel to innovate, since corporate investors are likely to be in a better position to provide important resources to investees, thereby obtaining innovative knowledge and products externally. Therefore, by referring to these conflicting perspectives, CVC investment in Korea provides us with an ideal environment to identify the relevant effect of CVC channel on innovation as well as long-term outcomes.

Additionally, we explore if the group-affiliated analysts' reports hold greater influence on the three investment channels than their non-group affiliated counterparts, which has

not received much academic attention. The literature mostly focuses on the level of bias in the group-affiliated analysts' forecasts and subsequent market reaction (Lim and Kim, 2019; Yoo and Park, 2016). However, studies on such biased coverage by group-affiliated analysts and its effect on managers' strategic adjustment are surprisingly rare, as shown in panel A and B of Table 6. This study aims at filling this gap by studying how the information and pressure effects of financial analysts, including group-affiliated ones, vary across long-term corporate strategies, focusing on innovation.

Using publicly traded non-financial firms in Korean stock market between 2010 and 2018, we consider how the information and pressure effects of financial analysts different among CVC, R&D, and acquisition. *First*, our result is different from Guo et al. (2019), in that analyst coverage results in not only the cut in R&D, but also negative CVC investment, supporting the pressure effect that the short-term earnings targets estimated by analysts put pressure on managers, since investors can punish managers who miss the earnings forecasts. The reason is that CVC as an innovation vehicle has only recently entered emerging economies. Given that successful outcomes of venture capital investments are generally limited in these markets, companies may be careful to choose CVC investment as their innovation strategy (Rajamani and Velamuri, 2014). As a result, we argue that the pressure effect works as disciplinary actions to cut such uncertain investment as CVC in Korea.

Second, in terms of innovation outcome, the change in innovation strategies due to financial analysts does not increase the innovation output, *that is,* the sources of pressure exerted on managers by financial analysts cause the CEO to focus heavily on the short-term performance, and this may affect the long-term innovation output, which differs from the case in the U.S.

Finally, although analyst coverage increases acquisition, the change in acquisition is attributed to the substitution effect of the CVC cut, *that is,* firms covered by more analysts acquire more innovative firms, which is ascertained by the number of patents of target firms

taken over (Guo et al., 2019). However, our result differs from the case in the U.S. in that acquisition is indirectly affected from the pressure effect to substitute for the reduction in CVC investment. This is consistent with studies arguing that one of motives for CVC is to identify opportunistic acquisition candidates (Benson and Ziedonis, 2010). Overall, three results support the fact that the pressure effect dominates in Korean market, *that is*, the analyst coverage act as a disciplinary tool to reallocate long-term expenses such as innovation. Simply put, the analyst effect on innovation is indirect, anchored on the pressure story of He and Tian (2013).

To exploit the potential endogeneity problem, we apply an instrumental variable (IV) approach, based on the finding of Yu (2008) and Guo et al. (2019). Specifically, we impose the expected number of analyst coverage as our IV variable. The IV regressions generate a result consistent with the main one mentioned above. Overall, the endogeneity test supports a causal effect of the amount of analyst coverage on innovation, although it does not perfectly rule out endogeneity as a confounding factor.

Additionally, our main results are robust when we do subsample analyses: We divide the sample based on the level of corporate governance, whether a firm belongs to high-technology industries, and when a firm is followed by more group-affiliated analysts. It turns out that analyst coverage exerts pressure effects on the likelihood of decreasing innovation for firms, followed by group-affiliated analysts in low-tech industries and good corporate governance.

Here we emphasize that the pressure effect is also observed in acquisitions when firms are followed by group-affiliated analysts. The pressure effect exists both when group-affiliated analysts estimate firms in the same business groups and when those analysts follow firms in other business groups. This is due to the positive bias in group-affiliated estimates (Lim and Kim, 2019), which puts more pressure on managers to cut long-term expenses, including innovation. Overall, our sub-sample analysis implies that the pressure

effect of financial analysts dominates in Korea.

We also do additional analyses to check if the increased investment in acquisition results from a direct effect of financial analysts or an indirect effect of firms to compensate for the decrease in CVC and R&D investment. The result from CVCs is relatively mixed in that both the indirect and direct effect of financial analysts on acquisition exist, *that is,* firms followed by more analysts have an extra incentive to invest in M&A. At the same time, firms make acquisition to compensate for the reduction in CVC investment.

We also analyze the impact of analyst coverage on innovation output, taking three corporate innovation strategies into account. When we include the differential effect of firms' innovation strategies on the future granted patents, the three channels do not increase the long-term outcome. Finally, when we apply the difference between actual EPS and EPS estimates instead of the number of analysts, we show that there is incentive to meet analysts' forecasts to cut R&D expenditure, but it does not affect firms' innovation output in the long-term. When we investigate the decrease in CVCs, the pressure effect to cut CVCs does not increase the long-term innovation outcomes.

Overall, the results above suggest that analyst coverage has the pressure effect, and that the effect is stronger in Korean market. Specifically, the analyst coverage reduces CVC investment and R&D expenditure, but it increases acquisition. Such results are stronger for firms followed by more group-affiliated analysts. The analyst coverage leads managers to decrease R&Ds and CVC investment, but the increase in acquisition is owing to both direct information and indirect pressure effect. However, the disciplinary action of analyst coverage and subsequent managers' short-termism exist, since the forward number of patents do not increase.

Our study relates to the literature on the relation between finance and firm innovation. Especially, positive bias in group-affiliated analysts' estimates put extra pressure on managers to cut long-term expenses. Moreover, this study shows that higher uncertainties

associated with CVC investment for emerging economies and different accounting standard may lead to different strategic adjustment from managers. Whereas the existing research highlights the pressure from such internal strategies as R&D, this study shows that the external innovation channel can be another candidate for the pressure effect. Although the information effect on acquisition exists, the long-term output stemming from the pressure effect is stronger, implying that different innovation channels can absorb potential positive impact of analyst coverage, as suggested by previous studies (He and Tian, 2013). Given that IFRS has been adopted in many jurisdictions, including the European Union, and that many emerging markets face the difficulty in CVC investment, our findings are not restricted to Korean market setting but rather a general phenomenon in emerging markets.

This chapter is organized as follows. Section 2 discusses prior research on analyst coverage and firm innovation. Section 3 explains the data and empirical strategy. Section 4 presents our empirical results. Section 5 concludes.

2.2 Literature Review

This study relates to the following three broad streams of literature: innovation, financial analysts, and managers' short-termism. A growing body of literature examines various economic forces that may affect innovation. Some of the factors that have been documented to affect innovation of public firms are acquisitions (Teece, 2010; Seru, 2014), external financial dependence, and corporate venture capital. For example, Acharya and Xu (2017) find that public firms financing through internal cash flows (Rajan and Zingales, 1996) invest less on R&Ds and less patents outcome. Recent studies focus on CVC, or corporate venture capital, as an important innovation channel through which established firms may conduct external R&Ds (Gaba and Bhattacharaya, 2012). González-Uribe (2020) finds that venture capital can influence innovation among companies within the same

venture capital portfolios. Ma (2020) finds that firms have motivation to invest in CVCs in order to fix their innovation weaknesses. We add to this literature by relating analyst coverage to the above-mentioned firm innovation strategies in an emerging market setting.

This study also contributes to a substantial body of research that studies the role of financial analysts. While traditional analyst research has focused more on asset pricing implications, recent studies extend this literature and focus on how improvement in information environment led by analyst coverage may reduce uncertainty over firm information and ultimately affect firm performance (Lee and So, 2017). There are two conflicting explanations regarding how financial analysts may affect firm investment: Derrien and Kecskes (2013) find that more analyst coverage leads to increase in capital expenditures owing to a decrease in information asymmetry. However, other studies show that analysts may distort corporate investment out of the pressure effect on managers to beat short-term earnings targets (Benner and Ranganathan, 2012; He and Tian, 2013). Merkley et al. (2017) reconcile these two views by arguing that analysts' informativeness depends on factors such as the number of financial analysts covering an industry.

Another criticism on the validity of analysts' forecasts is potential bias from investment banking relationships. For example, Corwin et al. (2017) find that the change in investment bank–firm relationships affects analysts to issue biased coverage. In our setting, an additional source of potential bias owing to conflict of interest is the existence of chaebol-affiliated brokerages. Lim and Kim (2019) show that long-term investment strategies based on analyst coverage may be more profitable when investors discount a positive bias in chaebol-affiliated analysts' recommendations. Whether chaebol-affiliated brokerages may encourage or discourage corporate investment is unclear, *ex ante*. Since chaebol-affiliated brokerages firms may attract analysts with better ability, they may improve information environment, thereby increasing corporate investment in innovation. However, non-arm's length forecasts may impose a strict pressure on managers who are *de*

facto accountable to the joint controlling shareholder of both the covered firm and the brokerage.

Perhaps the study closest to ours is that by Guo et al. (2019), who show that the effect of analyst coverage on U.S. firms' innovation varies across R&D, acquisition and CVC investment, thereby influencing the long-term outcomes. Our study complements and extends theirs by analyzing the effect of financial analysts on innovation in a representative emerging market and how this relationship may be affected by the existence of chaebol-affiliated brokerages.

Finally, this study also relates to the literature on managers' incentives for "short-termism." For instance, Kolasinski and Yang (2018) suggest that managerial myopia may be one of the factors that led to the subprime mortgage crisis, since CEOs with short-term incentives may decide to take on riskier exposure to subprime mortgage-backed securities. Such managerial short-termism has been one suspect of distortions in firm innovation. Dechow and Sloan (1991) find that managers tend to cut R&D investment by the end of their tenure, resulting in a decrease in the firm's reported earnings. The current study complements these by connecting the effect of analyst coverage and mangers' decisions to adjust their innovation strategy and subsequently examining the long-term innovation outcome to further verify whether managers' decisions were indeed short-term based or not.

2.3 Data and Methodology

2.3.1. Sample Construction

Our sample consists of publicly traded firms in Korea from 2010 to 2018, available on DataguidePro, our primary local dataset comparable to Compustat and IBES combined. Following Guo et al. (2019), we exclude financial and utility firms with KSIC codes of 64-66 and 35-36, respectively. The financial analyst information is also obtained from

DataguidePro. Since the analyst information is incomplete prior to 2009, our sample period starts from 2010.

Our key innovation channel variables taken from the previous literature are R&D, acquisitions, and CVC investment. While R&Ds are directly taken from DataguidePro, the latter two variables are constructed as follows: Since most arm's-length acquisitions in South Korea take the form of a block trade between the old, outgoing controlling shareholder and the incoming controlling shareholder, we first identify all changes in the largest shareholder maintained by the Korea Investor's Network for Disclosure database. We then exclude the following cases: cases when commercial banks become the new largest shareholder; control changes that occur owing to unilateral declines in the equity stakes of the previous largest shareholder; cases where control block transactions are withdrawn after the initial disclosure as well as miscellaneous cases such as SPAC listings where actual control remains unchanged; cases in which the value of the acquired stock is less than 5% of the market value or the new largest shareholder's ownership is less than 5%; and deals with less than 1 billion KRW, roughly $1 million (Cho and Kim, 2019).

To assemble CVC investment data, we first obtain the fund names and the names of the parent companies, defined as the largest equity investor of the fund from the Disclosure Information of Venture Capital Analysis and DART database. The former is a comprehensive dataset of venture capital funds and their investment targets, whereas the latter is a disclosure platform similar to EDGAR in the U.S. The sample period ends in 2018, since the periodic annual reports from venture capital funds are available until 2018. Then, we manually collect the names of venture capital funds' investment targets and classify them into three mutually exclusive sets of start-ups based on their age: those that are (1) less than three years old, (2) at least three but less than seven years old, (3) and at least seven years old. Once we have identified the targets and the age group they belong to, we locate the target with the largest investment amount within each fund, *that is*, the start-

up with the largest portfolio weight, and assign that target's age group as the age group of the fund. Once we have a list of parent companies that are participating in venture capital funds, we merge this list with our sample firms from DataguidePro to identify firms that engage in CVC investment.

Finally, we obtain patent information from the WIPS ON database. This database offers the list of documentation of patents by individuals and firms. Since the information on patent citation is unavailable in Korea, we use granted patents from the WIPS ON instead. This leaves us the final sample of 18,351 firm-year observations and 2,039 unique firms.

2.3.2. Variables

Our dependent variables are three innovation channels as well as an innovation output, following Guo et al. (2019). We first compute three measures for CVC investment: *CVC1* is a dummy variable equal to 1 when a firm invests in CVC fund for a start-up less than three years old and 0 otherwise; *CVC2* is an indicator variable equal to 1 for CVC investment for a firm at least three but less than seven years old and 0 otherwise; *CVC3* is a dummy variable equal to 1 for CVC investment for a firm at least seven years old and 0 otherwise.

Unlike in the U.S., where capital market is the primary financing source for both public firms and start-ups, a vast majority of financing in Korea is mediated through commercial banks, which provide collateral-based loans. Even start-ups' initial external financing is typically a loan from a commercial bank, guaranteed by either one of the two government organizations, *namely*, Korea Credit Guarantee Fund and Korea Technology Finance Corporation. Since these loans stand first in line, prior to any other external financier in case when the start-up fails, it is difficult for Korean venture capital to invest

in an early-stage start-up, since they stand in line behind commercial lenders. As a result, only a limited number of start-up firms are successful in attracting CVC investment, and the timing of obtaining investments ranges from the initial stage to the later stage of start-up growth. To accommodate this unique feature of the Korean venture capital market, we classify CVC investment into three categories based on the investee's growth stages.

We next measure R&D investment using *RDchange*, which is the difference between the ratio of R&D expenses to total assets at time *t* and *t-1*. Another measure of R&D is the dummy variable *RDcut*, which equals 1 if a firm's R&D expenses divided by total assets are lower in time *t* than in *t-1*, and 0 otherwise. We replace missing observations with zeros in R&D expenses, following Lewis and Tan (2016), among many others in the R&D literature.

Our last measure of innovation channel, *namely*, acquisitions, is captured by two variables: *Acquisition* is a dummy variable equal to 1 if a firm engages in an acquisition of a controlling stake in another firm in time *t*, and 0 otherwise. We also use *lnAcq*, defined as the natural log of one plus the number of targets that a firm acquires in a given year. As for the degree of innovativeness of targets, we follow Guo et al. (2019) and compute the natural log of one plus the total number of patents applied for by the target at the Korean Intellectual Property Office in a given year (*lnTargPatent*), and the natural log of one plus the total number of granted patents held by the target up to the year when a given acquisition takes place (*lnTargGrant*).

Finally, as a measure of innovation output to check if the long-term output is affected by any changes in innovation efforts, we calculate patent variables for our sample firms, similar to those obtained for acquisition targets. Specifically, we apply the natural log of one plus the number of both the patents filed patents granted held up during a given year, indicated as *lnPatents* and *lnGranted*, respectively.

Our key independent variable is the number of analysts per firm, *lnCoverage*,

computed as the natural log of one plus the coverage. As a robustness test, we consider an alternative measure of analyst pressure, *EPSD*, defined as the difference between the actual EPS and analysts' consensus EPS estimate, divided by the stock price. Consensus EPS estimate is the arithmetic mean of a firm's earnings forecasts by financial analysts following each firm.

Our control variables include firm size (*Size*), R&D ratio (*RDRatio*), firm age (*Age*), leverage (*Leverage*), cash (*Cash*), return on equity (*ROE*), property, plant and equipment (*PPE*) ratio, capital expenditure (*CAPEX*), institutional ownership (*InstOwn*), Tobin's Q (*Q*), Kaplan–Zingales index (*KZIndex*), corporate governance index (*CGIndex*), market share (*MktShare*) computed as sales divided by the sum of sales of all firms within the two-digit Korean Standard Statistical Classification (KSIC) code, and Hirshman–Herfindahl Index (*HHI*), all lagged by one year. We obtain institutional ownership information from TS-2000, a local dataset similar to DataguidePro, as well as DART. *ROE*, *Q*, *RDChange*, and the *KZIndex* are winsorized at the 1st and 99th percentiles. Definitions of all variable are described in detail in the Appendix.

Table 1 provides summary statistics for our data. The average *RDRatio* is 1.6% in our sample, and the average change in that ratio is about -0.004 percentage points. The second measure for R&D investment, *RDCut*, implies that 29.6% of our sample firm-years decide to cut their R&D expenses. As for the acquisition measure, 1.2% of firms in the sample are engaging in an acquisition in a given year, and 0.009 companies are acquired. For 897 firm-years that do acquire targets, the average total number of patents of the target is 5.5, and that of granted patents are 5.2. The final measure for our innovation strategies or channels is CVC investment. The results from Table 1 indicates that 4.7% of sample firms invest in early stage start-ups through CVCs, 4.4% in mid-stage start-ups and 4.2% in relatively mature start-ups. With respect to the innovation output, an average firm applies for 1 patent during a given year and holds roughly a similar number of granted patents at a given point

in time. In terms of coverage, firms on average are followed by 5.3 analysts per year. Normalized difference between actual earnings and earnings consensus earnings forecasts is -3.8% on average, which implies that earnings forecasts tend to be upwardly biased.

[Table 1]

2.3.3. Methodology

Following Guo et al. (2019), we use ordinary least squares (OLS) to estimate how analyst coverage may affect firm innovation. Since analyst coverage is clearly not random, the causality may well run the other way around. Specifically, there may be more analyst coverage for firms that engage in more innovation activities, *namely*, more acquisitions, more R&D, and more CVC investments. To address this potential reverse causality, we consider "expected" coverage as an instrument variable and implement a two-stage least squares (2SLS) approach. The baseline estimation based on OLS is as follows:

$$Innovation_{(i,t+k)} = \alpha + \beta lnCoverage_{(i,t)} + \gamma X_{(i,t)} + \delta_i + \mu_t + \varepsilon_{(i,t)} \quad (1)$$

where subindex i and t represent firm and year, respectively. The dependent variable $Innovation_{(i,t+k)}$ stands for different measures of innovation channels: *RDChange* and *RDCut* for the R&D investment; *Acq* and *lnAcq* for firms' acquisition activities; *lnTargPatent* and *lnTargGrant* for how innovative the target firms are; and *CVC1*, *CVC2*, and *CVC3* for firms' CVC investment. The main independent variable is $lnCoverage_{(i,t)}$, which represents the number of analysts following a firm. The remaining control variables in $X_{(i,t)}$ are firm size (*Size*), R&D ratio (*RDRatio*), firm age (*Age*), leverage (*Leverage*), cash (*Cash*), return on equity (*ROE*), property, plant and equipment (*PPE*) ratio, capital expenditure (*CAPEX*), institutional ownership (*InstOwn*), Tobin's Q (*Q*), Kaplan–Zingales index (*KZIndex*), corporate governance index (*CGIndex*), market share (*MktShare*), and the Hirshman–Herfindahl index (*HHI*), as described in the previous section. δ_i and μ_t

represent to firm and year fixed effects, respectively. We examine innovation activity up to two years (k = 1,2).

To address the non-randomness of coverage, we consider "expected" coverage as an IV. Expected coverage is obtained by first applying the increase in brokerage size to the firm-brokerage level coverage at the beginning of the sample period and then summing them up across the brokerages as in Yu (2008) and Guo et al. (2019). As explained in Yu (2008) and previous studies, we believe that this is legitimate instrument since it exploits exogenous variation in analyst coverage, *namely*, the change in the size of the brokerage houses, which should be independent from any characteristics of covered firms. Specifically, we construct our IV, *ExpectedCoverage*, as follows:

$$ExpectedCoverage_{(i,t,j)} = \left(\frac{Brokersize_{(t,j)}}{Brokersize_{(0,j)}}\right) * Coverage_{(i,0,j)} \quad (2)$$

where $ExpectedCoverage_{(i,t,j)}$ is the expected coverage of firm i in year t from brokerage j. $Brokersize_{(t,j)}$ and $Brokersize_{(0,j)}$ are the number of analysts working for broker j in year t and the benchmark year 0, respectively. The benchmark year is 2010, the first year in our sample period. $Coverage_{(i,0,j)}$ is the number of analysts following firm i in year 2010 working for brokerage j. $ExpectedCoverage_{(i,t,j)}$, therefore, is the expected number of analysts from brokerage j following firm i at time t with respect to the initial year 2010, which is attributable to the change in brokerage size. Once we obtain the firm-brokerage level expected coverage extrapolated from natural increase (or decrease) in brokerage size, we sum up $ExpectedCoverage_{(i,t,j)}$ across all brokerage firm j's to get the aggregate expected number of analysts following firm i as below:

$$ExpectedCoverage_{(i,t)} = \sum_{j=1}^{n} ExpectedCoverage_{(i,t,j)} \quad (3)$$

where n is the total number of brokerages in year t. Since *ExpectedCoverage* is based on original coverage and changes in brokerage size, we expect this variable to be well

correlated with actual coverage. However, we do not see a direct relationship between this variable and our measures of current innovation activities. Hence, we argue that this is a valid instrument for actual coverage and use this IV to instrument for $lnCoverage_{(i,t)}$ in Equation (1) and incorporate the estimated $\widehat{lnCoverage}_{(i,t)}$ in the second stage regression as follows:

$$lnCoverage_{(i,t)} = \alpha + \beta ExpectedCoverage_{(i,t)} + \gamma X_{(i,t)} + \delta_i + \mu_t + \varepsilon_{(i,t)} \quad (4)$$

$$Innovation_{(i,t+k)} = \alpha + \beta \widehat{lnCoverage}_{(i,t)} + \gamma X_{(i,t)} + \delta_i + \mu_t + \varepsilon_{(i,t)} \quad (5)$$

where $\widehat{lnCoverage}_{(i,t)}$ is the fitted value of $lnCoverage_{(i,t)}$ from the first stage regression in Equation (4).

In the cross-sectional sub-sample analyses, we divide our sample into two groups based on three dimensions: corporate governance based on *CGIndex*; high-tech industries according to the OECD classification (Organisation for Economic Co-operation and Development, 2011), and whether covering brokerage belongs in a large business group or chaebol.

The unique feature of our sample allows us to categorize both covered firms and analysts into those that are affiliated with chaebols and those that are not. Based on the list of firms provided by the Korea Fair Trade Commission, we identify both brokerages and firms into group-affiliated and non-group-affiliated categories, and define group-affiliated (*GA*) analysts as analysts in a group-affiliated brokerage estimating group-affiliated firms, *that is*, *GA* is a dummy variable defined at analyst-firm-broker level. Note that this variable does not require the covered firm and covering brokerage to be from the same business groups. As such, this variable reflects the general level of reputation of the covered firm and the covering brokerage. However, we would expect potential conflict of interests to be more severe when both the firm and the brokerage belong to the same business group. To capture this possibility, we consider another dummy variable, *SameGA*, which equals 1 if

both the firm and the broker are from the same business group.

Based on *CGIndex*, we create *GoodGov*, a dummy variable set equal to 1 if a firm's corporate governance index (*CGIndex*) is higher than the sample mean value of *CGIndex* and 0 otherwise. *CGIndex* is collected and summated from Korea Corporate Governance Service (KCGS) when evaluates firms' governance practices in terms of sub-categories including protection for shareholder rights, board independence, and managerial transparency for disclosures and audit. Hence, higher *CGIndex* implies that the firm has higher level of corporate governance.

Lastly, we split the sample in high-tech industries, following industry classification of OECD (2011). As a result, firms with KSIC codes 20, 21, 26–31, 35, 49, 61, 62, 70, and 86 belong to high-tech industries, and high-tech dummy (*HT*) is set equal to 1 for these firms in high-tech industries and 0 otherwise.

Once we create these four dummies, we then interact them with the instrumented $lnCoverage_{(i,t)}$ in Equation (5) as follows:

$$Innovation_{(i,t+k)} = \alpha + \beta_1 CharDummy + \beta_2 \widehat{lnCoverage}_{(i,t)} + \beta_3 \widehat{lnCoverage}_{(i,t)} \\ CharDummy + \gamma X_{(i,t)} + \delta_i + \mu_t + \varepsilon_{(i,t)} \quad (6)$$

where $CharDummy$ represents three distinct cross-sectional dimensions, *namely*, corporate governance, group-affiliation, and membership in high-tech industries as mentioned. Specifically, this variable is equal to 1 for firms that under good corporate governance, group-affiliated, and high tech, and 0 otherwise. Here, our key coefficient of interest is β_3, since it measures how analyst coverage may affect innovation activities of firms in each sub-group.

Additionally, we perform several robustness tests to disentangle the direct and the indirect effect of analyst coverage. Specifically, we include interaction term to capture the indirect substitution, which comes from any decrease in innovation channels:

$$Innovation_{(i,t+k)} = \alpha + \beta_1 ln\widehat{Coverage}_{(i,t)} + \beta_2 Cut_{(i,t+1)} +$$

$$\beta_3\left(ln\widehat{Coverage}_{(i,t)} * Cut_{(i,t+1)}\right) + \gamma X_{(i,t)} + \delta_i + \mu_t + \varepsilon_{(i,t)} \quad (7)$$

where $Cut_{(i,t+1)}$ corresponds to the decrease in other two innovation channels, if any. Our key variables of interest are β_1 and β_3, since the two capture the direct and the indirect effect of analysts on increased innovation. If β_1 is positive, analysts have a direct informational effect on acquisition strategies; if β_3 is positive, the indirect pressure effect of analysts forces managers to increase innovation to substitute the decrease in other innovation strategies, if any. The coefficient β_2 represents the increased innovation strategies and the decreased counterparts of firms without any analyst coverage. $ln\widehat{Coverage}_{(i,t)}$ is instrumented coverage variables from 2SLS in Equation (4).

We also analyze how innovation output is affected from the adjustment of innovation strategies out of analyst coverage as below:

$$Outcome_{(i,t+3)} = \alpha + \beta_1 ln\widehat{Coverage}_{(i,t)} + \beta_2 innovation_{(i,t+1)} +$$

$$\beta_3(ln\widehat{Coverage}_{(i,t)} * innovation_{(i,t+1)} + \gamma X_{(i,t)} + \delta_i + \mu_t + \varepsilon_{(i,t)} \quad (8)$$

where $Outcome_{(i,t+3)}$ are two measures of innovation output, which are *lnPatents* and *lnGranted*. $ln\widehat{Coverage}_{(i,t)}$ is the instrumented coverage variable from Equation (4). $Innovation_{(i,t+1)}$ corresponds to the three innovation channels which are R&D, acquisition and CVC investment after one year. We also include control variables and fixed effects as before. β_1 represents the effect of analysts on future patents; β_2 corresponds to the effect of three innovation strategies on long-term output of firms that are not followed by analysts; and β_3 captures the differential effect of firm innovation for firms covered by analysts.

Instead of using *lnCoverage*, we apply another measure of analyst pressure, *EPSD*, the difference between the actual EPS and analysts' EPS estimates, divided by stock price.

If analysts' estimates have negative effects on innovation strategies, it is important to see if such reduction affects long-term innovation output:

$$Innovation_{(i,t)} = \alpha + \beta_1 I_{Meet(i,t)} + \beta_2 EPSD_{(i,t)} + \beta_3 EPSD^2_{(i,t)} + \beta_4 EPSD_{(i,t)} * I_{Meet(i,t)} + \beta_5 EPSD^2_{(i,t)} * I_{Meet(i,t)} + \beta_6 X_{(i,t)} + \delta_i + \mu_t + \varepsilon_{(i,t)} \quad (9)$$

where $Innovation_{(i,t)}$ is the innovation channel that might decrease from the pressure effect. $I_{Meet(i,t)}$ is a dummy variable equal to 1 if firms meet estimated EPS and 0 for firms that miss the target. Here, our key coefficient of interest is β_1. If β_1 is negative, it implies that firms that meet analysts' estimate are likely to cut one of their innovation strategies, which supports the pressure effect of analysts. As in Equation (8), we also estimate the effect of cutting innovation investment because of *EPSD* on firms' patent outcomes. Following Guo et al. (2019), we use $I_{Meet(i,t)}$ as IV to estimate innovation channel that declines owing to the pressure effect, based on Equation (9), then put the instrumented innovation into the estimation below:

$$Outcome_{(i,t+3)} = \alpha + \beta_1 \widehat{innovation}_{(i,t)} + \beta_2 EPSD_{(i,t)} + \beta_3 (EPSD_{(i,t)} * I_{Meet(i,t)}) + \gamma X_{(i,t)} + \delta_i + \mu_t + \varepsilon_{(i,t)} \quad (10)$$

where $\widehat{Innovation}_{(i,t)}$ is from the first stage regression, which is equivalent to the Equation (9). The key coefficient of interest is β_1, which corresponds to the causal effect of cutting innovation on firms' long-term innovation outcome.

2.4 Findings

2.4.1. Baseline Results

In this section, we report our main empirical findings. We first document the effect of analyst coverage on firms' innovation strategies. The result from R&D expenditure is presented in Table 2. Panel A reports the OLS results while panel B reports the 2SLS results.

The first two columns of panel A reports the effect of an analyst coverage on the change in R&D expense, while columns (3) and (4) report the effect on a cut in R&D. Column (1) of panel B reports the results of the first-stage regressions and columns (2) to (4) report the second stage estimation.

Column (1) of panel B indicates that the coefficient of IV, *ExpectedCoverage*, is positive and significant at the 1% level, consistent with the previous studies (Yu, 2008; Guo et al., 2019). The large *t*-statistic (51.20) and F-statistic above the critical value of 10 confirms that our IV is not a weak instrument (Stock et al., 2002).

The results from panel A suggests that the impact of financial analysts on R&D are largely insignificant. However, the result from panel B implies that companies covered by more analysts significantly decrease their R&Ds one year ahead at the 1% significance level. Like in the case of the U.S., the one-year forward *RDChange* turns out to be negative; what is different from the U.S. is that the pressure effect is short-term, whereas the reduction in *RDChange* in the U.S. sustains for two years. Comparing the two panels, the coefficients of *lnCoverage* is larger in the 2SLS regressions, implying that there is downward bias in OLS estimation.

The rest of the coefficients on control variables show expected signs: Firms with fixed assets are more likely to reduce or decrease their R&Ds. The negative sign of cash might be owing to the fact that firms may depend on the amount of cash holdings to smooth R&D, which results in the negative coefficient of cash holdings, as suggested in Brown and Petersen (2011).

[Table 2]

Table 3 shows the effect of financial analysts on firms' CVC decision. The OLS coefficients in panel A suggest that covered by more analysts reduces CVC investment for mid-stage and final-stage firms, making the relevant investment in a start-up. Owing to the unique feature of Korean venture capital market mentioned in section 3.2, the result from

CVC1 reports an early start-up's difficulties in obtaining external finance. The same result applies to the coefficient from the 2SLS analysis, since the signs for CVC investment for mid- and final-stage firms are significantly negative. The result is different from Guo et al. (2019), since the analyst coverage increases CVC investment in the U.S. Another characteristic is that while the non-negative effect of analyst coverage only occurs in external innovation in the U.S., we show that negative pressure can distort such external innovation as CVCs in an emerging market setting. This may be because firms in emerging markets may face higher probability of CVC funds failed (Teppo et al., 2009), so that firms followed by financial analysts may feel pressure to decrease such uncertain investments. The control variables show that big firms with less leverage tend to invest via CVC channel. Later, we investigate whether the decrease in CVC, as well as in R&D, affects long-term innovation outcomes.

[Table 3]

In Table 4, we report both the OLS and 2SLS regression results to discuss the effect of analyst coverage on firm's acquisition. The results imply that firms covered by more analysts are more likely to take M&A targets and to increase their number of target firms in two years forward in panel A. In panel B, the results are same except for the fact that the likelihood of acquisition and the number of target firms are higher in one year forward. Overall, both results indicate that analyst coverage makes firm acquire other targets, and that the number of acquisition increases. This is consistent with the U.S. case, since analyst coverage increases acquisition as well. What differs from the U.S. is that there exists only a one-year-forward effect on acquisition in Korea. As for control variables, small firms and firms with more cash and more growth opportunities often acquire other firms. The negative coefficients of *ROE* and *CGindex* indicate that firms with low profitability and bad governance pursue more acquisition. For those firms, acquisition may not be out of their innovation strategy, but for the sake of growth, which necessitates the analysis of the

analyst effect on innovative acquisitions as in Table 5.

[Table 4]

Table 5 shows the evidence that financial analysts helps firms not only to invest more in acquisition, but also to acquire more innovative targets. The innovativeness of target firms is estimated by the number of patents and granted patents of targets. If acquisitions are part of firms' growth strategy, there should be either insignificant or negative effect on the patents generated by targets. Since the number of firm-year observation reduced, we apply industry fixed effects instead. The affirmative and significant coefficient of instrumented *lnCoverage* indicates that financial analysts help firms to acquire more innovative firms, which can be seen in the U.S. as well. What differs from the U.S. is that the effect in Korea is short-term, since the relevant effect sustains for two years in the U.S.

[Table 5]

Overall, our main findings imply that analysts discourage R&D and CVC investment while their coverage encourages acquisitions, *that is*, the pressure effect is stronger in R&D and CVC channel, whereas information effect exists in acquisitions.

2.4.2. Cross-sectional variation and robustness test

In this section, we do extra cross-sectional and robustness tests to further support the effect of analyst on firm innovations. In Table 6, we divide the sample into firms with group-affiliation, high-tech firms, and companies with good corporate governance. Following the standard of Fair Trade Commision (FTC) in Korea, we define group-affiliated analysts as analysts in a group-affiliated brokerage. In terms of industry classification, we follow the OECD standard (2011), and divide the firm according to their KSIC codes, where codes 20, 21, 26–31, 35, 49, 61, 62, 70, and 86 belong to high-tech industries. Corporate governance is based on *CGIndex*, and higher *CGIndex* indicates firms

with good governance.

Panel A reports the impact of group-affiliated analyst coverage (*GA*) on innovation strategies by group-affiliated firms. For instance, LG electronics followed by analysts working for Samsung securities belongs to this category. It shows that the estimate from group-affiliated analysts have pressure effects on acquisition. Based on the literature, the positive bias in group-affiliated analysts may have higher pressure effect on firms, so that those firms have higher incentive to cut expenses related to acquisition.

Panel B is the result for group-affiliated analyst coverage for a firm in the same business group (*SameGA*). Identical group affiliation requires the covered firm and coverage brokerage to be from the same business groups; for instance, Samsung Electronics followed by a financial analyst in Samsung Securities. It shows that the identical group affiliation exerts pressure on managers to cut acquisition, which further supports the pressure effect resulting from the positive bias of group-affiliated analysts. This is consistent to the findings of Lim and Kim (2019) who argue that markets pay attention to a positive bias in group-affiliated analysts. Panel B also indicates that the analyst coverage from identically group-affiliated brokerage leads to higher CVC investment for mid-stage start-ups at the 10% significance level. This may be due to the managers' incentive to compensate for the reduction in acquisition. In this case, there exists an indirect substitution effect between CVC and acquisition, which we investigate later in Table 7.

Estimates in panel C show that companies in the high-tech industries tend to invest more in CVCs when more financial analysts follow those firms. Given that most of the innovation occurs in high-tech industries, it is reasonable to assume that financial analysts motivate innovation strategy of firms in high-tech industries. The results from panel C imply that analyst coverage increases information transparency, thereby motivating managers to increase their investment in CVC, supporting the information effect to some extent. This is identical to the case of the U.S., since analyst coverage increases CVC

investment in high-tech industries as well. What differs from the U.S. is that U.S. firms in high-tech industries reduce R&D but increase acquisition as well as CVC investment.

Finally, in panel D of Table 6, the result for corporate governance shows that firms with higher *CGIndex*, or firms with good governance decrease acquisition and CVC investment. An explanation is that market participants tend to be positively surprised by the actual earnings of good-governance firms (Bebchuk et al., 2013), which makes managers experience more pressure from financial analysts to meet the targets. As a result, managers decide to cut their acquisition and CVC investment. At the same time, the result shows that the effect of the amount of analyst coverage on external innovation is positively significant for badly governed firms, *that is*, firms with poor corporate governance tend to suffer from information asymmetry, so analyst coverage, to some extent, compensate for the poor corporate governance in these companies (Guo et al., 2019). This is different from the case in the U.S., since U.S. firms with good governance increases acquisition when they are followed by financial analysts.

[Table 6]

In Table 7, we estimate the two effects by including an interaction term of *lnCoverage* and reduced investment, which are R&D and CVCs, following Equation (7). As mentioned, the interaction term captures the indirect effect and the coefficient of *lnCoverage* represents the direct counterpart. Panels A.1 and A.2 report both direct and indirect effects of analyst on acquisition and innovative acquisitions, respectively. They show that the number of analysts hold an affirmative effect on the acquisition decision and on the number of firms taken over as well as the innovative acquisitions, which implies that firms' increased acquisition is owing to analysts' informational role. The coefficient of the interaction terms is insignificant in two panels, consistent with the case in the U.S.

Finally, panel B.1 shows that analyst coverage both have direct effect on acquisition and the number of firms acquired. However, the coefficient of interaction term indicates

that the indirect effect from cutting CVC investment is also significant. This result is different from the case in the U.S., since there exists only a direct influence of analyst coverage and no indirect effect owing to the decrease in CVCs in the U.S. One possible explanation is that firms reduce innovation after cutting their CVC investment because those firms are less able to leverage to do acquisitions. However, the larger coefficient of *lnCoverage*, compared to that of the interaction term implies that the direct effect from analyst coverage dominates in acquisition, consistent with previous literature (Guo et al., 2019). Panel B.2 shows that the affirmative effect of the amount of analyst coverage on innovative acquisition is only attributable to a direct effect of financial analysts.

[Table 7]

Table 7 above shows that the result from pressure effect on CVC investment is mixed, given that both direct information and indirect pressure effect exist in the investment. Firms cutting R&D and CVC investment may see a decrease in innovation output. However, as seen in the subsample analysis, analyst coverage provides firms with reallocating their resources, since the firm may cut inefficient innovation investment. Moreover, if CVC investment is for the sake of their growth, the final innovation outcome should not be unaffected. To investigate the final outcome from the reduction in the two strategies, Table 8 shows the possible consequences of firms' adjustment on three innovation strategies, following the Equation (8).

According to panel A in Table 8, a three-year-forward number of patents submitted by a firm in the sample is affected by analyst coverage. Except for CVCs, the differential effect of R&D cut and acquisition when the amount of analyst coverage is reduced are significantly negative, which might be because some firms acquire other firms out of their growth, unrelated to their innovation. When we add the interaction term between acquisition and analyst coverage, the negative partial effect from acquisition is absorbed. However, the effect of three innovation strategies when firms are covered by financial

analysts is significantly negative, differing from the U.S. Note that the effect of financial analysts covering firms remains significantly negative. Simply put, the negative effect from the pressure of analysts persists even when we take innovation strategies of firms followed by analyst coverage into account.

Panel B presents similar results for granted patents. The coefficient for interaction term implies that the differential effect of firms' external strategies on the innovation long-term outcome for firms followed by analysts are negative. Moreover, the effect of analyst coverage on granted patents remains negative, even when three innovation channels are taken into consideration. The results in panel A and B are different from the case in the U.S., since negative effect of financial analysts on patents becomes insignificant when the interaction term between U.S. firms' three innovation strategies and analyst coverage is included. Overall, this supports our argument that the reduction in innovation channels does not increase the final innovation outcomes.

[Table 8]

In Table 9, we apply another estimate of analyst pressure, *EPSD*, defined as the difference between the actual earnings per share (EPS) and the estimated counterparts, divided by stock price, to support our argument that the pressure effect exists. Although this measure is better estimation for the pressure effect (Guo et al., 2019), the difference between the actual EPS and the estimates is widely dispersed, and this is why we do not use it as our main variable. Panels A.1 and B.1 report the results of Equation (9), and panels A.2 and B.2 represent the estimation from Equation (10). Panel A.1 indicates that meeting the estimated EPS (I_{meet}) increases the likelihood of cutting R&D expenditure, similar to the U.S. case. However, the pressure effect is a short-term phenomenon, since columns (3) and (6) of panel A.1 show significantly positive results, which differs from the U.S. case. On the other hand, the result from CVC investment turns out to be insignificant, meaning that the pressure effect on CVC investment is relatively weak.

Panels A.2 and B.2 show the result for the effect of cutting R&D and CVC investment on innovation outcomes, respectively. Following Guo et al. (2019), we use the indicator variable (I_{meet}) to instrument R&D cut and CVC investment, and report the result from the second-stage regression. Both panels indicate that a decrease in R&D and CVC investment does not increase the innovation outcomes, further supporting our previous argument that the pressure effect on managers to cut the two channels persists. This is consistent with the case in the U.S., since the reduction in R&D does not affect innovation output of the U.S. firms either.

[Table 9]

2.4 Conclusion

This study relates to the growing body of literature, in that it addresses how financial markets influence efforts and outcomes of innovation by firms. Among factors that affect corporate long-term innovation, there are conflicting views regarding the information pressure effects of financial analysts. Specifically, when analysts release reliable information to the market, managers have stronger incentive to pursue innovative projects, whereas they also face short-term pressure to meet the estimated EPS, which impels them to cut long-term expense such as R&Ds. This study adds on this literature by investigating the effect of analysts on firms in emerging markets, where firms face higher uncertainties to undertake innovative long-term strategies, and large conglomerates hold higher comparative advantage to undertake innovations as well as successful start-ups that grow into innovative giants.

Using data on publicly traded non-financial Korean firms in 2010–2018, we establish the following patterns: analysts put pressure on firms' R&D and CVC investments; analyst coverage encourages a firm to undertake acquisitions as well as acquire innovative targets.

The former consequence of the pressure effect of financial analysts gets more pronounced when group-affiliated firms are followed by analysts from group-affiliated brokerage. We further examine if increased acquisitions are due to the direct effect from analysts and find that the substitution out of the decrease in CVC investment exists unlike in the case of the U.S. Moreover, innovation outcomes, as measured in three-year-forward number of patents, are negatively affected by the decrease in R&D and CVC investment, even when we take into account the analyst effect on the two strategies. Additionally, we apply another measure, *EPSD*, and provide evidence that the pressure effect exists in the R&D cut, *that is*, R&D change and R&D cut out of the alternative coverage measure turns out to be negative and positive, respectively. Additionally, the pressure effect on both CVC and R&D investment does not increase the long-term outcomes, meaning that the pressure effect is stronger in Korean market.

Overall, findings in this study support the argument that analyst coverage is a disciplinary tool against managers to reallocate long-term expenses. Even if financial analysts increase firms' acquisition activity, this increase results from indirect substitution of the decrease in R&D. What is unique about Korean firms is that the uncertainty faced by firms on CVC investment induces managers to cut the external innovation out of the pressure they get from the analyst coverage. Moreover, the chaebol structure provides analysts with extra incentive to increase their estimates on their affiliated companies, thereby increasing the pressure effect on managers to decrease acquisitions. We believe that these findings are not restricted to Korean market, since its market structure and group-affiliation can be seen in many emerging markets. The contribution of this study is that the higher difficulty in undertaking long-term innovation efforts, faced by firms in emerging market, may result in the pressure effect of the number of financial analysts; the positive bias in group-affiliated analysts hold higher impact on firms' decision to innovate; higher uncertainties associated with external innovation, such as CVC investment, can be either

substituted via increased acquisition or out of the pressure effect from financial analysts.

Nevertheless, findings in this study do not necessarily argue against the information effect the and subsequent effect on innovation outcomes. As shown in the sub-sample analysis, the information effect exists in firms from high-tech industries. Given that the indirect effect on acquisition from substituting the decrease in CVC investment exists, the final outcome depends on whether parent firms' innovation recovers when they reduce or terminate CVCs (Ma, 2020). Instead, this paper highlights that the short-term analysts' forecasts can influence a firm's long-term decision. Moreover, the benefits are not limited at the firm level, given that, due to its spillover effect, the technological development benefits not only a firm but also other participants in the industry and their subsequent innovation efforts; we leave this for future research.

References

Acharya, V., and Xu, Z., 2017, Financial dependence and innovation: The case of public versus private firms, *Journal of Financial Economics* 124, pp. 223-243.

Bebchuk, L. A., A. Cohen, and C. C. Wang, 2013 Learning and the disappearing association between governance and returns, *Journal of Financial Economics* 108.2, pp. 323-348.

Bena, J., and K. Li, 2014, Corporate innovations and mergers and acquisitions, *Journal of Finance* 69, pp. 1923-1960.

Benner, M. J., and R. Ranganathan, 2012, Offsetting illegitimacy? How pressures from securities analysts influence incumbents in the face of new technologies, *Academy of Management Journal* 55, pp. 213-233.

Benson, D., and R. H. Ziedonis, 2010, Corporate venture capital and the returns to acquiring portfolio companies, *Journal of Financial Economics* 98, pp. 478-499.

Brown, J. R., and B. C. Petersen, 2011, Cash holdings and R&D smoothing, *Journal of Corporate Finance* 17, pp. 694-709.

Chen, E., I. Gavious, and B. Lev, 2017, The positive externalities of IFRS R&D capitalization: enhanced voluntary disclosure, *Review of Accounting Studies* 22, pp. 677-714.

Cho, E., and W. Kim, 2019, Do Bad Targets Become Worse Targets?: Evidence from Sequential Transfers of Control Blocks, Working Paper.

Corwin, S. A., S. A. Larocque, and M. A. Stegemoller, 2017, Investment banking relationships and analyst affiliation bias: The impact of the global settlement on sanctioned and non-sanctioned banks, *Journal of Financial Economics* 124, pp. 614-631.

Dechow, P. M., and R. G. Sloan, 1991, Executive incentives and the horizon problem: An empirical investigation, *Journal of Accounting and Economics* 14, pp. 51-89.

Derrien, F., and A. Kecskés, 2013, The real effects of financial shocks: Evidence from exogenous changes in analyst coverage, *Journal of Finance* 68, pp. 1407-1440.

Dushnitsky, G., and M. J. Lenox, 2006, When does corporate venture capital investment create firm value?, *Journal of Business Venturing* 21, pp. 753-772.

Gaba, V., and S. Bhattacharya, 2012, Aspirations, innovation, and corporate venture capital: A behavioral perspective, *Strategic Entrepreneurship Journal* 6, pp. 178-199.

González-Uribe, J., 2020. Exchanges of innovation resources inside venture capital portfolios, *Journal of Financial Economics* 135, pp. 144-168.

Guo, B., D. Pérez-Castrillo, and A. Toldrà-Simats, 2019. Firms' innovation strategy under the shadow of analyst coverage, *Journal of Financial Economics* 131, pp. 456-483.

He, J. J., and X. Tian, 2013. The dark side of analyst coverage: the case of innovation, *Journal of Financial Economics* 109, pp. 856-878.

Jegadeesh, N., and W. Kim, 2006, Value of analyst recommendations: International

evidence, *Journal of Financial Markets* 9, pp. 274-309.

Joh, S. W., 2003, Corporate governance and firm profitability: evidence from Korea before the economic crisis, *Journal of Financial Economics* 68, pp. 287-322.

Khatami, S. H., M. Marchica, and R. Mura, 2015, Corporate acquisitions and financial constraints, *International Review of Financial Analysis* 40, pp. 107-121.

Kim, W., Y. Ko, and S. Wang, 2019, Debt restructuring through equity issues, *Journal of Banking and Finance* 106, pp. 341-356.

Kim, Y., Y. Kim, and J. Lee, 2011, Corporate venture capital and its contribution to intermediate goods firms in South Korea, *Asian Economic Journal* 25, pp. 309-329.

Kolasinski, A. C., and N. Yang, 2018, Managerial myopia and the mortgage meltdown, *Journal of Financial Economics* 128, pp. 466-485.

La Porta, R., F. Lopez-de-Silanes, and A. Shleifer, 1999, Corporate ownership around the world, *Journal of Finance* 54, pp. 471-517.

Lee, C. M., and E. C. So, 2017, Uncovering expected returns: Information in analyst coverage proxies, *Journal of Financial Economics* 124, pp. 331-348.

Lewis, C. M., and Y. Tan, 2016, Debt-equity choices, R&D investment and market timing, *Journal of Financial Economics* 119, pp. 599-610.

Lim, Y., and H. Kim, 2019, Market reaction to optimistic bias in the recommendations of chaebol-affiliated analysts, *Journal of Contemporary Accounting & Economics* 15, pp. 224-242.

Ma, S., 2020, The life cycle of corporate venture capital, *Review of Financial Studies* 33, pp. 358-394.

Mantecon, T., and Z. Altintig, 2012, Chaebol-affiliated analysts: conflicts of interest and market responses, *Journal of Banking and Finance* 36, pp. 584-596.

Merkley, K. J., R. Michaely, and J. Pacelli, 2017, Does the scope of the sell-side analyst industry matter? An examination of bias, accuracy, and information content of analyst

reports, *Journal of Finance* 72, pp. 1285-1334.

Organisation for Economic Co-opration and Development, 2011. ISIC Rev. 3. Technology Intensity Definition: Classification of Manufacturing Industries into Categories Based on R&D Intensities, OECD Directorate for Science, Technology and Industry, Economic Analysis and Statistics Devision.

Rajamani, S. S., and S. R. Velamuri, Corporate Venture Capital Programmes in China and India.

Rajan, R. G., and L. Zingales, 1996, Financial dependence and growth, No. w5758. National bureau of economic research.

Seru, A., 2014, Firm boundaries matter: Evidence from conglomerates and R&D activity, *Journal of Financial Economics* 111, pp. 381-405.

Stock, J. H., J. H. Wright, J. H., and M. Yogo, 2002, A survey of weak instruments and weak identification in generalized method of moments, *Journal of Business & Economic Statistics* 20, pp. 518-529.

Teece, D. J., 2010, Technological innovation and the theory of the firm: the role of enterprise-level knowledge, complementarities, and (dynamic) capabilities, In: Rosenberg, N., Hall, B. H. (Eds.), *Handbook of the Economics of Innovation, Handbook of the Economics of Innovation*, vol. 1. Elsevier B. V., pp. 679-730.

Teppo, T., and R. Wüstenhagen, 2009, Why corporate venture capital funds fail–evidence from the European energy industry, *World Review of Entrepreneurship, Management and Sustainable Development* 5, pp. 353-375.

Wang, J. H., and C. Tsai, 2010, National model of technological catching up and innovation: Comparing patents of Taiwan and South Korea, *The Journal of Development Studies* 46, pp. 1404-1423.

Yoo, Y., and H. Park, 2016, The informational content of changes in stock recommendation: Chaebol vs. non-chaebol affiliated analysts, *Journal of Applied Business Research* 32,

pp. 1687-1696.

Yu, F. F., 2008, Analyst coverage and earnings management, *Journal of Financial Economics* 88, pp. 245-271.

<Appendix> Variable definitions

This table describes the definitions for all variables used on the sample of Korean public firms from 2010 to 2018. Variable constructions are based on Guo et al. (2019).

Variable	Definition
RDChange	The difference between R&D expense / total assets at time *t* and that at time *t*-1
RDCut	Dummy variable equals to one if the R&D / total asset at time *t* is lower than that at time *t*-1, and zero otherwise
Acq	Dummy variable that equals one if a firm acquires one or more targets in a given year, and zero otherwise
lnAcq	Natural log of one plus the number of target firms acquired in a given year
CVC1	Dummy variable that equals one when a firm invests in a CVC fund whose portfolio start-up with the largest weight is less than three years old and zero otherwise.
CVC2	Dummy variable that equals one when a firm invests in a CVC fund whose portfolio start-up with the largest weight is at least three but less than seven years old and zero otherwise
CVC3	Dummy variable that equals one when a firm invests in a CVC fund whose portfolio start-up with the largest weight is at least seven years old and zero otherwise
lnTargPatent	Natural log of one plus the total number of patents of all target firms
lnTargGrant	Natural log of one plus the total number of granted patents of all target firms
lnPatents	Natural log of one plus the number of annual patents of a firm
lnGranted	Natural log of one plus the number of annual granted patents of a firm
lnCoverage	Natural log of one plus the annual average number of earnings estimates from financial analysts
EPSD	The difference between the actual EPS and EPS forecast / stock price
I_{Meet}	Indicator variable equal to one if a firm meets EPS forecast and zero otherwise.
Size	Natural log of total assets
RDratio	R&D expense / total assets
Age	The number of years since a firm first appears in DataguidePro
Leverage	Total debt / total assets
Cash	Cash / total assets
ROE	Operating income before depreciation / total stockholders' equity
PPE	Property, plant and equipment / total assets
CAPEX	Capital expenditure / total assets
InstOwn	The combined shareholding of institutional investors for a firm as provided in TS-2000 and Data Analysis, Retrieval and Transfer System (DART) database
Q	(Market value of equity + total assets – book value of equity – deferred tax) / total assets (Guo et al., 2019)
KZIndex	-1.002 * cash flow [(income before extraordinary item + depreciation) / property, plant and equipment]+ 0.283 * Tobin's Q (*Q*) + 3.139 * leverage (*Leverage*) – 39.368 * dividends [(common dividends + preferred dividends) / property, plant and equipment] – 1.315 * cash holdings [cash / property, plant and equipment] (Guo et al., 2019)

(continued)

CGIndex	Collected and summated from Korea Corporate Governance Service (KCGS) which evaluates firms' governance practices in terms of sub-categories including protection for shareholder rights, board independence, and managerial transparency for disclosures and audit.
MktShare	Market share computed as sales divided by the sum of sales of all firms within the two-digit Korean Standard Statistical Classification (KSIC) code
HHI	Herfindahl-Hirschman index for sample firms' two-digit KSIC code, calculated as $\sum_{i=1}^{N} MktShare_i^2$, where N is the number of firms in the two-digit KSIC industry.
GA	A dummy variable set equal to one if a covered firm and an estimating analyst's brokerage belongs to a business group during a given firm-year, and zero otherwise. Business groups are identified from the list of large business groups designated by the Korea Fair Trade Commission (KFTC) every year.
SameGA	A dummy variable set equal to one if both the covered firm and the estimating analyst's brokerage belong to the same business group during a given firm-year, and zero otherwise.
HT	A dummy variable set equal to one if a firm belongs to their KSIC codes of which the code 20, 21, 26-31, 35, 49, 61, 62, 70, 86 is based on OECD (2011) definition of high-tech industries and zero otherwise.
GoodGov	A dummy variable set equal to one if a firm's corporate governance index (*CGIndex*) is higher than the sample mean value of *CGIndex*, and zero otherwise.

<Table 1> Descriptive statistics

This table reports the summary statistics, including number of observations, mean, standard deviation, 25th percentile, median, and the 75th percentile of variables used in the analyses. The data corresponds to Korean non-financial firms for the period 2010-2018. All variable definitions are described in the Appendix.

Variable	N	Mean	Std Dev	p25	Median	p75
RDratio	17,099	0.016	0.039	0.000	0.002	0.018
RDchange	17,139	-0.00004	0.013	-0.0003	0.000	0.0003
RDcut	16,312	0.296	0.457	0.000	0.000	1.000
Acq	18,351	0.012	0.109	0.000	0.000	0.000
lnAcq	18,351	0.009	0.080	0.000	0.000	0.000
CVC1	18,351	0.047	0.211	0.000	0.000	0.000
CVC2	18,351	0.044	0.206	0.000	0.000	0.000
CVC3	18,351	0.042	0.201	0.000	0.000	0.000
lnTargPatent	897	1.878	1.897	0.000	1.386	3.135
lnTargGrant	897	1.820	1.803	0.000	1.386	3.135
lnPatents	18,305	1.005	1.413	0.000	0.000	1.609
lnGranted	18,305	0.986	1.319	0.000	0.693	1.609
lnCoverage	18,351	1.839	3.263	0.000	0.000	0.000
EPSD	14,978	-0.038	2.765	-0.066	-0.0008	0.061
Size	17,099	18.737	1.451	17.812	18.541	19.458
Age	18,351	24.133	17.808	12.000	19.000	37.000
Leverage	17,099	0.371	0.232	0.198	0.358	0.517
Cash	17,099	0.088	0.102	0.020	0.054	0.118
ROE	17,188	0.059	0.195	0.004	0.056	0.135
PPE	17,099	0.265	0.192	0.106	0.246	0.392
CAPEX	17,095	0.038	0.122	0.001	0.018	0.057
InstOwn	18,351	5.169	8.661	0.000	0.000	8.320
Q	17,099	1.293	0.977	0.751	1.005	1.474
KZIndex	15,001	-20.709	105.999	-3.231	0.002	1.322
CGIndex	18,351	28.023	44.605	0.000	0.000	65.000
MktShare	18,351	0.004	0.026	0.0001	0.0002	0.0006
HHI	18,351	0.001	0.015	0.000	0.000	0.000

<Table2> Number of analyst and R&D expenses

This table shows OLS (panel A) and 2SLS (Panel B) estimation results of the effect of analysts (*lnCoverage*). The dependent variables are: the change in the ratio of R&D expense to total assets one and two years ahead (*RDChange*) in column (1) and (2); and the dummy equal to one if a firm reduces its R&D ratio and zero otherwise one and two years ahead (*RDCut*) in column (3) and (4). In Panel B, column (1) shows the first-stage regression where *lnCoverage* is instrumented, and column (2) to (5) shows the result from the second-stage of R&D change and R&D cut, respectively. Control variables include *Size, RDRatio, Age, Leverage, Cash, ROE, PPE, CAPEX, InstOwn, Q, KZIndex, CGIndex, MktShare* and *HHI*. Standard errors are in parentheses, and ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively. All variable definitions are in Appendix.

Panel A : OLS				
Dependent	*RDChange*		*RDCut*	
	(1)	(2)	(3)	(4)
	t+1	t+2	t+1	t+2
lnCoverage	0.00002	-0.00006	-0.0029	0.0021
	(0.00004)	(0.00007)	(0.0020)	(0.0024)
Control Variable	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes
Firm Fixed Effect	Yes	Yes	Yes	Yes
No. of obser	12,976	10,800	11,004	9,106
R^2	0.14	0.17	0.38	0.31

Panel B: IV 2SLS					
Dependent	First-Stage	Second-Stage			
	LnCoverage	*RDChange*		*RDCut*	
	(1)	(2)	(3)	(4)	(5)
	t	t+1	t+2	t+1	t+2
ExpectedCoverage	0.1335***				
	(0.0026)				
$\widehat{lnCoverage}$		-0.0004***	-0.0002	-0.0066	0.0067
		(0.0001)	(0.0002)	(0.0047)	(0.0057)
Size	0.8327***	0.0051***	0.0016***	-0.0444**	-0.0450**
	(0.0612)	(0.0004)	(0.0006)	(0.0180)	(0.0212)
RDratio	3.4848***			5.1578***	2.5004***
	(1.0192)			(0.2651)	(0.3603)
Age	-0.1842***	-0.0003	0.00006	-0.0086	-0.0183**
	(0.0643)	(0.0003)	(0.0005)	(0.0134)	(0.0078)
Leverage	-0.9333***	-0.0032***	-0.0035***	-0.0720*	-0.0002
	(0.1462)	(0.0008)	(0.0013)	(0.0378)	(0.0454)
Cash	-0.5862**	-0.0033**	0.0002	-0.0451	-0.0142
	(0.2624)	(0.0015)	(0.0023)	(0.0690)	(0.0859)
ROE	0.5576***	0.0034***	-0.0003	-0.0507*	-0.0446
	(0.1160)	(0.0006)	(0.0010)	(0.0283)	(0.0336)
PPE	0.2740	-0.0043***	0.0016	0.2324***	0.1226
	(0.2603)	(0.0015)	(0.0024)	(0.0721)	(0.0849)
CAPEX	0.1154	0.0026***	-0.0004	-0.0750*	0.0351
	(0.1674)	(0.0009)	(0.0013)	(0.0394)	(0.0462)
InstOwn	0.0052*	-0.00003**	-0.00002	-0.0005	-0.0004
	(0.0031)	(0.00002)	(0.00003)	(0.0008)	(0.0009)

(continued)

Dependent	First-Stage	Second-Stage			
	LnCoverage	*RDChange*		*RDCut*	
	(1)	(2)	(3)	(4)	(5)
	t	t+1	t+2	t+1	t+2
Q	0.2660***	0.0003**	0.0002	-0.0002	-0.0085
	(0.0273)	(0.0002)	(0.0002)	(0.0073)	(0.0094)
KZIndex	-0.0007***	-0.000001	-0.000001	0.00001	-0.0001
	(0.0002)	(0.000001)	(0.000002)	(0.00005)	(0.0001)
CGIndex	-0.0025**	-0.00001**	0.00001	0.0001	0.0006*
	(0.0010)	(0.000005)	(0.00001)	(0.0003)	(0.0004)
MktShare	11.8821*	-0.0768**	-0.0135	4.5701***	3.6135**
	(6.2153)	(0.0343)	(0.0500)	(1.5153)	(1.7299)
HHI	-44.1626**	0.1348	0.0671	-11.7007***	-9.7218**
	(17.6457)	(0.0943)	(0.1311)	(3.9736)	(4.5183)
Year Fixed	Yes	Yes	Yes	Yes	Yes
Firm Fixed	Yes	Yes	Yes	Yes	Yes
No. of Obs	14,997	12,976	10,800	11,044	9,106
F-statistic	15.27				
R^2	0.71	0.14	0.17	0.38	0.31

<Table3> Number of analyst and CVC investments

This table shows OLS (panel A) and 2SLS (Panel B) estimation results of the effect of analysts (*lnCoverage*). The dependent variables are: a dummy variable equal to one if a firm starts its CVC for a firm with less than three years old and zero otherwise in column (1) and (2) (*CVC1*); a dummy variable equal to one if firms's CVC invests in a start-up with at least three but less than seven years old and zero otherwise in column (3) and (4) (*CVC2*); and a dummy variable equal to one if firms's CVC invests in a start-up with at least seven years old and zero otherwise in column (5) and (6) (*CVC3*). In Panel B, column (1) to (6) shows the result from the second-stage of the three dependent variables, respectively. Control variables include *Size, RDRatio, Age, Leverage, Cash, ROE, PPE, CAPEX, InstOwn, Q, KZIndex, CGIndex, MktShare* and *HHI*. Standard errors are in parentheses, and ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively. All variable definitions are in Appendix.

Panel A : OLS						
Dependent	*CVC1*		*CVC2*		*CVC3*	
	(1)	(2)	(3)	(4)	(5)	(6)
	t+1	t+2	t+1	t+2	t+1	t+2
lnCoverage	-0.0003	-0.0005	-0.0005	-0.0013**	0.0002	-0.0011**
	(0.0005)	(0.0006)	(0.0005)	(0.0005)	(0.0005)	(0.0005)
Control Variable	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Firm Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
No. of obs.	14,996	14,995	14,996	14,995	14,996	14,995
R^2	0.61	0.49	0.59	0.48	0.60	0.48
Panel B: IV 2SLS						
Dependent	Second-Stage					
	CVC1		*CVC2*		*CVC3*	
	(1)	(2)	(3)	(4)	(5)	(6)
	t+1	t+2	t+1	t+2	t+1	t+2
$\widehat{lnCoverage}$	-0.0002	-0.0009	-0.0011	-0.0027**	0.00004	-0.0022*
	(0.0013)	(0.0014)	(0.0013)	(0.0013)	(0.0013)	(0.0013)
Size	0.0109**	0.0218***	0.0116***	0.0248***	0.0077*	0.0190***
	(0.0044)	(0.0046)	(0.0044)	(0.0045)	(0.0043)	(0.0044)
RDRatio	0.0141	0.0104	0.0179	0.0326	-0.0017	0.0270
	(0.0686)	(0.0711)	(0.0688)	(0.0700)	(0.0667)	(0.0687)

(continued)

Dependent	Second-Stage					
	CVC1		*CVC2*		*CVC3*	
	(1) t+1	(2) t+2	(3) t+1	(4) t+2	(5) t+1	(6) t+2
Age	-0.0416***	-0.0017	-0.0354***	-0.0023	-0.0380***	-0.0017
	(0.0043)	(0.0045)	(0.0043)	(0.0044)	(0.0042)	(0.0043)
Leverage	-0.0011	-0.0052	0.0042	-0.0083	-0.0006	-0.0201**
	(0.0099)	(0.0102)	(0.0099)	(0.0101)	(0.0096)	(0.0099)
Cash	0.0045	0.0224	-0.0132	0.0077	0.0109	0.0175
	(0.0176)	(0.0182)	(0.0176)	(0.0180)	(0.0171)	(0.0176)
ROE	-0.0150*	-0.0054	-0.0074	-0.0107	-0.0127*	-0.0030
	(0.0078)	(0.0081)	(0.0078)	(0.0080)	(0.0076)	(0.0078)
PPE	-0.0254	0.0087	-0.0392**	0.0099	-0.0051	0.0066
	(0.0175)	(0.0181)	(0.0175)	(0.0178)	(0.0170)	(0.0175)
CAPEX	0.0177	-0.0568***	0.0090	-0.0448***	0.0165	-0.0392***
	(0.0112)	(0.0116)	(0.0112)	(0.0114)	(0.0109)	(0.0112)
InstOwn	-0.0003	-0.00001	-0.0002	-0.0001	-0.0002	-0.0002
	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)
Q	-0.0002	0.0011	0.0002	0.0010	-0.0010	0.0009
	(0.0019)	(0.0019)	(0.0019)	(0.0019)	(0.0018)	(0.0019)
KZIndex	-0.0001	0.00004**	0.00001	0.00004**	-0.00001	0.00001
	(0.00001)	(0.00001)	(0.00002)	(0.00001)	(0.00002)	(0.00002)
CGIndex	0.0001	0.0005***	0.0001*	0.0005***	0.0002**	0.0005***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
MktShare	-0.1586	0.2363	0.3803	0.2093	0.7491*	0.5746
	(0.4175)	(0.4321)	(0.4182)	(0.4258)	(0.4055)	(0.4180)
HHI	0.7011	-0.2287	-0.6359	-0.4358	-1.5059	-0.9356
	(1.1852)	(1.2268)	(1.1873)	(1.2089)	(1.1512)	(1.1867)
Year Fixed	Yes	Yes	Yes	Yes	Yes	Yes
Firm Fixed	Yes	Yes	Yes	Yes	Yes	Yes
No. of Obs	14,996	14,995	14,996	14,995	14,996	14,995
R^2	0.61	0.49	0.59	0.48	0.60	0.48

<Table4> Number of analyst and acquisition

This table shows OLS (panel A) and 2SLS (Panel B) estimation results of the effect of analysts (*lnCoverage*). The dependent variables are: a dummy variable equal to one if a firm acquires one or more targets and zero otherwise (*Acq*) in column (1) and (2); and the natural log of one plus the number of targets (*lnAcq*) in column (3) and (4). In Panel B, column (1) to (4) shows the result from the second-stage of the two dependent variables, respectively. Control variables include *Size, RDRatio, Age, Leverage, Cash, ROE, PPE, CAPEX, InstOwn, Q, KZIndex, CGIndex, MktShare* and *HHI*. Standard errors are in parentheses, and ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively. All variable definitions are in Appendix.

Panel A : OLS

Dependent	*Acq*		*lnAcq*	
	(1) t+1	(2) t+2	(3) t+1	(4) t+2
lnCoverage	0.000002	0.0010*	0.0001	0.0008*
	(0.0005)	(0.0006)	(0.0004)	(0.0004)
Control Variable	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes
Firm Fixed Effect	Yes	Yes	Yes	Yes
No. of obser	12,985	11,002	12,985	11,002
R^2	0.18	0.20	0.19	0.20

Panel B: IV 2SLS

Dependent	Second-Stage			
	Acq		*lnAcq*	
	(1) t+1	(2) t+2	(3) t+1	(4) t+2
$\widehat{lnCoverage}$	0.0035***	0.0005	0.0024***	0.0003
	(0.0012)	(0.0014)	(0.0009)	(0.0010)
Size	-0.0095**	-0.0061	-0.0076**	-0.0052
	(0.0043)	(0.0052)	(0.0031)	(0.0038)
RDratio	-0.0773	0.0243	-0.0594	0.0121
	(0.0663)	(0.0761)	(0.0481)	(0.0554)
Age	0.0045	-0.0015	0.0034	-0.0010
	(0.0037)	(0.0039)	(0.0027)	(0.0028)
Leverage	0.0094	0.0080	0.0084	0.0062
	(0.0094)	(0.0108)	(0.0069)	(0.0079)
Cash	0.0655***	0.0213	0.0457***	0.0111
	(0.0168)	(0.0198)	(0.0122)	(0.0144)
ROE	-0.0026	-0.0166**	-0.0015	-0.0122**
	(0.0072)	(0.0081)	(0.0052)	(0.0059)
PPE	0.0270	0.0398*	0.0188	0.0309**
	(0.0170)	(0.0207)	(0.0124)	(0.0151)
CAPEX	-0.0317***	0.0129	-0.0231***	0.0093
	(0.0103)	(0.0113)	(0.0075)	(0.0082)
InstOwn	0.00005	0.0003	0.0001	0.0003
	(0.0002)	(0.0002)	(0.0001)	(0.0002)
Q	0.0032*	0.0041**	0.0029**	0.0031**
	(0.0018)	(0.0021)	(0.0013)	(0.0015)

(continued)

Dependent	*Acq*		*lnAcq*	
	(1) t+1	(2) t+2	(3) t+1	(4) t+2
KZIndex	0.00001	0.00002	0.00001	0.00001
	(0.0001)	(0.0001)	(0.00001)	(0.00001)
CGIndex	-0.0002**	-0.0002**	-0.0001***	-0.0001**
	(0.0001)	(0.0001)	(0.00005)	(0.0001)
MktShare	-1.2580***	0.2809	-0.8964***	0.1252
	(0.3842)	(0.4347)	(0.2791)	(0.3168)
HHI	3.2227***	-0.5515	2.3194***	-0.2282
	(1.0543)	(1.1400)	(0.7660)	(0.8307)
Year Fixed	Yes	Yes	Yes	Yes
Firm Fixed	Yes	Yes	Yes	Yes
No. of Obs	12,985	11,002	12,985	11,002
R^2	0.19	0.20	0.19	0.20

<Table5> Number of analysts and innovative acquisition

This table shows the 2SLS regressions for the effect of analyst coverage on the acquisition of innovative target firms. The dependent variables are: the natural log of one plus the total number of patents on average of all target firms when they are acquired (*lnTargPatent*) in column (1) and (2); and the natural log of one plus the total number of granted patents of all targets up to the acquisition (*lnTargGrant*) period in column (3) and (4). Control variables include *Size, RDRatio, Age, Leverage, Cash, ROE, PPE, CAPEX, InstOwn, Q, KZIndex, CGIndex, MktShare* and *HHI*. Standard errors are in parentheses, and ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively. All variable definitions are in Appendix.

Dependent	*lnTargPatent*		*lnTargGrant*	
	(1)	(2)	(3)	(4)
	t+1	t+2	t+1	t+2
$\widehat{lnCoverage}$	0.1336***	0.0238	0.1214***	0.0252
	(0.0390)	(0.0401)	(0.0367)	(0.0380)
Control Variable	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes
Industry Fixed Effect	Yes	Yes	Yes	Yes
No. of obs	787	633	787	633
R^2	0.24	0.19	0.26	0.20

<Table 6> Split sample analysis

This table reports the 2SLS regression on the effect of financial analysts on one-year forward innovation by splitting the sample. In panel A, we define group affiliated analysts(*GA*) as analysts working for a group-affiliated brokerage estimating group-affiliated firms, based on Fair Trade Commision (FTC); In panel B, we define same group affiliated analysts(*SameGA*) as analysts working for a group-affiliated brokerage estimating firms in the same business groups; in Panel C, we split the sample in high-tech industries (*HT*), following industry classification of OECD (2011); in panel D, we split the sample by the mean value based on *CGIndex* (*GoodGov*). In all regressions, we include control variables which are *Size, RDRatio, Age, Leverage, Cash, ROE, PPE, CAPEX, InstOwn, Q, KZIndex, CGIndex, MktShare* and *HHI*, and firm and year fixed effects. Standard errors are in parentheses. ***, **, and * shows significance at the 1%, 5%, and 10%, respectively. All variable definitions are in Appendix.

Panel A: Group Affiliated Analysts (*GA*)								
Dep.	*RDChange*	*RDCut*	*Acq*	*lnAcq*	*lnTargPatent*	*lnTargGrant*	*CVC2*	*CVC3*
Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
*lnCoverage**	0.0002	-0.0077	-0.0038**	-0.0027**	-0.0116	-0.0064	0.0010	-0.0027
GA	(0.0001)	(0.0067)	(0.0016)	(0.0012)	(0.0450)	(0.0471)	(0.0018)	(0.0017)
No.Obs	12,976	11,004	12,985	12,985	787	787	14,996	14,996
R^2	0.14	0.38	0.19	0.19	0.24	0.26	0.59	0.60
Panel B: Group Affiliated Analysts estimating the same business groups (*SameGA*)								
Dep.	*RDChange*	*RDCut*	*Acq*	*lnAcq*	*lnTargPatent*	*lnTargGrant*	*CVC2*	*CVC3*
Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
*lnCoverage**	0.0001	-0.0060	-0.0034*	-0.0023*	-0.0569	-0.0468.	0.0032*	-0.0028
SameGA	(0.0002)	(0.0075)	(0.0018)	(0.0013)	(0.0513)	(0.0483)	(0.0019)	(0.0018)
No.Obs	12,976	11,004	12,985	12,985	787	787	14,996	14,996
R^2	0.14	0.38	0.19	0.19	0.24	0.26	0.59	0.60
Panel C: High-tech (*HT*) industries								
Dep.	*RDChange*	*RDCut*	*Acq*	*lnAcq*	*lnTargPatent*	*lnTargGrant*	*CVC2*	*CVC3*
Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
LnCoverage	-0.00001	-0.0036*	0.0005	0.0002	0.0296	0.0346	0.0024***	0.0016**
**HT*	(0.00004)	(0.0021)	(0.0001)	(0.0004)	(0.0323)	(0.0304)	(0.0007)	(0.0007)
No.Obs	12,976	11,004	12,985	12,985	787	787	14,996	14,996
R2	0.01	0.08	0.01	0.01	0.27	0.29	0.16	0.16

(continued)

Panel D: Good Corporate Governance (*GoodGov*)								
Dep. Variable	*RDChange* (1)	*RDCut* (2)	*Acq* (3)	*lnAcq* (4)	*lnTargPatent* (5)	*lnTargGrant* (6)	*CVC2* (7)	*CVC3* (8)
LnCoverage	0.00003	-0.0017	-0.0051***	-0.0042***	-0.0546	-0.0257	-0.0109***	-0.0121***
**GoodGov*	(0.0001)	(0.0056)	(0.0013)	(0.0009)	(0.0346)	(0.0325)	(0.0008)	(0.0008)
No.Obs	12,976	11,004	12,985	12,985	787	787	14,996	14,996
R2	0.14	0.38	0.19	0.20	0.25	0.27	0.17	0.17

<Table 7> Direct versus indirect effect

This table reports the 2SLS estimation results of the effect of interaction between analyst coverage and R&D Cut (Panel A.1 and Panel A.2) as well as CVC investment for mid-age start-ups (*CVC2,* Panel B). Panel A.1 is the effect on acquisitions and panel A.2 is on innovative acquisitions. Dependent variables are: a dummy variable (*Acq*) equal to one if a firm acquires one or more targets and zero otherwise in column (1) and (2); and the natural log of one plus the number of targets (*lnAcq*) in column (3) and (4) for panel A.1 and B.1; the natural log of one plus the total number of patents on average of all target firms (*lnTargPatent*) when they are acquired in column (1) and (2); and the natural log of one plus the total number of granted patents of all targets (*lnTargGrant*) up to the acquisition period in column (3) and (4) for panel A.2. and B.2. In all regressions, we include control variables which are *Size, RDRatio, Age, Leverage, Cash, ROE, PPE, CAPEX, InstOwn, Q, KZIndex, CGIndex, MktShare* and *HHI,* and firm and year fixed effects. Standard errors are in parentheses, and ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively. All variable definitions are in Appendix.

Panel A.1 : R&D and acquisitions

Dependent	*Acq*		*lnAcq*	
	(1)	(2)	(3)	(4)
	t+1	t+2	t+1	t+2
$\widehat{lnCoverage}$	0.0036***	0.0003	0.0024**	0.0002
	(0.0013)	(0.0014)	(0.0009)	(0.0010)
RDCut	0.0004	-0.0066	-0.0003	-0.0017
	(0.0089)	(0.0094)	(0.0064)	(0.0068)
$\widehat{lnCoverage}$	0.0005	0.0008	0.0004	0.0003
$* RDCut$	(0.0007)	(0.0007)	(0.0005)	(0.0005)
No. of Obs	11,004	11,002	11,004	11,002
R^2	0.22	0.20	0.23	0.20

Panel A.2 : R&D and innovative acquisitions

Dependent	*lntargPatent*		*lntargGrant*	
	(1)	(2)	(3)	(4)
	t+1	t+2	t+1	t+2
$\widehat{lnCoverage}$	0.1877***	0.0314	0.1670***	0.0313
	(0.0448)	(0.0410)	(0.0427)	(0.0388)
RDcut	0.5350	0.3084	0.3218	0.2564
	(0.4607)	(0.4392)	(0.4392)	(0.4156)
$\widehat{lnCoverage}$	-0.0227	-0.0313	-0.0150	-0.0254
$* RDCut$	(0.0385)	(0.0356)	(0.0367)	(0.0337)
No. of Obs	665	633	665	633
R^2	0.28	0.19	0.28	0.20

(continued)

Panel B.1 : CVC and acquisitions				
Dependent	*Acq*		*lnAcq*	
	(1)	(2)	(3)	(4)
	t+1	t+2	t+1	t+2
$\widehat{lnCoverage}$	0.0034***	0.0008	0.0024***	0.0005
	(0.0012)	(0.0014)	(0.0009)	(0.0010)
CVC2	0.0012	0.0212	0.0009	0.0145
	(0.0163)	(0.0198)	(0.0118)	(0.0145)
$\widehat{lnCoverage}$	0.0013	-0.0042*	0.0008	-0.0029
$* CVC2$	(0.0021)	(0.0025)	(0.0015)	(0.0018)
No. of Obs	12,985	11,002	12,985	11,002
R^2	0.19	0.20	0.19	0.20
Panel B.2: CVC and innovative acquisition				
Dependent	*lntargPatent*		*lntargGrant*	
	(1)	(2)	(3)	(4)
	t+1	t+2	t+1	t+2
$\widehat{lnCoverage}$	0.1377***	0.0271	0.1241***	0.0273
	(0.0391)	(0.0402)	(0.0369)	(0.0381)
CVC2	0.1088	0.4278	-0.0962	0.3094
	(0.6918)	(0.7746)	(0.6517)	(0.7338)
$\widehat{lnCoverage}$	0.0446	0.0201	0.0468	0.0076
$* CVC2$	(0.0941)	(0.0963)	(0.0886)	(0.0912)
No. of Obs	787	633	787	633
R^2	0.24	0.19	0.26	0.20

<Table 8> Analyst coverage, innovation strategies, and outputs

This table reports the 2SLS regression results on the effect of analyst coverage interacted with the three innovation channels on future innovation outcomes: RD Cut, acquisition and CVCs for mid-age start-ups (*CVC2*). In column (2) to (4), we include interaction term between analyst coverage and R&D, acquisition and CVC, respectively. The dependent variables are: the natural log of one plus the number of three-year-forward patents (*lnPatents*) and granted patents by firms in the sample (*lnGranted*), respectively. In all regressions, we include control variables which are *Size, RDRatio, Age, Leverage, Cash, ROE, PPE, CAPEX, InstOwn, Q, KZIndex, CGIndex, MktShare* and *HHI,* and firm and year fixed effects. Standard errors are in parentheses. ***, ** and * indicate the significance level of 1%, 5% and 10%, respectively. All variable definitions are in Appendix.

Panel A: Patents

Dependent	*lnPatents(t+3)*			
	(1)	(2)	(3)	(4)
$\widehat{lnCoverage}$	-0.1114***	-0.1075***	-0.1072***	-0.1034***
	(0.0153)	(0.0154)	(0.0153)	(0.0155)
RDCut	-0.0715**	0.1203	-0.0706**	-0.0731**
	(0.0337)	(0.1051)	(0.0336)	(0.0336)
Acq	-0.2366*	-0.2323*	1.0433***	-0.2267*
	(0.1257)	(0.1257)	(0.3196)	(0.1256)
CVC2	-0.1496	-0.1535	-0.1517	0.5412**
	(0.1212)	(0.1212)	(0.1211)	(0.2351)
$\widehat{lnCoverage} * RDCut$		-0.0160*		
		(0.0083)		
$\widehat{lnCoverage} * acquisitions$			-0.0920***	
			(0.0211)	
$\widehat{lnCoverage} * CVC2$				-0.0972***
				(0.0284)
Control variables	yes	yes	yes	Yes
Year Fixed Effect	yes	yes	yes	yes
Firm Fixed	yes	yes	yes	yes
No. Obs	9,058	9,058	9,058	9,058
R^2	0.49	0.49	0.50	0.49

Panel B: Granted Patents

Dependent	*lnGranted(t+3)*			
	(1)	(2)	(3)	(4)
$\widehat{lnCoverage}$	-0.1051***	-0.1003***	-0.1022***	-0.0974***
	(0.0144)	(0.0145)	(0.0144)	(0.0145)
RDCut	-0.0450	0.1903*	-0.0443	-0.0465
	(0.0315)	(0.0985)	(0.0315)	(0.0315)
Acq	-0.2627**	-0.2574**	0.6321**	-0.2533**
	(0.1177)	(0.1177)	(0.2997)	(0.1177)
CVC2	-0.1049	-0.1097	-0.1064	0.5502**
	(0.1136)	(0.1135)	(0.1135)	(0.2203)
$\widehat{lnCoverage} * RDCut$		-0.0196**		
		(0.0078)		
$\widehat{lnCoverage} * acquisitions$			-0.0643***	
			(0.0198)	
$\widehat{lnCoverage} * CVC2$				-0.0922***
				(0.0266)
Control variables	yes	yes	yes	Yes
Year Fixed Effect	yes	yes	yes	Yes
Firm Fixed	yes	yes	yes	Yes
No. Obs	9,058	9,058	9,058	9,058
R^2	0.49	0.49	0.49	0.49

<Table 9> The effect of EPSD

This table reports the effect of the difference between actual EPS and EPS estimates (*EPSD)* on firm's R&D (Panel A.1) and that on long-term output (Panel A.2); Panel B.1 is the EPSD effect on CVCs for mid- and final-stage start-ups (*CVC2* and *CVC3*) and Panel B.2 is for their long-term outcomes. Panel A.1 and B.1 is from the OLS estimation of the effect of the indicator variable equal to one if a firm meets EPS forecast and zero otherwise (I_{Meet}), and *EPSD*. The dependent variables are: the change in R&D (*RDChange*) in column (1) to (3); and the dummy equal to one if a firm reduces its R&D ratio and zero otherwise (*RDCut*) in column (4) to (6). For panel A.2 and B.2, the dependent variables are: the natural log of one plus the number of three-year-forward patents (*lnPatent*, column (1)) and granted ones (*lnGranted*, column (2)). In all regressions, we include control variables which are *Size, RDRatio, Age, Leverage, Cash, ROE, PPE, CAPEX, InstOwn, Q, KZIndex, CGIndex, MktShare* and *HHI,* and firm and year fixed effects. Standard errors are in parentheses. ***, ** and * indicate the significance level of 1%, 5% and 10%, respectively. Variable definitions are in Appendix.

Panel A.1 : EPSD and R&D

Dependent	*RDChange*			*RDCut*		
	(1)	(2)	(3)	(4)	(5)	(6)
	t	t	t+1	t	t	t+1
I_{Meet}	-0.0004	-0.0004	0.0004*	0.0275***	0.0269***	-0.0296**
	(0.0003)	(0.0003)	(0.0002)	(0.0096)	(0.0096)	(0.0115)
EPSD	0.00001	-0.00007	-0.00005	0.0015	0.0064	-0.0087*
	(0.00005)	(0.0001)	(0.0001)	(0.0018)	(0.0045)	(0.0052)
EPSDpolynomial	1-order	2-order	2-order	1-order	2-order	2-order
Control variable	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed	Yes	Yes	Yes	Yes	Yes	Yes
No.Obs	13,353	13,353	11,403	13,353	13,353	9,540
R^2	0.14	0.14	0.14	0.36	0.36	0.40

Panel A.2 : EPSD, R&D investment, and patents

Dependent	*lnPatent*	*lnGranted*
	(1)	(2)
	t+3	t+3
$\widehat{RDCut}$	-1.4019	-0.8599
	(1.5177)	(1.4300)
Control variable	Yes	Yes
Year fixed	Yes	Yes
Firm Fixed	Yes	Yes
No.Obs	7,747	7,747
R^2	0.50	0.49

Panel B.1 : EPSD and CVC investment

Dependent	*CVC2*			*CVC3*		
	(1)	(2)	(3)	(4)	(5)	(6)
	t	t	t+1	t	t	t+1
I_{Meet}	0.0027	0.0029	-0.0028	-0.0048	-0.0047	0.0021
	(0.0032)	(0.0032)	(0.0034)	(0.0030)	(0.0030)	(0.0033)
EPSD	-0.0005	-0.0027*	-0.0010	-0.0001	-0.0002	0.0003
	(0.0006)	(0.0015)	(0.0016)	(0.0006)	(0.0014)	(0.0015)
EPSDpolynomial	1-order	2-order	2-order	1-order	2-order	2-order
Control variable	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed	Yes	Yes	Yes	Yes	Yes	Yes
Firm Fixed	Yes	Yes	Yes	Yes	Yes	Yes
No.Obs	13,353	13,353	13,352	13,353	13,353	13,352
R^2	0.70	0.70	0.59	0.72	0.72	0.60

(continued)

Panel B.2 : EPSD, CVC investment, and patents		
Dependent	*lnPatent*	*lnGranted*
	(1)	(2)
	t+3	t+3
$\widehat{CVC}2$	-178.7367	-109.6357
	(193.5118)	(182.3279)
Control variable	Yes	Yes
Year Fixed	Yes	Yes
Firm Fixed	Yes	Yes
No.Obs	7,747	7,747
R^2	0.50	0.49

국문초록

기업재무에 관한 연구

최 윤 영

서울대학교 대학원

경영학과 경영학 전공

본 연구는 기업의 재무적 곤경, 애널리스트 커버리지와 기업혁신 등 기업재무에 관한 2개의 소논문으로 구성되어 있다. 첫 번째 논문에서는 집중된 주식의 소유와 집중된 은행 채무에 대한 의존도가 높은 국내 환경에서 기업의 성공적인 구조조정을 이끄는 요인을 분석한다. 재무적 곤경에 처한 외감 기업을 대상으로 분석한 결과, 성공적인 구조 조정을 위해서는 최대 주주 변경을 동반한 제 3자 배정 신주 발행이 수반되어야 하는 것으로 나타났다. 이러한 결과는 피인수기업이 대기업 집단에 속할 때 더 뚜렷하게 나타남을 확인하였다. 또한 이러한 현상은 Cox 위험 모형 (Cox regression)과 내생성을 감안한 매칭 분석 결과를 통해서도 확인되었다. 본 연구 결과는 투자자 보호가 약하고, 은행 부채 의존으로 인한 적극적인 채권자의 역할이 부재한 환경에서는 자기 자본 유입과 최대 주주 변경이 기업 구조조정에 중요한 요인임을 시사한다. 또한 본 연구는 소유의 집중이 국내 시장과 같은 환경에서 지속될 수 밖에 없는 이유에 대하여 설명을 제공한다는 점에서 연구 의의를 지닌다.

두 번째 논문에서는 애널리스트 커버리지가 기업 혁신에 미치는 영향을 분석하였다. 국내 상장 기업을 대상으로 분석한 결과, 애널리스트가 많이

커버하는 회사일수록 혁신 관련 투자인 R&D와 기업벤처캐피탈 투자가 감소하는 것을 확인하였다. 이러한 혁신 관련 투자의 감소는 대기업 집단에 속하는 증권 회사 소속 애널리스트들이 대기업 집단에 속하는 기업을 분석할 때 더욱 뚜렷한 모습을 보였다. 특히 애널리스트의 예측치가 경영진에게 예측치 달성을 위한 압력으로 작용해 혁신을 저해할 수 있다는 설명은 (“압력 효과”) 애널리스트들이 그들이 속한 대기업 집단과 다른 대기업 집단 소속인 기업을 분석할 때에도 뚜렷하게 나타나는 것을 확인하였다. 본 연구 결과는 선진 경제를 대상으로 한 기존 연구에서 애널리스트 커버리지가 정보 비대칭성을 낮추어 기업 혁신을 증가시킨다는 정보 효과를 보인 것과 상이한 결과를 보인다. 오히려 투자자 보호가 약한 개발 도상국에서는 애널리스트들이 많이 커버하는 회사일수록 경영진에 대한 예측치 달성 압력으로 작용하여 혁신 관련 투자를 낮춘다는 것을 보였다는 점에서 연구 의의를 지닌다.

주요어 : 재무적 곤경, 주주 변경, 소유의 집중, 유상증자, 기업벤처캐피탈, 애널리스트 커버리지, 기업 혁신

학 번 : 2014-30173