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Essays in Corporate Finance

기업재무에 관한 연구

2019년 2월

서울대학교 대학원

경영학과 경영학 전공

조 은 아

Essays in Corporate Finance

기업재무에 관한 연구

지도교수 김 우 진

이 논문을 경영학 박사 학위논문 으로 제출함

2018년 12월

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Abstract

Essays in Corporate Finance

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This thesis consists of three essays in corporate finance: takeovers, tax avoidance, and the investment of SMEs. The first essay finds that takeovers in Korea occur in the relation of financial distress, and that some companies tend to be targets repeatedly. This is because shareholders and managers do not want to transfer control in normal situations, but only after they are unable to pursue private interests due to financial distress. It also presents the new takeover method that a target firm issues new shares to the acquirer, and therefore the acquisition funds replenish the capital of the target firm. However, after the takeover, financial distress is not resolved, indicating that the performance of takeover motivated by financial distress is not good. The analysis also shows that the takeover exacerbates the financial distress of the acquiring firm, suggesting that the incentive to acquire a company in financial distress is attributable to agency problem rather than synergies.

The second essay analyzes the tax avoidance of privately held companies comparing to that of publicly traded companies. Although privately held companies have fewer human resources in financial and accounting and experts in tax consulting than publicly traded companies, they have fewer agency problems due to the high proportion of shareholder-manager. The analysis shows that publicly traded companies routinely perform higher levels of tax avoidance than privately held companies. However, privately held firms are more aggressive than publicly traded companies if they have some manpower or external resources available for tax purposes or if the benefits of tax avoidance are relatively large. This is also confirmed by a difference-in-differences analysis using the revision of the tax law in 2012.

The third essay examines the effect of SMEs' listing on their investment based on Korean SMEs' financial data from 2004 to 2015. We find that publicly traded SMEs invest more on R&D than comparable privately-held SMEs identified through propensity score matching. We also find that SMEs that went public during our sample period use IPO proceeds on both CapEx and R&D, but those that were highly levered prior to the IPO do not use the proceeds on CapEx. 'Difference-in- differences' results further verify that SMEs that went public increase R&D investment more conspicuously than CapEx after the IPO. These results suggest that Korean public equity market is more likely to facilitate SME's R&D investment than their capital expenditure.

Keywords: Takeovers, Financial distress, Tax avoidance, Listing, SMEs, Investments

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Chapter 1.

Takeover, Distress, and Equity issuance

1. Introduction

The environment of M&A market in Korea is quite different from the U.S. and other countries that the market for corporate control is well-developed. First of all, the control of Korean companies usually changes through control stake acquisition[1] that is less likely to incur a potential loss of control benefits through dilution(Kim, 2012). Due to the lack of a mandatory takeover bid rule, M&A occurs by transferring the shares held by a small number of controlling shareholders. Second, most targets are listed even after the change in controlling shareholders. Third, hostile M&As are hardly observed and therefore has a little disciplinary role(Park et al, 2017). Finally, the level of M&A activity is very low. According to Rossi and Volpin (2004), the M&A volume of Korean listed companies is 4.81%, which is much lower than the world average of 23.54%. This study is initiated to find out the motivations of takeovers in this environment. Many explanations have been suggested and tested to explain the motive for takeovers. Among them, four major motives are synergy, agency problem, hubris, and mispricing. The synergy motive is related to the economic gains of target and acquirer such as revenue enhancement, cost reduction, and tax gains. The agency problem motive is related to the private interest of the acquirer's manager such as empire building preference. Hubris motive is related to a misjudgment due to the

1) The type of transaction that the bidders buy less than 100% (or even less than 50% for a publicly traded firm) of the target rather than 100% through a merger.

overconfidence of the acquirer's manager. Lastly, mispricing motive is related to the undervalued target or overvalued acquirer in the stock market. However, these studies have been mainly developed based on the countries where the market for corporate control is well-developed, so they can only partially explain the motive for takeovers in countries where the M&A market is less developed.

We have found several features that emerge from the change in controlling shareholders of Korean listed companies. First of all, despite the very low level of M&A activity, some companies repeatedly become targets. Another notable feature is that the target firm issues new shares to the acquirer for the control transfer. Anecdotal evidence suggests that these are related to the distress of the target firm and its shareholders. For example, Korea Express is the largest general transport company in Korea which was an affiliated firm of Dong-Ah business group. In 2000 Dong-Ah Group went bankrupt and Korea Express was in severe financial distress, its shares were transferred to creditors. In 2005, STX Group became the largest shareholder by acquiring shares from the creditors, and the next year, Goldman Sachs became the largest shareholder through a debt-equity swap. In 2008, Kumho-Asiana Group was selected as the preferred bidder and acquired the new stocks through the private placement. However, Korea Express was finally sold to CJ Group since Kumho-Asiana Group fell into financial distress under the influence of the global financial crisis. In the

case of Korea Express, the transfers of corporate control is largely related to the financial distress of the target, or its controlling shareholders. Debt-equity swaps and private placement equity issuance were used as the methods of the control transfer.

A hypothesis based on the anecdotes is as follows. In Korea, managers and shareholders are reluctant to transfer corporate control because they value private benefits of control. In particular, Cronqvist and Nilsson(2003) show that the controlling family would not give up control, which leads to a lower probability of a takeover, or a higher probability of financial distress. Meanwhile, private benefits of control are positively related to firm performance(Albuquerque and Schroth, 2010; Barclay and Holderness, 1989). When the deficit continues and financial distress becomes severe, the private benefits of control are reduced due to the depletion of resources to divert and heavy scrutiny. Therefore, we hypothesize that takeover is likely to occur when the target firm is financially distressed and the motivation of M&A is the resolution of the financial distress.

On the other hand, distressed firms need to raise fund to resolve their losses. Funding through capital markets is crucial for the survival of the company. However, due to high debt ratios companies with financial distress usually have a difficulty in making additional loans or issuing debt securities. Alternatively, to avoid bankruptcy, a firm may choose to raise capital by issuing shares(Moreno-Bromber and Vo, 2017). This can be

interpreted in the line with pecking order theory, in that firms issue equity as a last resort. Högfeldt and Oborenko(2005) also argue that an equity issuance of a firm reflects a lack of internal capital and difficulty issuing liabilities, namely financial distress especially in the case of the large wedge between control and ownership. Since controlling shareholders can use the whole retained earnings with a smaller proportion to cash flow rights, internal capital is a less expensive method of financing for them. On the other hand, external capital is costly for the incumbent controller because control is diluted and the compensating transfer is required from incumbent shareholders to outside shareholders. In this context, an equity would be issued when the firm's internal reserves have been depleted. In particular, a distressed firm may be expected to choose private placements when issuing shares because of its high uncertainty and information asymmetry(Gomes and Phillips, 2012; Cronqvist and Nilsson, 2005; Wu, 2004; Chaplinsky and Haushalter, 2010; Chakraborty, Gantchev; 2013). This prediction is supported by empirical evidence suggested private placements are related to the financial distress(Krishnamurthy, Spindt, Subramaniam and Woidtke, 2005; Chakraborty, Gantchev, 2013; Kim, Ko, and Wang, 2018). Thus, the way that the target issues new shares to the acquirer is expected to be used primarily in takeovers for firms with financial distress since the funds are infused to target firm and mitigate financial distress at the same time as the takeover.

In addition, we hypothesize that the financial distress of the shareholders could also be a motivation. According to Boone and Mulherin(2007), the takeover process usually begins when the target firm decides to sell and seek potential bidders. Especially, in Korea, where there are few hostile takeovers, seller's decision whether to sell or not has a decisive effect on the occurrence of takeover transactions. So why do the bidders acquire a distressed firm? We hypothesize that an agency problem such as an empire building preference would be the reason. Therefore Takeovers are not effective in solving the financial distress and a distressed company is repeatedly targeted.

Of course, other restructuring methods, such as the corporate rehabilitation process, can be used to ease financial distress. In reality, however, M&A is actively encouraged even if a firm applies to the court for the rehabilitation process in Korea. When creditors become majority shareholders, they tend to be more interested in the redemption of their bonds than in reviving the company. Therefore, the court actively uses the M&A method to secure responsible shareholders who can redeem bonds by reviving the distressed firm and continue to manage it(Lee and Kang, 2009). A straightforward alternative is a hypothesis that the acquirers buy a temporarily undervalued target to create synergies and make the M&A market efficient. This alternative hypothesis does not predict the increase in the financial distress of the targets and the acquirers after the acquisition. In

the subsequent chapters, we found that the financial distress proxies of the targets and the acquirers are getting worse. We further confirmed that there is no deterioration of the financial distress proxies in the non-targets and the non-acquirers through the placebo tests.

To ensure whether the case of Korea Express can be generalized to a large sample of takeovers and in order to confirm that the hypothesis is correct, we examine the takeovers whose target is a listed company during 2004-2017 in Korea.

2. Data and Variables

2.1. Data

Data were collected manually from 2004 to 2017 by referring to the disclosure of the largest shareholder change of listed firms[2] from the homepage of the Korea Exchange (KIND).

Panel A in Table 1 shows the procedures of sample selection from initial

2) There are two kinds of disclosures relating to the changes in the largest shareholders: 'Disclosure of the change in the largest shareholders' and 'Disclosure of the change in shares of the largest shareholders'. The former applies to both KOSPI and KOSDAQ companies(Article 7(1) of the Regulations for Disclosure of the Stock Market, and Article 6 No. 3(1) of the Regulations for Disclosure of Kosdaq Market), while the latter applies only to KOSPI companies (Article 83 of the Regulations for Listing of Stock Markets). In this study, data were collected on the basis of the 'Disclosure of the change in the largest shareholders' to cover both KOSPI and KOSDAQ companies. Also, sample period starts from 2004 when disclosure began.

disclosures to the final sample. This study focuses on the actual changes in the control of non-financial companies. Therefore, financial targets are excluded. We also exclude takeovers between related parties since the actual control remains unchanged in this cases. This mainly occurs due to inheritance and the transition of governance structure to the holding company system. We first determine whether the seller and the acquirer are related parties on the basis of the disclosure. In addition, if the new shareholder is a company, we identify its largest shareholder and double check with official documents disclosed before and after the takeover. Next, we assume that a single takeover transaction involves the transfer of control from a non-financial entity to a non-financial entity. In the case of "Indirect" transactions through financial institutions, we remove financial institutions in between. We note that, in Indirect cases, the time and method of control transfer is determined when it is transferred to financial institutions because we are interested in the financial distress at the first time of the transfer of control. In case that we cannot see the non-financial entity who sold the target firm to the financial entity during the sample period, we track the transactions and identify the previous controlling shareholder and the time and method of the control transfer. In addition, we exclude the control change due to the unilateral decline in equity stakes of the previous largest shareholders, because the new largest shareholder did not have an active intention to acquire control. We also exclude the cases where takeovers are canceled after disclosure or miscellaneous such as

SPAC listing. In the case of SPAC, the shareholders of the merger will receive SPC shares in accordance with the merger ratio, so that the unlisted company goes through the SPAC for the listing and the actual control will remain unchanged. Also, takeovers that the value of the acquired stock is less than 5% of the market value are excluded, which is the filtering method similar to that of Mitchell and Lehn (1990). Finally, we exclude deals with less than 1 billion KRW to rule out the effect of very small takeovers.[3] The amount of takeover is calculated by multiplying the stock price at the reporting date and the new controlling shareholders' increased number of shares. We note that the date and stock price of Indirect-type is based on the current transaction.

Panel B reports the number of times the target was acquired during the sample period. Since most targets remain listed even after the acquisition, it is possible to observe the changes of control over time. Almost half of the targets experience more than two control changes during the sample period.

<Table 1>

Further, we divide the sample into two groups according to the way of control transfers: New-type and Old-type. New-type refers to the transfer of control in the manner the target issues new shares, and Old-type refers

3) The M&A items in the SDC are also subject to purchases of more than 3 percent of the shares or purchases of more than $1 million.

to the transfer of control in the manner the acquirer pays cash or stocks of the acquiring firm to the targe's shareholders. Acquisition methods have been studied in a wide range of contexts such as taxes, information asymmetry, capital structures and behavioral motives(Eckbo, 2009). In the point of this new classification, they are in fact all Old-types. Prior studies focus on cash or stocks as a means of payments, and the issuer of the stocks is the acquirer. On the other hand in the New-type of our classification, the issuer is the target firm. Thus, the New-type in which target issues new shares is expected to be used primarily in takeovers for firms with financial distress since the funds are infused to target firm and mitigate financial distress at the same time as the takeover. The shareholders of the target do not get paid and lose control. The New-type takeover, however, may also be beneficial to the shareholders of the target firm. They may be able to sell their shares at a higher price after financial distress is resolved, even though they will not be paid instantly for the transfer of control. It could be a good alternative for an incumbent controlling shareholder in the situation that a company has to choose between liquidation or recapitalization.

In addition, we assume that a single takeover transaction involves the transfer of control from a non-financial entity to a non-financial entity. In this point a view, we define a transaction that the control transfers from a non-financial entity to a non-financial entity as a "Direct" transaction, and

a transaction via a financial institution as an "Indirect" transaction. In indirect transactions, we determine whether the target or shareholders are distressed at the moment of control transferred to the financial institution since we are interested in whether the target experiences financial distress at the beginning of the transfer of control.

Table 2 shows the frequency and the size of takeover transactions by four types. Takeovers are classified into *Direct* and *Indirect* types depending on whether it goes through a financial institution or not, and as *New* and *Old* types depending on whether the target issues new shares or not. New-type accounts for 34% of the frequency, but 50% of the total amount. Old-type accounts for the rest. Direct-type, meanwhile, accounts for 87% of the frequency, but 60% of the total amount. Indirect-type accounts for the rest. In terms of the size of the takeover, the Indirect-type is larger than the Direct-type, and New-type is larger than the Old-type. This suggests that large takeovers tend to occur in a New-Indirect manner, given that 7% for the frequency but 30% for the total amount. The average amount of this type is 212 billion KRW, which is the greatest among all types.

<Table 2>

Next, we examined the distributions of the ownership ratio of controlling shareholders before and after takeovers by year. The new

controlling shareholders newly acquired 21% of shares at the time of the takeover, and they had owned 2% of shares even before takeover on average. On the other hand, the former controlling shareholders had held 13% of shares in the New-type and 25% in the Old-type before takeovers. Since the target firm in a new-type takeover is likely to be implementing restructuring measures such as reduction of capital, the share of existing shareholders is often lowered at the time of acquisition. The ownership after the acquisition of the former controlling shareholders is 7% in New-types and 5% in Old-types. In New-type, the ownership of the former controlling shareholders is diluted because the target firm issues shares to the new shareholders, even though they do not sell to the new shareholders. Meanwhile, the former controlling shareholders in Old-type takeover maintain their shares at a level that does not exercise control on the firm.

<Table 3>

2.2 Variables

Financial distress refers to a situation where a firm is unable to meet its obligations on debt (Wruck 1990; Gilson 1989). In particular, Purnanandam (2008) separates the financial distress from the insolvency and defines as follows: financial distress is a low cash-flow state in which the firm incurs losses without being insolvent. Opler and Titman (1994) also make a distinction between financial distress and default in a similar context. This study follows the definition of Purnanandam (2008).

To measure financial distress, financial indicators or predicting models are mainly used. Indicators include interest coverage ratio (Bruyland and Maeseneire, 2016; Andrade and Kaplan, 1998; Bernanke and Gertler, 1995), leverage (Gilson, 1989), net profit (Ang and Nathan, 2011) and continuous deficits(Wu, 2004; Hertzel and Smith, 1993). Models for predicting financial distress include Altman's Z-score and Ohlson's O-score. In this study, a variety of financial distress measures are used: Three continuous variables(ROA, Lnintcov, Kscore) and three dummy variables (Deficit, Caper, Dintcov). First, ROA, Lnintcov, Deficit, and Dintcov are related to the firm's profitability. ROA is net income scaled by the book value of total assets. Lnintcov is the log value of interest coverage ratio plus 2, Deficit is a dummy variable with a value of 1 if net income is negative for two consecutive years, or 0 otherwise. Dintcov is a dummy variable with a value of 1 if operating income is less than its interest expense, or 0 otherwise. Caper is related to the capital structure. A firm is considered in capital erosion when paid-in-capital (book equity - retained earning) is greater or equal to book equity. Finally, we use Altman (1995) K-score, introduced to Korean companies to predict the probability of bankruptcy. The lower the index, the higher the risk of corporate insolvency. Kscore1 calculated with the market value of equity can be applied to listed firms, and kscore2 calculated with the book value of equity can be applied to unlisted firms(see appendix for more details). Kscore1 below －2.00 or Kscore2 below －2.30 indicates severe distress potential, while Kscore above

0.75 is interpreted as distress-free for both Kscores.

Other variables that may affect the likelihood of takeover or the method of acquisition from the previous studies are included as control variables. Hasbrouck (1985) uses a logit model to predict takeovers and includes size, q(market to replacement value, liquidity, and leverage. Palepu (1986) uses logit estimates using sales growth, leverage, size, market-to-book ratio, price-earning ratio, and liquidity. Schwert (2000) includes roe, sales growth, liquidity, debt to equity, market-to-book, price-earning ratio, and size in the probit and regression models. Akhigbe, Martin, and Whyte (2007) provide logit estimates including size, institutional ownership, market-to-book, free cash flow, leverage, performance, and fixed asset as the characteristics of the target.

The empirical evidence suggests that the likelihood of takeover decreases with firm size due to transaction costs. Firms with low market-to-book ratio are more likely to be an acquisition target since they may be perceived to be undervalued. For the free cash flow, predictions diverge. Smith and Kim (1994) argue that the higher the free cash flow, the more attractive the target candidate. Alternatively, if high free cash flow reflects excessive private benefits, it may reduce the probability of a successful takeover by increasing offer premium. The effect of the largest shareholder ownership also seems to have not been consented. Shleifer and Vishny (1986) suggest that a takeover becomes more likely as the

proportion of the firm's shares held by the large shareholder rises. They assume that a large shareholder replaces ineffective managers as a monitoring activity and accepts takeover even in a small increase in the firm's profit. Alternatively, Stulz (1988) argues that an increase in the fraction of voting right controlled by management decrease the probability of successful tender offer. Meanwhile, firms with high tangible asset ratio may be attractive targets because they provide additional production capacity to the bidders. With regard to institutional ownership, Clyde (1997) show that the acquisition is used more like a disciplinary mechanism. Since most foreign investors are institutional investors in Korea, foreign ownership is used in this study, instead of institutional ownership. Faleye (2004) shows that firms with excess cash are less likely to be a target of a takeover since they have the ability to defend themselves against an unwanted bid. Lastly, since information asymmetry may affect the choice of acquisition method, age is included as variables representing a firm's information asymmetry.

3. Empirical Analysis

3.1 Descriptive Statistics

We first report the descriptive statistics of key variables for the target by the types of takeovers. According to Panel A of Table 4, more than half of the targets are in financially distressed. The values of the

dummy variables such as Deficit, Caper, and Dintcov are greater than 0.5. Meanwhile, non-target firms(firm-year) are the listed companies that have never been a target during the sample period. The univariate analysis of both samples indicates that a target is in greater financial distress than a non-target. Targets have negative profitability (ROA) on average, and their average Kscore1 is below －2.00, while non-targets have positive profitability and their average Kscore1 is over 0.75. In addition, the leverage and cash holdings over total assets of the targets are significantly higher than the non-targets. Also, targets have a lower age, size, sales growth, largest shareholder ownership, foreign ownership, free cash flows, and tangible assets over total assets than non-targets. These are generally consistent with expectations based on the previous research. Although the market-to-book ratio is the opposite to our expectations in this table, its results of multivariate analysis after controlling other variables are consistent. Furthermore, the average financial distress of the New-type is greater than the Old-type. Deficit, Caper, and Dintcov of the new-type takeover are 0.73, 0.83, and 0.85 respectively, which means that 70%~80% of the targets are in financial distress. On the other hand, 40%~60% of Old-type targets are in financial distress.

We find more than 50% of takeover targets are acquired more than one time in Table 1. Now we see when a firm becomes a target again, whether its financial distress is relieved compared to the previous

acquisition. Panel B of Table 4 shows that financial distress of target gets worse as the order of takeover increases. Firms(firm-year) never targeted during the sample period are included in Order=0 groups, firms that are acquired at the first time are in Order=1, firms that are acquired at the second times are in Order=2, firms that are acquired at the third times are in Order=3, firms that are acquired at the forth times or more are in Order=4. As the order of takeover increases, the Roa and Kscore1 monotonically decrease, and Deficit, Caper and Dintcov monotonically increase.

<Table 4>

Table 5 documents the composition of the sellers and their characteristics. According to Panel A, individual largest shareholders are more than corporations. The shares of the largest shareholders are, however, the sum of the shares held by the individual as well as the related parties, and an individual or a corporation represent them by self-reporting. When the seller(or the representer of the largest shareholder) is an individual, it is difficult to know the financial status of the controlling shareholder at the time of sale. When the seller is a company and it is subject to mandatory disclosure, then, we can examine their financial status around the sale with its financial information. We first identify 376 takeovers whose largest shareholder is a company subject to mandatory disclosure. Then we filtered out the firms in the financial industry or with below 10% ownership before

the sale. Some firms are eliminated due to the lack of financial information. Financial statements for some years may be unavailable because the list of companies subject to mandatory disclosure changes every year. Finally, we have 242 sellers with financial data who are a non-financial company.

Panel B shows the results of the comparison between the sellers and the non-sellers. The non-sellers are the controlling shareholders of listed companies who are a non-financial firm with substantial ownership (the cut off is 10%) and have not sold the control of their subsidiary during the sample period. We find out that the sellers are more financially distressed than the non-sellers. Specifically, the sellers have negative values for Roa and kscore2, 32% of them are in two consecutive years of deficits, 44% of them are in capital erosion, and 56% of them cannot cover interest costs with their operating income. On the other hand, the average ROA and Kscore2 of the non-sellers are positive, and the level of financial distress proxied by other indicators is significantly lower than the sellers. Moreover, the sellers have higher leverage and cash holdings and lower free cash flows and tangibility than the non-sellers.

<Table 5>

3.2 Determinants of the Number of Being a Target

In this section, we analyze the factors that affect the frequency of being a target through ordered logit analysis and examine whether the

target's distress is one of the factors. The dependent variable is the number of times(never, first, second, third, fourth or more, in sequential order) to be targeted as the same as “Order” in Panel B of Table 4. Explanatory variables include proxies of a firm’s financial distress and variables known to affect the likelihood of being a target introduced in Section 3.2. When one unit increase in an explanatory variable would result in the change coefficient in the ordered log-odds of being in a higher number of times to be a target while the other variables in the model are held constant. The financial distress variables are highly correlated and therefore analyzed in the separate specifications. We include 2-digit industry fixed effects to control for industry unobserved heterogeneity, and year fixed effects to control for unobserved time effects in our models. We also employ standard errors clustered at 2-digit industry level to address concerns over potential biases from correlated residuals within an industry.

<Table 6>

Table 6 reports that the results of the ordered logit regression. As we predicted, financial distress is an important factor that affects the likelihood and the frequency of being a target after controlling other variables. More importantly, the number of times being a takeover target increases as financial distress become deeper. Specifically, lower Roa, Lnintcov, and Kscore1 would result in the increase in the ordered log-odds of being in more times of being a target. Also, distressed firms(deficit

equals one, Caper equals one, or Dintcov equals one)are more likely to be in more times of being a target than non-distressed firms. In addition, smaller companies are more likely to be targeted, which are consistent with previous studies. Higher leverage also would result in the number of times being a target. Low largest shareholder ownership tends to increase the number of times being a target, which is consistent with Stultz(1988)'s argument that incumbent shareholders are reluctant to be a target in order to extract private benefits. The results suggest that companies with severe financial distress face frequent changes in corporate control. It also implies that financial distress is not resolved by a single takeover.

3.3 Determinants of Takeover Types

In this section, we extend the analysis to explore whether financial distress affects the determination of takeover types. We use multinomial logit analysis to identify the factors that financial distress affects takeover types and examine whether the target's distress has a significant effect. The firms that have never been a target during the sample period are the baseline group against New-type targets and Old-type targets. The explanatory variables are the same as the ordered logit model in the previous section. We also include 2-digit Industry fixed effects and year fixed effects, and use industry clustered standard errors in our models.

<Table 7>

Table 7 reports the estimates of multinomial regressions. Since non-target firms are used as the baseline, the coefficients can be interpreted as the impact on the probability to be selected for a specific type of takeover relative to no takeovers. As financial distress becomes severe, the probability of both types of takeover tends to be higher than no takeovers. However, the magnitude of the coefficient is greater in New-type than Old-type. This indicates the firms with severe financial distress tend to be acquired through New-type rather than Old-type. Additional chi-square test was conducted to examine whether the coefficients are significantly different between the two types. The last rows of the table show the results and report the two coefficients are significantly different except for Lnintcov. More specifically, the coefficient of Roa and Kscore1 are significantly different at 95% confidence levels, and Deficit, Caper, and Dintcov are significantly different at 99% levels. This implies that severe financial distress weaken the bargaining power of the incumbent shareholders and they may be obliged to accept unfavorable terms. That is because the New-type takeover is generally more disadvantageous to incumbent shareholders than Old-type in that they are not paid immediately for the control transfer.

For the remaining variables, the size of the potential targets affects both types of takeovers, while the smaller firms are more likely to be acquired in an Old-type manner. Although the largest shareholders ownership

of a firm also affects both types, firms with lower ownership tend to be acquired in a New-type manner. Interestingly, the proportion of property, plant and equipment contributes mainly to the possibility of an Old-type takeover. That is, the higher the proportion of property, plant and equipment, the greater the negotiating power of incumbent shareholders.

3.4 Determinants of Being a Seller

In this section, we identify the factors that affect the probability to sell the subsidiary and analyze whether the sheller's own financial distress significantly affects the probability of a takeover through logit regression. Since the financial information of shareholders is only available when they disclose their financial statements, we limit the analysis to the cases where controlling shareholders are the mandatory disclosure firms. Financial firms and the firms with below 10% ownership are also excluded.

The dependent variable is a dummy variable with one if the firm is a seller or zero otherwise. Explanatory variables include financial distress, size, leverage, cash holding, age, sales growth, free cash flow, tangible asset ratio of the controlling shareholder. In this analysis, we use Kscore2, which can be applied not only to listed companies but also to unlisted companies since some parent companies are unlisted. The remaining financial distress measures other than kscore are the same as the previous analyses, but they indicate the financial distress of the incumbent controlling shareholder, not that of the target. We also include 2-digit industry fixed effects and year

fixed effects, and use industry clustered standard errors in our models.

<Table 8>

Table 8 shows the results of the logit analysis. In general, the greater the financial distress of incumbent controlling shareholders, the more likely the takeover is to be made. Specifically, the coefficients of continuous variables among financial distress proxies are all negative, meaning that controlling shareholders' own financial distress leads to the sale of a subsidiary. However, the effect of Lnintcov and Kscore2 on the probability of being a seller is not statistically significant, although the coefficient of Roa is significant. Meanwhile, the coefficients of dummy variables among financial distress proxies are all positive and statistically significant. In general, These results suggest that controlling shareholders fail to maintain control due to their own financial distress, resulting in the transfer of control.

4. Estimates of Takeovers' Effect on Financial Distress

The preceding analysis has shown that financial distress can be a motivation for takeover. However, in order for the takeover to take place, it is necessary to make a deal with the acquirer. So we look at the intention of the acquirer to buy the distressed company. We hypothesize that the acquirer is taking over to increase the size of the firm. Thus, it is expected

that the performance of the acquirer after the acquisition will deteriorate. Also, the financial distress of the target will not be improved.

4.1 Financial Distress After the Takeover

We estimate multivariate models evaluating firms' financial distress and evaluate whether they change when the firm is acquired, controlling for other potentially relevant factors. To test this hypothesis, we estimate equations predicting financial distress in a similar way to Erel, Chang, and Weisbach (2015). In specific, we estimate the following specification:

$$Distress = a + bAFTER + cControls + e,$$

where *AFTER* is a dummy variable that takes a value of one after the takeover. The dependent variables are financial distress proxies such as Roa, Lnintcov, and Kscores. Control variables are the same as the ordered logit model in the previous section. We also include 2-digit Industry fixed effects and year fixed effects, and use industry clustered standard errors in our models. I report the result from corresponding logit models for the discrete dependent variable such as Deficit, Caper, and Dintcov. We establish data set of five years around takeover and exclude the firm-year observations of the takeover year. Therefore, the sample includes pre-two years and post-two years for the acquirers and the targets respectively.

<Table 9>

The estimates in the financial distress proxies in the Panel A of Table 9 consistent with the hypothesis that the acquirer takes over to increase the size of the company. In particular, when the dependent variable is a continuous variable among financial distress proxies, the coefficients of AFTER are all significantly negative, and when the dependent variable is a dummy variable, the coefficients of AFTER are all significantly positive. This indicates that the financial distress of acquirer has increased after the takeover. Panel B, on the other hand, shows an increase in the financial distress of the targets after the takeover. In other words, when the dependent variable is a continuous variable among financial distress proxies, the coefficients of AFTER are all significantly negative, and when the dependent variable is a dummy variable, the coefficients of AFTER are all significantly positive except Dintcov. These results are not consistent with the findings of Erel et al (2015) that acquisitions relieve financial frictions of target firms in a way that improves the financial efficiency of the subsidiary.

4.2. Robustness Checks

The analysis of estimating the final distress after the takeover in the previous section is only intended for companies where takeover occurred, so it is not known how the degree of distress would have changed if the takeover did not occur. Therefore, we check if the takeover has a similar effect on the financial distress even in companies that do not actually

takeover through a placebo test. In detail, we use propensity score matching to construct a control group similar to that of acquirer and target based on the year before the takeover. Matching is performed in two stages. First, we construct a logit model using variables that represent a firm's characteristics to calculate a propensity score. The probability of becoming an acquirer is calculated for all companies regardless of whether it is an actual acquirer. The next step is to divide all firms into acquirers and non-acquirers(or targets and non-targets), and then find and match the acquirer and non-acquirer pair with the closest propensity score. Matching is carried out by industry so that two firms in the matched pair are in the same industry. In addition, a Caliper method that places an upper limit on the propensity score distance was used to improve the quality of matching. In this study, we use the following variables of the year before takeover to produce a propensity score: total assets(firm size), sales growth rate (growth opportunity), leverage (capital structure), and cash holdings (liquidity). We match firms using propensity score in the same industry(KSIC 2-digit) with Caliper=0.05 without replacement. Further, if the acquirer is a publicly traded firm, it has performed matching with the publicly traded firm. Inversely, if the acquirer is a privately held firm, it has performed matching with the privately held firm. On the other hand, all targets in the sample are publicly traded, and their matched controls are also publicly traded. Table 10 shows the results of a balance test to verify that the matching of acquirer and non-acquirer(or target and non-target) was successful.

<Table 10>

Panel A of Table 10 shows that the non-acquirer are not significantly different from the acquirers in size, growth opportunities, capital structure, age, and liquidity. Similarly, in Panel B, non-targets consist of firms that do not differ from the targets in terms of size, growth opportunities, capital structures, age, and liquidity. Therefore, we use non-acquirer control and non-target control to analyze whether the financial distress estimates change before and after the matching point with the same model as Table 9.

<Table 11>

Table 11 shows that there is no effect of the takeover on financial distress in both control groups(non-acquirer control and non-target control). Panel A, which specifically analyzes non-acquirers, indicates that when the proxy of financial distress is a continuous variable, the regression coefficients of AFTER are all positive but statistically insignificant. In addition, when the proxy of financial distress is a dummy variable, the regression coefficients of AFTER are all negative. Panel B, on the other hand, analyzes for non-targets, show that all of the regression coefficients of AFTER are not statistically significant, so there is no increase in the final distress. These Placebo tests provide more confidence that the increase in financial distress of acquirers and targets is the effect of the takeover.

5. Conclusions

The evidence in this paper shows the firm in financial distress are likely to be a takeover target repeatedly in Korea. Takeovers rarely occur in normal circumstances due to the high private benefits, but if a firm falls into financial trouble, and its private benefits shrink, then it could be considered as a target. At the same time, the target firm needs outside capital to resolve its financial distress. That is the reason that the New-type takeover is widely used in companies with severe financial distress as a solution. In terms of the seller, they failed to maintain control because of their own financial difficulties. Empirical evidence indicates that the sellers are in financial difficulties just before selling their subsidiary. Thus, financial distress of a target or a seller can be a motivation of a takeover. However, the results of a takeover motivated by financial distress is not successful since bidders acquire distressed target based on the intention of expanding the size rather than increasing the value of the company. Therefore takeovers are not effective in solving the financial distress and distressed firms are repeatedly targeted.

The contributions of this study can be summarized as follows: First, it suggests that the financial distress of a target or its controlling shareholders is a motivation for corporate takeovers. Second, we introduce the New-type takeover which has the simultaneous effects of acquisition and financing, along

with the Old-type which has been mainly studied in previous literature. Lastly, this paper can also contribute to the literature on equity financing by providing an example of external equity financing is used as a last resort in M&A activities.

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<Appendix> Definition of the Variables

Name	Descriptions
Dependent variables	
Target	A dummy variable with a value of 1 if the firm is a target, and 0 otherwise
Type	A variable with a value of 1 if the firm is a target of a New-type takeover, and 2 if it is that of an Old-type takeover, and 3 if it is not a target.
Distress variables	
ROA	Net income scaled by the book value of total assets
Lnintcov	Log value of 2 plus operating income divided by interest expense
Kscore	Altman et al (1995) introduced the following model to predict the probability of bankruptcy in the Korean companies Kscore1=-17.862+1.472*(X1)+3.041*(X2)+14.839*(X3)+1.516*(X4) Kscore2=-18.696+1.501*(X1)+2.706(X2)+19.760 (X3)+1.146 (X4') X1: log(Total assets) X2: log(Sales/Total assets) X3: Retained earnings/Total assets X4(KS2): Market value of equity/Total liabilities X4'(KS2): Book value of equity/ Total liabilites
Deficit	A dummy variable with a value of 1 if net income is negative for two consecutive years, or 0 otherwise
Caper	A dummy variable with a 1 if capital erosion occurs, or 0 otherwise. Capital erosion is considered to occur when the paid-in-capital (the total book equity-retained earnings) is greater than or equal to the total book equity
Dintcov	A dummy variable with an value of 1 if operating iincome is less than interest expense or 0 otherwise
Control variables	
Size	Log of total assets
Lev	Total liabilities/Total assets
Cash	Cash and cash equivalents/Total assets
Age	Number of years from the established year
Sgr	Sales growth rate
Lown	The largest shareholder ownership
Fown	The foreign investor ownership
Mtb	Market value of equity/Book value of equity
Fcf	Operating cash flow/Total assets
Tang	Tangible assets/Total assets

<Table 1> Sample Selection Procedure

This table presents the sample selection procedure of takeovers of Korean listed companies(including KRX and KOSPI) during 2004-2017. The procedure details the number of takeover transactions filtered out at each reason. The amount of takeover is calculated by multiplying the stock price at the reporting date and the new controlling shareholders' increased number of shares.

Panel A. Takeover Samples	
Total disclosures	4,171
(1)Target is a financial firm	255
(2)Deals between related parties	1,038
(3)Deals between financial firms in Indirect-type takeover	449
(4)Previous controlling shareholders unilaterally reduce their shares	209
(5)In case the contract is canceled after disclosure, financial statements are missing and miscellaneous such as SPAC listing[a)]	252
(6)If the amount purchased is less than 5% of the mark value	491
(7)If the amount purchased is less than 1 billion won	94
Final sample	1,383

Panel B. Frequency of Takeovers				
	Number of firms	(%)	Number of takeovers	(%)
1 time	389	(53.1)	389	(28.1)
2 times	170	(23.2)	340	(24.6)
3 times	89	(12.2)	267	(19.3)
4 times	49	(6.7)	196	(14.2)
5 times	26	(3.5)	130	(9.4)
6 times	9	(1.3)	54	(3.9)
7 times	1	(0.0)	7	(0.5)
Total	733	(100.0)	1,383	(100.0)

<Table 2> Different Types of Takeovers

This table classifies takeovers transactions into four types. New and old types are distinguished by the way they transfer control. Direct and indirect types are distinguished by whether they go through financial institutions. Panel A reports the number of takeover transactions and the proportion for each type. Panel B reports the total amount of takeovers and the proportion for each type. Panel C reports the average and median amounts for each type.

Panel A. Frequency of Takeovers						
	Direct		Indirect		Sum	
	N	(%)	N	(%)	N	(%)
New	381	(28)	86	(6)	467	(34)
Old	827	(60)	89	(6)	916	(66)
Sum	1,208	(88)	175	(12)	1,383	(100)
Panel B. Total Amounts of Takeovers (Units: KRW billions, %)						
	Direct		Indirect		Sum	
New	13,219	(23)	13,419	(24)	32,821	(47)
Old	24,556	(43)	5,678	(10)	32,353	(53)
Sum	31,271	(66)	25,372	(34)	65,174	(100)
Panel C. Average [Median] Amounts (Unit: KRW billions)						
All	41.1	[7.0]				
	Direct		Indirect			
New	34.7	[5.8]	156.0	[12.2]	57.0	[6.4]
Old	29.7	[7.2]	63.8	[11.9]	33.0	[7.4]
Sum	31.3	[6.7]	109.1	[11.9]		

<Table 3> Ownership of the Controlling Shareholder before and after the Control Changes

This table shows the number of takeover deals between 2004 and 2017 and their average ownership of the former controlling shareholders and the new controlling shareholders before and after the takeover. New and old types are distinguished by the way they transfer control.

Year	Num. of deals			Ownership(%)											
	Sum	New -type	Old -type	New-type						Old-type					
				Old-shareholder			New-shareholder			Old-shareholder			New-shareholder		
				Before	After	Diff	Before	After	Diff	Before	After	Diff	Before	After	Diff
2004	19	7	12	8.0	1.7	-6.3	0.1	35.3	35.2	32.5	3.1	-29.4	1.2	38.2	37.0
2005	95	26	69	12.8	6.2	-6.6	2.7	22.0	19.4	26.5	7.2	-19.3	1.6	24.6	23.0
2006	134	29	105	12.4	8.8	-3.5	1.1	19.6	18.5	25.4	6.3	-19.1	2.9	23.1	20.2
2007	220	65	155	12.0	6.6	-5.4	1.6	19.8	18.2	22.9	4.1	-18.7	2.0	20.4	18.4
2008	208	59	149	12.0	6.9	-5.1	1.3	22.4	21.1	21.4	4.6	-16.8	2.3	21.5	19.2
2009	145	60	85	12.0	6.8	-5.2	1.4	23.8	22.4	22.9	4.2	-18.6	3.3	25.2	21.9
2010	104	31	73	12.7	7.9	-4.9	1.4	23.8	22.4	25.1	5.5	-19.6	2.2	25.8	23.7
2011	49	13	36	16.6	13.0	-3.6	3.8	34.8	31.0	29.6	7.0	-22.5	3.5	24.7	21.3
2012	54	14	40	13.3	8.0	-5.3	2.3	27.8	25.5	30.0	6.2	-23.9	2.9	27.3	24.4
2013	43	17	26	19.0	9.3	-9.7	1.5	28.7	27.2	25.7	4.7	-21.1	1.4	23.8	22.3
2014	52	19	33	14.1	7.3	-6.8	2.9	25.5	22.5	34.5	4.1	-30.4	2.2	33.1	30.8
2015	80	35	45	15.9	7.7	-8.2	2.8	26.0	23.2	29.3	4.4	-24.9	0.9	26.5	25.6
2016	97	39	58	11.6	6.7	-4.9	1.6	20.3	18.7	24.8	4.4	-20.4	1.3	18.7	17.4
2017	79	30	49	11.9	8.0	-3.9	0.8	18.1	17.3	29.4	3.8	-25.5	1.4	25.2	23.8
Sum	1,379	444	935	12.9	7.4	-5.5	1.7	23.0	21.3	25.3	5.0	-20.3	2.2	23.7	21.5

<Table 4> Summary Statistics for Targets

This table presents the summary statistics of takeover targets. Panel A shows the summary statistics of main variables for target firms and the comparison to non-targets. Panel B shows the distribution of target firms by the order of takeover transactions. ***, ** and * denote statistical significance at the 1%, 5% and 10% levels, respectively.

Panel A. Summary Statistics of Targets by Different Types									
	Target	Non-target	Diff	NEW	OLD	Diff	Direct	Indirect	Diff
N	1383	35522		467	916		1,208	175	
Roa	-0.25	0.01	-0.25 ***	-0.40	-0.17	-0.24 ***	-0.24	-0.26	0.02
Lnintcov	4.66	4.82	-0.16 ***	4.60	4.70	-0.11 ***	4.67	4.63	0.04
Kscore1	-4.68	5.09	-9.78 ***	-11.97	-0.96	-11.01 ***	-4.64	-4.98	0.34 *
Deficit	0.53	0.14	0.38 ***	0.73	0.42	0.31 ***	0.53	0.53	0.00
Caper	0.61	0.21	0.40 ***	0.83	0.50	0.33 ***	0.60	0.67	-0.07 *
Dintcov	0.71	0.30	0.41 ***	0.85	0.64	0.21 ***	0.72	0.69	0.02
Size	17.64	18.43	-0.80 ***	17.62	17.65	-0.02	17.56	18.20	-0.64 ***
Lev	0.55	0.50	0.06 ***	0.71	0.47	0.23 ***	0.54	0.68	-0.14 ***
Cash	0.09	0.08	0.01 ***	0.08	0.09	-0.02 ***	0.09	0.08	0.01
Age	21.97	25.13	-3.16 ***	23.60	21.13	2.47 ***	21.71	23.76	-2.05 **
Sgr	11.34	18.77	-7.42 ***	8.45	12.82	-4.37	12.14	5.76	6.38
Lown	26.23	40.33	-14.11 ***	19.08	29.87	-10.79 ***	26.30	25.73	0.56
Fown	3.33	6.30	-2.96 ***	2.45	3.78	-1.33 ***	3.10	4.97	-1.87 ***
Mtb	2.02	1.36	0.66 ***	2.19	1.94	0.25 *	2.11	1.39	0.72 ***
Fcf	-0.10	0.05	-0.14 ***	-0.21	-0.04	-0.17 ***	-0.10	-0.06	-0.04
Tang	0.26	0.32	-0.05 ***	0.26	0.27	-0.01 ***	0.26	0.30	-0.04 **

Panel B. Targets by Order of Control Transfer(Mean)					
	0	1	2	3	4 or more
N	35,522	733	344	174	132
Roa	0.01	-0.16	-0.31	-0.38	-0.39
Lnintcov	2.25	2.05	1.18	1.14	1.01
Kscore1	5.09	0.06	-7.66	-11.02	-14.80
Deficit	0.14	0.42	0.60	0.70	0.72
Caper	0.21	0.46	0.69	0.85	0.89
Dintcov	0.30	0.61	0.78	0.85	0.89
Size	18.43	17.84	17.48	17.37	17.28
Lev	0.50	0.54	0.59	0.55	0.57
Cash	0.08	0.09	0.09	0.08	0.09
Age	25.13	21.30	22.16	22.61	24.32
Sgr	18.77	10.20	14.63	10.10	10.72
Lown	40.33	30.65	23.82	19.22	17.26
Fown	6.30	4.36	2.12	1.59	3.07
Mtb	1.36	1.79	2.27	2.21	2.44
Fcf	0.05	-0.05	-0.16	-0.14	-0.17
Tang	0.32	0.28	0.25	0.25	0.24

<Table 5> Summary Statistics for Sellers

This table reports the composition and characteristics of the sellers. Panel A documents the frequency of each group of sellers. Panel B presents the univariate comparison of firm characteristics between the sellers and the non-sellers. The non-sellers are the controlling shareholders of a listed company who is a non-financial firm with more than 10% ownership and have not transferred corporate control during the sample period. ***, ** and * denote statistical significance at the 1%, 5% and 10% levels, respectively.

Panel A. Composition of the Sellers		
Company		545
Not subject to mandatory disclosure	169	
Subject to mandatory disclosure	376	
Individual		829
Unconfirmed		9
Total		1,383

Panel B. Comparison Statistics of the Sellers			
	Seller	Non-seller	Diff
N	242	4,195	
Roa	-0.08	0.04	-0.12***
Lnintcov	4.65	4.87	-0.22***
Kcore2	-1.20	10.68	-11.88***
Deficit	0.32	0.06	0.25***
Caper	0.44	0.12	0.32***
Dntcov	0.56	0.20	0.36***
Size	18.45	19.89	-1.44***
Lev	0.59	0.39	0.20***
Cash	0.06	0.04	0.01***
Age	23.75	35.16	-11.40***
Sgr	0.20	0.15	0.05
Fcf	-0.02	0.05	-0.07***
Tang	0.20	0.22	-0.02*

<Table 6> Determinants of Order of Targets

This table gives coefficients of multivariate ordered logit regressions in which the dependent variable is a dummy variable with a value of 1 if the firm is a target, and 0 otherwise. Standard errors (reported in parentheses) are clustered at the 2-digit industry level. ***, ** and * denote statistical significance at the 1%, 5% and 10% levels, respectively.

Dependent variable=Order of takeover						
	(1)	(2)	(3)	(4)	(5)	(6)
Roa	-1.2693 ***					
	(0.2061)					
Lnintcov		-0.0905 *				
		(0.0517)				
Kscore1			-0.0158 ***			
			(0.0034)			
Deficit				0.7967 ***		
				(0.0729)		
Caper					0.8502 ***	
					(0.1008)	
Dintcov						0.8790 ***
						(0.0857)
Size	-0.5362 ***	-0.5793 ***	-0.5741 ***	-0.5776 ***	-0.5582 ***	-0.5883 ***
	(0.0588)	(0.0729)	(0.0611)	(0.0592)	(0.0591)	(0.0605)
Lev	0.7275 ***	1.3689 ***	0.8900 ***	1.0385 ***	0.9281 ***	0.9704 ***
	(0.2618)	(0.2243)	(0.2249)	(0.2013)	(0.2001)	(0.1832)
Cash	0.5025	0.2284	0.5245	0.5400	0.6421	0.5173
	(0.6580)	(0.8099)	(0.6391)	(0.6225)	(0.6444)	(0.6660)
Age	-0.0053	-0.0084 **	-0.0054 *	-0.0062 *	-0.0068 **	-0.0055 *
	(0.0033)	(0.0039)	(0.0033)	(0.0033)	(0.0031)	(0.0031)
Sgr	-0.0001	-0.0001	-0.0007	-0.0006	-0.0007	-0.0002
	(0.0006)	(0.0008)	(0.0006)	(0.0006)	(0.0006)	(0.0005)
Lown	-0.0320 ***	-0.0361 ***	-0.0338 ***	-0.0312 ***	-0.0290 ***	-0.0321 ***
	(0.0029)	(0.0042)	(0.0027)	(0.0025)	(0.0025)	(0.0024)
Fown	-0.0004	0.0076	0.0008	0.0015	0.0013	0.0021
	(0.0048)	(0.0050)	(0.0047)	(0.0045)	(0.0045)	(0.0053)
Mtb	-0.0151	0.0107	0.0146	-0.0129	-0.0237	-0.0057
	(0.0180)	(0.0288)	(0.0196)	(0.0192)	(0.0174)	(0.0200)
Fcf	0.0860 *	-0.0817	0.0053	0.0155	-0.0200	0.0376
	(0.0489)	(0.0605)	(0.0940)	(0.0774)	(0.0997)	(0.0859)
Tang	0.2958	-0.4510	0.1783	0.1832	0.2439	0.2203
	(0.2447)	(0.3781)	(0.2375)	(0.2227)	(0.2324)	(0.2525)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Obj.	28,258	22,600	28,252	28,252	28,257	26,966
Pseudo R^2	0.20	0.16	0.20	0.20	0.20	0.21

<Table 7> Determinants of Takeover Types

This table gives coefficients of multinomial logit regressions in which the dependent variable with a value of 1 if the firm is a target of a New-type takeover, and 2 if it is that of an Old-type takeover, and 3 if it is not a target. Standard errors (reported in parentheses) are clustered at the 2-digit industry level. ***, ** and * denote statistical significance at the 1%, 5% and 10% levels, respectively.

	(1)		(2)		(3)		(4)		(5)		(6)	
	New	Old	New	Old	New	Old	New	Old	New	Old	New	Old
Roa	-1.5250***	-0.8977***										
	(0.2227)	(0.2160)										
Lnintcov			-0.1381	-0.0869**								
			(0.1112)	(0.0412)								
Kscore1					-0.0236***	-0.0080**						
					(0.0066)	(0.0034)						
Deficit							1.2677***	0.5379***				
							(0.1409)	(0.0714)				
Caper									1.4790***	0.5536***		
									(0.1675)	(0.1037)		
Dintcov											1.2376***	0.7352***
											(0.1675)	(0.0831)
Size	-0.2841***	-0.6421***	-0.3317***	-0.6255***	-0.3005***	-0.6755***	-0.3246***	-0.6573***	-0.3073***	-0.6402***	-0.3627***	-0.6548***
	(0.0833)	(0.0604)	(0.1027)	(0.0827)	(0.0860)	(0.0589)	(0.0701)	(0.0603)	(0.0669)	(0.0612)	(0.0728)	(0.0631)
Lev	1.7259***	0.3577	3.0027***	0.2288	1.9142***	0.4544**	2.0831***	0.4800**	1.9318***	0.3981*	2.0989***	0.3143
	(0.2846)	(0.2738)	(0.3910)	(0.2538)	(0.2956)	(0.2246)	(0.2624)	(0.2175)	(0.2545)	(0.2212)	(0.2184)	(0.2151)
Cash	0.2912	0.6465	1.5023	0.0589	0.3354	0.6503	0.4587	0.6662	0.5594	0.7329	0.5259	0.5452
	(0.7221)	(0.7182)	(1.3196)	(0.8999)	(0.6968)	(0.7094)	(0.6652)	(0.6981)	(0.6576)	(0.7055)	(0.6581)	(0.7504)
Age	0.0018	-0.0106***	0.0010	-0.0136***	0.0008	-0.0104***	0.0003	-0.0111***	-0.0007	-0.0117***	0.0016	-0.0111***
	(0.0038)	(0.0035)	(0.0055)	(0.0041)	(0.0038)	(0.0034)	(0.0039)	(0.0034)	(0.0036)	(0.0034)	(0.0037)	(0.0033)
Sgr	-0.0001	0.0000	-0.0001	0.0003	-0.0006	-0.0004	-0.0007	-0.0003	-0.0008	-0.0004	-0.0003	0.0000
	(0.0009)	(0.0007)	(0.0011)	(0.0008)	(0.0009)	(0.0007)	(0.0008)	(0.0007)	(0.0009)	(0.0007)	(0.0008)	(0.0006)
Lown	-0.0639***	-0.0192***	-0.0703***	-0.0244***	-0.0653***	-0.0207***	-0.0606***	-0.0188***	-0.0559***	-0.0174***	-0.0616***	-0.0183***
	(0.0039)	(0.0029)	(0.0061)	(0.0043)	(0.0040)	(0.0027)	(0.0038)	(0.0026)	(0.0035)	(0.0027)	(0.0033)	(0.0025)
Fown	-0.0170	0.0036	-0.0158	0.0119**	-0.0148	0.0041	-0.0100	0.0039	-0.0084	0.0038	-0.0074	0.0040
	(0.0128)	(0.0046)	(0.0141)	(0.0053)	(0.0121)	(0.0046)	(0.0119)	(0.0045)	(0.0113)	(0.0046)	(0.0119)	(0.0055)
Mtb	-0.0056	-0.0305	0.0572	-0.0126	0.0274	-0.0070	-0.0020	-0.0269	-0.0142	-0.0354	0.0078	-0.0191
	(0.0332)	(0.0228)	(0.0419)	(0.0414)	(0.0318)	(0.0234)	(0.0314)	(0.0229)	(0.0310)	(0.0224)	(0.0328)	(0.0229)
Fcf	-0.1148	0.0990	-1.3173***	-0.6034	-0.2175	-0.0720	-0.1995	0.0073	-0.2580	-0.0556	-0.1434	0.0871
	(0.1370)	(0.1148)	(0.4154)	(0.3834)	(0.3372)	(0.2734)	(0.2422)	(0.2034)	(0.3262)	(0.2512)	(0.2480)	(0.1817)
Tang	-0.5218	0.5595**	-0.9102	-0.0673	-0.6460	0.5154**	-0.6828*	0.5260**	-0.5903	0.5725**	-0.6770	0.5936**
	(0.3941)	(0.2392)	(0.6806)	(0.3628)	(0.4217)	(0.2346)	(0.4010)	(0.2242)	(0.4005)	(0.2338)	(0.4212)	(0.2405)
Cons	1.9465	8.6160***	1.9916	8.8597***	2.2875	9.2693***	2.0095	8.7177***	1.3777	8.3383***	2.4992*	8.6175***
	(1.6030)	(1.0576)	(2.0550)	(1.3690)	(1.6753)	(1.0220)	(1.3795)	(1.0588)	(1.3485)	(1.0992)	(1.4772)	(1.0883)
Industry FE	Yes		Yes		Yes		Yes		Yes		Yes	
Year FE	Yes		Yes		Yes		Yes		Yes		Yes	
Obj	28,258		22,600		28,252		28,252		28,257		26,966	
Pseudo R^2	0.25		0.21		0.24		0.25		0.25		0.26	
	chi2=6.05		chi2=0.29		chi2=5.18		chi2=32.10		chi2=50.87		chi2=12.13	
	Prob chi2= 0.0139		Prob chi2=0.5906		Prob chi2=0.0229		Prob chi2=0.0000		Prob chi2=0.0000		Prob chi2=0.0005	

<Table 8> Determinants of Sellers

This table gives coefficients of binary logit regressions in which the dependent variable is a dummy variable with a value of 1 if the firm is a seller, and 0 otherwise. Standard errors (reported in parentheses) are clustered at 2-digit industry level. ***, ** and * denote statistical significance at the 1%, 5% and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Roa	-2.1223***					
	(0.7910)					
Lnintcov		-0.4496				
		(0.2803)				
Kscore2			-0.0201			
			(0.0184)			
Deficit				0.8626***		
				(0.2426)		
Caper					1.1654***	
					(0.2731)	
Dintcov						0.5484**
						(0.2687)
Size	-0.5796***	-0.6620***	-0.5750***	-0.5946***	-0.5842***	-0.6184***
	(0.0993)	(0.0939)	(0.1095)	(0.1032)	(0.0976)	(0.1008)
Lev	0.1718	0.6818*	0.1858	0.3521	0.2059	0.5490
	(0.4926)	(0.4116)	(0.7661)	(0.4646)	(0.4680)	(0.3950)
Cash	3.2622***	3.5475**	3.2635**	3.5501***	3.5521**	3.7465***
	(1.2062)	(1.4718)	(1.3684)	(1.2650)	(1.3930)	(1.3843)
Age	-0.0108	-0.0101	-0.0101	-0.0093	-0.0072	-0.0100
	(0.0113)	(0.0147)	(0.0116)	(0.0117)	(0.0120)	(0.0135)
Sgr	0.0608	0.0368	0.0205	0.0348	0.0116	0.0576
	(0.0573)	(0.0609)	(0.0595)	(0.0634)	(0.0560)	(0.0546)
Fcf	-4.2044***	-4.2898***	-4.6946***	-4.4663***	-4.5883***	-3.9841***
	(1.0103)	(1.0631)	(1.0124)	(0.9571)	(0.9543)	(1.0137)
Tang	0.3560	0.2395	0.6201	0.4142	0.3519	0.3764
	(0.5854)	(0.5762)	(0.6147)	(0.5947)	(0.6066)	(0.5884)
Cons	8.9516***	12.4336***	8.9954***	9.0476***	8.8052***	9.2547***
	(2.0149)	(2.2921)	(2.1154)	(2.1519)	(2.0141)	(2.0802)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Obj	4,138	3,781	4,121	4,138	4,131	3,799
Pseudo R^2	0.28	0.28	0.28	0.28	0.29	0.28

<Table 9> The Effect of the Takeover on Financial Distress

This table shows the estimates of an equation predicting financial distress. After is a binary variable that has a value of one for the years after the takeover, and zeros otherwise. Panel A presents the effect of the takeover on financial distress of acquirers. Panel B presents the effect of the takeover on financial distress of acquirers. Standard errors (reported in parentheses) are clustered at the 2-digit industry level. ***, ** and * denote statistical significance at the 1%, 5% and 10% levels, respectively.

Panel A. The Effect of the Takeover on Financial Distress of Acquirers						
	OLS Dep=ROA	OLS Dep=Lnintcov	OLS Dep=Kscore1	LOGIT Dep=Deficit	LOGIT Dep=Caper	LOGIT Dep=Dintcov
	(1)	(2)	(3)	(4)	(5)	(6)
AFTER	-0.0478 ***	-0.0960 **	-3.1852 ***	0.5009 ***	0.6965 ***	0.5583 ***
	(0.0162)	(0.0382)	(0.7515)	(0.1807)	(0.2115)	(0.1484)
Size	0.0391 ***	0.1035 ***	4.2325 ***	-0.6363 ***	-0.7443 ***	-0.3356 ***
	(0.0086)	(0.0301)	(0.6067)	(0.1283)	(0.1113)	(0.1215)
Lev	-0.2378 ***	-0.0528	-20.8436 ***	0.7000 *	1.4953 ***	1.0963 *
	(0.0418)	(0.0822)	(1.7170)	(0.4206)	(0.5491)	(0.6266)
Cash	0.1745 ***	1.4616 **	9.2378 *	-1.1917	0.5720	1.0922
	(0.0549)	(0.5553)	(5.0663)	(0.8226)	(1.1287)	(0.7464)
Age	-0.0014 ***	-0.0026	-0.0445	0.0231 ***	0.0225 **	0.0139 *
	(0.0005)	(0.0022)	(0.0341)	(0.0079)	(0.0087)	(0.0082)
Sgr	0.0173 **	-0.0027	0.6386 **	-0.0330	-0.0359	-0.2847 **
	(0.0074)	(0.0123)	(0.2980)	(0.0594)	(0.0604)	(0.1377)
Fcf	0.0080	0.0066	2.1666	-0.0458	-5.2665 ***	-8.4134 ***
	(0.0552)	(0.0332)	(1.4797)	(0.4045)	(1.1453)	(1.8783)
Tang	0.0029	-0.1384	-3.8367	-0.0112	-0.9826 *	0.0103
	(0.0751)	(0.0850)	(3.2689)	(0.7074)	(0.5792)	(0.7147)
Cons.	-0.6359 ***	3.2702 ***	-71.9484 ***	9.3237 ***	11.8322 ***	6.0623 ***
	(0.1762)	(0.3825)	(12.0262)	(2.3912)	(2.0994)	(2.1163)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Obj	1,387	1,295	1,372	1,341	1,349	1,272
R^2 or Pseudo R^2	0.35	0.21	0.57	0.20	0.30	0.30

Panel B. The Effect of the Takeover on Financial Distress of Targets

	OLS Dep=ROA	OLS Dep=Lnintcov	OLS Dep=Kscore1	LOGIT Dep=Deficit	LOGIT Dep=Caper	LOGIT Dep=Dintcov
	(1)	(2)	(3)	(4)	(5)	(6)
AFTER	-0.0486 ***	-0.2638 ***	-3.4241 ***	0.3360 ***	0.7543 ***	0.0186
	(0.0155)	(0.0871)	(0.7086)	(0.0988)	(0.0888)	(0.1153)
Size	0.2204 ***	0.0442	7.5302 ***	-0.5260 ***	-0.7932 ***	-0.4669 ***
	(0.0294)	(0.0517)	(1.2485)	(0.0851)	(0.0940)	(0.0898)
Lev	-0.8120 ***	-0.5983 ***	-29.1385 ***	1.1755 **	3.7893 ***	2.4779 ***
	(0.0946)	(0.1947)	(1.9624)	(0.5015)	(0.3216)	(0.2900)
Cash	0.3115	4.0393 ***	-1.5579	-0.3885	-0.0788	0.3560
	(0.2630)	(1.1387)	(6.7426)	(0.7920)	(0.7383)	(0.5396)
Age	-0.0025	-0.0123 ***	-0.0838 *	0.0194 ***	0.0302 ***	0.0046
	(0.0018)	(0.0038)	(0.0464)	(0.0052)	(0.0074)	(0.0059)
Sgr	0.0001	0.0000	0.0014	0.0001	0.0002	-0.0001
	(0.0001)	(0.0001)	(0.0013)	(0.0002)	(0.0002)	(0.0004)
Lown	0.0039 ***	0.0169 ***	0.1025 ***	-0.0261 ***	-0.0416 ***	-0.0192 ***
	(0.0014)	(0.0027)	(0.0301)	(0.0040)	(0.0039)	(0.0033)
Fown	-0.0051 ***	0.0287 ***	-0.1265 ***	-0.0087	0.0014	-0.0118
	(0.0012)	(0.0059)	(0.0422)	(0.0098)	(0.0080)	(0.0100)
Mtb	0.0017	-0.0014	0.1107 *	0.0035	0.0269 **	-0.0020
	(0.0012)	(0.0012)	(0.0627)	(0.0073)	(0.0136)	(0.0035)
Fcf	0.3998	-0.2391	45.3604 ***	-2.1908	-5.7262 ***	-8.7889 ***
	(0.5111)	(0.1541)	(9.2320)	(1.8308)	(0.4534)	(0.8342)
Tang	0.0860	-0.5530	-15.5815 ***	0.8417 **	0.7886 **	0.8850 **
	(0.1708)	(0.3648)	(4.4901)	(0.3436)	(0.3173)	(0.4387)
Cons.	-4.2054 ***	0.6433	-124.2286 ***	3.1549	0.9753	-1.7938
	(0.4910)	(1.0889)	(22.8105)	(2.0010)	(2.1634)	(1.8524)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Obj	4,855	2,435	4,854	4,811	4,817	4,606
R^2 or Pseudo R^2	0.55	0.28	0.77	0.22	0.38	0.31

<Table 10> Balance Tests

This table determines whether the observed characteristics are significantly different between the treated group and the control group. Propensity score matching is used to construct a control group similar to that of acquirer and target based on the year before the takeover. We use the observed characteristics to calculate a propensity score such as total assets(firm size), sales growth rate (growth opportunity), leverage (capital structure), and cash holdings (liquidity), and match firms in the same industry(KSIC 2-digit) with Caliper=0.05 without replacement. if the acquirer is a publicly traded firm, it has performed matching with the publicly traded firm. Inversely, if the acquirer is a privately held firm, it has performed matching with the privately held firm. On the other hand, all targets in the sample are publicly traded, and their matched controls are also publicly traded. Panel A compares the characteristics of non-acquirers and acquirers after matching. Panel B compares the characteristics of non-targets and targets after matching.

Panel A. Acquirer and non-acquirer controls					
	Non-acquirer (N=342)	Acquirer (N=342)	Diff	t Value	Pr > |t|
Asset	594	649	-54.56	-0.28	0.7826
Sales growth	0.24	0.23	0.01	0.06	0.9496
Leverage	0.47	0.47	-0.01	-0.29	0.7690
Age	21.81	22.40	-0.59	-0.52	0.6010
Cash	36	34	1.68	0.14	0.8893
Panel B. Target and non-target controls					
	Non-target (N=1,117)	Target (N=1,117)	Diff	t Value	Pr > |t|
Asset	181	174	6.35	0.20	0.8428
Sales growth	13	12	1.04	0.38	0.7062
Leverage	0.56	0.54	0.02	1.48	0.1381
Age	21.61	21.97	-0.36	-0.65	0.5166
Cash	13	11	1.92	0.77	0.4401

<Table 11> Placebo Tests

This table estimates the same regression as Table 9 using matched controls to check if the financial distress changes in the control group. Standard errors (reported in parentheses) are clustered at the 2-digit industry level. ***, ** and * denote statistical significance at the 1%, 5% and 10% levels, respectively.

Panel A. The Effect of the Takeover on Financial Distress of Non-acquirers

	OLS Dep=ROA	OLS Dep=Lnintcov	OLS Dep=Kscore2	LOGIT Dep=Deficit	LOGIT Dep=Caper	LOGIT Dep=Dintcov
	(1)	(2)	(3)	(4)	(5)	(6)
AFTER	0.0046	0.0590	0.1216	-0.0189	-0.3677 **	-0.1230
	(0.0070)	(0.0456)	(0.5983)	(0.2179)	(0.1762)	(0.2354)
Size	0.0154 ***	0.0150	2.5805 ***	-0.0838	-0.5381 ***	-0.1146
	(0.0053)	(0.0301)	(0.3677)	(0.1603)	(0.1482)	(0.1101)
Lev	-0.1814 ***	-0.6066 ***	-25.8789 ***	2.6008 ***	4.3918 ***	2.5486 ***
	(0.0395)	(0.1295)	(1.3877)	(0.6014)	(1.2398)	(0.5609)
Cash	0.0348	1.1729 **	4.5147	1.1704	-0.0876	-0.1087
	(0.0620)	(0.5190)	(4.8935)	(1.1186)	(1.6351)	(0.9217)
Age	-0.0012 ***	0.0034	-0.0613 *	0.0015	0.0261	0.0204 **
	(0.0004)	(0.0053)	(0.0357)	(0.0105)	(0.0160)	(0.0082)
Sgr	0.0227 **	-0.0005	0.5711	-0.0791	-0.0068	-0.4236
	(0.0099)	(0.0207)	(0.3487)	(0.1498)	(0.0861)	(0.3428)
Fcf	0.1846	0.9305 *	9.5803 **	-3.5849	-1.9524	-5.3744 *
	(0.1256)	(0.4882)	(3.9400)	(2.4267)	(1.8649)	(2.9040)
Tang	0.0028	-0.0412	-2.8199	0.7805	0.6856	0.7967
	(0.0307)	(0.1752)	(2.2909)	(0.7682)	(0.8712)	(0.7280)
Cons	-0.4067 ***	4.6141 ***	-36.0971 ***	-0.8707	9.3004 ***	0.2127
	(0.1203)	(0.6045)	(7.2550)	(3.6094)	(2.4135)	(2.3509)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Obj	1,136	966	1,129	1,012	1,006	953
R^2 or Pseudo R^2	0.26	0.21	0.65	0.21	0.30	0.21

Panel B. The Effect of the Takeover on Financial Distress of Non-targets

	OLS Dep=ROA	OLS Dep=Lnintcov	OLS Dep=Kscore1	LOGIT Dep=Deficit	LOGIT Dep=Caper	LOGIT Dep=Dintcov
	(1)	(2)	(3)	(4)	(5)	(6)
AFTER	-0.0009	-0.0685	-0.1176	-0.1493	0.1005	0.0041
	(0.0111)	(0.0602)	(0.3844)	(0.0994)	(0.1107)	(0.0598)
Size	0.0753 ***	-0.0006	3.6824 ***	-0.1307	-0.4067 ***	-0.2055 ***
	(0.0173)	(0.0356)	(0.6970)	(0.1536)	(0.0873)	(0.0721)
Lev	-0.8599 ***	-2.1282 ***	-31.1003 ***	2.6916 ***	5.6671 ***	3.5896 ***
	(0.2037)	(0.2521)	(4.1893)	(0.6802)	(0.7457)	(0.3579)
Cash	-0.5204 ***	3.2424 ***	6.4612	-1.1511	-0.9522	-1.0940
	(0.0871)	(0.7407)	(8.5582)	(1.1497)	(1.3986)	(0.9239)
Age	0.0009	-0.0017	-0.0528 ***	0.0020	0.0106 *	-0.0039
	(0.0009)	(0.0030)	(0.0176)	(0.0058)	(0.0058)	(0.0067)
Sgr	0.0003 ***	0.0016 ***	0.0072 *	-0.0040	-0.0036	-0.0046
	(0.0001)	(0.0004)	(0.0038)	(0.0030)	(0.0028)	(0.0044)
Lown	-0.0005	0.0084 ***	0.0291	-0.0249 ***	-0.0265 ***	-0.0172 ***
	(0.0009)	(0.0025)	(0.0352)	(0.0044)	(0.0076)	(0.0041)
Fown	-0.0043 ***	0.0127 **	-0.0533	-0.0233	0.0086	-0.0042
	(0.0014)	(0.0052)	(0.0373)	(0.0194)	(0.0077)	(0.0131)
Mtb	0.0077	-0.0088	0.9817 ***	0.0480 ***	0.0582 *	-0.0197
	(0.0051)	(0.0082)	(0.3318)	(0.0178)	(0.0335)	(0.0134)
Fcf	1.0163 ***	3.1123 ***	32.1535 ***	-5.5950 ***	-4.0735 ***	-8.1958 ***
	(0.1930)	(0.4542)	(7.8135)	(0.6447)	(1.0672)	(0.6821)
Tang	0.1020	-1.5993 ***	-1.1642	0.9231 ***	-1.2075 ***	1.2094 ***
	(0.0872)	(0.3185)	(3.8189)	(0.3373)	(0.3944)	(0.3653)
Cons	-1.2823 ***	4.2341 ***	-38.9101 **	-1.0165	3.4982 **	3.3858 ***
	(0.3394)	(0.5752)	(14.8633)	(2.6943)	(1.6753)	(1.2727)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Obj	3,057	2,420	3,056	3,013	2,980	2,867
R^2 or Pseudo R^2	0.64	0.40	0.64	0.27	0.34	0.27

Chapter 2.

Tax Avoidance of Publicly-traded and Privately-held Firms

1. Introduction

Traditionally, tax avoidance was perceived as an act of raising the firm value by reducing corporate net income. In this perspective, Weisbach (2002) referred to the under-sheltering puzzle, that the degree of tax avoidance is significantly dispersed rather than high for all firms. However, even if the benefits from tax avoidance are obvious, there are costs and risks involved in avoiding taxes, which makes it difficult to achieve the desired level. Specifically, there are costs associated with internal resources and external consulting, which can be costly and involve illegal parts, resulting in the risk of detection from tax authorities or the risk of declining corporate reputation (Chen and Chu, 2005; Crocker and Slemrod , 2005; Chen, Chen, Cheng, and Shevlin, 2010; Armstrong and Jagolinzer, 2015). On the other hand, recent studies show that tax avoidance does not contribute to raising the corporate value since it leads to private benefits of the insiders (Chan, Mo and Tang, 2016; Hong, Kalcheva, and Srivastava, 2017). Thus, the level of tax avoidance varies from company to company.

This study analyzes the determinants of tax avoidance of public and private firms and the effect of listing on tax avoidance. Previous studies usually analyze tax avoidance of publicly traded firms. There is little known about the tax avoidance of privately held firms, although the motivations of tax avoidance of public firms and private firms can be different due to the differences in governance structure, capital structure and market monitoring

(Hanlon and Heitzman, 2010). First of all, the shares of privately held firms are concentrated on a small number of shareholders and have less market monitoring than publicly traded companies. In addition, they rely heavily on debt to raise fund, so the leverage is high. Second, the reason for the lack of research on tax avoidance of privately held firms is not only because of the scarcity of data but also because of the low credibility of their financial statements. In Korea, companies with larger than a certain size are required to receive external audits on their financial statements and announce it, thus making it possible to use reliable data on privately-held firms. Further, in this study, to alleviate the problems caused by differences in the accounting environment between privately-held and publicly-traded companies, we include only the firms with audit opinions of “unqualified”.

The remainder of this paper is constructed as follows. In Section 2, we study the factors affect tax avoidance through previous literature. Section 3 presents the data and variables used in this study in detail. In Section 4, we analyze the determinants affecting corporate tax avoidance through empirical analysis. In particular, we analyze not only the whole sample, but also sub-samples, such as sub-samples divided by size, and sub-samples around the tax bracket breakpoints. Section 5 reports the results of difference-in-differences analysis exploiting the tax law revision in 2012 as a natural experiment. Finally, Section 6 summarizes the results and concludes.

2. Literature review

Tax avoidance has different meanings depending on the perspective, i.e. that of corporations, academic institutions, and governments agencies (Hanlon et al., 2010). Traditionally, corporate finance understands tax avoidance as a tax cut using tax loopholes under legitimate regulations. Also, tax avoidance is deemed to increases the net income of the company, thereby increasing the firm value. However, there is no clear evidence that tax avoidance increases corporate value. Rather, recent studies show that the effect of tax avoidance on corporate value depends on corporate governance and agency problems (Desai and Dharmapala, 2009; Jun, 2011b). In addition, the extent of tax avoidance varies widely across country and company, and a lot of research is being done to explain this. In this section, we examine the factors that influence tax avoidance through previous studies.

First, the agency problem between shareholders and managers affects tax avoidance. As tax avoidance increases, the firm value increases, so shareholders ask managers to avoid more tax. The manager determines the degree of tax avoidance comparing its compensation and the expenses. However, the level of tax avoidance the managers determine is usually lower than the level the shareholders want because of misalignment of their interests. Chenand Chu (2005) and Crocker and Slemrod (2005) analyze the contract between shareholders and managers on tax avoidance through a theoretical model. They argue that contracts on tax avoidance distort

managerial efforts and reduce contract efficiency. Further, they suggest that it is more effective to punish managers than shareholders to reduce tax avoidance. On the other hand, the results of empirical studies on whether compensation for managers increase tax avoidance are mixed. Desai and Dharmapala (2006) show that high-powered incentives reduce management's agency problems, along with a decrease in tax avoidance activities due to the complementary relationship between diversion and tax avoidance. Especially, this tendency is strong in companies where corporate governance is inefficient and there is much room to reduce diversion of managers. On the other hand, some studies have shown that tax avoidance increases as the compensation based on equity, such as stock options, are increased (Armstrong, Blouin and Larker, 2012; Rego and Wilson, 2012).

In addition, corporate governance can affect tax avoidance. However, the results of empirical studies on how governance affects tax avoidance are inconsistent. First, there are studies that tax avoidance increases as the governance structure become worse. This is the view that the insiders (managers or controlling shareholders) avoid taxes in order to pocket the economic benefits of tax reduction. Chan, Mo, and Tang (2016) show that tax avoidance has a positive correlation with tunneling measured by insider loan transactions. There are also a number of studies showing that the effective corporate tax rate of the entire business group is lowered through the transfer of profits among the affiliates in the same business group (Gramlich, Limpaphayom and Rhee, 2004; Beuselinck and Deloof, 2014). On

the other hand, some studies have revealed the mechanism in which tax avoidance increases with better governance. Armstrong et al (2015) and Robinson (2012) argue that the board of directors with financial expertise and independence tends to determine tax avoidance levels appropriately by assessing the benefits and costs of tax avoidance. In particular, the board of directors with good corporate governance tends to increase tax avoidance when the level of tax avoidance is low, but reduce it when the level of tax avoidance is too high.

The use of debt is also related to tax avoidance. According to traditional financial theory, there is a tax shield that is a reduction in taxable income by claiming allowable deductions such as interest expenses incurred by the use of debt. Recent studies suggest that the use of debt decreases as the tax avoidance increases because tax avoidance replaces the tax shield of debt (Lin, Tong, and Tucker, 2014; Richardson, Lanis, and Leung, 2014).

There are studies that point out other factors affecting tax avoidance such as family business, characteristics of CEOs, and external monitoring. First, family firms are passive in avoiding tax because the costs such as a potential decline in share prices due to the reputation of exploiting minority shareholders are greater than benefit from tax avoidance (Chen, Chen, Cheng and Shevlin, 2010). On the other hand, some studies show that the degree of tax avoidance varies depending on the CEO's experience and ability.

According to Dyreng, Hanlon, and Maydew (2010), tax avoidance increases when CEO who has worked for a company that engages a lot of tax avoidance is newly appointed. Koester, Shevlin, and Wangerin (2017) argue that a talented CEO who can use corporate resources effectively increases tax avoidance. Finally, there are studies showing that tax avoidance decreases when external monitoring increases. Chen and Lin (2017) study that a decrease in analyst activity leads to an increase in tax avoidance. This effect was particularly pronounced in companies with tax havens, those with less monitored by taxation authorities, and industries where reputation matters. Kim, Li, and Zhang (2011) argue that firms with high tax avoidance increase the risk of stock price crash because they create an environment that justifies managerial opportunistic behavior and accumulate negative news. They also argue that the negative effect of tax avoidance is reduced by an increase in external monitoring, such as institutional investors' shareholdings, analyst activities and the threat of takeover.

However, the research on the tax avoidance of privately held companies is relatively small. Privately held firms have lower agency problem than that of publicly traded firms because shareholders and managers are more likely to be the same person. The existence of large shareholders also reduces the conflict of interests among shareholders and increases monitoring. Related studies also support this view. Lehn and Poulsen (1989) find out that the shareholders' benefit from going private is mainly due to a decrease in agency costs related to free cash flow. Pagano

and Roell (1998) argue that when the ownership of the large shareholder becomes large enough, diversions by the manager do not occur and the agent problem disappears. For these reasons, motivations for tax avoidance of privately held companies may be different from publicly traded companies. Jaafar and Thornton (2015) analyze tax avoidance through the use of tax havens by dividing them into public and private companies. The results show that both types of companies use tax havens for the purpose of tax avoidance, and the degree of reduction in effective tax rate is larger in private companies. They argued that thus it is necessary for the tax authorities to monitor against private companies. On the other hand, Badertscher, Katz, and Rego (2013) argue that owner-managers in privately held firms are less likely to avoid taxes because they are more risk-averse than managers who do not have ownership. Steijvers and Niskanen (2014) divide privately held firms into family firms and non-family firms and show the degree of tax avoidance is lower in non-family firms.

Tax avoidance studies in Korea also focus on publicly traded companies. Koh, Kim, and Choi (2007) analyze the characteristics of publicly traded firms related to corporate tax avoidance for the period of 2000-2005 and investigate the effect of tax avoidance on firm value. They verify that tax avoidance has a significant positive relationship with the level of the tax burden, profitability, and the existence of owner-manager, and a significant negative relationship with the level of tax benefits. It also indicates that tax avoidance could have a positive effect on firm value by

reducing cash outflow. Jun (2011a) analyzes the effect of tax avoidance on the firm value of publicly traded companies from 1994 to 2007. He concludes that tax avoidance has a positive effect on the value of the firm where the ownership of institutional investors is high but has a negative effect under governance structures with a highly concentrated ownership. On the other hand, there are studies analyzing other factors related to tax avoidance in Korea. Woo (2015) shows that private consumption of CEO is high in companies where tax avoidance is large, using entertainment expenses and welfare expenses as a measure of managers' private consumption in the publicly traded companies. Choi, Koh, and Cho (2011) demonstrate that firms tend to minimize the tax burden of the total affiliates in the business group through the transfer of income using related party transactions in Korea. Although there are also few studies on the tax avoidance of privately held companies in Korea, Jun (2011b) analyzes the effect of tax avoidance on corporate performance for the firms that are required to receive external audits, including privately held firms. This study shows that tax avoidance may not increase firm value under bad governance.

3. Data and Variables

The data is from TS-2000 financial statements of the firms that are required to meet their external audit requirements during the period between

2003 and 2017. The information on the major shareholders of each company is from the Kisvalue database. In this study, we identify whether each firm is a legitimate SMEs under *Act on Small and Medium Businesses* in order to control the effect of the SMEs' tax benefits. The effect of SMEs' tax benefits must be controlled in the study that tax avoidance is proxied by the difference between accounting income and tax income because SMEs' tax benefits widen the gap between accounting income and tax income regardless of tax avoidance. However, most of the previous studies have been overlooked to control the effect of SMEs' tax benefits.

The final sample is obtained through the following process. Firms in financial and insurance industry (K), public administration, defense and social security administration (O), association, group, and individual service industry (S), household employment activity and unclassified self-consumption production activities (T) are excluded because of the nature and purpose of such business differ from those of a conventional business. Companies with capital erosion are excluded because they would not be able to perform normal business activities, and companies with a negative pretax profit or tax standard are also excluded because they are not likely to be motivated by tax avoidance. We also excluded firms whose audit opinion is other than 'Unqualified'. Companies with missing information on whether they are SME are excluded. Companies with missing information on their shareholder are also excluded.

We also analyze sub-samples as well as the whole sample. Sub-samples are generated by dividing the whole sample by specific criteria. First, the whole sample is divided into 10 sub-samples according to its size of the company. As the size of public and private companies differ significantly on average, we need to compare them within sub-samples of similar size. Next, we construct sub-samples of only those companies whose taxable incomes are located around the tax bracket breakpoints. As the corporate tax in Korea is a progressive tax structure, different tax rates are applied to each tax bracket. As shown in Table 1, the higher tax rate is applied if the taxable income exceeds 100 million won by 2007, and if the taxable income exceeds 200 million won by 2011. Since 2012, the tax law has been revised and the new tax bracket is added. Specifically, before the revision, taxable income exceeding 200 million was subject to the same tax rate, but after the revision, the middle tax rate is applied to taxable income between 200 million and 20 billion won and the highest tax rate for taxable income exceeding 20 billion. We expect that the benefit of tax avoidance is the highest when the taxable incomes are slightly above the tax bracket breakpoint.

<Table 1>

Assuming that firms reduce the same amount of income on the purpose of tax avoidance, the actual amount of tax reduction will be larger when they avoid higher tax bracket as a result of the tax avoidance since

the marginal tax rate becomes lower. Therefore, the sub-sample is composed of companies that are around (±10% ~ ±80%) the tax bracket breakpoints. More information on the sub-samples is described in detail in each section.

3.1 Estimates of tax avoidance

Tax avoidance is an activity that can occur in companies that have positive taxable incomes, so information on taxable income is necessary to estimate it. However, since tax reporting data is not disclosed, they are usually estimated through its financial statements. First, the corporate tax burden is calculated by adding the increase in deferred tax asset and deducting the increase in the deferred tax liability to the corporate tax expense (Choi, Koh, and Cho, 2011). Next, the taxable income is calculated by dividing the tax burden by the corporate tax rate as in Equation (1). The corporate tax rate for each year in Table 1 is reflected when calculating.

$$\widehat{TI}_{it} = \frac{tax}{\tau} \qquad (1)$$

$\widehat{TI}_{it}$: Estimates of taxable income
tax : Corporate tax burden
τ : Corporate tax rate

In this study, we define tax avoidance (resid) as the difference between accounting income and taxable income that is not explained by the total accrual, following Desai et al (2006). Desai et al. (2006) use the residual

book-tax gap which is obtained by regression of the difference between accounting income and taxable income on earnings management, in order to separate the effect of earnings management. The detailed equations are as follows:

$$BTG = Ys - \hat{Y}i \quad (2)$$

BTG: Book-Tax Gap

Ys: Net income before income taxes

$$BTG_{i,t} = \beta_1 TA_{i,t} + \epsilon_{i,t} \quad (3)$$

$BTG_{i,t}$: Difference between accounting income and taxable income of firm i, year t divided by total assets

$TA_{i,t}$: Total accruals (net income - operating cash flow) of firm i, year t divided by total assets

$\epsilon_{i,t}$: The residual of firm i in year t

The estimate of tax avoidance is the residual obtained from equation (3), which is the difference between accounting income and taxable income that is not explained by the total accrual.

3.2. Factors that affect tax avoidance

Status of company

- List is a dummy variable that indicates whether the company is publicly

traded or not. If it is before the year listed, it is regarded as privately held, and if it is after the year listed, it is regarded as publicly traded. If the company is moved from the Kospi market to the Kosdaq market (or from the Kosdaq market to the Kospi market), it is considered to be listed continuously since the year of listing at the first market. If it is after the year delisted, it is considered privately held.

• Small and medium-sized enterprise (sme) is a dummy variable that indicates whether a company is legally eligible for a small and medium business. We use the data provided by TS-2000. It is difficult to judge correctly whether a company is SMEs by law due to lack of detailed information on the qualifications and the grace periods. TS-2000 database reclassifies SME status considering their inside information.

• Business group (bg) is a dummy variable that indicates whether it is a affiliate of any business group. TS-2000 provides the group name if it belongs to the business group.

Corporate governance

• CEO-Shareholder (ceosh5) is a dummy variable indicating whether the CEO is among the 5 largest shareholders. If the CEO is the large shareholder of the corporation, it is expected that the agency problem decreases because the interests of the shareholder and the manager are aligned. This variable was made by matching the annual CEO list in the TS-2000 database with the annual list of the five major shareholders in the

Kisvalue database. If one of the CEOs are the same as one of 5 major shareholders in the same year, the company is considered a shareholder managed company.

• CEO-Shareholder ownership (ceoown) is the ownership stake of the CEO-shareholder if the CEO is among the 5 largest shareholders. It was calculated in the same manner as that of ceosh5.

• Asset utilization (Asset Util) is the variable that measures how effectively assets are used to generate revenue. This is the value of the sales divided by total assets, following Ang, Cole, and Lin (2000). Larger values mean more efficient use of the assets, so low agency costs.

• Free cash flow (fcash) is measured by operating cash flow divided by total assets. If the free cash flow is large in the firm, the insiders can divert it for their private benefits. Therefore, the more the free cash flows are expected to increase the agency problem.

• S1 is the ownership stake of the largest shareholder in the Kisvalue, indicating the concentration of the ownership. However, it does not include shareholdings of related parties, and therefore it does not necessarily mean the control power over the company.

Information asymmetry

• Age refers to the number of years from the establishment year. The younger the age, the greater the information asymmetry is since the less

information is known to the market.

- Size is calculated as the log of total assets.

Capital structure

- Leverage (lev) is the total liabilities divided by the total assets.

- Cash is the sum of cash, cash equivalents, and short-term financial assets, scaled by total assets. A firm with high financial flexibility does not need to hold a large amount of cash since it can raise funds when necessary. Therefore, companies with low cash holdings are regarded as companies with high financial flexibility and low financial constraints.

Risk

- Risk aversion (rovol) is calculated as the standard deviation of the return of asset (roa) over five years. Risk aversion may affect the degree of tax avoidance since tax avoidance accompanies risks such as the risk of investigation, the risk of reputation damage, and the risk of stock price decline.

3.3. Summary statistics

<Table 2>

Table 2 shows the summary statistics for the entire sample. To eliminate the effects of extreme values due to errors in data or scaling

problems, 1% of the extremes was removed. The total number of samples is 53,907, including 11,190 (21%) publicly traded companies and 42,717 (79%) privately held companies. Publicly traded companies are larger than privately held companies in terms of taxable income (yt), net income (ys), and the size (size). Estimates of tax avoidance show that publicly traded firms have a positive value, while privately held firms have a negative value, indicating that tax avoidance of publicly traded firms is high on average. However, since the listing status affects various variables at the same time, more rigorous analysis through multivariate regression is needed. Privately held firms have high CEO-shareholder (ceosh5) ratio and high concentration of ownership (s1) as expected. 40% of the publicly traded companies belong to a business group, whereas only 5% of the privately held companies do. The leverage of a publicly traded company is lower than privately held companies since they can raise capital through the stock market. Also, privately held firms are younger and smaller than publicly traded companies on average, resulting in higher information asymmetry. 46% of publicly traded companies and 79% of privately held companies are SMEs.

On the other hand, 22,872 companies with positive tax avoidance estimates account for 42% of the entire sample. Although a few studies include only the companies with positive estimates of tax avoidance, most of the studies include all companies regardless of whether the estimates of tax avoidance have positive and negative values. Moreover, most of them report that the estimate of tax avoidance is positive on average since they

include publicly traded companies only. In this study, also, the average of tax avoidance estimates for publicly traded companies is positive and consistent with the previous studies.

4. Empirical analysis

4.1 Determinants of tax avoidance

In this section, we analyze the determinants of tax avoidance considering factors known to affect tax avoidance in the previous studies. In particular, we investigate the effect of each factor on publicly traded and privately held companies respectively. Specifically, we consider the factors such as corporate status (listing, SMEs, business group), corporate governance and agency problems(CEO-shareholder, the concentration of ownership, asset utilization, free cash flow), information asymmetry (age, size), capital structure (leverage, financial flexibility), and risk aversion. OLS regressions and logit regressions are used, and the explanatory variables are lagged to limit potential endogenous problems in the models. Following the method of Brav (2009), each explanatory variable is multiplied by the listed dummy or unlisted dummy, generating interaction terms.

<Table 3>

Table 3 shows the determinants of tax avoidance. Column (1) represents the results of a regression analysis for the entire sample; column

(2) shows the results of regression analysis for firms with positive tax avoidance estimates only; column (3) represents the results of logit analysis where the dependent variable is tax avoidance; and column (4) shows the results of the logit analysis, in which the dependent variable is long-term tax avoidance (ltaxavd). Long-term tax avoidance is an indicator variable that has a value of 1 when a firm remains in the sample for more than 5 years and its book-tax gap(btg) is bigger than zero for more than half of its total years. The results show that tax avoidance increases when its CEO is one of the top 5 shareholders. This is consistent with previous studies showing that tax avoidance increases when the interests of shareholders and those of the management are aligned. Although not reported, the results are similar when the CEO-shareholder variable is substituted with the CEO-shareholder ownership variable. On the other hand, companies with a high potential for private benefits are related to a large tax avoidance. Specifically, tax avoidance increases as the asset utilization becomes lower and the free cash flow becomes larger. In particular, regression coefficients of publicly held firms are higher than those of privately held firms, which implies that the effect of agency problems on tax avoidance is greater for publicly held firms. In addition, it is shown that tax avoidance occurs more as the age of a company is younger and the leverage is lower, and the financial flexibility is higher. Although tax avoidance is likely to be higher when the risk-aversion is high in privately held firms, it seems that the effect is not significant because all the analyzes do not show consistent

results. The coefficients of SME (sme) show significant positive values, confirming that the tax benefits of SMEs affect the estimates of tax avoidance.

Finally, it is shown that a coefficient of listing has a significant positive value, indicating the level of tax avoidance for publicly traded companies is higher than for privately held companies, even considering the effects of other variables. Compared to privately held companies, publicly traded companies are expected to carry out tax avoidance routinely because they have more financial and accounting staff and better internal systems, and more expertise external consulting. However, the entire sample has limitations in analyzing the motivations of tax avoidance for publicly traded and privately held companies in two respects. Firstly, the difference in size between publicly traded and privately held companies may affect tax avoidance ability. Since it is difficult to control these effects effectively by adding control variables in the regression analysis, it is necessary to compare companies of similar size. Next, tax avoidance behavior can be changed depending on whether the benefit of tax avoidance is high or low. For instance, privately held firms are likely to more actively avoid tax as the benefit of tax avoidance increases, since the net income increased by tax avoidance are mostly attributed to a small number of insiders. While publicly traded companies are required to share it with a large number of shareholders. therefore, they may less sensitive to whether the benefit of tax avoidance is high or low. The following section focuses on the effect of

listing on tax avoidance using sub-samples.

4.2. Determinants of tax avoidance by size

Tax avoidance activities require considerable resources. It is expected that the larger the size of the company, the greater the number of human resources or external resources available for tax avoidance. Therefore, the determinants of tax avoidance may vary depending on size. Armstrong et al (2015) show that the higher the financial expertise of members of the audit committee, the more likely the tax avoidance increases. McGuire, Omer, and Wang (2012) show that tax avoidance tends to increase as the tax expertise of external auditors increases since companies are also affected by tax-related services from their outside auditors. Therefore, it is difficult for small firms to engage in tax avoidance. Small firms are likely to lack financial or tax professionals within the firm. In addition, since it receives external audits mainly by an audit team or an individual CPA, which is expected that tax expertise will be lower than that of a large accounting firm mainly dealing with publicly traded and large companies. In order to reduce the effect of tax expertise on tax avoidance, we divide the total sample into 10 subsamples by firm size and analyze the determinants of tax avoidance for each sub-sample.

<Table 4>

Table 4 summarizes the 10 sub-samples by firm size. The proportion

of publicly traded companies are very low in the sub-samples with smaller size, while it is high in the sub-samples with larger size. For the privately held firms, the degree of tax avoidance tends to decrease as the size increases, but for the publicly traded firms, it is the highest in the medium-sized sub-samples.

<Table 5>

Table 5 shows the determinants of tax avoidance by size. Although in the first three sub-samples, listing status has no effect on tax avoidance, in the rest of the sub-samples, listing status affects tax avoidance. Most notably, in the subsample with the largest size, the tax avoidance of privately held companies is higher than that of publicly traded companies. These results show that privately held firms can be more aggressive in tax avoidance than publicly traded companies in the case of securing enough manpower or external resources. Analyzing the effect of the other factors, CEO-shareholder increases tax avoidance in most small and medium-sized sub-samples of privately held firms, but in large-sized sub-samples, the statistical significance of the coefficients disappears. The effect of the ownership of the largest shareholder is similar to that of the entire sample. In specific, it reduces tax avoidance in the medium-sized sub-samples for the publicly traded firms, and in small and medium-sized sub-samples for the privately held firms. On the other hand, tax avoidance increases as the asset utilization become lower for the privately held firms in all

sub-samples, but not for the publicly traded firms. Furthermore, for both public and private firms, firms with high free cash flow increase tax avoidance. Information asymmetry seems to increase tax avoidance for the publicly traded companies in the medium and large-sized sub-samples, but the effect is weak for privately held companies. Besides, publicly traded firms tend to increase tax avoidance when their leverage decreases, while privately held firms tend to increase tax avoidance when their financial flexibility increases.

4.3. Tax avoidance and the tax brackets

This section examines which companies, publicly traded or privately held, are more active in tax avoidance, using the sub-sample of companies that are near the tax bracket breakpoints. The Korean corporate tax structure progressive and the higher tax rate is applied to the higher income bracket. Therefore, if the taxable income is around the boundary between two tax brackets, a small reduction of taxable income might result in a large amount of tax avoidance. Therefore, it is expected that firms whose taxable incomes are around the tax bracket breakpoints are more likely to engage in tax avoidance than others.

<Table 6>

Table 6 shows the summary statistics of the subsample. There are 1,228 companies within ± 10% of the tax bracket breakpoints, which is

2.3% of the total sample. On the other hand, there are 14,114 companies within ± 80% of the tax bracket breakpoints, which is 26.2% of the total sample. The ratio of publicly traded companies in the sub-samples is about 20%. The t-value shows the result of t-test whether there is a difference in the level of tax avoidance between privately held and publicly traded companies within each sample. In the sub-samples of ± 10% to ± 60% range, tax avoidance of privately held companies is higher than that of publicly traded companies, while there is no difference in the ± 70% sub-sample; and, in the sub-sample of ± 80% range sub-sample, in reverse, the tax avoidance of publicly traded companies is higher than that of the privately held companies. However, since univariate comparison does not take into account the influence of other factors, it is necessary to test through multivariate analysis after controlling the influence of other factors.

<Table 7>

Table 7 shows the results of the regression analysis for each sub-sample around the tax bracket breakpoints where the benefit for tax avoidance is expected to be the greatest. In all sub-samples, privately held firms' tax avoidance is higher than publicly traded firms, but the regression coefficient decreases as the range widen from the tax bracket breakpoints. This shows that privately held firms are more aggressive in avoiding taxes when the benefits of tax avoidance are large. The effect of other variables on tax avoidance is also different from the results in the whole sample.

CEO-shareholder still increases tax avoidance in privately held firms but does not in publicly traded companies. In addition, the largest shareholder reduces tax avoidance in the whole sample, but there is no significant effect on tax avoidance in this sub-sample. On the other hand, in the entire sample, tax avoidance increases as the agency problem become larger, but in the sub-sample around tax bracket breakpoints, the effect of the agency problem on tax avoidance is not clear. Some sub-samples still show a tendency for tax avoidance to increase as the asset utilization rate become lower. However, tax avoidance tends to increase as the free cash flow decreases in privately held companies, indicating that the fewer agency problems, the more tax avoidance. This is contrasted with the results from the entire sample.

5. Difference-in-differences analysis

Finally, we examine which companies, public and private, are more aggressive in avoiding taxes using the revision of the tax law in 2012 as an exogenous shock. In addition, we use difference-in-differences analysis to establish a causal relationship. The difference-in-differences analysis is a quasi-experimental design that identifies the pure effect of the event using the difference between the control group and the treatment group, and the difference between before and after the event. If companies actively engage in tax avoidance in order to avoid a higher tax bracket, groups affected by

the revision of tax law is likely to change their tax avoidance behavior and groups unaffected is not likely to change. As shown in <Table 1>, the number of tax bracket changes from two to three in 2012. Thus, companies with taxable income around 20 billion won were subject to a tax rate of 22% before the revision of the tax law, but after the revision, the marginal tax rate can be changed depending on the amount of taxable income. In detail, a 20% tax rate will be applied when it is less than 20 billion won, and a 22% tax rate will be applied to the amount of taxable income over 20 billion won. In this study, companies with a 5-year average taxable income of around the new tax bracket breakpoint (20 billion won ± 10%, ± 20%, ± 30%, ± 50%) are treated as treatment groups and the rest of the firms that is required to meet external audit obligations as control groups to test the aggressiveness of tax avoidance. The regression equation is as follows.

$$Resid_{i,t} = \alpha + \beta_1 After_t + \beta_2 Around_i + \beta_3 Did_{i,t} + \gamma Controls_{i,t} + FE + \epsilon_{i,t}$$

Resid: Estimates of tax avoidance

After: A dummy variable with a value of 1 in the year after the revision of the tax law (2012), and zero otherwise

Around: A dummy variable with a value of 1 if the past five years average taxable income is around 20 billion won (± 10%, ± 20%, ± 30%, ± 50%), and zero otherwise

Did: A interaction term of After and Around representing the effect of difference-in-differences

<Table 8>

<Table 9>

Table 8 shows the summary statistics for the treatment group and the control group. The treatment group consists of privately held companies and publicly traded companies, 40% of that is publicly traded companies. The results of difference-in- differences analysis are presented in Table 9. In Panel A, the coefficients of Did show a significant positive value. Therefore, it can be interpreted that firms with increasing incentives for tax avoidance due to the change in tax bracket structure increase tax avoidance compared to the past of their own and other firms. In panel B, we conduct the same regression analysis on the publicly traded firms and on the privately held companies respectively. The results show that a significant increase in tax avoidance is observed only in privately held firms. Therefore, the effect of the difference-in-differences is driven by privately held companies. In sum, firms engage in tax avoidance in order to belong to the lower tax bracket, and privately held firms are more aggressive.

6. Conclusion

In this study, we analyze the determinants of tax avoidance for public and private companies and the effect of listing on tax avoidance using firms have the external audits requirement in Korea. The contributions of this

study are twofold. First, it analyzes the tax avoidance of privately held companies. Their tax avoidance behavior may be different from that of publicly traded firms since they are different in terms of corporate governance structure, capital structure, and market surveillance. Nevertheless, there are few studies on the tax avoidance of privately held companies due to the lack of reliable information. In this study, we integrate information of the external audit company from TS-2000 and Kisvalue to make the variables that can affect tax avoidance such as corporate status, shareholders, and managers in addition to financial information. Furthermore, the influence of SMEs that has been overlooked in previous studies is controlled. Moreover, we try to mitigate the effects of differences in accounting environments between publicly traded firms and privately held firms by only including firms with audit opinions of unqualified.

Second, we try to contribute to related research by explaining the difference of tax avoidance behavior of publicly traded and privately held companies. Although publicly traded firms tend to avoid tax than privately held firms in general, privately firms are found to be more aggressive in tax avoidance in the case where tax avoidance would result in large tax savings. It seems that publicly traded companies, that have abundant financial and accounting staff and use highly specialized outside consulting services, are usually performing a high level of tax avoidance compared to privately held companies. However, privately held firms are more aggressive in tax avoidance when the number of manpower or external resources is

secured or the incentive for tax avoidance is relatively high. In privately held firms, the increments of earnings from tax avoidance are attributed to a small number of insiders. Therefore, they actively avoid tax when the benefit from tax avoidance is relatively high in spite of the poor resources available. On the other hand, a publicly traded company must share the increments of earnings from tax avoidance with a large number of shareholders. Moreover, they have to take additional risks such as stock price decline. Therefore, it seems that they engage in tax avoidance on a regular basis but refrain from excessive tax avoidance.

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<Appendix> Definition of the Variables

Variable	Name	Definition
Corporate status		
List	List	A dummy variable with a value of 1 if the corporation is publicly traded on the firm-year, and zero otherwise
SME	Sme	A dummy variable with a value of 1 if the corporation is an SME(small and medium-sized enterprise) on the firm-year, and zero otherwise
Business group affiliation	Bg	A dummy variable A dummy variable with a value of 1 if it belongs to a business group on the firm-year, and zero otherwise
Corporate governance		
Manager-Shareholder	Ceosh5	A dummy variable with a value of 1 if the CEO is one of the five largest shareholders on the firm-year, and zero otherwise
The largest shareholder	S1	The ownership stake of the largest shareholder
Asset utilization	Ass.Util	Sales divided by total assets
Free cash flow	Fcash	Operating cash flow divided by total assets
Information asymmetry		
Age	Age	Number of years from the establishment date
Size	Size	Log value of total assets
Capital structure		
Debt ratio	Lev	Total liability divided by total assets
Financial flexibility	Cash	Cash and cash equivalents divided by total assets
Risk		
Risk aversion	Roavol	The standard deviation of 5-year return on assets (roa)

<Table 1> Corporate Tax Tables

This table shows the Korean corporate tax rates for given taxable income level each year.

For Taxable Income (KRW million)	2002 ~2004	2005 ~2007	2008	2009	2010 ~2011	2012~
Less than or equal to 100	15%	13%				
Greater than 100	27%	25%				
Less than or equal to 200			11%	11%	10%	10%
Greater than 200			25%	22%	22%	
Less than or equal to 20,000						20%
Greater than 20,000						22%

<Table 2> Summary Statistics

This table shows the means of the main variables, and their medians are indicated within square parentheses. The sample is from 2003 to 2017, excluding the followings: (1) companies in the financial and insurance industries, (2) companies with capital erosion, (3) companies with negative income before tax or negative taxable income, (4) companies with audit opinions other than 'unqualified', (5) companies without information on SMEs, (6) companies without information on the largest shareholder. yt is the taxable income (in million won), ys is income before tax (in million won), and resid is the estimate of tax avoidance, which is the difference between taxable income and income before tax that is not accounted for by total accruals. See Appendix for definitions of other variables. The sample is divided into publicly traded and privately held companies and indicates whether the differences of them are significant. In addition, this table also shows whether the difference between the firms with positive tax avoidance and the firms with negative tax avoidance is significant. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	Total	Publicly Traded	Privately Held	Diff	t value [z value]	Tax Avoidance >0	Tax Avoidance ≤0	Diff	t value [z value]
	53,907	11,190	42,717			22,872	31,035		
Yt	9,628	24,107	5,835	18,272	53.9 ***	6,367	12,032	-5,665	19.9 ***
	[2,304]	[7,303]	[1,793]	[5,510]	[67.9] ***	[1,537]	[3,038]	[-1,501]	[42.3] ***
Ys	9,232	23,192	5,574	17,618	54.9 ***	8,845	9,517	-672	2.5 **
	[2,348]	[7,667]	[1,789]	[5,878]	[75.7] ***	[2,463]	[2,236]	[227]	[6.6] ***
Resid	-0.0022	0.0010	-0.0030	0.0040	11.4 ***	0.0240	-0.0215	0.0455	216.0 ***
	[-0.0027]	[-0.0006]	[-0.0033]	[0.0027]	[12.0] ***	[0.0160]	[-0.0135]	[0.0295]	[196.0] ***
Ceosh5	0.58	0.51	0.60	-0.09	15.4 ***	0.63	0.54	0.09	20.8 ***
	[1.00]	[1.00]	[1.00]	[0.00]	[15.4] ***	[1.00]	[1.00]	[0.00]	[20.7] ***
Ceoown	28.18	3.01	34.78	-31.77	92.0 ***	30.01	26.84	3.17	10.4 ***
	[0.00]	[0.00]	[29.80]	[-29.80]	[100.7] ***	[2.32]	[0.00]	[2.32]	[10.0] ***
S1	0.59	0.33	0.66	-0.33	122.2 ***	0.57	0.61	-0.04	15.7 ***
	[0.52]	[0.29]	[0.60]	[-0.31]	[86.8] ***	[0.51]	[0.54]	[-0.03]	[9.4] ***
Ass.Util	1.23	1.02	1.28	-0.26	30.8 ***	1.16	1.29	-0.13	18.5 ***
	[1.07]	[0.91]	[1.13]	[-0.22]	[32.3] ***	[1.02]	[1.11]	[-0.09]	[12.8] ***
Roavol	0.04	0.04	0.04	0.00	2.1 **	0.04	0.04	0.00	11.1 ***
	[0.03]	[0.03]	[0.03]	[0.00]	[2.5] ***	[0.03]	[0.03]	[0.00]	[14.3] ***
Sgr5	3.17	0.26	3.93	-3.67	2.4 **	3.52	2.91	0.61	0.5
	[0.09]	[0.06]	[0.10]	[-0.04]	[36.1] ***	[0.10]	[0.09]	[0.01]	[4.8] ***
Bg	0.12	0.40	0.05	0.35	115.0 ***	0.11	0.13	-0.02	5.6 ***
	[0.00]	[0.00]	[0.00]	[0.00]	[103.1] ***	[0.00]	[0.00]	[0.00]	[5.6] ***
Fcash	0.07	0.07	0.08	-0.01	2.6 **	0.08	0.07	0.01	9.6 ***
	[0.07]	[0.07]	[0.07]	[0.00]	[1.0]	[0.07]	[0.06]	[0.01]	[14.0] ***
Cash	0.08	0.08	0.08	0.00	0.9	0.07	0.08	-0.01	9.3 ***
	[0.04]	[0.05]	[0.04]	[0.01]	[13.0] ***	[0.04]	[0.04]	[0.00]	[2.0] **
Lev	0.48	0.38	0.51	-0.13	57.6 ***	0.47	0.49	-0.02	11.9 ***
	[0.49]	[0.37]	[0.53]	[-0.16]	[50.6] ***	[0.48]	[0.50]	[-0.02]	[7.5] ***
Age	21.81	28.29	20.11	8.18	62.8 ***	21.18	22.28	-1.10	9.9 ***
	[19.00]	[26.00]	[18.00]	[8.00]	[34.6] ***	[18.00]	[19.00]	[-1.00]	[9.8] ***
Size	10.73	11.82	10.44	1.38	132.1 ***	10.69	10.76	-0.07	7.2 ***
	[10.43]	[11.69]	[10.22]	[1.47]	[92.1] ***	[10.41]	[10.45]	[-0.04]	[3.9] ***
Sme	0.72	0.46	0.79	-0.33	72.4 ***	0.79	0.67	0.12	30.0 ***
	[1.00]	[0.00]	[1.00]	[-1.00]	[69.1] ***	[1.00]	[1.00]	[0.00]	[29.7] ***

<Table 3> Determinants of Tax Avoidance

This table gives coefficients of multivariate OLS regression and Logit regression to examine the determinants affecting tax avoidance. The dependent variable of OLS is a book-tax gap (Resid), and that of Logit regression is tax avoidance(Taxavd) or long-term tax avoidance (Ltaxavd). X-1 represents an interaction term with the variable X and a dummy variable having a value of 1 for a publicly traded company and a value of 0 for a privately held company. On the other hand, X_u represents an interaction term with the variable X and a dummy variable having a value of 1 for a privately held company and a value of 0 for a publicly traded company. All specifications include the year and industry fixed effects. The standard errors consider the heteroscedasticity. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	OLS		Logit	
	Dep.var=Resid	Dep.var=Resid	Dep.var=Taxavd	Dep.var=Ltaxavd
List	0.0145 ***	0.0283 ***	1.6052 ***	1.9113 ***
	(0.0041)	(0.0047)	(0.2854)	(0.3133)
Ceosh5-l	0.0018 ***	-0.0007	0.1463 ***	0.4046 ***
	(0.0007)	(0.0007)	(0.0451)	(0.0480)
Ceosh5-u	0.0033 ***	0.0006	0.1600 ***	0.2214 ***
	(0.0004)	(0.0004)	(0.0236)	(0.0267)
S1-l	-0.0052 ***	-0.0027	-0.5603 ***	-1.0381 ***
	(0.0017)	(0.0019)	(0.1160)	(0.1321)
S1-u	-0.0054 ***	0.0004	-0.2325 ***	-0.3336 ***
	(0.0006)	(0.0007)	(0.0412)	(0.0464)
Ass.Util-l	-0.0027 ***	-0.0009	-0.2302 ***	-0.5414 ***
	(0.0006)	(0.0007)	(0.0408)	(0.0498)
Ass.Util-u	-0.0025 ***	0.0004	-0.1189 ***	-0.1789 ***
	(0.0002)	(0.0003)	(0.0148)	(0.0181)
Fcash-l	0.0139 ***	0.0274 ***	0.7214 ***	1.1100 ***
	(0.0041)	(0.0043)	(0.2678)	(0.2917)
Fcash-u	0.0053 ***	0.0255 ***	0.4938 ***	0.7825 ***
	(0.0018)	(0.0021)	(0.1127)	(0.1286)
Bg-l	0.0008	0.0001	0.0534	-0.0695
	(0.0007)	(0.0008)	(0.0488)	(0.0524)
Bg-u	0.0043 ***	-0.0031 ***	0.0388	-0.0293
	(0.0007)	(0.0011)	(0.0549)	(0.0647)
Age-l	-0.0002 ***	-0.0002 ***	-0.0109 ***	-0.0185 ***
	(0.0000)	(0.0000)	(0.0015)	(0.0017)
Age-u	-0.0001 ***	-0.0001 ***	-0.0048 ***	0.0008
	(0.0000)	(0.0000)	(0.0010)	(0.0012)
Size-l	-0.0007 **	-0.0012 ***	-0.0775 ***	0.0329
	(0.0003)	(0.0004)	(0.0227)	(0.0250)
Size-u	0.0001	0.0012 ***	0.0051	0.0859 ***
	(0.0002)	(0.0002)	(0.0108)	(0.0118)
Lev-l	-0.0078 ***	-0.0021	-0.5008 ***	-1.8929 ***
	(0.0018)	(0.0019)	(0.1278)	(0.1398)
Lev-u	-0.0049 ***	-0.0083 ***	-0.2681 ***	-1.4321 ***
	(0.0008)	(0.0010)	(0.0533)	(0.0612)
Cash-l	-0.0091 **	0.0033	-0.8153 ***	-2.0174 ***
	(0.0045)	(0.0048)	(0.2944)	(0.3253)
Cash-u	-0.0155 ***	0.0062 **	-0.5875 ***	-1.4341 ***
	(0.0021)	(0.0026)	(0.1339)	(0.1562)
Roavol-l	-0.0011	0.0271 ***	0.4322	-0.5345
	(0.0055)	(0.0082)	(0.3250)	(0.3598)
Roavol-u	0.0064	0.0486 ***	1.5442 ***	0.6996 ***
	(0.0039)	(0.0097)	(0.2310)	(0.2404)
Sme	0.0064 ***	0.0017 ***	0.4688 ***	0.4230 ***
	(0.0004)	(0.0005)	(0.0295)	(0.0336)
IndustryFE	Yes	Yes	Yes	Yes
YearFE	Yes	Yes	Yes	Yes
Obj	53,650	22,776	53,651	53,651
Adj R^2 or Pseudo R^2	0.10	0.54	0.18	0.40

<Table 4> Sub-samples by Size

This table shows summary statistics for the 10 sub-samples divided by firm size. Each sample represents the number of privately held and publicly traded companies, size, and the degree of tax avoidance (Resid).

	Number of Samples			Size	Resid		Privately held		Publicly traded	
	Total	Privately held	Publicly traded		Mean	Median	Mean	Median	Mean	Median
1	5,390	5,270	120	9.41	-0.0016	-0.0027	-0.0015	-0.0027	-0.0061	-0.0042
2	5,391	5,227	164	9.68	-0.0006	-0.0021	-0.0006	-0.0021	0.0012	-0.0002
3	5,391	5,216	175	9.88	-0.0012	-0.0021	-0.0015	-0.0022	0.0078	0.0072
4	5,389	5,127	262	10.08	-0.0012	-0.0023	-0.0019	-0.0026	0.0123	0.0047
5	5,393	5,051	342	10.31	-0.0011	-0.0025	-0.0017	-0.0028	0.0070	0.0050
6	5,390	4,739	651	10.57	-0.0016	-0.0023	-0.0028	-0.0033	0.0074	0.0061
7	5,391	4,273	1,118	10.91	-0.0021	-0.0024	-0.0043	-0.0037	0.0060	0.0041
8	5,390	3,566	1,824	11.33	-0.0037	-0.0029	-0.0065	-0.0049	0.0019	0.0011
9	5,392	2,820	2,572	11.91	-0.0044	-0.0035	-0.0074	-0.0056	-0.0011	-0.0012
10	5,390	2,053	3,336	13.22	-0.0042	-0.0040	-0.0035	-0.0042	-0.0046	-0.0039

<Table 5> Determinants of Tax Avoidance by Size

This table gives coefficients of multivariate OLS regression to examine the factors affecting tax avoidance for each sample classified by size. All specifications include the year and industry fixed effects. The standard errors consider the heteroscedasticity. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
List	0.2195	0.1191	0.1157	0.2423 **	0.3117 ***	0.2765 ***	0.1345 ***	0.1263 ***	0.0734 ***	-0.0195 *
	(0.2065)	(0.1565)	(0.1301)	(0.1227)	(0.0946)	(0.0712)	(0.0484)	(0.0377)	(0.0264)	(0.0113)
Ceosh5-l	0.0008	-0.0070	-0.0016	0.0012	0.0057	0.0075 ***	0.0027	0.0013	0.0018	0.0011
	(0.0076)	(0.0058)	(0.0064)	(0.0051)	(0.0046)	(0.0029)	(0.0022)	(0.0016)	(0.0013)	(0.0011)
Ceosh5-u	0.0044 ***	0.0039 ***	0.0056 ***	0.0010	0.0047 ***	0.0047 ***	0.0039 ***	0.0002	0.0006	-0.0016
	(0.0010)	(0.0011)	(0.0010)	(0.0011)	(0.0010)	(0.0011)	(0.0011)	(0.0013)	(0.0015)	(0.0021)
S1-l	-0.0012	0.0049	0.0040	-0.0176 *	-0.0248 ***	-0.0117 *	-0.0158 ***	-0.0106 **	0.0010	0.0038
	(0.0104)	(0.0094)	(0.0112)	(0.0090)	(0.0085)	(0.0064)	(0.0053)	(0.0043)	(0.0038)	(0.0029)
S1-u	-0.0036 **	-0.0048 ***	-0.0046 ***	-0.0059 ***	-0.0049 ***	-0.0080 ***	-0.0116 ***	-0.0059 ***	0.0007	0.0000
	(0.0017)	(0.0017)	(0.0018)	(0.0018)	(0.0018)	(0.0018)	(0.0019)	(0.0021)	(0.0025)	(0.0028)
Ass.Util-l	-0.0034	-0.0033	-0.0040	-0.0095 ***	-0.0055 **	-0.0017	0.0012	-0.0001	-0.0042 ***	-0.0028 ***
	(0.0026)	(0.0022)	(0.0030)	(0.0029)	(0.0023)	(0.0024)	(0.0017)	(0.0015)	(0.0012)	(0.0011)
Ass.Util-u	-0.0023 ***	-0.0036 ***	-0.0023 ***	-0.0021 ***	-0.0030 ***	-0.0023 ***	-0.0020 ***	-0.0016 *	-0.0020 **	-0.0031 ***
	(0.0006)	(0.0006)	(0.0006)	(0.0006)	(0.0006)	(0.0006)	(0.0008)	(0.0009)	(0.0010)	(0.0010)
Fcash-l	-0.0343	0.0263	0.0217	0.0509 **	0.0436 **	0.0264 *	0.0074	0.0196 **	0.0063	-0.0047
	(0.0288)	(0.0286)	(0.0293)	(0.0227)	(0.0217)	(0.0144)	(0.0116)	(0.0095)	(0.0086)	(0.0078)
Fcash-u	0.0005	0.0033	0.0027	0.0101 *	0.0151 ***	0.0055	-0.0036	0.0017	0.0089	0.0014
	(0.0052)	(0.0049)	(0.0047)	(0.0053)	(0.0052)	(0.0054)	(0.0057)	(0.0070)	(0.0082)	(0.0090)
Bg-l	0.0092	0.0143	0.0038	-0.0024	-0.0043	-0.0001	-0.0028	0.0007	0.0017	-0.0008
	(0.0271)	(0.0170)	(0.0123)	(0.0062)	(0.0062)	(0.0036)	(0.0023)	(0.0018)	(0.0013)	(0.0011)
Bg-u	0.0091 *	0.0048	0.0096 **	-0.0006	0.0041	0.0002	0.0035	0.0062 ***	0.0037 **	-0.0003
	(0.0047)	(0.0042)	(0.0042)	(0.0034)	(0.0033)	(0.0027)	(0.0023)	(0.0019)	(0.0018)	(0.0016)
Age-l	0.0002	-0.0003	-0.0006 *	-0.0006 ***	0.0000	-0.0004 ***	-0.0002 ***	-0.0003 ***	-0.0002 ***	-0.0001 **
	(0.0003)	(0.0004)	(0.0003)	(0.0002)	(0.0002)	(0.0001)	(0.0001)	(0.0001)	(0.0000)	(0.0000)
Age-u	-0.0001 *	0.0000	0.0000	0.0000	-0.0001 **	-0.0001 **	-0.0002 ***	-0.0001 **	-0.0001	0.0000
	(0.0000)	(0.0000)	(0.0001)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0001)	(0.0001)
Size-l	-0.0258	-0.0134	-0.0116	-0.0219 *	-0.0310 ***	-0.0255 ***	-0.0121 ***	-0.0095 ***	-0.0053 **	0.0012 *
	(0.0216)	(0.0165)	(0.0132)	(0.0121)	(0.0090)	(0.0068)	(0.0043)	(0.0033)	(0.0021)	(0.0007)
Size-u	-0.0007	-0.0004	-0.0019 ***	-0.0004	-0.0010	-0.0005	-0.0002	0.0007	0.0000	0.0000
	(0.0010)	(0.0009)	(0.0007)	(0.0008)	(0.0006)	(0.0007)	(0.0008)	(0.0007)	(0.0007)	(0.0006)
Lev-l	0.0195	0.0071	0.0069	0.0005	-0.0003	-0.0178 **	-0.0160 **	-0.0179 ***	-0.0056	-0.0068 **
	(0.0182)	(0.0133)	(0.0139)	(0.0113)	(0.0090)	(0.0089)	(0.0066)	(0.0045)	(0.0039)	(0.0033)
Lev-u	-0.0081 ***	-0.0052 **	-0.0038	-0.0009	-0.0028	-0.0007	-0.0057 **	-0.0030	-0.0050	-0.0108 ***
	(0.0022)	(0.0023)	(0.0023)	(0.0025)	(0.0025)	(0.0024)	(0.0027)	(0.0029)	(0.0033)	(0.0038)
Cash-l	0.0045	-0.0084	-0.0203	0.0062	0.0151	-0.0070	0.0014	-0.0118	-0.0130	-0.0241 ***
	(0.0496)	(0.0330)	(0.0305)	(0.0243)	(0.0226)	(0.0159)	(0.0128)	(0.0112)	(0.0096)	(0.0083)
Cash-u	-0.0138 **	-0.0045	-0.0159 ***	-0.0122 **	-0.0141 **	-0.0115 *	-0.0116 *	-0.0353 ***	-0.0252 ***	-0.0224 **
	(0.0064)	(0.0061)	(0.0058)	(0.0060)	(0.0058)	(0.0066)	(0.0067)	(0.0081)	(0.0087)	(0.0108)
Roavol-l	-0.1097	0.1004	-0.0789	0.0191	0.0495	-0.0109	-0.0061	-0.0190 **	-0.0094	0.0124
	(0.0899)	(0.0726)	(0.0687)	(0.0311)	(0.0364)	(0.0120)	(0.0094)	(0.0092)	(0.0179)	(0.0077)
Roavol-u	-0.0048	0.0219	0.0119	-0.0051	0.0330 **	0.0117	0.0034	0.0097	-0.0021	0.0209
	(0.0133)	(0.0146)	(0.0119)	(0.0106)	(0.0155)	(0.0149)	(0.0153)	(0.0104)	(0.0090)	(0.0173)
Sme	0.0124 ***	0.0058 **	0.0098 ***	0.0106 ***	0.0089 ***	0.0042 ***	0.0043 ***	0.0084 ***	0.0056 ***	0.0008
	(0.0028)	(0.0023)	(0.0023)	(0.0020)	(0.0017)	(0.0015)	(0.0013)	(0.0012)	(0.0011)	(0.0022)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obj	5,322	5,342	5,355	5,362	5,352	5,372	5,377	5,388	5,391	5,389
Adj R^2	0.10	0.10	0.11	0.12	0.13	0.12	0.11	0.13	0.11	0.11

<Table 6> Sub-sample around the Tax Bracket Breakpoints

This table shows the summary statistics of the sub-samples around the tax bracket breakpoint. It presents the sample size and the average of tax avoidance estimates of each sub-sample. It also presents the difference of tax avoidance between privately held and publicly traded companies. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	Sample size			Resid				
	All	Private	Public	All	Private	Public	Diff	t-value
10%	1,228	980	248	-0.0016	-0.0001	-0.0075	0.0074	3.08 ***
20%	2,412	1,900	512	-0.0016	-0.0003	-0.0066	0.0063	3.67 ***
30%	3,600	2,846	754	-0.0020	-0.0009	-0.0064	0.0055	3.94 ***
40%	4,968	3,909	1,059	-0.0024	-0.0014	-0.0060	0.0045	3.84 ***
50%	6,487	5,070	1,417	-0.0031	-0.0024	-0.0057	0.0033	3.28 ***
60%	8,247	6,454	1,793	-0.0038	-0.0035	-0.0053	0.0018	1.97 **
70%	10,581	8,353	2,228	-0.0046	-0.0045	-0.0049	0.0004	0.46
80%	14,114	11,268	2,846	-0.0053	-0.0057	-0.0037	-0.0021	2.89 ***

<Table 7> Determinants of Tax Avoidance around the Tax Bracket Breakpoints

This table gives coefficients of multivariate OLS regression to examine the factors affecting tax avoidance for each sample around the tax bracket breakpoint. All specifications include the year and industry fixed effects. The standard errors consider the heteroscedasticity. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	10%	20%	30%	40%	50%	60%	70%	80%
List	-0.0789 **	-0.0864 ***	-0.0898 ***	-0.0636 ***	-0.0579 ***	-0.0584 **	-0.0466 **	-0.0283 ***
	(0.0326)	(0.0239)	(0.0188)	(0.0165)	(0.0143)	(0.0121)	(0.0106)	(0.0092)
Ceosh5-l	0.0006	0.0030	0.0019	0.0008	0.0004	0.0001	0.0012	0.0016
	(0.0040)	(0.0031)	(0.0025)	(0.0021)	(0.0018)	(0.0015)	(0.0014)	(0.0012)
Ceosh5-u	0.0052 *	0.0029	0.0046 ***	0.0040 ***	0.0035 ***	0.0039 **	0.0046 **	0.0048 ***
	(0.0028)	(0.0019)	(0.0015)	(0.0013)	(0.0011)	(0.0010)	(0.0009)	(0.0007)
S1-l	0.0184 **	0.0128 *	0.0129 **	0.0038	-0.0010	-0.0027	-0.0023	-0.0032
	(0.0089)	(0.0072)	(0.0055)	(0.0050)	(0.0045)	(0.0041)	(0.0036)	(0.0030)
S1-u	-0.0027	-0.0045	-0.0053 **	-0.0064 ***	-0.0053 ***	-0.0060 **	-0.0063 **	-0.0056 ***
	(0.0040)	(0.0030)	(0.0024)	(0.0020)	(0.0018)	(0.0016)	(0.0014)	(0.0012)
Ass.Util-l	0.0064 *	0.0059 **	0.0047 **	0.0027	0.0022	0.0024 *	0.0004	-0.0009
	(0.0037)	(0.0026)	(0.0022)	(0.0019)	(0.0016)	(0.0014)	(0.0013)	(0.0011)
Ass.Util-u	-0.0004	-0.0008	-0.0009	-0.0015 *	-0.0016 **	-0.0026 **	-0.0032 **	-0.0033 ***
	(0.0018)	(0.0012)	(0.0010)	(0.0008)	(0.0007)	(0.0006)	(0.0006)	(0.0005)
Fcash-l	0.0057	0.0249	0.0008	0.0020	0.0086	0.0159	0.0152 *	0.0213 ***
	(0.0273)	(0.0204)	(0.0160)	(0.0130)	(0.0112)	(0.0100)	(0.0090)	(0.0078)
Fcash-u	-0.0224	-0.0164	-0.0182 **	-0.0145 **	-0.0133 **	-0.0107 **	-0.0064	-0.0030
	(0.0146)	(0.0102)	(0.0079)	(0.0065)	(0.0056)	(0.0049)	(0.0043)	(0.0037)
Bg-l	-0.0059	-0.0005	-0.0024	-0.0012	-0.0002	-0.0006	-0.0006	-0.0012
	(0.0044)	(0.0032)	(0.0025)	(0.0021)	(0.0018)	(0.0015)	(0.0014)	(0.0012)
Bg-u	0.0069	0.0101 ***	0.0117 ***	0.0099 ***	0.0092 ***	0.0098 **	0.0084 **	0.0072 ***
	(0.0046)	(0.0032)	(0.0027)	(0.0023)	(0.0019)	(0.0018)	(0.0016)	(0.0013)
Age-l	-0.0001	-0.0001	-0.0001	-0.0001 **	-0.0001 **	-0.0001 **	-0.0002 **	-0.0002 ***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0000)	(0.0000)	(0.0000)
Age-u	0.0000	0.0000	0.0000	-0.0001	-0.0001	-0.0001 *	-0.0001 **	-0.0001 ***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Size-l	0.0049 *	0.0053 ***	0.0058 ***	0.0035 ***	0.0035 ***	0.0038 **	0.0035 **	0.0026 ***
	(0.0025)	(0.0018)	(0.0014)	(0.0013)	(0.0011)	(0.0009)	(0.0008)	(0.0007)
Size-u	-0.0008	-0.0012	-0.0013 **	-0.0016 ***	-0.0016 ***	-0.0014 **	-0.0008 **	-0.0003
	(0.0011)	(0.0008)	(0.0006)	(0.0005)	(0.0005)	(0.0004)	(0.0004)	(0.0003)
Lev-l	-0.0024	-0.0121 *	-0.0142 **	-0.0107 **	-0.0129 ***	-0.0156 **	-0.0142 **	-0.0122 ***
	(0.0093)	(0.0071)	(0.0058)	(0.0050)	(0.0043)	(0.0039)	(0.0036)	(0.0031)
Lev-u	-0.0016	-0.0074 *	-0.0069 **	-0.0065 **	-0.0028	-0.0014	-0.0005	0.0010
	(0.0056)	(0.0041)	(0.0033)	(0.0028)	(0.0024)	(0.0022)	(0.0019)	(0.0016)
Cash-l	-0.0510 *	-0.0503 ***	-0.0355 **	-0.0265 *	-0.0255 **	-0.0246 **	-0.0240 **	-0.0233 ***
	(0.0293)	(0.0181)	(0.0157)	(0.0137)	(0.0111)	(0.0100)	(0.0088)	(0.0077)
Cash-u	-0.0261	-0.0178	-0.0309 ***	-0.0288 ***	-0.0223 ***	-0.0180 **	-0.0192 **	-0.0158 ***
	(0.0177)	(0.0119)	(0.0097)	(0.0081)	(0.0069)	(0.0062)	(0.0053)	(0.0043)
Roavol-l	0.0064	0.0164	0.0081	-0.0093	-0.0163	-0.0079	-0.0031	-0.0018
	(0.0250)	(0.0215)	(0.0197)	(0.0195)	(0.0164)	(0.0097)	(0.0085)	(0.0073)
Roavol-u	0.0133	0.0133	0.0180	-0.0030	-0.0156	-0.0165	-0.0126	-0.0112
	(0.0260)	(0.0186)	(0.0156)	(0.0136)	(0.0125)	(0.0117)	(0.0085)	(0.0075)
Sme	0.0118 ***	0.0161 ***	0.0144 ***	0.0129 ***	0.0113 ***	0.0101 **	0.0076 **	0.0053 ***
	(0.0037)	(0.0027)	(0.0021)	(0.0017)	(0.0014)	(0.0012)	(0.0010)	(0.0008)
IndustryFE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
YearFE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obj	1,226	2,404	3,588	4,952	6,467	8,221	10,550	14,071
Adj R^2	0.13	0.17	0.18	0.18	0.17	0.16	0.15	0.15

<Table 8> Summary Statistics of the Sample for Difference-in-differences Analysis

This table shows the summary statistics of the sub-samples for difference-in-differences analysis. The companies that are affected by the revision of the tax law in 2012 are the companies whose taxable income exceeds 20 billion won among all firms that are required to meet external audit obligations. Therefore, as of 2012, companies with an average taxable income of 20 billion won (1) ± 10%, (2) ± 20% (3) ± 30% (4) ± 50% over five years are classified as the treated group; others as the control group.

	Sample size				Resid			
	Control	Treated			Control	Treated		
			Privately held	Publicly traded			Privately held	Publicly traded
10%	53,689	217	148	69	-0.0022	-0.0077	-0.0073	-0.0088
20%	53,375	531	301	230	-0.0021	-0.0103	-0.0099	-0.0109
30%	52,979	927	538	389	-0.0020	-0.0116	-0.0133	-0.0092
50%	52,019	1,887	1,055	832	-0.0019	-0.0108	-0.0127	-0.0085

<Table 9> Difference-in-differences Analysis of Tax Avoidance

This table is a result of a difference-in-differences analysis on whether companies more actively avoid tax when the benefits of tax avoidance are large. companies with an average taxable income of 20 billion won (1) ± 10%, (2) ± 20% (3) ± 30% (4) ± 50% over five years have Around=1, otherwise Around=0. The dependent variable is the estimate of tax avoidance (resid). The equation is as follows.

$$Resid_{i,t} = \alpha + \beta_1 After_t + \beta_2 Around_i + \beta_3 Did_{i,t} + \gamma Controls_{i,t} + FE + \epsilon_{i,t}$$

Resid: Estimate of residual of tax avoidance
After: A dummy variable with a value of 1 in the year after 2012, and zeros otherwise
Around: A dummy variable with a value of 1 if the past five years average taxable income is around 20 billion won (± 10%, ± 20%, ± 30%, ± 50%), and zeros otherwise
Did: A variable representing the effect of difference-in-differences analysis as an interaction term of After and Around

Standard error (tabulated in parentheses) considers heteroscedasticity. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A. The Aggressiveness of Tax Avoidance							
	±10%		±20%		±30%		±50%	
After	0.0013		0.0003		0.0000		0.0000	
	(0.0031)		(0.0031)		(0.0031)		(0.0031)	
Around	-0.0091	***	-0.0093	***	-0.0077	***	-0.0077	***
	(0.0023)		(0.0014)		(0.0012)		(0.0012)	
Did	0.0107	***	0.0063	***	0.0028	*	0.0028	*
	(0.0033)		(0.0020)		(0.0017)		(0.0017)	
Ceosh5	0.0031	***	0.0031	***	0.0031	***	0.0031	***
	(0.0003)		(0.0003)		(0.0003)		(0.0003)	
S1	-0.0057	***	-0.0056	***	-0.0056	***	-0.0056	***
	(0.0005)		(0.0005)		(0.0005)		(0.0005)	
Ass.Util	-0.0028	***	-0.0028	***	-0.0028	***	-0.0028	***
	(0.0002)		(0.0002)		(0.0002)		(0.0002)	
Fcash	0.0278	***	0.0278	***	0.0279	***	0.0279	***
	(0.0026)		(0.0026)		(0.0026)		(0.0026)	
Bg	0.0020	***	0.0021	***	0.0021	***	0.0021	***
	(0.0005)		(0.0005)		(0.0005)		(0.0005)	
Age	-0.0001	***	-0.0001	***	-0.0001	***	-0.0001	***
	(0.0000)		(0.0000)		(0.0000)		(0.0000)	
Size	0.0004	**	0.0005	***	0.0005	***	0.0005	***
	(0.0002)		(0.0002)		(0.0002)		(0.0002)	
Lev	-0.0080	***	-0.0082	***	-0.0082	***	-0.0082	***
	(0.0007)		(0.0007)		(0.0007)		(0.0007)	
Cash	-0.0166	***	-0.0165	***	-0.0165	***	-0.0165	***
	(0.0020)		(0.0020)		(0.0020)		(0.0020)	
Roavol	0.0065	*	0.0065	*	0.0066	*	0.0066	*
	(0.0038)		(0.0038)		(0.0038)		(0.0038)	
Sme	0.0071	***	0.0070	***	0.0069	***	0.0069	***
	(0.0033)		(0.0005)		(0.0005)		(0.0005)	
Year FE	Yes		Yes		Yes		Yes	
Industry FE	Yes		Yes		Yes		Yes	
Obj.	53,707		53,707		53,707		53,707	
Adj R^2	0.11		0.11		0.11		0.11	

(Continued)

Panel B. The Aggressiveness of Tax Avoidance for Publicly Traded and Privately Held Companies								
	Publicly Traded Companies				Privately Held Companies			
	±10%	±20%	±30%	±50%	±10%	±20%	±30%	±50%
After	0.0147 **	0.0138 *	0.0146 **	0.0145 **	-0.0015	-0.0031	-0.0044	-0.0062 *
	(0.0073)	(0.0073)	(0.0073)	(0.0073)	(0.0035)	(0.0035)	(0.0035)	(0.0035)
Around	-0.0100 ***	-0.0053 ***	-0.0039 **	-0.0035 ***	-0.0084 ***	-0.0133 ***	-0.0115 ***	-0.0081 ***
	(0.0034)	(0.0019)	(0.0016)	(0.0011)	(0.0030)	(0.0021)	(0.0018)	(0.0011)
Did	0.0058	-0.0009	-0.0018	-0.0006	0.0126 ***	0.0128 ***	0.0074 ***	0.0036 **
	(0.0044)	(0.0024)	(0.0021)	(0.0014)	(0.0044)	(0.0031)	(0.0026)	(0.0015)
Ceosh5	0.0010	0.0011	0.0011 *	0.0011	0.0037 ***	0.0036 ***	0.0036 ***	0.0037 ***
	(0.0007)	(0.0007)	(0.0007)	(0.0007)	(0.0004)	(0.0004)	(0.0004)	(0.0004)
S1	-0.0072 ***	-0.0072 ***	-0.0071 ***	-0.0070 ***	-0.0057 ***	-0.0056 ***	-0.0056 ***	-0.0056 ***
	(0.0018)	(0.0018)	(0.0018)	(0.0018)	(0.0006)	(0.0006)	(0.0006)	(0.0006)
Ass.Util	-0.0032 ***	-0.0031 ***	-0.0031 ***	-0.0031 ***	-0.0027 ***	-0.0027 ***	-0.0027 ***	-0.0027 ***
	(0.0006)	(0.0006)	(0.0006)	(0.0006)	(0.0002)	(0.0002)	(0.0002)	(0.0002)
Fcash	0.0472 ***	0.0471 ***	0.0473 ***	0.0474 ***	0.0259 ***	0.0260 ***	0.0261 ***	0.0264 ***
	(0.0047)	(0.0047)	(0.0047)	(0.0047)	(0.0028)	(0.0028)	(0.0028)	(0.0028)
Bg	0.0002	0.0004	0.0004	0.0004	0.0039 ***	0.0040 ***	0.0041 ***	0.0040 ***
	(0.0007)	(0.0007)	(0.0007)	(0.0007)	(0.0008)	(0.0008)	(0.0008)	(0.0008)
Age	-0.0002 ***	-0.0002 ***	-0.0002 ***	-0.0002 ***	-0.0001 ***	-0.0001 ***	-0.0001 ***	-0.0001 ***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Size	0.0001	0.0001	0.0001	0.0001	0.0005 **	0.0006 ***	0.0007 ***	0.0009 ***
	(0.0004)	(0.0004)	(0.0004)	(0.0004)	(0.0002)	(0.0002)	(0.0002)	(0.0002)
Lev	-0.0119 ***	-0.0125 ***	-0.0125 ***	-0.0128 ***	-0.0068 ***	-0.0069 ***	-0.0070 ***	-0.0073 ***
	(0.0019)	(0.0019)	(0.0019)	(0.0019)	(0.0008)	(0.0008)	(0.0008)	(0.0008)
Cash	-0.0111 **	-0.0109 **	-0.0112 **	-0.0109 **	-0.0172 ***	-0.0171 ***	-0.0171 ***	-0.0171 ***
	(0.0046)	(0.0046)	(0.0046)	(0.0046)	(0.0022)	(0.0022)	(0.0022)	(0.0022)
Roavol	0.0003	0.0001	0.0001	0.0001	0.0087 *	0.0089 *	0.0091 *	0.0093 **
	(0.0059)	(0.0059)	(0.0059)	(0.0059)	(0.0047)	(0.0047)	(0.0047)	(0.0047)
Sme	0.0080 ***	0.0079 ***	0.0079 ***	0.0075 ***	0.0065 ***	0.0064 ***	0.0064 ***	0.0062 ***
	(0.0009)	(0.0009)	(0.0009)	(0.0009)	(0.0006)	(0.0006)	(0.0006)	(0.0006)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obj	10,554	10,554	10,554	10,554	43,153	43,153	43,153	43,153
Adj. R^2	0.13	0.13	0.13	0.13	0.11	0.11	0.11	0.11

Chapter 3.

중소기업의 상장이 유형자산 및 연구개발 투자에 미치는 영향[4)]

4) 본 내용은 중소기업연구 제39권 제3호에 게재(공동저자 김우진, 2017)되었음.

1. 서론

중소기업의 자금 조달은 전통적으로 은행 대출에 크게 의존해 왔으며, 이에 따라 각국 정부는 중소기업과 은행 간의 정보비대칭을 완화하여 중소기업이 보다 쉽게 은행대출을 받을 수 있도록 대출을 보증하는 방식으로 중소기업 정책금융을 수행해 왔다. 최근 OECD 보고서[5]에 따르면 우리나라 전체 기업 대출에서 중소기업 대출이 차지하는 비중은 2007년 86.8% 에서 2014년에는 74%로 떨어졌지만, 국제 기준과 비교할 때 여전히 높은 수준이다. 중소기업 대출에 부과되는 금리 평균도 2008년 7.5%, 2013년 5.1%, 2014년 4.7%로 낮아졌지만, 서방 국가에 비해서는 아직 높다. 정부의 대출보증규모는 금융위기 기간(2007년~2009년)동안 42% 증가하였으며, 2014년 현재 60.1조원으로 이는 GDP대비 4.1%에 해당하며, 그리스(9.2%), 일본(5.7%)에 이어 세 번째로 높다.

그러나 최근 이러한 중소기업 정책금융이 효율적으로 작동하지 못하고 오히려 한계기업의 퇴출을 막는 등 부작용을 일으킨다는 보고가 잇따르고 있다(장우현, 2014; 우석진•장우현, 2016). OECD 보고서에 따르면 해외 각국에서도 중소기업이 은행대출에 과도하게 의존하여 겪는 어려움에 대한 인식이 증가하고 있으며, 이에 따라 상장이나 벤처 캐피털 투자와 같은 대안적 수단의 사용을 독려하는 움직임이 확대되고 있다. 특히, 지분 형식의 투자 수단(Equity-type Instruments)과 관련하여 세금 혜택, 정부 기금 설립, 크라우드 펀딩 활동을 고려한 새로운 법안의 입안 활동 등이 진행되고 있다. 이에 따라 우리나라에서도 시장을 왜곡하지 않는

5) 주 오이시디 대한민국 대표부(외교부), '37개 국가의 중소기업 자금조달 동향과 우리나라 현황,' 정책포커스(http://oecd.mofa.go.kr/korean/eu/oecd/policy/focus/index.jsp)에서 재인용.

보다 근본적인 해결책으로 상장 등 자기자본의 확충을 통해 중소기업의 직접금융에 대한 접근성을 높여야 한다는 주장이 제기되고 있다. 최근 개설된 코넥스 시장도 기존 상장요건을 갖추지 못한 중소기업에 주식시장을 통해 자금을 조달할 수 있는 길을 마련하여 직접금융에 대한 접근성을 높인 조치라고 할 수 있다.

이론적으로 기업의 상장이 투자에 미치는 영향에 있어서는 다음과 같은 두 개의 상반된 입장이 존재한다. 먼저, 상장의 긍정적인 측면으로는 자금조달 원천이 다양해지고 정보비대칭성이 완화되어 재무적 곤경이 해소된다는 견해를 들 수 있다. 예컨대, Mortal and Reisel(2013)은 유럽 국가들의 데이터를 이용하여 상장기업은 비상장기업에 비해 성장기회에 대해 투자민감도가 높음을 보였다. 반면, 상장 이후에는 외부주주의 존재로 인해 내부주주와 외부주주간 이해관계의 상충 및 이에 따른 대리인비용이 발생한다는 견해도 있다. Asker, Farre-Mensa and Ljungqvist(2015)는 상장기업이 다른 여건이 비슷한 비상장기업에 비해 단기업적압력(Short-termism Pressure)이 커서 투자가 적고, 투자기회에 덜 민감하게 반응함을 보였다. 이처럼 상반된 연구결과가 나타나는 이유는 상장시 직접금융 접근성이 높아져 자본조달이 용이해지는 효과와 아울러 지분이 분산되어 대리인비용이 높아지는 효과가 서로 상충되어 동시에 나타나기 때문이다.

본 논문에서는 국내 중소기업을 대상으로 상장시 투자에 미치는 영향을 보다 엄밀한 실증분석 기법을 통해 고찰하고자 한다. 중소기업의 주식시장 접근성에 대한 높은 정책적 관심에도 불구하고 중소기업이 상장

하였을 때 기업의 투자에 어떤 영향을 미치는지에 대한 실증 연구는 많지 않다.

우선 국내 기업의 투자와 관련된 기존 연구는 주로 부채의 대리인 문제와 관련하여 높은 부채비율이 투자에 미치는 영향에 초점을 맞추고 있으며, 상장이라는 사건이 투자에 미치는 영향은 고려하고 있지 않다. 이 연구들은 높은 부채비율이 과소투자를 유발하는지 또는 과대투자를 유발하는지에 대해 일치된 결론을 내리지 못하고 있으며 성장기회, 신용도, 투자자보호 등에 따라 달라지는 것으로 나타나고 있다(박승일•박세운•김철중, 2015; 권용재•윤정선•최대헌, 2012; 국찬표•강윤식, 2011). 또한 이들 연구는 거래소 상장기업을 분석대상으로 하고 있어 대기업의 투자에 집중되는 경향이 있다.

한편, 상장의 효과를 분석하기 위해 성향점수짝짓기(Propensity Score Matching) 방법을 이용하여 상장 중소기업과 비상장 중소기업을 비교분석한 연구들이 있으나, 역시 상장이 투자에 미치는 영향은 다루지 않고 있다. 예컨대 표한형•홍성철(2013)은 성향점수 매칭을 이용하여 코스닥시장에 신규 상장한 기업들의 성과가 매칭 표본으로 설정된 비상장기업에 비해 장기간 유의한 음의 값을 가지는 것을 보여주었다. 이외에도 중소기업과 관련하여 정책금융, 신용정책, 현금보유정책 및 운전자본관리 등을 분석한 연구가 지속되어 왔지만(장우현, 2014) 중소기업의 투자를 분석한 연구는 드물다.

이에 본 논문에서는 중소기업의 상장 사건과 투자 행태를 연결하여, 상장여부가 투자 의사결정에 어떠한 영향을 주는지를 분석한다. 분석 기

법으로는 우선 성향점수짝짓기(Propensity Score Matching) 방법을 사용하여 상장 중소기업과 비상장 중소기업을 매칭한 후 양자의 투자 행태를 비교한다. 이어서 표본 기간 중에 신규상장한 중소기업에 대해 상장시 신주 발행으로 조달한 자금을 실제로 투자에 사용하였는지를 확인한다. 궁극적으로는 상장과 투자간 보다 엄밀한 인과관계(Causality) 확립을 위해 표본 기간 중 신규상장한 중소기업을 대상으로 이중차이법(Difference-in-differences)을 적용하여 신규상장이 투자에 미치는 영향을 분석한다.

2004년부터 2015년까지 우리나라 중소기업의 재무자료를 이용하여 분석한 주요 결과는 다음과 같다. 우선 성향점수짝짓기 방법을 이용하여 상장 중소기업과 비상장 중소기업의 투자를 비교한 결과, 상장 중소기업은 비교대상인 비상장 중소기업에 비해 연구개발 투자 규모가 더 크게 나타났다. 또한 신규상장 중소기업을 대상으로 한 분석에서는 상장으로 조달된 자금을 유형자산 투자와 연구개발 투자에 모두 사용하지만, 상장 이전에 레버리지가 높았던 그룹은 IPO자금을 유형자산 투자에 사용하지 않는 것으로 나타났다. 이러한 결과는 상장 이전에는 투자에 필요한 자금 조달을 주로 차입에 의존하기 때문에 담보가 가능한 유형자산 투자에 집중하는 반면, 상장 이후에는 이러한 경향이 완화된 것으로 해석이 가능하다.

한편 신규상장 중소기업을 대상으로 매칭을 통한 이중차이법을 이용하여 분석한 결과, 상장 이후 연구개발 투자는 비교적 뚜렷이 증가하는 반면 유형자산 투자는 비교 대상에 따라 서로 상이한 결과가 나타남을 확

인할 수 있었다. 이 결과는 앞서 보고한 분석 내용에 상응하는 동시에, 상장이 연구개발 투자를 증가시킨다는 인과관계를 지지하는 것으로 해석할 수 있다. 전반적으로 본 연구의 결과에 따르면 중소기업의 상장을 통한 직접금융 접근성 향상은 담보 제공이 어려운 연구개발 투자에 긍정적인 효과를 야기한다고 볼 수 있다. 반면, 담보 제공이 가능한 유형자산 투자에 있어서는 상장이 이를 증가시킨다는 실증적인 근거를 찾기가 상대적으로 어려웠다. 이러한 결과는 상장 및 기업공개가 투자에 미치는 효과는 투자의 형태에 따라 상반되게 나타날 수 있으며, 만약 유형자산에 대한 투자 증가가 정책 목표일 경우, 그 수단으로서 중소기업의 상장 및 기업공개를 촉진하는 방안은 목표 달성에 어느 정도 한계가 있을 수 있음을 시사한다.

본 연구는 다음과 같이 구성되었다. 서론에 이어 제2장에서는 기존의 문헌을 토대로 가설을 설정한다. 제3장에서는 국내 중소기업의 개괄적인 자금 조달 및 재무 현황을 살펴보고, 분석에 사용된 표본의 구성과 방법론에 대해 구체적으로 설명한다. 제4장에서는 상장 중소기업과 성향점수 짝짓기 방법을 통해 매칭된 비상장 외감 중소기업간 투자 패턴을 비교 분석한다. 제5장에서는 표본 기간 중 상장한 중소기업을 대상으로 조달 자금이 실제로 투자에 이용되는지를 살펴보고, 성향점수짝짓기로 구성한 패널데이터에 이중차이법을 적용하여 상장과 투자 간의 인과관계를 확립한다. 제6장에서는 결론을 제시한다.

2. 가설 설정

기존 문헌을 토대로 본 연구에서 구체적으로 검증하고자 하는 가설은 크게 다음 4 가지로 정리될 수 있다. 우선 상장이 투자에 미치는 영향에 대해서는 크게 두 가지 견해가 있다. 먼저 상장을 통해 자금조달 원천이 다양해지고 정보비대칭성이 완화되어 재무적 곤경이 해소되어 투자가 증가하는 효과가 있다. 유럽 데이터를 이용한 Mortal and Reisel(2013)의 연구에 의하면 상장기업은 비상장기업에 비해 성장기회에 대한 투자민감도가 더 높다는 것이 발견되었다. 한편 상장으로 지분이 분산됨에 따라 대리인 비용이 발생하여 투자가 감소하는 효과가 있다. Asker, Farre-Mensa and Ljungqvist(2015)는 상장기업이 다른 여건이 비슷한 비상장기업에 비해 오히려 투자가 적고, 투자기회에 덜 민감하게 반응함을 보였는데, 이는 경영자가 단기업적에 치중하여 투자를 게을리하기 때문이라고 주장하였다. 전자의 견해에 입각할 경우, 상장 기업은 비상장기업에 대해 투자를 더 많이 하고 성장기회에 대한 투자민감도도 더 높을 것으로 전망되는 반면, 후자의 경우는 그 반대가 예상된다. 본 논문에서는 전자의 견해에 입각하여 첫 번째 및 두 번째 대립가설을 다음과 같이 설정한다.

가설 1: 상장 중소기업은 비상장 중소기업보다 많이 투자한다.

가설 2: 상장 중소기업은 비상장 중소기업에 비해 투자의 성장기회에 대한 민감도가 높다.

한편, Brav(2009)는 영국의 상장기업과 비상장기업 간의 비교를 통하여 비상장기업은 상장기업에 비해 차입에 더 의존함을 보였다. 이처럼 비상장기업은 투자를 위한 자금조달시 자기자본(Equity) 보다는 차입을 이용

하는 경향이 있으므로 투자가 차입에 민감할 것으로 예측할 수 있다. 반면 상장기업은 주식발행을 통한 외부에서의 자기자본 조달이 용이하므로 비상장 기업보다 투자의 차입에 대한 민감도가 낮을 것으로 기대된다. 또한, 비상장 기업은 일반적으로 상장 기업에 비해 재무적 제약(Financial Constraints)이 더 강하게 나타날 것으로 예상할 수 있다. 이에 본 연구의 세 번째 가설을 다음과 같이 제시한다.

가설 3: 상장 중소기업은 비상장 중소기업에 비해 투자의 차입 및 영업현금흐름에 대한 민감도가 낮다.

마지막으로, 상장 여부의 투자에 대한 영향은 투자의 유형별로 다르게 나타날 가능성이 있다. 우선, 투자의 특성에 따른 자금조달 방식을 고려할 경우 상장시 연구개발 투자가 유형자산 투자보다 더 크게 영향을 받을 것으로 예상할 수 있다. Titman(2013)에 의하면 기술 투자를 위한 자금은 주로 자기자본에 의해 조달되고 유형자산 투자를 위한 자금은 주로 차입에 의해 조달되는 경향이 있다고 한다. 그 이유는 연구개발 투자는 차입으로 조달하기 어려운 특성이 있기 때문이다. 우선, 연구개발 투자는 유형자산 투자에 비해 재사용가능성이 낮고, 담보가치가 제한적이다(Williamson, 1988; Shi, 2003). 또한, 연구개발 투자는 정보비대칭성을 높이는 경향이 있다. Aboody and Lev(2000)에 따르면 유형자산 투자는 동종산업에서 공통적인 속성을 갖는 반면, 연구개발투자는 구체적인 사업에 특화된 개별적인 속성을 갖기 때문에 다른 기업의 연구개발 성과를 통해 해당 연구개발투자의 가치나 수익성을 유추하거나 정보를 얻기가 매우 어렵다. 또한, 유형자산은 거래되는 시장이 존재하므로 가격정보를

얻을 수 있지만 연구개발에 대한 조직화된 시장이 존재하지 않으므로 가격정보도 없다. 최근의 이론 및 실증 연구들은 정보비대칭성이 큰 투자는 자본으로 조달되는 경향이 있음을 보여준다(Brown, Fazzari and Petersen, 2009; Wu and Wang, 2005; Baxamusa, Mohanty and Rao, 2015).

반면, 대리인 이론에 따르면 상장시 대리인 문제가 심화되어 유형자산 투자가 연구개발 투자보다 더 크게 영향 받을 것으로 예상할 수 있다. Ghosh, Moon and Tandon(2007)는 경영자는 기업의 규모를 키우기 위해 유형자산에 대해 과대투자하는 경향이 있는 반면, 연구개발 투자와 같이 위험이 큰 투자는 위험을 회피하기 위해 과소투자하는 경향이 있음을 지적하였다.

이처럼 기존 연구에 따르면 상장으로 인한 주식시장 접근성의 개선이 투자의 종류에 따라 다른 영향을 미칠 것으로 예상할 수 있다. 본 논문에서는 전자의 견해에 입각하여 네 번째 가설을 다음과 같이 설정한다.

가설 4: 중소기업의 상장은 유형자산 투자보다 연구개발 투자에 크게 영향을 미친다.

3. 자료 및 연구방법

3.1. 국내 중소기업의 자금 조달 및 재무 현황

중소기업연구에 있어서 가장 큰 어려움 중 하나는 데이터의 부족이

다. 중소기업에 대한 자료는 개별 금융기관에서 작성된 사적인 자료를 제외하면 외감기업의 재무제표와 통계청이 제공하는 광업제조업조사, 경제총조사 및 기업활동조사 등이 있다. 그러나 외감기업 데이터는 일정규모(직전사업연도말 자산총액 120억원, 또는 부채총액 70억원, 또는 상용근로자수 300명 및 자산총액 70억) 이상인 기업이 대상이므로 소규모 기업에 대한 데이터가 존재하지 않는 한계점이 있다. 한편, 경제총조사 및 광업제조업조사는 사업체 단위로 조사가 이루어지기 때문에 여러 사업체로 구성된 기업의 경우 하나의 실체로 인식하지 못하는 문제가 있다. 기업활동조사는 기업 단위 조사이기는 하지만 조사대상 기업수가 120,000개 정도로 전체 중소기업을 대표하기에는 한계가 있다.

반면, 통계청의 영리법인 기업체 행정통계는 법인세를 납부하는 영리법인기업 전체를 모집단으로 여러 공공기관의 행정자료를 통합하여 작성되는 기업 단위의 전수 자료로, 최근 통계청에서 이 중 일부 항목에 대해 당해연도의 횡단면 자료를 제한적으로 제공하고 있다.[6] 이하에서는 이 자료를 활용하여 국내 중소기업 전체를 대상으로 개괄적인 자금조달 현황을 보고한다.

<표 1>

<표 1>은 통계청에서 제공하는 영리법인 기업체 행정통계의 개별 기업 데이터를 이용하여 우리나라 법인기업 전체의 분포와 규모에 따른 재무비율을 나타낸 것이다. 제공된 데이터 상으로는 중소기업여부를 확인할

6) 2016년말 현재 2014년 마이크로데이터를 유료로 제공하고 있으며, 제공항목은 14개(기업집단여부, 산업분류(대분류 및 중분류), 자산, 유동자산, 비유동자산, 부채, 유동부채, 비유동부채, 자본, 자본금, 매출액, 영업손익, 당기순손익)이다.

수 없으므로 해당연도(2014년)의 영리법인 기업체 행정통계에서 대기업으로 공표된 수 (또는 금액)를 제외하는 방식으로 중소기업의 상대적인 비중을 추정하였다.[7] 패널 A에서 보듯이 2014년 우리나라 영리법인 가운데 중소기업이 차지하는 비중은 97.8% 정도이다. 그러나 패널 B에서 알 수 있듯이 이들 가운데 주식시장(유가증권 및 코스닥 시장)에 접근할 수 있는 기업은 6% 정도밖에 되지 않는다.[8]

<그림 1>

<그림 1>은 우리나라 전체 법인기업을 자산규모에 따라 1,000개 그룹으로 나눈 뒤 각 그룹별로 레버리지를 나타낸 것이다. 레버리지는 비유동부채를 자산총계로 나눈 값이고 가독성 제고를 위해 레버리지의 상하위 10%에서 winsorize 하였다. 그런데 우리나라 전체 법인기업 중에서 비유동부채가 없는 기업이 절반 이상이고 이들은 대부분 규모가 매우 작은 기업들이다. 이에 소규모 기업들까지 분석에 포함하기 위하여 부채총계를 자산총계로 나눈 총레버리지를 함께 제시하였다.

그림에서 보듯이 레버리지는 기업의 규모에 따라 U-shape을 나타낸다. 소규모 기업은 레버리지가 매우 높으며 중규모로 갈수록 감소한다. 한편 중규모 이상의 기업들은 기업규모가 커질수록 레버리지가 지속적으로 증가하다가 기업규모가 가장 큰 구간에서 레버리지가 감소하는 모습을 보

7) 본 연구에서 지칭하는 대기업은 공정거래법상 상호출자제한기업집단에 소속되어 있는 기업이다. 대기업을 제외하는 추정 방식의 특성상 <표 1>의 중소기업의 범위에는 부득이 중견기업도 포함된다.

8) 상장요건 가운데 규모요건은 유가증권시장은 자본금 300억원 이상 및 매출액 1000억원 이상, 코스닥시장은 자본금 30억원 이상(단, 벤처기업은 자본금 15억원 이상, 기술성장기업은 자본금 10억원 이상)이다. 2013년 중반이후 진입요건을 완화한 코넥스 시장이 개장하였지만 아직까지 크게 활성화되고 있지는 않다.

인다. 레버리지가 감소하는 구간은 주식시장 접근이 가능한 구간과 상당 부분 일치한다. 이는 중소기업이 주식시장에서 자금을 조달한다면 재무적 제약이 완화되어 투자여력을 확보할 수 있게 될 것이라는 예상과 부합한다.

3.2. 표본의 구성

본 연구의 분석에 사용될 기본적인 표본은 상장사협의회가 제공하는 외감기업 및 상장(주권상장 및 코스닥)법인의 2004년부터 2015년까지 사업보고서 자료를 이용하여 구성하였으며, 자료 추출은 TS-2000을 사용하였다. 최근 코넥스 시장이 개장되어 상장요건이 간소화되었지만 시계열이 짧아 본 분석에서는 제외하였다.

상장사협의회가 제공하는 외감법인 데이터는 연도별로 중소기업기본법상 중소기업에 해당하는지 여부에 대한 자료를 포함하고 있다. 우리나라는 중소기업 여부에 따라 적용되는 규제 및 지원 정책이 달라지기 때문에 중소기업 여부의 판단은 기업의 재무행태에도 영향을 미칠 수 있는 중요한 변수이다. 그런데 중소기업 여부의 판단은 여러 요건과 유예기간 등을 적용해야 하므로 규모 등 관찰 가능한 일부 요건만을 적용하여 중소기업 여부를 추정하는 것은 정확하지 않을 수 있다. 반면, 상장사협의회에서는 해당기업이 중소기업에 해당하는지 여부를 공시하면 이를 참고하여 외감기업을 대기업, 중견기업, 중소기업으로 재분류하여 제공한다.[9)]

9) 중소기업은 상시 근로자 수, 자본금 또는 매출액이 업종별로 일정규모 이하인 기업으로 공정거래법상 상호출자제한기업집단에 속하지 않는 회사이다. 중견기업은 중소기업기본법상 중소기업이 아니면서 상호출자제한기업집단에 속하지 않는 기업이다. 대기업은 중소기업 및 중견기업에 속하지 않는 기업이다.

표본 기간이 2004년도부터 시작하는 이유는 중소기업 구분이 이 때 부터 제공되기 때문이다. 2003년 데이터는 표본에는 포함되지 않았지만 성장률 등 전기 데이터를 이용해야 하는 변수를 생성하기 위해 사용되었다. 이밖에 표본 기간 중에 주식 시장에 상장하여 기업을 공개한 중소기업들의 신주 발행을 통한 조달 자금은 금융감독원 전자공시(DART)를 이용하여 직접 수집하였다.

추출된 전체 자료에서 사업의 성격 및 목적이 일반적인 기업과 다른 금융 및 보험업(K), 공공행정·국방 및 사회보장행정(O), 협회 및 단체(S94), 가구내고용활동 및 달리 분류되지 않은 자가소비 생산활동(T) 업종의 기업은 제외하였다. 또한 정상적인 영업활동을 수행하는 기업들을 분석 대상으로 하기 위해 매출액이 0인 기업, 관리종목(주권상장법인, 코스닥 법인 중) 및 감사의견이 '적정'이 아닌 기업은 제외하였다.

이후, 다음과 같이 세 개의 매칭 표본을 구성하였다. 우선 유가증권 시장 및 코스닥 시장 상장 중소기업-연도 전체를 대상으로 동일 산업 내에서 규모, 성장기회, 레버리지, 수익성이 유사한 비상장 중소기업-연도 표본을 외감 중소기업들 중에서 성향점수짝짓기(Propensity Score Matching) 방식으로 추출하였다. 외감법인 데이터는 상장 중소기업은 모두 포함하지만 비상장 중소기업은 모두 포함하는 것은 아니다. 그러나 상장요건(유가증권 및 코스닥) 등을 감안할 때 소규모기업은 상장 중소기업의 비교대상으로 고려하기에 적절치 않으므로 전수 데이터를 이용한 매칭과 크게 차이나지 않을 것으로 판단하였다. 이 방식으로 구성된 표본은 상장 기업-연도 7,666개와 이에 대응되는 비상장 기업-연도 7,666

개이며 이하에서는 편의상 ‘매칭표본A’로 지칭한다.

다음에는 표본 기간 중에 상장한 중소기업을 대상으로 상장 직전의 기업특성을 파악한 후, 동일 산업 내에서 규모, 성장기회, 레버리지, 수익성이 유사한 기업을 성향점수짝짓기(Propensity Score Matching) 방식으로 선정하되, 표본 기간 중 (1) 계속 비상장 중소기업군 및 (2) 계속 상장 중소기업군 중에서 각각 추출하여 매칭 표본을 구성하였다. 즉 하나의 신규상장 중소기업에 대해 두 개 (계속 비상장, 계속 상장)의 대응 표본을 추출하여 두 개의 매칭 표본을 구성하였는데, 이는 추후 이중차이법(Difference-in-differences)에서 활용된다. 이 때, 코넥스 상장이후 코스닥으로 이전 상장한 기업은 신규상장 중소기업에서 제외하였다. 이하에서는 상장기업 361개와 매칭된 계속 비상장기업 361개로 구성된 표본을 ‘매칭표본B’, 상장기업 309개와 매칭된 계속 상장기업 309개로 구성된 표본을 ‘매칭표본C’로 지칭한다.

3.3. 연구방법

상장이 투자에 미치는 효과를 엄밀히 추정하기 위해서는 한 기업이 상장했을 때의 행태와 상장하지 않았을 때의 행태가 어떻게 다른지를 비교해야 하지만 실제로는 하나의 기업이 상장 상태와 비상장 상태로 동시에 존재할 수는 없다. 하지만 상장한 기업에 대해 반사실적(Counterfactual) 상황을 가정해볼 수는 있다. 이를 위해 본 연구에서는 기업-연도 단위(Firm-year Level)의 성향점수짝짓기(Propensity Score Matching)와 기업 단위(firm level)의 이중차이법(Difference-in-differences)을 이용한다.

먼저, 성향점수짝짓기는 자연과학의 실험(Experiment)을 사회과학에 적용하여 인과관계를 분석하고자 하는 시도 중 하나로 볼 수 있다. 자연과학에서는 처치(Treatment)를 무작위로 배정(Randomization)하고, 실험군(Treatment Group)과 대조군(Control Group)을 비교하여 그 차이를 처치의 효과(Treatment Effect)로 본다. 성향점수짝짓기 방법은 중소기업들의 관찰된 특성을 토대로 상장할 확률을 점수화하여 실제로는 상장되지 않았지만 성향점수가 상장기업과 유사한 비상장기업과 상장기업을 짝짓는 방식이다. 이처럼 비슷한 성향을 가진 기업들 중에서 어떤 기업은 상장되고 어떤 기업은 상장되지 않은 표본을 구성함으로써 '상장'이라는 처치를 무작위 배정하는 것과 같은 상황을 만든다. 무작위 배정 상황은 상장기업이 비상장기업과 근본적인 특성이 다르기 때문에 발생하는 내생성 문제를 완화시켜 준다. 짝지어진 표본에서 상장기업을 실험군으로, 짝지어진 비상장기업을 대조군으로 설정하여 두 기업군간의 차이를 비교함으로써 상장으로 인한 효과를 추정하게 된다.

구체적인 적용방법은 두 단계로 나누어볼 수 있다. 첫 번째 단계로 매칭에 사용할 변수들을 독립변수로 하는 로짓모형을 구성하여 성향점수를 산출한다. 이를 통해 실제 상장여부에 관계없이 모든 기업-연도에 대해 상장될 확률(성향점수)이 계산된다. 다음 단계로 모든 기업-연도를 상장기업-연도와 비상장 기업-연도로 나눈 뒤, 상장 기업-연도와 성향점수가 가장 가까운 비상장 기업-연도를 찾아 짝짓는다. 이 때 동일한 업종 내에서 짝지어지도록 업종별로 매칭을 수행한다. 짝짓는 방법은 여러 가지 방식이 있을 수 있지만 많이 사용되는 방법은 NN(Nearest Neighbor) 매칭과 Caliper 매칭이다. NN 매칭은 실험군에 속한 관측치와 가장 성향점

수가 비슷한 관측치를 대조군에서 찾아서 짝짓는 방식이다. 그러나 이 방식은 성향점수가 가장 비슷하더라도 그 차이가 과다한 경우를 배제할 수 없다는 단점이 있다. Caliper 매칭은 성향점수 차이에 상한을 두어 매칭이 이루어지지 않는 경우가 발생할 수 있지만 매칭의 질을 높일 수 있는 방법이다(Caliendo and Kopeinig, 2005; Dehejia and Wahba, 2002).

본 연구에서는 기존 문헌에서 상장 여부에 영향을 미치는 것으로 보고된 기업규모, 성장기회, 레버리지, 수익성 등을 이용하여 성향점수를 추정한 다음, 동일 산업(Fama-French 48 산업분류) 내에서 Caliper 매칭방법(Caliper=0.1 with Replacement)을 사용하여 대응표본을 추출한다.[10] 이처럼 성향점수의 차이가 0.1 이내인 경우에만 대응표본이 구성되도록 함에 따라 매칭이 이루어지지 않은 상장 기업-연도는 표본에서 제외된다. <그림 2>는 매칭 전후의 상장과 비상장 중소기업의 자산분포를 보여준다. 그림에서 알 수 있듯이 매칭 이전에는 비상장 기업-연도와 상장 기업-연도의 자산 분포가 상당히 다르지만 매칭 후에는 분포가 비슷하게 나타난다.

<그림 2>

이상과 같은 성향점수짝짓기는 두 그룹간의 특성을 유사하게 유지시킴으로써 상장의 효과를 어느 정도는 무작위(Randomize)에 근접하게 할 수는 있으나, 상장 확률 추정에서 누락된 또 다른 기업 특성에 의해 상장의 효과가 과대 또는 과소 추정될 가능성이 있다. 엄밀히 말하면 이 분

10) 한국표준산업분류(KSIC)에서 제시된 68개 업종을 기준으로 매칭을 재실시하여 분석한 결과, 기존 분석 결과와 유사함을 확인하였다.

석은 상장-기업연도와 유사한 비상장-기업연도간의 비교 분석은 될 수 있으나, 상장의 ‘효과’를 주장하기에는 한계가 있을 수 있다.

이에 상장과 투자 간의 인과관계를 보다 엄밀하게 실증적으로 검증하기 위해 이중차이법(Difference-in-differences)를 활용한다. 이중차이법에서는 먼저 표본 기간 중에 처치(Treated)가 일어난 표본을 실험군(Treated group)으로, 처치가 일어나지 않은 표본을 대조군(Control Group)으로 설정한다. 본 연구에서는 표본 기간 중에 기업을 공개하여 주식 시장에 상장한 기업이 실험군으로, 동 기간 중 계속 비상장으로 남아 있는 기업 또는 계속 상장 상태로 유지된 기업이 대조군으로 설정된다. 다음 실험군과 대조군을 대상으로 각각 처치 이전과 이후의 차이를 관측한 후, 각 그룹별로 측정한 전후간 차이가 양 그룹 간에 얼마나 다른지를 측정한다. 이와 같이 계산된 전후간 ‘차이’의 그룹간 ‘차이’가 통계적으로 유의한 경우 처치의 효과가 있는 것으로 해석하게 된다.

보다 구체적으로 표본 기간 중 신규로 상장한 중소기업에 대해 상장 이전 기간에 업종이 동일하고 규모, 성장기회, 레버리지, 수익성이 비슷한 비상장 중소기업을 매칭(매칭표본B)하고 표본에 포함된 기업들의 패널 데이터를 구성한다. 이 때 짝지어지는 비상장 중소기업은 표본기간 동안에 계속 비상장 상태인 중소기업이다. 한편 비교를 위하여 동일한 방식으로 신규상장 중소기업에 대해 상장 이전 기간에 업종이 동일하고 규모, 성장기회, 레버리지, 수익성이 비슷한 상장 중소기업을 매칭(매칭표본C)하여 표본에 포함된 기업들의 패널 데이터를 구성하였다. 이 때 신규상장 중소기업과 짝지어지는 상장기업은 표본기간에 걸쳐 계속 상장

상태인 기업이다.

3.4. 요약통계

〈표 2〉

〈표 2〉는 상장 중소기업과 비상장 중소기업간 주요 기업특성 변수의 비교를 통해 매칭의 성과를 보여준다. 패널A의 첫 번째 4개 열은 외감 중소기업 전체를 포함하며 이 중 상장 기업-연도는 7,705개이고 비상장 기업-연도는 83,910개이다. 패널 A의 매칭표본A는 성향점수짝짓기 방법을 이용하여 상장 중소기업-연도(Firm-year)와 동일한 산업 내에서 규모, 성장기회, 레버리지, 수익성이 유사한 비상장 중소기업-연도(Firm-year)를 짝지은 표본이다.

패널 B의 첫 번째 4개 열은 표본기간 중에 최초로 기업을 공개한 중소기업(381개)의 패널 자료로 상장 이전(비상장 열) 기업-연도 1,897개와 상장 이후(상장 열) 기업-연도 2,849개로 구성된다. 패널 B의 매칭표본B는 이들 신규상장 기업을 계속 비상장기업과 짝지은 기업단위(Firm-level)의 횡단면 표본으로 상장 전전연도를 기준으로 매칭하였다. 매칭표본C는 신규상장 기업을 계속 상장기업과 짝지은 표본으로 마찬가지로 상장 전전연도를 기준으로 매칭하였다.

대응표본 구성시 상장 전전연도를 기준으로 한 이유는 신규상장 기업이 상장 이전에 가지고 있던 일상적인 특성을 보다 잘 반영하기 위해서이다. 예컨대 Teoh, Wong and Roa(1998) 및 Teoh, Welch and Wong(1998)에 따르면 상장 직전연도는 상장요건을 맞추기 위한 준비 및

공모가를 높이고자 하는 유인으로 인해 재무제표에 왜곡이 있을 수 있다. 각 매칭표본들에 포함된 상장 중소기업과 비상장 중소기업의 기업특성 간에 유의한 차이가 있는지 t-test를 통해 검증한 결과 유의한 차이가 없는 것으로 나타났다.

4. 상장-비상장 중소기업간 투자 행태 비교 분석

4.1. 상장여부가 중소기업의 투자 규모에 미치는 영향

우선 가설 1의 검증을 위해 외감 중소기업의 매칭표본(매칭표본A)을 이용하여 상장여부가 투자 규모에 미치는 영향을 분석하였다. 아울러 가설 4을 검정하기 위해 투자를 유형자산에 대한 투자와 연구개발에 대한 투자로 구분하였다. 유형자산에 대한 투자는 현금흐름표상 유형자산 구입으로 유출된 현금으로 측정하였고, 연구개발에 대한 투자는 개발비 변화분(대차대조표)에 개발비상각액과 연구비 및 경상개발비(손익계산서상)를 더한 값으로 측정하였다. 기타 변수에 대한 자세한 정의는 부록에 수록하였다.

〈표 3〉

〈표 3〉은 상장 중소기업과 비상장 중소기업간 절대적인 투자 규모의 차이를 보여준다. 외감 중소기업 전체표본에서는 상장 중소기업의 연평균 투자 금액이 46억원으로 비상장 중소기업의 연평균 투자 금액 18억원

보다 통계적으로 유의하게 더 많은 것으로 나타났다. 이러한 평균 투자 규모의 차이는 유형자산 투자와 연구개발 투자에 공히 존재하였다.

그러나 상장 중소기업과 비상장 중소기업 간에는 상장 여부 이외에도 다른 특성의 차이로 인해 투자 규모에 차이가 발생할 수 있으므로 양 집단간 단순 비교만으로는 상장의 효과를 엄밀하게 확인하기는 어렵다. 특히, <표 2>에서 제시되었듯이 매칭 이전에는 상장 중소기업의 규모가 비상장 중소기업의 규모보다 훨씬 크므로, 절대적인 투자 규모의 차이는 단순히 기업 규모의 차이를 반영한 결과일 수 있다.

따라서 상장 중소기업과 유사한 비상장 중소기업으로 구성된 매칭표본 A와의 비교 분석을 해야 상장으로 인한 투자 규모의 차이를 보다 더 정확하게 식별할 수 있다. 매칭표본A와의 비교 분석 결과를 보면 상장-비상장 중소기업간 전체적인 투자 규모는 서로 차이가 없는 것으로 나타났다. 즉, 기업 규모 등 주요한 기업특성을 통제한 후에는 상장 중소기업이 유사한 비상장 중소기업에 비해 특별히 더 투자를 더 많이 하지는 않는다는 것을 의미한다. 이러한 결과는 상장을 통해 자금조달이 더 원활해지더라도 전반적인 투자 규모에는 큰 영향이 없을 수 있음을 시사하며, 가설 1의 예측과 부합하지 않는 결과로 볼 수 있다.

한편, 중소기업의 상장 여부는 유형자산 투자와 무형자산 투자에 대해 서로 다른 영향을 미치는 것을 알 수 있다. 즉 비상장 중소기업을 매칭표본 A에 국한하여 상장 중소기업과 비교할 경우 비상장에서 유형자산 투자가 더 높은 것으로 나타났다. 다만, 이러한 결과는 전체 표본을 대상으로 한 비교와는 결과가 상이하므로 유형자산 투자에 대한 상장 여부

의 영향은 해석상 주의를 요한다.

〈표 4〉

〈표 4〉에서는 상장 여부가 투자에 미치는 영향을 다변량 회귀분석을 통해 보고하고 있다. 종속변수는 투자 금액을 직전연도말 자산총계로 나눈 값으로 투자총계, 유형자산 투자 및 연구개발 투자로 구분하였다. 투자총계는 유형자산 투자와 연구개발 투자를 합한 금액이다. 연구개발 투자는 자산 총계 이외에 매출액으로도 표준화하여 분석하였다.[11]

통제 변수를 추가하지 않은 기본 모형에서는 상장여부가 투자 총계 및 유형자산 투자에는 통계적으로 유의한 부(-)의 영향을 미치는 반면, 연구개발 투자에서는 유의한 정(+)의 영향을 미치는 것으로 나타났다. 다만, ROA, Cash(=현금/자산) 및 Age를 통제한 후에는, 투자 총계 및 유형자산 투자에 대한 상장 여부의 효과는 유의하지 않게 나타나 상장 여부가 투자 총계 및 유형자산 투자에 부정적인 영향을 미친다고 단정하기는 어려운 것으로 보인다.

4.2. 상장여부가 중소기업의 투자 민감도 및 재무적 제약에 미치는 영향

한편, 〈표 4〉에서는 가설 2를 검증하기 위해 상장 중소기업과 비상장 중소기업 중 어느 집단의 투자가 성장기회에 더 민감하게 반응하는지를 추가로 분석하였다. 성장기회의 대용치로는 Asker et al.(2015)의 방법론을 적용하여 구한 예측 Q를 사용하였다. 예측 Q는 우선 상장기업에 대

11) 극단치의 영향을 최소화하기 위해 매출액으로 표준화한 연구개발투자 분포의 상하위 1%를 제거한 후 분석을 진행하였다.

해 토빈의 Q를 구하고 이를 매출액증가율, ROA, EBIT, 및 레버리지에 대해 회귀분석하여 회귀계수 값을 구한 다음, 추정된 회귀계수에 각 비상장기업의 특성치를 대입하여 계산하였다. 상장 여부는 더미변수 List에 반영하였고, List와 성장기회변수(예측 Q)와의 교차항을 통해 상장에 따른 투자의 민감도를 측정하였다.

분석 결과, 상장 여부는 성장기회에 대한 투자의 민감도에 긍정적인 영향을 미치는 것으로 나타났다. 즉, 예측 Q와 상장 여부의 교차항에 대한 회귀계수는 투자총계, 유형자산 투자 및 연구개발 투자에서 모두 유의하게 정(+)으로 나타나서 성장 기회에 대한 투자의 민감도에 있어서는 유형자산 투자와 연구개발 투자간 유의미한 차이를 발견할 수 없었다. 이는 상장 이후 유형자산투자와 연구개발 투자 공히 투자 기회에 더 민감하게 반응함을 시사한다.

Asker et al.(2015)은 상장기업은 비상장기업에 비해 투자가 적을 뿐만 아니라 성장기회에 대한 투자의 민감도가 낮음을 보이고, 이는 상장 이후 지배주주의 지분율이 희석되어 발생하는 대리인 문제 때문이라고 주장하였다. 그러나, <표 4>의 결과에 따르면 국내 중소기업의 경우 상장 중소기업의 투자가 비상장 중소기업보다 적다고 보기 어렵고, 성장기회에 대해 투자가 덜 민감하지도 않으므로 대리인 문제로 인한 현상이라고 해석하기는 적절하지 않다. 투자 총계는 물론 유형자산투자와 연구개발 투자에서 모두 상장 중소기업이 성장기회가 있을 때 투자를 더욱 증가시키는 것으로 나타났는데, 이러한 결과는 가설 2를 지지하는 것으로 해석할 수 있다.[12)]

<표 5>

<표 5>에서는 가설 3을 검증하기 위하여 상장여부가 중소기업의 재무적 제약에 미치는 영향을 분석하였다. 재무적 제약을 측정하는 방법으로 많은 변수들이 제안되어 왔지만 본 논문에서는 현금흐름에 대한 투자의 민감도를 이용한다. 현금흐름에 대한 투자의 민감도 지표는 Fazzari, Hubbard and Petersen(1988)이 처음 사용한 이후 많은 문헌에서 재무적 제약을 측정하는 지표로 활용되고 있다. 재무적 제약이 없는 기업은 기업의 자금 상태에 관계없이 수익성 있는 모든 투자를 수행할 수 있지만, 재무적 제약이 있는 기업은 현금흐름이 증가해야만 추가적인 투자를 수행할 수 있다. 따라서 현금흐름이 증가함에 따라 투자가 민감하게 증가할수록 기업에 재무적 제약이 있다고 판단할 수 있다.

아울러 장기차입금에 대한 투자의 민감도도 분석하였다. Titman(2013)은 유형자산 투자를 위한 자금 조달에 있어서 차입의 중요성을 지적한 바 있다. 장기차입금이 증가함에 따라 투자가 민감하게 증가할수록 기업의 투자가 상당부분 장기차입금에 의존하는 것으로 볼 수 있다. <표 5>에서는 투자를 종속변수로, 현금흐름(Cf)과 장기차입금(Ldin)을 설명변수로 설정하고 회귀분석을 통해 재무적 제약이 있는지를 확인한다. Cf는 영업현금흐름을 직전연도말 자산으로 나눈 값으로 양극단 1%를 제거한 후 산출하였다. Ldin은 장기차입금 유입액/직전연도말 자산으로 정의되며 역시 양극단 1%를 제거한 후 사용하였다. 현금흐름의 회귀계수가 유의

12) Asker et al(2015)은 투자를 유형자산 총액의 변화분으로 정의하고 여기에 비유동자산 변화분 또는 광고선전비를 추가하기도 하였다. 연구개발 항목은 비유동자산 변화분에 일부 포함되지만 별도로 구분하여 분석하지는 않았기 때문에 연구개발에 대한 투자가 감소했는지 여부는 명확히 알 수 없다.

한 양의 값을 갖는 경우 기업에 재무적 제약이 있다고 판단하고, 장기차입금의 회귀계수가 유의한 양의 값을 갖는 경우 투자가 차입에 의존하는 것으로 판단하였다. 특히, 상장으로 인해 재무적 제약이 감소하는지를 알아보기 위해 상장더미(List)와 현금흐름의 교차항을 추가한다. 또한 상장시 장기차입금을 통한 투자자금의 조달이 감소하는지 알아보기 위해 상장더미(List)와 장기차입금의 교차항을 추가한다.

분석결과 매출액 대비 연구개발 투자를 제외한 모형에서 현금흐름의 회귀계수가 유의한 양의 값을 보이므로 비상장 중소기업은 투자에 어느 정도 재무적 제약이 있음을 확인할 수 있다. 그러나 상장더미와 현금흐름 교차항의 계수는 유의한 값을 보이지 않아 상장으로 인한 재무적 제약의 완화 효과는 없는 것으로 나타났다. 한편, 장기차입금의 회귀계수도 매출액 대비 연구개발 투자를 제외한 분석에서 유의한 양의 값을 보여 비상장 중소기업의 투자가 장기차입금에 대체로 민감한 것으로 나타났다. 특히 유형자산 투자에 대한 장기차입금의 회귀계수는 3/4이상으로 비상장기업에 있어서는 장기차입금의 상당부분이 유형자산 투자에 사용되는 것을 알 수 있다. 상장더미와 장기차입금 교차항의 계수는 투자총계 및 유형자산 투자에서 유의한 음의 값을 갖는 것으로 나타나 상장 중소기업은 유사한 비상장 중소기업에 비해 유형자산 투자시 장기차입금에 덜 민감함을 알 수 있다. 이는 비상장기업이 차입을 통해 투자자금을 조달하고 이에 따라 담보가능한 유형자산 투자에 집중하게 된다는 예상과 부합하며, 상장 이후 투자의 장기차입금에 대한 민감도가 낮아진다는 측면에서 가설 3을 부분적으로 지지한다.

상장 중소기업의 연구개발 투자는 비상장 중소기업에 비해 유의하게 높은 것으로 나타났으나, 연구개발 투자는 현금흐름이나 차입에 크게 민감하지 않은 것으로 확인되었다. 특히, 매출액으로 표준화한 연구개발 투자의 경우 비상장, 상장 공히 현금흐름에 의존하지 않은 반면, 장기차입금에 대한 민감도는 상장 중소기업에서 오히려 더 크게 나타나 상장이 연구개발 투자에 소요되는 자원의 제약을 완화한다고 단정하기는 어려울 것으로 사료된다.

5. 신규상장 중소기업의 투자 행태 분석

5.1. 중소기업 IPO 조달자금의 사용

이번 절에서는 중소기업이 신규상장을 통해 조달한 자금을 어떻게 사용했는지 분석한다. 신규상장 기업 중 중소기업인지 여부는 신규상장 직전연도를 기준으로 판단하였다. 중소기업 여부에 대한 정보는 2004년부터 제공되므로 2004년도 신규상장기업은 제외되었다. 또한 표본기간의 마지막 연도인 2015년에 신규상장한 기업에 대해서는 조달자금의 사용내역을 확인할 수 없으므로 2014년까지 신규상장한 기업을 대상으로 분석하였다. 분석방법은 Kim and Weisbach(2008)의 방법을 이용하였으며 회귀식은 다음과 같다.

$$Y = \beta_1 \ln\left(\frac{IPO\text{조달자금}}{\text{직전연도말 자산}} + 1\right) + \beta_2 \ln\left(\frac{\text{기타 현금유입액}}{\text{직전연도말 자산}} + 1\right) + \beta_3 Size_1 \quad (1)$$
$$+ Year\,FE + \epsilon$$

Y = ln[(당기지출액/직전연도말 자산)+1]
for 투자총계, 유형자산투자, 연구개발투자
= ln[((당해연도말 잔액-직전연도말 잔액)/직전연도말 자산)+1]
for 총자산, 현금, 기타 비유동자산, 순운전자본, 장기부채, 단기부채

설명변수는 IPO조달자금을 직전연도말 자산으로 나누어 1을 더한 후에 로그를 취한 값과, 기타 현금유입액을 직전연도말 자산으로 나누어 1을 더한 후에 로그를 취한 값이다. 기타 현금유입액은 영업현금흐름, 투자 및 재무 활동으로 인한 현금유입액에서 조달자금을 뺀 금액이다. 통제변수로 전기말 자산에 로그를 취한 값을 이용한다. 종속변수는 (i)△자산총계 (ii)△현금 (iii)투자총계 (iv) 유형자산 투자 (v) 연구개발 투자 (vi) △기타비유동자산 (vii) △순운전자본 (viii)△장기부채 (ix) △단기부채 이다. 저량항목인 총자산, 현금, 기타비유동자산, 순운전자본, 장기부채, 단기부채는 각 항목의 증가분을 직전연도말 자산으로 나누어 1을 더한 후에 로그를 취한 값이고 유량항목인 투자총계, 유형자산 투자와 연구개발 투자는 각 항목을 직전연도말 자산으로 나누어 1을 더한 후에 로그를 취한 값이다. 분석 결과는 <표 6>에 제시되어 있다. 패널 A에서는 전체 신규상장 중소기업에 대한 결과를 보고한다. 패널 B와 C는 전체 IPO 중소기업을 IPO 전전연도 레버리지를 기준으로 2개 그룹으로 나누었을 때 레버리지가 높은 그룹과 낮은 그룹에 대하여 분석한 결과를 각각 보고한다.

〈표 6〉

〈표 6〉 패널 A의 결과를 보면 우선 자산 총계 증가분에 대한 IPO 조달 자금의 회귀계수가 거의 1에 가까운 값을 갖는데, 이는 IPO 조달 자금의 대부분이 자산 증가로 반영된다는 것을 의미한다. 조달 자금의 대부분은 순운전자본의 증가로 나타나며 이 중 현금의 증가가 상당 부분을 차지함을 알 수 있는데, 이는 Kim and Weisbach(2008) 등 기존 연구와 일치하는 결과이다. 그럼에도 불구하고 상장연도에 유형자산 및 연구개발에 대한 투자 역시 모두 증가하는 것으로 나타났다. 이는 IPO 조달자금의 일정 부분은 실제로 투자로 이어지고 있음을 시사한다.

그러나 이러한 현상은 상장이전에 레버리지가 높았던 기업과 레버리지가 낮았던 기업을 구분해서 분석할 경우 다르게 나타난다. 패널 B에서 보듯이 상장 이전에 레버리지가 높았던 중소기업은 조달 자금으로 유형자산 투자는 증가시키지 않는 반면 연구개발 투자는 증가시킨다. 이는 상장 이전에 레버리지가 높았던 기업은 주로 차입을 통해 유형자산 투자를 했기 때문에 상장으로 조달한 자금으로 더 이상 유형자산에 투자하지 않고 연구개발 투자를 증가시키는 것으로 볼 수 있다. 특히, 상장 이후에는 레버리지를 줄이기 위해 장기차입금을 상환하는 경향을 보인다.

반면, 패널 C에서 상장 이전에 레버리지가 낮았던 중소기업은 상장과 함께 단기부채도 증가시켜 차입에 의한 자금 조달을 더욱 확대하였으며 연구개발 투자뿐만 아니라 유형자산 투자도 함께 증가시키는 것을 알 수 있다. 이는 상장 이전에 레버리지가 낮았던 중소기업은 과도한 차입을 통한 유형자산 투자를 하지 않았기 때문으로 볼 수 있다.

5.2. 이중차이법을 이용한 중소기업 신규상장의 투자에 대한 효과 분석

이 절에서는 2005~2014년 중에 신규상장한 중소기업을 대상으로 매칭 표본을 구성하여 패널 분석을 통해 상장의 효과를 분석한다. 적절한 패널 분석 모형 선정을 위해 우선 Hausman Test를 실시하였다. 검정 결과 전체 8개 분석 대상 모형 중 유의확률이 0.01% 미만인 경우가 6개 이고, 나머지 2개의 유의확률은 각각 0.049, 0.061로 나타났다.[13] 본 결과에 따라 고정효과모형(Fixed Effect Model)과 랜덤효과모형(Random Effect Model)간에 차이가 없다는 귀무가설이 기각되었으므로 랜덤효과모형 보다는 고정효과모형이 더 적합한 것으로 확인되었다.

이하에서는 상장과 투자간 인과관계를 보다 효과적으로 보여 주기 위해 이중차이법(Difference-in-differences)을 도입한다. 이중차이법은 차분을 통해 개별효과를 제거하기 때문에 고정효과모형의 일종으로 볼 수 있다. 보다 구체적으로, 신규상장 중소기업에 대해 상장 이전기간에 동일한 산업 내에서 규모, 성장기회, 레버리지, 수익성이 유사한 계속 비상장 중소기업을 매칭(매칭표본B)하고 표본에 포함된 기업들의 패널 데이터를 구성하여 회귀분석을 수행한다. 비교를 위하여 신규상장 중소기업에 대해 상장 이전기간에 동일한 산업 내에서 규모, 성장기회, 레버리지, 수익성이 유사한 계속 상장 중소기업을 매칭(매칭표본C)하여 표본에 포함된

13) 투자 유형별 종속변수가 4개이고, 비교대상 그룹이 계속 비상장기업, 계속 상장기업 2개이므로 분석대상 모형은 총 8개이다. Hausman Test의 구체적인 결과는 다음과 같다. 계속비상장기업과 매칭한 패널에서는 유형자산 투자 m값 9.55(p<0.0487), 연구개발 투자(총자산 scale) m값 28.19(p<.0001), 연구개발 투자(매출액 scale) m값 48.85(p<.0001), 투자총계 m값 8.98(p<0.0615)이며, 계속상장기업과 매칭한 패널에서는 유형자산 투자 m값 59.01(p<0.0001), 연구개발 투자(총자산 scale) m값 44.98(p<.0001), 연구개발 투자(매출액 scale) m값 52.1(p<.0001), 투자총계 m값 41.11(p<0.0001)이다.

기업들의 패널 데이터를 구성한다. 신규 상장된 중소기업을 대상으로 상장이 투자에 미치는 영향을 분석하기 위하여 다음과 같은 회귀식을 구성하였다. 종속변수는 투자이며 투자총계, 유형자산 투자 및 연구개발 투자에 대해 각각 분석하였다. 설명변수는 신규상장기업과 계속 비상장(또는 상장) 중소기업을 구분하기 위한 더미변수(Dlist)와 상장 이전기간과 상장 이후기간을 구분하기 위한 더미변수(Dpost)이다. 또한 두 더미변수의 교차항(Dlist*Dpost)은 이중차이법(Difference-in-differences)에 의한 효과를 분석하기 위한 변수로 상장 이후기간에 신규상장 중소기업의 투자변화를 설명한다. 통제변수로는 규모(Size), ROA, 성장기회(Salesgr), 레버리지(Lev)를 사용하였다.

$$I = \alpha + \beta_1 Dlist + \beta_2 Dpost + \beta_3 Dlist \times Dpost + \gamma Controls + FE + \epsilon \quad (2)$$

I: 투자총계, 유형자산 투자, 연구개발 투자

Dlist: 신규 상장 중소기업=1, 계속 비상장(또는 상장) 중소기업=0

Dpost: 신규 상장연도를 기준연도로 하여 기준연도 이전기간=0, 기준연도와 그 이후기간=1

〈표 7〉

분석결과는 〈표 7〉에 제시되어 있으며, 패널A는 계속 비상장 중소기업과의 비교 결과를, 패널 B는 계속 상장 중소기업과의 비교 결과를 보고한다. 패널 A의 결과에 의하면 신규상장 중소기업은 상장 여부와 무관하게 유사한 계속 비상장 중소기업보다 투자를 많이 하는 기업인 것으로

나타났으며, 이러한 경향은 유형자산 투자와 연구개발 투자에서 공히 발견되었다.

이는 앞에서 보고한 기업-연도 매칭 표본의 결과가 상장시 투자에 미치는 영향을 어느 정도 과대평가 했을 수 있음을 시사한다. 즉, 상장 기업-연도가 비상장 기업-연도보다 투자가 더 많다고 하더라도 이들 상장 기업-연도들은 비상장일 때도 이미 투자를 많이 했던 기업일 수 있으며, 상장 이후 특별히 더 투자를 증가시키지 않을 수도 있는 것이다. 이러한 해석은 투자총계 및 유형자산 투자에 대한 교차항의 계수를 통해 보다 더 명확하게 알 수 있다. 즉 이들 계수는 통계적 유의성이 없는 것으로 나타났는데, 이는 신규상장 중소기업이 상장 이후 투자총계 또는 유형자산 투자를 유사한 비상장 중소기업보다 특별히 더 증가시키지는 않은 것으로 볼 수 있다.

그러나 연구개발 투자에 대한 교차항의 계수는 통계적으로 유의한 양수로 나타나 신규상장 중소기업이 상장 이후 비상장 중소기업보다 연구개발 투자를 더 증가시킨 것을 확인할 수 있다. 이는 앞에서 보고한 기업-연도 매칭 표본의 분석 결과와 일치하는 내용으로, 유형자산투자와 연구개발투자에 대한 상장의 효과가 다를 것이라는 가설 4를 지지하는 것으로 해석할 수 있다.

한편, 신규상장 중소기업을 계속 상장 중소기업과 비교한 패널B에서도 신규상장 중소기업은 상장과 무관하게 기존 상장 중소기업보다 투자를 많이 하는 것으로 나타났다. 즉, 신규상장 중소기업은 상장 이전에도 유사한 계속 상장 중소기업보다 투자를 더 많이 하고 있었던 것이다. 그러

나 교차항의 계수는 매출액 대비 연구개발 투자를 제외한 투자 유형에 대해 통계적 유의성이 없는 것으로 나타났다. 즉, 신규상장 중소기업이 상장 이후 기존 상장 중소기업보다 특별히 투자를 더 증가시키지는 않은 것으로 볼 수 있다.

마지막으로 이중차이법을 이용하여 시간에 걸친 상장의 효과(Time-trends)를 보다 면밀히 살펴보기 위해 상장 전후 3년간(상장연도를 포함하여 7개 연도)의 자료만을 대상으로 연도별 더미를 추가하여 분석하였다. 회귀식은 다음과 같다. 연도더미변수(D_i)는 신규상장 전년도를 기준으로 이전 3년, 이후 3년으로 구성하였다. 또한 이중차이 효과를 나타내는 교차항(DID_i)은 상장더미(Dlist)와 연도더미변수(D_i)를 곱한 값이다. 통제변수로는 규모(Size), ROA, 성장기회(Salesgr), 레버리지(Lev)를 사용하였다.

$$I = \alpha + \beta_1 Dlist + \beta_2 D_{-3} + \beta_3 D_{-2} + \beta_4 D_{-1} + \beta_5 D_{+1} + \beta_6 D_{+2} + \beta_7 D_{+3} + \beta_8 Dlist \times D_{-3} + \beta_9 Dlist \times D_{-2} + \beta_{10} Dlist \times D_{-1} + \beta_{11} Dlist \times D_{+1} + \beta_{12} Dlist \times D_{+2} + \beta_{13} Dlist \times D_{+3} + \gamma Controls + FE + \epsilon \quad (3)$$

I: 투자총계, 유형자산 투자, 연구개발 투자

Dlist: 신규 상장 중소기업=1, 신규상장 중소기업이 아닌 경우-=0

D_i: 신규 상장 전년도를 기준으로 이전 3년간 i=-3,-2,-1, 이후 3년간 i=1,2,3,

<표 8>

<표 8> 패널 A에서는 계속 비상장 중소기업과의 비교를, 패널 B에서는 계속 상장중소기업과의 비교를 보고하고 있다. 패널 A에서 이중차이 효

과를 나타내는 변수(DID)를 살펴보면, 상장 이전기간(DID-2, DID-1)에는 신규상장 중소기업과 매칭된 계속 비상장 중소기업 간에 대체로 투자에 유의한 차이가 없다. 반면, 상장 이후 첫해에는 투자총계, 유형자산투자, 자산대비 연구개발투자 모두 유의하게 증가하는 것을 알 수 있다. 한편 계속 상장 중소기업과의 비교 결과를 나타내는 패널 B에 의하면 상장 이후 3년차에는 투자총계와 유형자산투자가 유의하게 감소하는 한편, 연구개발 투자는 상장 이후 2년차에 유의하게 증가함을 알 수 있다. 즉, 중소기업의 상장 이후 투자 총계 및 유형자산 투자는 비교 대상에 따라 일관된 결과를 보여 주지 않는 반면, 연구개발 투자는 상대적으로 더 뚜렷하게 증가시키는 것을 확인할 수 있으며 양자에 차이가 있다는 가설 4를 지지하는 결과로 볼 수 있다.

6. 결론

본 연구에서는 중소기업의 상장이 투자에 미치는 효과를 실증적으로 분석하였다. 연구결과에 따르면 우리나라의 주식시장은 중소기업의 연구개발 투자에 필요한 자금을 조달하는 긍정적인 역할을 할 수 있음을 시사한다. 중소기업의 투자기회에 대한 민감도는 상장 이후 유형자산 투자와 연구개발 투자 공히 더 증가하는 것으로 나타났다. 다만, 이중차이법에 의한 보다 엄밀한 인과관계 분석에서는 상장의 효과가 유형자산 투자보다는 연구개발 투자에서 비교적 더 뚜렷이 나타나는 것으로 확인되었다. 또한 신규상장 중소기업은 상장으로 조달된 자금을 유형자산 투자와

연구개발 투자에 모두 사용하지만 상장 이전에 레버리지가 높았던 그룹은 유형자산 투자에는 IPO자금을 사용하지 않는 것으로 나타났다.

이와 같은 연구 결과는 기술력 있는 중소기업의 자금 조달 및 투자 활성화를 위해 중요한 정책적 시사점을 제공한다. 즉, 지금까지 기술력이 있으나 담보력이 부족한 중소기업에 대한 정책 자금 지원은 주로 보증 확대를 통한 금융기관의 대출 확대를 통해 이루어져 왔다. 그러나 여신 금융기관 입장에서는 성장에 따른 이익 (Upside Gain)을 공유할 수 없는 반면, 부실 대출에 따른 위험은 고스란히 떠안게 되므로 이러한 기업들에 대한 대출확대에는 근본적인 한계가 있다. 따라서 여신 증가를 통한 연구개발 투자의 확대를 기대하기는 쉽지 않으며, 본 연구의 결과는 이러한 예측을 뒷받침하고 있다. 따라서 기술력 있는 중소기업에 대해서는 기존의 보증 및 대출 중심의 정책 금융 지원보다는 직접 금융에 대한 접근성을 보다 제고시킴으로써 이들 기업의 연구개발 투자를 보다 확대시키고 성장을 촉진시킬 수 있을 것으로 기대된다.

(부록) 변수의 정의

	변수명	정의
규모	Size	ln(자산총계)
	Size_1	ln(직전연도말 자산총계)
투자기회	Salesgr	매출액성장률
	Predq	Asker et al.(2015)에서 사용한 방식을 적용하여 상장 중소기업에 대해 토빈's Q를 구하고 이를 Salesgr, ROA, EBIT, Lev에 대해 회귀분석하여 회귀계수 값을 구한 다음 회귀식에 추정된 회귀계수와 각 기업의 변수(Salesgr, ROA, EBIT(ln(법인세비용차감전이익)), Lev)를 대입하여 계산한 값
투자	유형자산 투자	<표 3> 현금흐름표상 유형자산 구입으로 유출된 현금 이후, 회귀분석시에는 전년도말 자산으로 표준화
	연구개발 투자	<표 3> 대차대조표상 당해연도말 개발비-직전연도말 개발비+손익계산서상 개발비상각액+손익계산서상 연구비 및 경상개발비 이후, 회귀분석시에는 전년도말 자산으로 표준화
자본구조	레버리지	비유동부채/자산총계
	총레버리지	부채총계/자산총계
	자기자본비율	자기자본/자산총계
수익성	CF	현금흐름표상 영업현금흐름
	ROA	당기순이익/자산총계
	ROE	당기순이익/자본총계
더미변수	List	상장여부를 나타내는 더미변수로 상장=1, 비상장=0
	Dlist	신규상장 법인에 대해 상장여부를 나타내는 더미변수로 상장=1, 비상장=0
	Dpost	상장전후를 나타내는 더미변수로 상장후=1, 상장전=0
	D_i	신규 상장 전연도를 기준으로 이전 3년간 i=-3,-2,-1, 이후 3년간 i=1,2,3, 해당연도인 경우=1, 아닌 경우=0
기타	총자산	대자대조표상 자산총계
	매출액	손익계산서상 매출액
	현금	대차대조표상 현금
	기타비유동자산	대차대조표상 유형자산을 제외한 비유동자산
	순운전자본	대차대조표상 유동자산 - 유동부채
	장기부채	대차대조표상 비유동부채
	단기부채	대차대조표상 유동부채
	Proceeds (IPO조달자금)	IPO를 통해 조달한 자금(백만원)
	OtherSources (기타현금유입액)	영업현금흐름과 투자 및 재무활동을 통한 현금유입액 합계에서 IPO조달자금을 차감한 값
	Ldin	현금흐름표상 장기차입금으로 유입된 현금
	자기자본비율	자기자본총계/자산총계
	비유동장기적합률	비유동자산/(자본총계+비유동부채)
	총자산회전율	매출액/자산총계
	자기가본회전율	매출액/자본총계
	Age	기업업력으로 설립일이후 존속연수로 계산
	Cash	대차대조표상 현금/자산총계

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<표 1> 우리나라 전체 중소기업의 재무 현황

이 표는 우리나라 전체 법인기업 중에서 중소기업의 주식시장 접근성 및 재무현황을 통계청이 제공하는 영리법인기업체행정통계의 마이크로데이터를 이용하여 작성한 것이다. 금융 및 보험업(K), 공공행정·국방 및 사회보장행정(O), 협회, 단체 및 개인서비스업(S), 가구내고용활동 및 달리 분류되지 않은 자가소비 생산활동(T)은 사업의 성격 및 목적이 일반적인 기업과 다르므로 제외하고 매출액이 0인 기업은 당해 영업활동이 없는 것으로 보아 제외하였다.
패널 A는 우리나라 영리법인중 중소기업의 비중을 나타내며 영리법인기업체행정통계를 이용하였다. 패널 B는 중소기업 중에서 주식시장에서 자금을 조달할 수 있는 기업의 비중을 나타낸다. 주식시장에 접근할 수 있는 중소기업의 수는 우리나라 전체기업 중에서 상장요건 중 규모요건을 충족하는 기업 수를 계산한 뒤 대기업수를 차감하여 계산하였다. 상장요건 가운데 규모요건은 유가증권시장은 자본금 300억원 이상이고 매출액 1000억원 이상, 코스닥시장은 자본금 30억원 이상(단, 벤처기업은 자본금 15억원 이상, 기술성장기업은 자본금 10억원 이상)이다. 패널 C는 전체 우리나라 전체 법인을 규모별로 10개 그룹으로 나누어 각 그룹의 재무비율 중위수값을 구한 것이다. (변수의 정의는 <Appendix>참조)

패널A. 중소기업의 비중

	기업수(개,%)		매출액(십억원,%)		자산(십억원,%)	
대기업	3,825	(0.7)	2,095,239	(59.7)	2,730,353	(66.2)
중소기업	517,347	(99.3)	1,495,238	(42.6)	1,395,940	(33.8)
전체	521,172	(100.0)	3,509,476	(100.0)	4,126,291	(100.0)

패널B. 중소기업의 주식시장 접근성

	유가증권 및 코스닥		코스닥벤처		코스닥기술성장	
가능(개,%)	7,288	(1.43)	17,086	(3.4)	29,625	(6.1)
불가능(개,%)	510,059	(98.6)	500,261	(96.7)	487,722	(94.3)
합계(개,%)	517,347	(100.0)	517,347	(100.0)	517,347	(100.0)

패널C. 우리나라 전체 법인의 규모별 그룹의 재무비율 중위수(가장 큰 그룹은 추가 구분)

	Small	2	3	4	5	6	7	8	9	Large					
											96	97	98	99	100
기업수	51,884	52,396	51,813	52,081	52,078	51,982	52,155	52,007	52,063	52,047	5,204	5,206	5,204	5,205	5,205
자산(백만원)	20	79	166	290	453	691	1,067	1,764	3,367	9,912	10,957	14,825	22,148	40,454	134,264
자본금(백만원)	20	50	50	100	100	100	100	200	250	640	580	800	1,000	1,967	6,936
총레버리지	1.33	0.61	0.57	0.48	0.48	0.51	0.53	0.57	0.61	0.63	0.61	0.66	0.64	0.61	0.55
레버리지	1.00	0.32	0.20	0.13	0.12	0.12	0.13	0.17	0.21	0.19	0.17	0.15	0.13	0.15	0.31
유동부채/총부채	1.00	1.00	1.00	1.00	1.00	0.99	0.95	0.86	0.74	0.73	0.73	0.76	0.79	0.80	0.77
자기자본비율	0.00	0.49	0.45	0.53	0.52	0.49	0.47	0.43	0.39	0.37	0.39	0.34	0.36	0.39	0.45
ROA	-0.34	-0.02	0.01	0.03	0.03	0.04	0.04	0.04	0.03	0.03	0.03	0.02	0.02	0.02	0.02
ROE	0.10	0.04	0.08	0.08	0.09	0.10	0.10	0.11	0.10	0.09	0.10	0.08	0.08	0.07	0.06
비유동장기적합률	0.00	0.10	0.16	0.21	0.21	0.21	0.25	0.37	0.56	0.73	0.71	0.86	0.86	0.87	0.91
총자산회전율	0.95	1.03	1.35	1.26	1.35	1.33	1.27	1.21	1.03	0.89	0.99	0.86	0.84	0.76	0.66
자기자본회전율	0.00	0.25	1.48	1.68	2.15	2.38	2.47	2.56	2.42	2.10	2.31	2.18	1.96	1.65	1.25

<표 2> 상장–비상장간 매칭 성과

이 표는 상장 중소기업과 비상장 중소기업 간의 비교를 통해 매칭의 성과를 보여준다. 패널A는 2004년-2015년 동안 우리나라 외감 중소기업 전체를 상장과 비상장으로 나누어 비교한다. 매칭표본A는 외감 중소기업 내에서 성향점수짝짓기(Propensity score matching)방법을 이용하여 상장 중소기업(firm-year)과 비슷한 성향을 가진 비상장 중소기업(firm-year)을 짝지은 표본으로 횡단면 분석에 사용된다. 패널B는 신규상장 2005년-2014년 중에 신규상장한 중소기업들의 표본이다. 매칭표본B는 상장일이 속한 연도의 전전연도말 변수를 이용하여 표본기간중 상장되지 않은 비상장기업과 매칭하였다. 매칭표본C는 상장일이 속한 연도의 전전연도말 변수를 이용하여 표본기간 전기간에 걸쳐 상장되어있었던 상장기업과 매칭하였다. 매칭표본B와 C는 이후 패널자료를 구성하는데 이용된다. 매칭에 사용된 변수는 업종(FF48), 규모(Size), 성장기회(Salesgr), 레버리지(Lev), 자기자본이익률(ROE)이다. 한편 금융 및 보험업(K), 공공행정·국방 및 사회보장행정(O), 협회 및 단체(S94), 가구내고용활동 및 달리 분류되지 않은 자가소비 생산활동(T)을 제외하고, 관리종목(주권상장법인, 코스닥 법인 중) 및 감사의견이 '적정'이 아닌 기업은 제거하였다.

패널A. 외감 중소기업

	외감 중소기업 전체				매칭표본A (상장- 비상장)			
	상장	비상장	차이	t값	상장	비상장	차이	t값
Size	10.96	9.98	0.98	104.42	10.95	10.95	0.00	0.71
Salesgr	0.35	3.13	-2.77	-0.95	0.36	0.27	0.09	0.49
Lev	0.09	0.21	-0.12	-1.97	0.09	0.090	0.00	0.90
ROE	-0.09	0.03	-0.12	-1.09	-0.08	-0.04	-0.04	-0.55
기업수	7,705	83,910			7,666	7,666		

패널B. 신규상장 중소기업

	신규상장 중소기업 전체				매칭표본B (신규상장-계속 비상장)				매칭표본C (신규상장-계속 상장)			
	상장	비상장	차이	t값	상장	비상장	차이	t값	상장	비상장	차이	t값
Size	11.23	10.20	1.02	42.20	10.31	10.32	-0.01	-0.17	10.36	10.45	-0.11	-1.44
Salesgr	0.62	1.13	-0.51	-0.63	4.17	7.10	-2.93	-0.38	0.47	0.40	0.07	0.66
Lev	0.08	0.15	-0.06	-19.12	0.13	0.13	0.00	0.02	0.12	0.13	-0.01	-1.52
ROE	0.03	0.01	0.02	0.23	0.23	0.30	-0.07	-0.52	0.20	0.55	-0.35	-0.80
기업수	2,849	1,897			361	361			309	309		

<표 3> 상장 및 비상장 중소기업의 평균 투자금액

이 표는 상장 중소기업과 비상장 중소기업 간의 평균 투자금액의 차이를 보여준다. 외감 중소기업 전체표본은 2004년-2015년 동안 우리나라 외감 중소기업 전체이며 매칭표본A는 외감 중소기업 내에서 성향점수짝짓기(Propensity score matching)방법을 이용하여 상상장 중소기업(firm-year)과 비슷한 성향을 가진 비상장 중소기업(firm-year)을 짝지은 표본이다.

	외감 중소기업 전체			매칭표본A		
	상장	비상장	차이	상장	비상장	차이
투자 총계(백만원)	4,635	1,758	2,877 ***	4,633	4,614	18
기업수	7,684	83,903		7,645	7,655	
유형자산 투자(백만원)	3,660	1,609	2,051 ***	3,655	3,951	-296 **
기업수	7,705	83,909		7,666	7,666	
연구개발 투자(백만원)	975	150	825 ***	978	659	319 ***
기업수	7,684	83,903		7,645	7,655	

<표 4> 상장과 성장기회가 중소기업의 투자에 미치는 영향

이 표는 매칭표본A를 이용하여 상장여부 및 성장기회가 투자에 미치는 영향을 보여준다. 종속변수는 투자금액을 직전연도말 자산총계로 나눈 값으로 투자총계, 유형자산 투자 및 연구개발 투자로 구분하였다. 투자총계는 유형자산 투자와 연구개발 투자를 합한 금액이다. 성장기회(Invopp)는 예측Q로 측정하였다. 예측Q는 Asker et al. (2015)에서 사용한 방식을 적용하여, 상장기업에 대해 토빈's Q를 구하고 이를 Salesgr, ROA, EBIT, Lev에 대해 회귀분석하여 회귀계수 값을 구한 다음 회귀식에 추정된 회귀계수와 각 기업의 변수(Salesgr, ROA, 법인세비용차감전이익의 로그값, Lev)를 대입하여 계산한 값이다. List는 상장여부를 나타내는 더미변수이고, List*Invopp는 상장더미와 성장기회의 교차항이다. 통제변수로 사용된 ROA, Cash, Age는 각각 당기순이익/자산총계, 현금/자산총계, 기업 업력이다. 모든 분석에 연도 및 산업 고정효과를 포함하였다. 표준오차(괄호에 표기)는 이분산성을 고려하였다. ***, ** 및 *는 각각 1%, 5% 및 10% 수준에서 통계적으로 유의함을 나타낸다.

Dep.var	투자총계			유형자산 투자			연구개발 투자 (총자산 Scale)			연구개발 투자 (매출액 Scale)		
List	-0.0120***	-0.0016	-0.0287*	-0.0173***	-0.0085	-0.0240*	0.0053***	0.0070***	-0.0046	0.0095***	0.0105***	0.0023
	(0.0071)	(0.0064)	(0.0166)	(0.0071)	(0.0064)	(0.0138)	(0.0005)	(0.0005)	(0.0052)	(0.0004)	(0.0004)	(0.0023)
Predq			0.0897***			0.0778***			0.0119***			0.0045***
			(0.0148)			(0.0131)			(0.0037)			(0.0016)
List*Predq			0.0296**			0.0201*			0.0095**			0.0059***
			(0.0132)			(0.0109)			(0.0042)			(0.0018)
ROA		0.0571***	-0.2633***		0.0405***	-0.2626***		0.0166***	-0.0004		0.0013	-0.0176**
		(0.0132)	(0.0659)		(0.0121)	(0.0583)		(0.0029)	(0.0147)		(0.0012)	(0.0082)
Cash		-0.0525***	-0.0524***		-0.0781***	-0.0713***		0.0256***	0.0189***		0.0141***	0.0129***
		(0.0172)	(0.0126)		(0.0169)	(0.0116)		(0.0031)	(0.0038)		(0.0025)	(0.0027)
Age		-0.0021***	-0.0015***		-0.0018***	-0.0012***		-0.0003***	-0.0003***		-0.0003***	-0.0003***
		(0.0003)	(0.0001)		(0.0003)	(0.0001)		(0.0000)	(0.0000)		(0.0000)	(0.0000)
Obj	14,443	14,424	11,474	14,453	14,434	11,484	14,443	14,424	11,474	144,43	14,424	11,474
Adj. R^2	0.05	0.06	0.35	0.04	0.04	0.29	0.26	0.29	0.35	0.33	0.35	0.36

<표 5> 상장여부가 중소기업의 재무적 제약에 미치는 영향

이 표는 매칭표본A를 이용하여 상장여부가 중소기업의 재무적 제약에 미치는 영향을 보여준다. 재무적 제약은 현금흐름에 대한 투자의 민감도를 이용하였다. 종속변수는 투자금액을 직전연도말 자산총계로 나눈 값으로 투자총계, 유형자산 투자 및 연구개발 투자로 구분하였다. 투자총계는 유형자산 투자와 연구개발 투자를 합한 금액이다. List는 상장여부를 나타내는 더미변수이다. CF는 영업현금흐름을 직전연도말 자산으로 나눈 값으로 양극단 1%를 제거했다. List*CF는 이들 두 변수의 교차항이다. Ldin '장기차입금 유입액/직전연도말 자산'을 나타내며 양극단 1%를 제거했다. List*Ldin은 두 변수의 교차항이다. 통제변수로 사용된 ROA, Cash, Age는 각각 당기순이익/자산총계, 현금/자산총계, 기업 업력이다. 모든 분석에 연도 및 산업 고정효과를 포함하였다. 표준오차(괄호에 표기)는 이분산성을 고려하였다. ***, ** 및 *는 각각 1%, 5% 및 10% 수준에서 통계적으로 유의함을 나타낸다.

Dep.var	투자총계			유형자산 투자			연구개발 투자(총자산 Scale)			연구개발 투자(매출액 Scale)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
List	0.0111***	0.0101***	0.0127***	0.0037**	0.0034**	0.0054***	0.0074***	0.0067***	0.0074***	0.0107***	0.0100***	0.0103***
	(0.0018)	(0.0018)	(0.0018)	(0.0017)	(0.0016)	(0.0017)	(0.0005)	(0.0005)	(0.0005)	(0.0005)	(0.0005)	(0.0005)
CF	0.1813***		0.1860***	0.1634***		0.1680***	0.0179***		0.0180***	-0.0014		-0.0014
	(0.0140)		(0.0128)	(0.0136)		(0.0123)	(0.0040)		(0.0039)	(0.0024)		(0.0024)
List*CF	-0.0126		-0.0077	-0.0055		-0.0008	-0.0071		-0.0070	-0.0047		-0.0043
	(0.0186)		(0.0171)	(0.0178)		(0.0163)	(0.0056)		(0.0056)	(0.0042)		(0.0042)
Ldin		0.7735***	0.7772***		0.7585***	0.7617***		0.0151***	0.0156***		0.0052	0.0053
		(0.0421)	(0.0411)		(0.0412)	(0.0404)		(0.0058)	(0.0058)		(0.0044)	(0.0044)
List* Ldin		-0.1243**	-0.1189**		-0.1254**	-0.1200**		0.0010	0.0010		0.0172**	0.0168**
		(0.0576)	(0.0565)		(0.0567)	(0.0557)		(0.0079)	(0.0079)		(0.0080)	(0.0080)
ROA	0.0248***	0.0752***	0.0268***	0.0143***	0.0609***	0.0163***	0.0105***	0.0143***	0.0106***	0.0012	0.0002	0.0012
	(0.0062)	(0.0126)	(0.0066)	(0.0049)	(0.0103)	(0.0051)	(0.0025)	(0.0028)	(0.0026)	(0.0014)	(0.0014)	(0.0014)
Cash	-0.0883***	0.0134*	-0.0453***	-0.1078***	-0.0121*	-0.0657***	0.0195***	0.0255***	0.0204***	0.0165***	0.0164***	0.0172***
	(0.0087)	(0.0077)	(0.0080)	(0.0082)	(0.0069)	(0.0075)	(0.0027)	(0.0029)	(0.0027)	(0.0027)	(0.0026)	(0.0027)
Age	-0.0012***	-0.0011***	-0.0010***	-0.0009***	-0.0008***	-0.0007***	-0.0003***	-0.0003***	-0.0003***	-0.0003***	-0.0003***	-0.0003***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Obj	13,795	13,795	13,795	13,805	13,805	13,805	13,795	13,795	13,795	13,795	13,795	13,795
Adj. R^2	0.41	0.48	0.50	0.34	0.42	0.45	0.33	0.32	0.33	0.35	0.35	0.35

<표 6> 중소기업 IPO 조달자금의 사용

이 표는 상장직후 중소기업의 IPO조달자금의 사용을 다음 회귀식을 통해 보여준다.

$$Y = \beta_1 \ln\left(\frac{IPO\text{조달자금}}{\text{직전연도말자산}}+1\right) + \beta_2 \ln\left(\frac{\text{기타현금유입액}}{\text{직전연도말자산}}+1\right) + \beta_3 Size_1 + \sum_{t=2005}^{2014} \theta_i yeardummy + \epsilon$$

종속변수는 유량항목인 투자총계, 유형자산 투자와 연구개발 투자는 각 항목을 직전연도말 자산으로 나누어 1을 더한 후에 로그를 취한 값이고, 저량항목인 자산총계, 현금, 기타비유동자산, 순운전자본, 장기부채, 단기부채는 각 항목의 증가분을 직전연도말 자산으로 나누어 1을 더한 후에 로그를 취한 값이다. 기타 현금유입액은 영업현금흐름과 투자 및 재무 활동으로 인한 현금유입액 합계에서 조달자금을 뺀 금액이다. 통제변수로 직전연도말 자산에 로그를 취한 값을 사용한다. 한편 모든 분석에 연도 고정효과를 포함하였다. 패널 A는 전체 IPO 중소기업을 대상으로 분석한 결과이다. 패널 B와 C는 각각 전체 IPO 중소기업을 IPO 전전연도 레버리지를 기준으로 두 그룹으로 나누었을 때 레버리지가 높은 그룹과 낮은 그룹에 대하여 분석한 결과이다. 표준오차(괄호에 표기)는 이분산성을 고려하였다. ***, ** 및 *는 각각 1%, 5% 및 10% 수준에서 통계적으로 유의함을 나타낸다.

	⊿자산총계	⊿현금	투자총계	유형자산 투자	연구개발 투자 (총자산 Scale)	연구개발 투자 (매출액 Scale)	⊿기타비유동 자산	⊿순운전자본	⊿장기부채	⊿단기부채
패널 A.. IPO 조달자금의 사용										
Proceeds	1.0089 ***	0.2453 ***	0.1593 ***	0.1101 **	0.0537 ***	0.0613 **	0.0952 ***	0.9115 ***	-0.0323	0.0378
	(0.0750)	(0.0658)	(0.0528)	(0.0501)	(0.0185)	(0.0243)	(0.0306)	(0.0658)	(0.0402)	(0.0506)
OtherSources	0.0697 **	0.0079	0.0260	0.0310	-0.0058	-0.0044	0.0166	0.0170	0.0022	0.0228
	(0.0319)	(0.0225)	(0.0228)	(0.0216)	(0.0076)	(0.0070)	(0.0119)	(0.0239)	(0.0151)	(0.0243)
Size_1	0.0067 **	-0.0002	0.0049 **	0.0044 **	0.0005	-0.0001	0.0026 *	0.0035	-0.0003	-0.0011
	(0.0029)	(0.0028)	(0.0020)	(0.0018)	(0.0009)	(0.0011)	(0.0013)	(0.0024)	(0.0014)	(0.0026)
Obj	321	321	321	321	321	321	321	321	321	321
Adj. R^2	0.83	0.24	0.57	0.44	0.42	0.32	0.40	0.81	0.03	0.04

(계 속)

	⊿자산총계	⊿현금	투자총계	유형자산 투자	연구개발 투자 (자산 Scale)	연구개발 투자 (매출액 Scale)	⊿기타비유동 자산	⊿순운전자본	⊿장기부채	⊿단기부채
패널 B 상장전 레버리지가 높은 그룹										
Proceeds	0.9062 ***	0.1752 *	0.2105 **	0.1254	0.0921 ***	0.0888 ***	0.1016 **	0.8378 ***	-0.1282 *	-0.0407
	(0.1442)	(0.0906)	(0.0852)	(0.0860)	(0.0223)	(0.0272)	(0.0468)	(0.1184)	(0.0730)	(0.1040)
OtherSources	0.0456	-0.0349	0.0624	0.0482	0.0152 **	0.0087	0.0249	-0.0326	-0.0032	0.0312
	(0.0607)	(0.0311)	(0.0393)	(0.0389)	(0.0075)	(0.0095)	(0.0158)	(0.0387)	(0.0251)	(0.0551)
Size_1	0.0094 *	0.0023	0.0060 *	0.0060 *	0.0002	0.0001	0.0041 **	0.0046	0.0013	0.0004
	(0.0049)	(0.0037)	(0.0033)	(0.0031)	(0.0012)	(0.0014)	(0.0020)	(0.0039)	(0.0026)	(0.0041)
Obj	158	158	158	158	158	158	158	158	158	158
Adj. R^2	0.82	0.24	0.63	0.53	0.45	0.29	0.52	0.80	0.07	0.04
패널 C. 상장전 레버리지가 낮은 그룹										
Proceeds	1.0578 ***	0.2681 ***	0.1605 **	0.1220 *	0.0431 *	0.0549 *	0.0965 **	0.9209 ***	0.0111	0.0941 *
	(0.0906)	(0.0896)	(0.0646)	(0.0619)	(0.0227)	(0.0327)	(0.0386)	(0.0810)	(0.0446)	(0.0524)
OtherSources	0.0693 **	0.0307	-0.0016	0.0136	-0.0173 **	-0.0139 **	0.0063	0.0407	0.0014	0.0150
	(0.0351)	(0.0290)	(0.0263)	(0.0260)	(0.0082)	(0.0067)	(0.0152)	(0.0302)	(0.0187)	(0.0213)
Size_1	0.0057	-0.0010	0.0018	0.0017	0.0000	-0.0009	0.0009	0.0049	-0.0005	-0.0024
	(0.0040)	(0.0040)	(0.0022)	(0.0021)	(0.0011)	(0.0015)	(0.0017)	(0.0034)	(0.0014)	(0.0036)
Obj	163	163	163	163	163	163	163	163	163	163
Adj. R^2	0.84	0.26	0.54	0.36	0.43	0.39	0.29	0.84	-0.01	0.03

<표 7> 중소기업의 IPO가 투자에 미치는 영향

이 표는 신규상장 중소기업의 매칭표본을 이용하여 중소기업 신규 상장의 효과를 분석한 표이다. 패널A는 상장일이 속한 연도의 전전연도말 변수를 이용하여 계속 비상장 상태인 기업과 매칭한 매칭표본B를 이용하여 패널 데이터를 구성하여 분석하였다. 패널B는 상장일이 속한 연도의 전전연도말 변수를 이용하여 계속 상장 상태인 기업과 매칭한 매칭표본C를 이용하여 패널 데이터를 구성하여 분석하였다. 회귀식은 다음과 같다.

$$I = \alpha + \beta_1 Dlist + \beta_2 Dpost + \beta_3 Dlist \times Dpost + \gamma Controls + FE + \epsilon$$

I: 투자총계, 유형자산 투자, 연구개발 투자
Dlist: 신규 상장 중소기업=1, 신규상장 중소기업이 아닌 경우=0
Dpost: 신규 상장연도를 기준연도로 하여 기준연도 이전기간=0, 기준연도와 그 이후기간=1

통제변수로 사용된 Size, ROA, Salesgr, Lev는 각각 자산총계에 로그를 취한 값, 당기순이익/자산총계, 매출액증가율, 장기부채/자산총계이다. 모든 분석에 연도 및 산업 고정효과를 포함하였다. 표준오차 (괄호에 표기)는 이분산성을 고려하였다. ***, ** 및 *는 각각 1%, 5% 및 10% 수준에서 통계적으로 유의함을 나타낸다.

Dependent var.	투자총계	유형자산 투자	연구개발 투자 (총자산 Scale)	연구개발 투자 (매출액 Scale)
패널A. 비상장 중소기업과 신규 상장 중소기업기업의 투자				
Dlist	0.0160	0.0028	0.0132***	0.0135***
	(0.0253)	(0.0253)	(0.0018)	(0.0026)
Dpost	-0.0276**	-0.0247*	-0.0029*	-0.0283*
	(0.0140)	(0.0140)	(0.0016)	(0.0164)
Dlist*Dpost	0.0214	0.0161	0.0053**	0.0377*
	(0.0221)	(0.0220)	(0.0022)	(0.0144)
Size	0.0161	0.0216	-0.0055***	-0.0118
	(0.0147)	(0.0147)	(0.0006)	(0.0043)***
ROA	0.2032***	0.1661***	0.0372***	-0.0215
	(0.0232)	(0.0222)	(0.0061)	(0.0143)
Salesgr	0.0001	0.0001	0.0000**	0.0000
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Lev	0.4591***	0.4454***	0.0137***	-0.0684
	(0.1456)	(0.1457)	(0.0047)	(0.0851)
Const	-0.2365	-0.2796*	0.0431***	0.1220**
	(0.1609)	(0.1608)	(0.0069)	(0.0528)
Obj	5,667	5,667	5,667	5,664
Adj R-Sq	0.03	0.02	0.12	0..03
패널B. 기존 상장 중소기업과 신규 상장 중소기업의 투자				
Dlist	0.0257***	0.0214***	0.0044**	0.0005
	(0.0085)	(0.0081)	(0.0022)	(0.0023)
Dpost	-0.0001	0.0011	-0.0012	-0.0001
	(0.0070)	(0.0066)	(0.0020)	(0.0028)
Dlist*Dpost	-0.0036	-0.0049	0.0013	0.0067**
	(0.0094)	(0.0090)	(0.0025)	(0.0031)
Size	-0.0062**	0.0016	-0.0078***	-0.0073***
	(0.0026)	(0.0025)	(0.0009)	(0.0011)
ROA	0.0976***	0.0765***	0.0212***	0.0038
	(0.0298)	(0.0243)	(0.0065)	(0.0045)
Salesgr	0.0252***	0.0223***	0.0029*	-0.0010
	(0.0087)	(0.0079)	(0.0015)	(0.0007)
Lev	0.3855***	0.3820***	0.0035	0.0241***
	(0.0644)	(0.0640)	(0.0064)	(0.0079)
Const	0.0471	-0.0488	0.0959***	0.0866***
	(0.0345)	(0.0325)	(0.0116)	(0.0162)
Obj	4,373	4,373	4,373	4,373
Adj. R^2	0.16	0.15	0.14	0.08

<표 8> 중소기업의 IPO가 연도별 투자에 미치는 영향

이 표는 신규상장 중소기업의 매칭표본에서 상장 전후 3년간(상장연도를 포함하여 7개 연도)의 자료만을 대상으로 연도별 더미를 추가하여 분석한 표이다. 패널A는 상장일이 속한 연도의 전전연도말 변수를 이용하여 계속 비상장 상태인 기업과 매칭한 매칭표본B를 이용하였다. 패널B는 상장일이 속한 연도의 전전연도말 변수를 이용하여 계속 상장 상태인 기업과 매칭한 매칭표본C를 이용하였다. 회귀식은 다음과 같다.

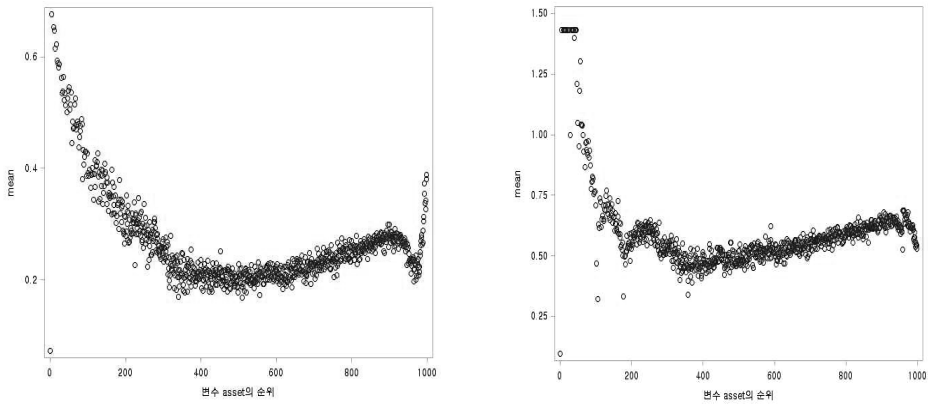
$$I = \alpha + \beta_1 Dlist + \beta_2 D_{-3} + \beta_3 D_{-2} + \beta_4 D_{-1} + \beta_5 D_{+1} + \beta_6 D_{+2} + \beta_7 D_{+3} + \beta_8 Dlist \times D_{-3} + \beta_9 Dlist \times D_{-2} + \beta_{10} Dlist \times D_{-1} + \beta_{11} Dlist \times D_{+1} + \beta_{12} Dlist \times D_{+2} + \beta_{13} Dlist \times D_{+3} + \gamma Controls + FE + \epsilon$$

I: 투자총계, 유형자산 투자, 연구개발 투자
Dlist: 신규 상장 중소기업=1, 신규상장 중소기업이 아닌 경우=0
D_i: 신규 상장 전연도를 기준으로 이전 3년간 i=-3,-2,-1, 이후 3년간 i=1,2,3, 해당연도인 경우=1, 아닌 경우=0

통제변수로 사용된 Size, ROA, Salesgr, Lev는 각각 자산총계에 로그를 취한 값, 당기순이익/자산총계, 매출액증가율, 장기부채/자산총계이다. 모든 분석에 연도 및 산업 고정효과를 포함하였다. 표준오차(괄호에 표기)는 이분산성을 고려하였다. ***, ** 및 *는 각각 1%, 5% 및 10% 수준에서 통계적으로 유의함을 나타낸다.

Dependent var.	투자총계	유형자산 투자	연구개발 투자 (총자산 Scale)	연구개발 투자 (매출액 Scale)
패널A. 비상장 중소기업과 신규 상장 중소기업기업의 투자				
Dlist	0.0454***	0.0324**	0.0130***	0.0187***
	(0.0133)	(0.0130)	(0.0033)	(0.0042)
D-3	-0.0078	-0.0041	-0.0037	0.0078
	(0.0129)	(0.0126)	(0.0036)	(0.0053)
D-2	-0.002	-0.0036	0.0016	0.0087
	(0.0152)	(0.0147)	(0.0034)	(0.0058)
D-1	0.0012	0.0012	-0.0001	0.0053
	(0.0118)	(0.0115)	(0.0029)	(0.0041)
D+1	-0.0339***	-0.0287**	-0.0052*	-0.0530
	(0.0128)	(0.0125)	(0.0029)	(0.0505)
D+2	-0.0153	-0.0132	-0.0021	-0.0388
	(0.0174)	(0.0172)	(0.0040)	(0.0366)
D+3	-0.0412***	-0.0378***	-0.0034	0.0021
	(0.0131)	(0.0128)	(0.0038)	(0.0063)
DID-3	-0.0362**	-0.0378**	0.0016	-0.0027
	(0.0185)	(0.0178)	(0.0061)	(0.0072)
DID-2	-0.0069	-0.0023	-0.0046	-0.0069
	(0.0233)	(0.0228)	(0.0053)	(0.0058)
DID-1	-0.0068	-0.0069	0.0001	-0.0061
	(0.0183)	(0.0178)	(0.0048)	(0.0052)
DID+1	0.0551***	0.0436**	0.0115***	0.0608
	(0.0189)	(0.0186)	(0.0044)	(0.0496)
DID+2	-0.0033	-0.0075	0.0042	0.0529
	(0.0204)	(0.0201)	(0.0051)	(0.0369)
DID+3	0.0042	0.0010	0.0033	0.0104
	(0.0170)	(0.0166)	(0.0049)	(0.0082)
Size	0.0012	0.0080**	-0.0068***	-0.0165***
	(0.0033)	(0.0033)	(0.0008)	(0.0064)
ROA	0.2235***	0.1794***	0.0441***	-0.0414*

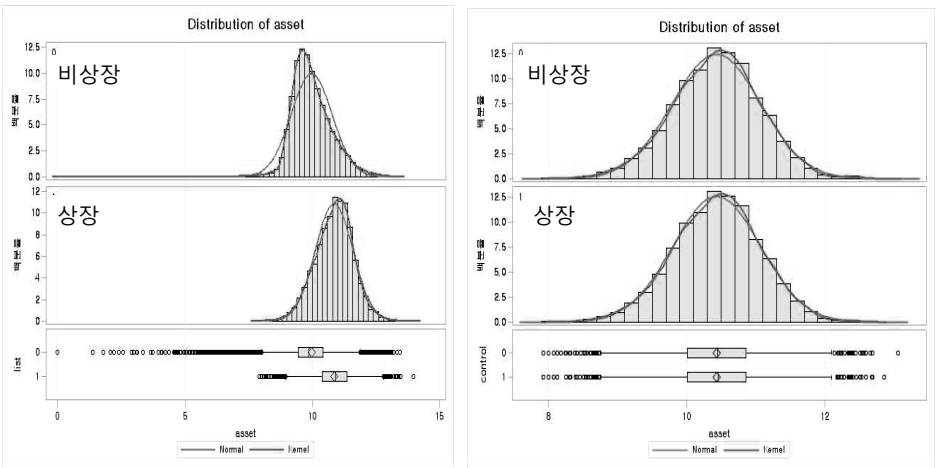
	(0.0291)	(0.0267)	(0.0081)	(0.0230)
Salesgr	0.0001***	0.0001***	0.0000***	0.0000
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Lev	0.3922***	0.3799***	0.0123*	-0.1398
	(0.0376)	(0.0379)	(0.0063)	(0.1351)
Const	-0.0545	-0.1105***	0.0560***	0.1682**
	(0.0402)	(0.0391)	(0.0092)	(0.0746)
Obj	3,519	3,519	3,519	3,516
Adj R^2	0.15	0.13	0.14	0.04
패널B. 기존 상장 중소기업과 신규 상장 중소기업의 투자				
Dlist	0.0386***	0.0361***	0.0025	0.0006
	(0.0138)	(0.0133)	(0.0041)	(0.0039)
D-3	0.0329	0.0286	0.0043	0.0117
	(0.0218)	(0.0206)	(0.0057)	(0.0081)
D-2	-0.0092	-0.0119	0.0027	0.0058
	(0.0168)	(0.0157)	(0.0050)	(0.0060)
D-1	-0.0098	-0.0089	-0.0009	0.0030
	(0.0162)	(0.0149)	(0.0045)	(0.0043)
D+1	-0.0002	0.0027	-0.0029	0.0017
	(0.0142)	(0.0135)	(0.0041)	(0.0048)
D+2	-0.0040	-0.0005	-0.0035	0.0022
	(0.0135)	(0.0129)	(0.0040)	(0.0057)
D+3	-0.0008	0.0026	-0.0034	-0.0010
	(0.0141)	(0.0134)	(0.0041)	(0.0050)
DID-3	-0.0741***	-0.0699***	-0.0042	-0.0083
	(0.0259)	(0.0245)	(0.0077)	(0.0092)
DID-2	-0.0009	0.0019	-0.0028	-0.0054
	(0.0225)	(0.0216)	(0.0064)	(0.0068)
DID-1	-0.0022	-0.0036	0.0014	-0.0024
	(0.0211)	(0.0198)	(0.0058)	(0.0052)
DID+1	0.0192	0.0107	0.0085	0.0048
	(0.0194)	(0.0186)	(0.0053)	(0.0057)
DID+2	-0.0095	-0.0154	0.0059	0.0116*
	(0.0174)	(0.0167)	(0.0051)	(0.0069)
DID+3	-0.0296*	-0.0323*	0.0028	0.0089
	(0.0176)	(0.0170)	(0.0051)	(0.0062)
Size	-0.0093	0.0004	-0.0098***	-0.0095***
	(0.0038)	(0.0037)	(0.0012)	(0.0012)
ROA	0.1420***	0.1084***	0.0336***	-0.0039
	(0.0421)	(0.0373)	(0.0079)	(0.0108)
Salesgr	0.0209**	0.0187**	0.0022	-0.0012**
	(0.0097)	(0.0086)	(0.0015)	(0.0006)
Lev	0.4063***	0.4041***	0.0022	0.0119
	(0.0494)	(0.0481)	(0.0093)	(0.0104)
Const	0.1249**	0.0041	0.1207***	0.1166***
	(0.0520)	(0.0494)	(0.0167)	(0.0154)
Obj	2,530	2,530	2,530	2,530
Adj R^2	0.16	0.15	0.14	0.11



레버리지 총레버리지

【그림 1】 우리나라 기업의 자산규모에 따른 레버리지

2014년 기준 우리나라 전체 기업을 10%수준에서 winsorizing하여 자산규모에 따라 1000개 그룹으로 나눈 뒤 그룹별로 레버리지의 평균을 나타낸 그림이다. 자료는 통계청에서 제공하는 영리법인 기업체 행정통계를 활용하였다. 레버리지는 비유동부채/자산총계이고, 총레버리지는 부채총계/자산총계이다.



매칭전 매칭후

【그림 2】 매칭 전후의 비상장과 상장 중소기업의 자산분포

국문초록

기업재무에 관한 연구

본 논문은 기업인수, 조세회피, 그리고 중소기업 투자 등 기업재무에 관한 3개의 소논문으로 구성되어 있다. 첫 번째 논문에서는 우리나라에서 기업인수가 주로 재무적 곤경과 관련하여 발생하며, 일부 기업이 반복적으로 피인수 되는 경향이 있음을 밝힌다. 이는 주주와 경영자가 지배권에 가치를 두어 일상적인 상황에서는 지배권을 양도하지 않으려 하지만, 재무적 곤경으로 인해 사적이익을 추구하기 어려워질 때 비로소 지배권을 이전하고자하기 때문이다. 또한 기존 M&A 문헌에서 제시되지 않았던 새로운 인수방식인 피인수기업이 인수기업에게 신주를 발행하는 방식이 활용됨을 제시한다. 이러한 인수방식에서는 인수자금이 피인수기업의 자본으로 투입되므로 기업인수가 피인수기업의 재무적 곤경을 해소시키기 위해 활용된다는 주장을 뒷받침한다. 그러나 기업인수 이후에 재무적 곤경이 해소되지 않고 오히려 심화되는 결과가 나타나, 재무적 곤경이 기업 인수의 동기가 되는 경우 기업인수의 성과가 좋지 않음을 보여준다. 또한 인수이후 인수기업의 재무적 곤경도 심화되는 것으로 나타나 재무적 곤경에 처한 기업을 인수하려는 동기가 시너지보다는 대리인 문제에 기인한 것임을 시사한다.

두 번째 논문에서는 비상장기업의 조세회피 행위를 상장기업과 비교하여 분석한다. 비상장기업은 재무 및 회계인력이나 세무컨설팅 자원이 상장기업에 비해 적지만, 주주경영자 비율이 높아 대리인 문제가 적고,

조세회피로 증가한 세후이익이 소수의 내부자에게 대부분 귀속되므로 적극적으로 조세회피를 하고자 하는 유인이 있다. 분석결과 상시적으로는 상장기업이 비상장기업에 비해 상시적으로 높은 수준의 조세회피를 수행하는 것으로 나타났다. 그러나 비상장기업이라 할지라도 조세회피에 활용할 수 있는 인력이나 외부자원이 어느 정도 확보된 경우 또는 조세회피의 효익이 큰 경우에는 상장기업보다 더 적극적으로 조세회피를 하는 것으로 나타났다. 이러한 현상은 2012년도 세법개정을 이용한 이중차이(Difference-in-differences) 분석을 통해서도 확인된다.

마지막 논문에서는 국내 중소기업을 대상으로 성향점수짝짓기(Propensity Score Matching) 방법을 이용하여 상장이 투자에 미치는 효과에 대해 연구하였다. 분석결과 상장 중소기업의 연구개발 투자규모는 비상장 중소기업에 비해 더 큰 것으로 나타났다. 또한 신규상장 중소기업은 상장으로 조달된 자금을 유형자산투자와 연구개발 투자에 모두 사용하지만 상장 이전에 레버리지가 높았던 기업들은 조달 자금을 유형자산 투자에 사용하지 않은 것으로 나타났다. 신규상장 중소기업을 대상으로 한 이중차이법(Difference-in-differences) 분석 결과에서는, 상장 이후 유형자산 투자보다는 연구개발 투자의 증가가 상대적으로 더 뚜렷하게 나타남을 확인하였다. 본 연구결과는 최근 부각되고 있는 중소기업 자금조달 창구로서의 주식시장의 역할은 유형자산에 대한 투자확대보다는 연구개발 투자 촉진에 상대적으로 더 유효할 수 있음을 시사한다.

주요어: 기업인수, 재무적 곤경, 조세회피, 상장, 중소기업, 투자

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