Effects of Stockholders' Secondary Tax Liability on Corporate Investment†

By JANGWOOK LEE*

This study analyzes the impact of secondary tax liability borne by stockholders, an exception to the principle of limited liability, on corporate investment. The paper constructs a model of a firm to examine the effect of this secondary tax liability, finding that the violation of limited liability increases firms' expected bankruptcy costs, thereby reducing investments. By means of an empirical analysis, the paper examines whether firms with the largest shareholder stake exceeding 50%, the condition under which secondary tax liability is incurred, decrease their investments. The results show that firm investment is highly concentrated in observations of cases in which the largest shareholder stake does not exceed 50%. Investments decrease sharply in cases where the largest shareholder stake exceeds 50%. The results here provide implications pertaining to how exceptions of the limited liability principle, existing only in Korea, affect corporate investments.

I. Introduction

The principle of shareholder limited liability refers to the principle that shareholders are responsible for the company up to the amount of stock they purchase. Requiring only limited liability from stockholders of a firm is significant in that it facilitates stock trading and accumulation of capital by the firm. If a firm goes bankrupt and stockholders are responsible for amounts greater than those invested, the incentive for stock buyers to purchase is significantly reduced. The stock company system based on the principle

of limited liability has played a significant role in the birth and development of numerous companies by facilitating the financing and dispersal of risks in risky businesses.

In Korea, there are exceptions to the principle of limited liability for shareholders. There are cases where investors must bear the company's liability in excess of the invested amounts. The principle of limited liability is adhered to in debt relationships between companies and other private economic entities (companies and individuals). However, in Korea, there are exceptions to the principle of limited liability in relation to debt relationships between companies and the government, especially with regard to delinquent national taxes. This secondary tax liability of stockholders is an exception to the principle of limited liability. The secondary tax liability requires oligopolistic shareholders to bear the unpaid amount of national taxes when a firm is liquidated. The purpose of this law is to achieve practical tax equality by preventing oligopolistic shareholders, who can exercise management rights, from accruing company profits to themselves and burdening the company with losses.

However, the secondary tax liability conflicts with the principle of tax law that imposes taxes only on those liable to pay taxes, and it does not comply with the principle of limited liability of shareholders. There have been many discussions centering on this tax system. Chung (2011) and Kim and Lee (2018) pointed out problems in determining the scope of oligopolistic shareholders. Hwang and Yang (2017) and Kim (2016) examined the legal legitimacy of the second tax payment system. Jun (2019) investigated ways to alleviate the burden on failed small and medium-sized business owners due to the secondary tax liability. Kim and Moon (2020) analyzed the secondary tax liability for investors in venture firms.

Existing discussions have mainly focused on the legal dimension. In particular, numerous studies have held that conscientious oligopolistic stock-holding managers become credit delinquents due to the secondary tax payment system, making economic recovery difficult. However, more research on how the secondary tax liability affects companies' business activities while firms are active is required.

This paper analyzes the impact of the second tax liability on corporate investment. First, we define the secondary tax liability and present a legal definition as well. I also check the current status of the companies that are subject to this tax system and report how many companies have a secondary tax liability. Finally, I investigate cases in which a firm can become exempted from the secondary tax liability.

This paper constructs a model of a firm to examine the effect of the secondary tax liability. The impact of the secondary tax liability on firm investments is derived by comparing the investment rates made by managers who maximize their profits through a rational decision-making model with and without the secondary tax liability. The findings show that the second tax liability acts as a management burden on oligopolistic stockholders, causing them to reduce their investments in the firm by up to 4% in advance. To the best of the author's knowledge, this is an economic effect that has never been studied before in the literature related to such a secondary tax liability.

I analyze whether the results found by the model analysis are supported by empirical data. By combining ownership ratio data and the financial data of companies existing in Korea from 2011 to 2016, the paper analyzes the investment rates of companies with a maximum shareholder ownership ratio exceeding 50%, at which point the secondary tax liability would apply. Among companies with the largest shareholder shareholding ratio of 49% to 51%, I looked for differences in investment rates when the shareholding ratio

exceeded 50%. When the largest shareholder shareholding ratio exceeds 50%, the investment rate drops from 2.6%p to 5.3%p. In short, the secondary tax liability is a factor that discourages corporate investment even if the company does not go bankrupt.

The remainder of this paper proceeds as follows. Section 2 describes the secondary tax liability and defines it legally. Section 3 examines how the secondary tax liability can affect a company's investment decisions through a model analysis. Section 4 examines whether the empirical analysis is consistent with the results of the model analysis. Chapter 5 draws conclusions and policy implications.

II. Secondary Tax Liability

A. *Definition*

Article 39 of the National Tax Basic Act defines a secondary tax liability that arises when a firm's assets do not cover the firm's national taxes. In such cases, designated individuals have an obligation to pay these national taxes. Individuals designated by law include more than members of a general partnership and unlimited partners of a limited liability company. Limited partners of a limited partnership, members of a limited liability company, and members of a limited company are also designated individuals according to the law as long as their share ratio exceeds 50% (oligopolistic stockholders). Because members of a general partnership and unlimited partners of a limited liability company have an obligation under commercial law to repay the company's debts, they have an obligation to cover the unpaid portion of national taxes. However, in that limited partners of limited partnerships, members of limited liability companies, and members of limited companies are liable for the company only within the limit of the amount invested under the Commercial Act, the principle of limited liability is not observed with regard to this secondary tax liability.

B. *Current status of the secondary tax liability*

In order to understand the impact of the secondary tax liability on corporate activities, it is necessary to investigate how many companies are burdened with secondary tax obligations and how significant such tax burdens are. I examine how much national tax is collected through the secondary tax liability and determine whether the system is being operated effectively.

Table 1 shows that most secondary taxpayers are oligopolistic shareholders rather than partners with unlimited liability. In 2017, there were 16,411 original taxpayers, that is, companies with original tax obligations, and 19,879 secondary taxpayers, who are oligopolistic shareholders obligated to pay the unpaid corporate tax or value-added tax of these companies. This number is gradually increasing, with 19,776 original taxpayers and 21,026 secondary taxpayers in 2019. On the other hand, the number of original taxpayers who are also general partners amounted to 20 in 2019, while there were 27 secondary taxpayers a very low number.

TABLE 1— NUMBER OF SECONDARY TAXPAYERS BY TYPE

Year	Oligopolistic stockholder		Partners with unlimited liability	
	Original taxpayer (firm)	Secondary taxpayers (individual)	Original taxpayer (firm)	Secondary taxpayers (individual)
2017	16,411	19,879	14	20
2018	18,728	19,883	19	20
2019	19,776	21,026	20	27

Source: processed by the author based on Kim & Moon (2021).

The number of companies that incur secondary tax obligations, which amounts to approximately 20,000 per year, is significant considering the scale of corporate extinction each year in Korea. According to Statistics Korea's business survival statistics, approximately 46,000 corporations disappeared in 2018. As of 2018, approximately 18,000 companies, nearly 41%, are believed to have incurred secondary tax obligations. The collection rate for such tax obligations is very low, and considering the high likelihood that secondary taxpayers of this size will default on national taxes and become credit delinquents, the impact of the secondary tax liability on Korea's economy is not negligible.

Table 2 reports that the tax amount to be paid by companies was in the approximate range of KRW 2.3 trillion to KRW 2.5 trillion from 2017 to 2019. Among the incurred liability, the amounts paid by firms equaled approximately 490 billion won in 2017 and 2018, but in 2019, the amount decreased to 320 billion won. The amount of taxes owed by original taxpayers has consistently remained at about two trillion won from 2017 to 2019. Among these, oligopolistic shareholders incur a liability only to an extent corresponding to their shareholding ratio. Thus, the delinquent tax amount is smaller than the amount unpaid by the original taxpayers (tax payable). The amount designated by stockholders was approximately 1.6 trillion won in 2019, up from approximately 1.4 trillion won in 2017. The collection rate is very low and is gradually decreasing. In 2017, about 82 billion won was received, but in 2019, only about 60 billion won was received. The approximate acceptance rate was 3.75% in 2019.

There are a range of tax items that can incur a secondary tax liability. Table 3 shows the secondary tax liability status by tax item in 2019. Corporate taxes and value-added taxes account for the largest portion of the secondary tax liability. In 2019,

TABLE 2— SECONDARY TAX LIABILITY DESIGNATED AND PAYMENT AMOUNTS

Year	Tax payable	Delinquent tax amount	Amount paid by original taxpayer (firm)	Secondary tax payer (individual)-designated amount	Amount received by secondary taxpayer (individual)
2017	2,319,589	2,045,563	489,706	1,412,055	82,786
2018	2,519,717	2,162,349	496,931	1,568,087	87,563
2019	2,491,722	2,085,214	320,834	1,618,792	60,059

Note: in millions of KRW.

Source: processed by the author based on Kim & Moon (2021).

TABLE 3— SECONDARY TAX LIABILITY BY TAX ITEM IN 2019

	Corporate tax	Value-added tax	Other indirect taxes	Withholding tax	Others	Total
Delinquent tax amount	771,731	1,110,819	22,718	176,836	3,691	2,085,993
Designated amount	546,620	921,576	10,314	137,800	2,774	1,619,202
Amount received	17,376	37,760	202	4,616	98	60,059

Note: in millions of KRW.

Source: processed by the author based on Kim & Moon (2021).

TABLE 4— CHARACTERISTICS OF ORIGINAL TAXPAYER (FIRM)

Year	Number of delinquent payments	Age (years)	Number of oligopolistic stockholders	Sales (in mil. KRW)	Amount of delinquent taxes (in mil. KRW)	Designated amount (in mil. KRW)	Collected amount (in mil. KRW)
2017	6.25	3.98	1.21	2,725.54	124.65	86.04	5.04
2018	6.80	4.02	1.06	2,432.95	115.46	83.73	4.68
2019	7.47	4.15	1.06	2,482.27	105.44	81.56	3.04

Source: processed by the author based on Kim & Moon (2021).

approximately 770 billion won in corporate tax was delinquent, resulting in a secondary tax liability of about 540 billion won, of which nearly 17 billion won was collected. Approximately KRW 1.1 trillion in value-added tax was delinquent, and secondary tax obligations of approximately KRW 920 billion were designated, of which approximately KRW 37 billion was collected.

Table 4 reports the average characteristics of the original taxpayer (firm) with a secondary tax liability. Companies must pay various taxes, and each company has an average of six to seven delinquent payments given that if one tax item is delinquent, the company's financial capacity is insufficient, and the likelihood of other tax items being delinquent increases. Companies with a secondary tax liability have been in business for approximately four years on average, implying that liquidity and the business environment are more likely to be challenging for younger companies than for older companies. The number of oligopolistic shareholders subject to a tax liability ranged from approximately 1.06 to 1.21, most likely due to the existence of more than one person exercising a strong influence on a firm. Most firms that incur a secondary tax liability are small firms. Average sales amount to approximately 2.8 billion won, and the average amount of delinquent taxes is about 120 million won. The average amount designated for the secondary tax liability is close to 80 million won, of which only about three to five million won is collected.

C. *Exceptions to the second tax liability*

If certain conditions are met, the tax authorities may exempt companies from the secondary tax liability or postpone or extinguish previously imposed liabilities in accordance with established requirements. For an accurate examination of the impact

of a secondary tax liability on corporate activities, it is necessary to investigate the companies to which the system applies and cases in which it does not apply. It appears that policy authorities are generally aware of the side effects of the secondary tax liability to some extent and have made efforts to prepare their own devices to alleviate them. Nonetheless, judging whether the scope or requirements are sufficient is complicated by many factors.

The secondary tax liability is postponed or extinguished or companies are exempted from paying it in the following cases. Companies listed on the stock market, certain venture companies, companies that have received re-startup funds from the Small and Medium Venture Business Corporation after they meet specific requirements, and cases where specific requirements are met during business conversion support projects are eligible for tax exemption or postponement.

It appears that policy authorities are somewhat aware of the side effects of the secondary tax liability, as noted above. They are thus attempting to form a consensus to try to alleviate them. However, in order to be exempted from a secondary tax liability in advance, a company must maintain a minimal sales volume and must use more than 5% of sales to pay research and development expenses. Unlisted companies with sales of approximately one to 12 billion won or more, depending on the industry, are not exempt from the secondary tax liability. In addition, because companies that meet the sales standard must also meet the R&D expense standard, companies that do not engage in R&D activities are incentivized to create extra R&D expenses.

In order to defer or extinguish the secondary tax liability ex-post, firms must receive re-startup financing from the Small and Medium Business Corporation. This condition only applies to limited cases, however. Thus, although policies exist to relieve companies of the secondary tax liability, there are limits to how much the burden can actually be reduced for a wide range of owners of small and medium-sized businesses.

III. Model analysis

In this section, I construct a model of a firm to examine the effects of the secondary tax liability as defined above. In particular, the examination focuses on the ex-ante impact of the secondary tax liability on corporate investments. In other words, the purpose is to analyze the effect of the secondary tax liability before a company goes bankrupt. Previous research has focused on the fact that a secondary tax liability imposed after a corporate bankruptcy hinders a recovery by conscientious managers. Taxes for a corporation must be paid with the personal property of oligopolistic shareholders, but in many cases, the oligopolistic stockholder becomes a credit delinquent because he or she is unable to pay these taxes. Additionally, an oligopolistic stockholder who becomes a credit delinquent has difficulty starting another business.

In the analysis here, rather than analyzing the aspects of investors' secondary tax liability making it difficult for them to recover as entrepreneurs, a model is designed to show that an investor's secondary tax liability can act as a pre-emptive factor that ultimately shrinks the company's management, even when a business failure has not

occurred. This section aims to show qualitatively that these exceptions to limited liability function as a burden on entrepreneurs so as to clarify the direction of the economic effect.

A. *Model*

I model a firm that makes rational decisions about their investments dynamically. The objective function of a firm is to maximize its value. State variables are the company's investments and deferred corporate tax liabilities as determined in the previous period. Taxes are determined based on the previous year's profits and are paid in the current year. This reflects that Korea's current corporate tax payment schedule is from March to May of the year subsequent to the company's settlement of accounts ending in December. In this model, it is assumed that deferred corporate tax liabilities do not accumulate but are determined at the current period and paid in full the following year. The choice variable is the company's investment (i).

The firm's production function, that is, its operating profit (π), is defined as follows:

$$\pi = e^x k^\alpha - f.$$

The operating profit (π) increases as the amount of capital (k) increases or productivity (x) increases. However, the marginal rate of return on capital is assumed to decrease given that parameter (α) is set to be less than 1. In addition, the production function reflects a realistic business environment such that fixed costs (f) are incurred even if there are no sales, which allows the company's value to fall below 0 even if the company's debt is not assumed in the model.

In this model, a firm's productivity follows a first-order autoregressive process. This process is defined as follows:

$$x' = \rho x + (1 - \rho)\bar{x} + \sigma\varepsilon',$$

where x' is the next period productivity, ρ is the persistence parameter, σ is the standard deviation of the error term, and ε' is a random variable that follows a standard normal distribution $N(0,1)$. Productivity follows autoregression centered on long-term averages, $\bar{x}$.

The process of asset accumulation is as follows. The next period's capital (k') is deducted at the depreciation rate (δ) of the current period's capital, and it increases as it is invested (i).

$$k' = i + (1 - \delta)k$$

Adjustment costs, c, are incurred when adjusting a company's assets. The definition of the adjustment cost is as follows:

$$c = \frac{a}{2}\left(\frac{i}{k}\right)^2 k.$$

The parameter a governs the level of the adjustment costs. Adjustment costs add reality to a firm's capital accumulation. They increase sharply as investments increase and decrease when the existing capital amount is large, reflecting that such costs are higher for a firm that rapidly increases its investment and lower for a firm with enough assets to accumulate additional assets.

The taxes(z') that a company must pay in the next period are defined as follows:

$$z' = \max(0, \tau_c(\pi - \delta k)).$$

The corporate tax rate is denoted by τ_c. Tax is levied only on operating profit after depreciation that is greater than 0.

A firm's cash flow (d) is defined using the equation below.

$$d = \pi - i - c - \frac{1}{1+r_f} z\lambda I_{\{n.l.l.\}}$$

The risk-free rate is denoted by r_f. The default probability is λ, and $I_{\{n.l.l.\}}$ is a dummy variable and takes a value of 1 if the investor's has a secondary tax liability, taking a value of 0 otherwise. The characteristics of this model are derived from the last term ($z\lambda I_{\{n.l.l.\}}$), indicating the potential burden felt by an entrepreneur due to the secondary tax liability. In the rational decision-making model, when an entrepreneur makes an investment, he or she determines the optimal investment level to maximize profits by considering the expected profits and costs.

Firm value, $v(k, z, x)$, can be expressed as state variables k, z, and x. The entrepreneur determines the investment amount that satisfies the following equation, thus determining the firm value:[1]

$$v(k,z,x) = \max_{i} \left[d + \frac{1}{1+r_f} E\{v'(k,z,x)\} \right].$$

B. *Parameter*

Table 5 shows the calibration results of the model parameters. The curvature parameter determines the decreasing, constant, or increasing returns to scale of the production function. It is set to 0.7 and assumes a diminishing return to scale. It is appropriate to assume that individual firms have diminishing returns to scale because as returns to scale increase, the optimal amount of corporate investment will increase infinitely. Empirically, the smaller the company, the higher the return on investment, and as the size of the company increases, the marginal return on investment tends to decrease.

---

[1]This model does not address the fact that the secondary tax liability can potentially prevent shareholders from engaging in moral hazard to some extent. Although empirical data show that collected taxes in relation to the secondary tax liability are minuscule, from the perspective of corporate managers, the incentive to tunnel may be reduced due to such a secondary tax liability.

The average productivity parameter, $\bar{x}$, is set to -0.6. The average firm value is determined by this parameter, and the average firm value determines the investment rate. The parameter is set such that the investment-to-total assets ratio with medium-level assets is 0.06 to 0.08. The ratio is similar to the investment rate shown in the empirical analysis data in the next section.

The productivity persistence parameter ρ and the standard deviation of productivity σ are set to 0.62 and 0.2, respectively. These two parameters are parameters of the autoregressive process (AR(1)) and determine the unconditional standard deviation of a firm's productivity, x. If the parameters and are 0.62 and 0.2, the unconditional standard deviation of productivity is approximately 0.25, similar to the standard deviation of the ROA of Korean companies.[2]

There are fixed costs, f, in this model. This value is assumed to be 0.5 such that the corporate extinction rate is 0.12, which is the average corporate extinction rate from 2013 to 2018 in the corporate survival and extinction administrative statistics published by Statistics Korea.

The discount rate r_f is set to 0.05, the depreciation rate δ is set to 0.1, and the capital adjustment cost a is set to 15. The capital adjustment cost is set so that the firm's market value is zero to two times the book value.
The corporate tax rate is 0.2 in the model analysis. Korea's corporate tax rate is assumed to be 25% if the tax base exceeds KRW 300 billion, 22% if the tax base exceeds KRW 20 billion but is less than KRW 300 billion, 20% if the tax base exceeds KRW 200 million but is less than KRW 200 billion, and 10% if the tax base is less than KRW 200 million. I set a tax rate of 20% because most firms of interest fall into this tax bracket.

I model a firm that makes rational decisions about its investments. The objective function of a firm is to maximize its value.

TABLE 5— PARAMETERS

	Parameters	Values
Production function curvature	α	0.7
Average productivity	$\bar{x}$	-0.6
Productivity persistence	ρ	0.62
Productivity standard deviation	σ	0.2
Fixed costs	f	0.5
Default probability	λ	0.12
Discount rate	r_f	0.05
Depreciation rate	δ	0.1
Capital adjustment costs	α	15
Corporate tax rate	τ_c	0.2

[2]Lee (2018).

C. *Analysis results*

The figure on the left in Figure 1 shows the investment rate without the secondary tax liability and the rate with the secondary tax liability. The horizontal axis of the figure represents the asset size. As the asset size decreases, the investment ratio relative to total assets gradually decreases from more than 20% to less than 5%. This reflects that the marginal return on investment decreases as the asset size increases by assuming a diminishing return to scale. In the figure, when a secondary tax liability exists, the investment rate is lower than when there is no secondary tax liability.

The figure on the right in Figure 1 shows the rate at which the investment decreases when there is a secondary tax liability compared to when there is no secondary tax liability. Interestingly, for a very small company, any secondary tax liability has little effect on reducing the investment rate. This is related to the characteristics of the model, defined to reflect reality. Suppose a company is currently unable to generate enough profits to pay taxes. In such a case, it is reasonable for the secondary tax liability not to be considered during the investment process. This is why the secondary tax liability does not impact a firm's investment decision when the firm's assets are close to 0.

As a company's assets grow, the company's profits and the resulting taxes also increase, which further increases the burden of the secondary tax liability. In the benchmark model, the investment reduction rate due to the investor's secondary tax liability could be as high as nearly 4%.

At this point, I examine the impact of a secondary tax liability for companies with a high probability of extinction. If the investment rate of companies decreases indeed due to the secondary tax liability in the previous benchmark result, the investment rate should decrease more when the expected burden on the firms increases. In order to confirm the appropriateness of the economic effect of the model, I analyze case with a high probability of extinction.

Analyzing such cases is meaningful from a policy perspective. In the benchmark model, the corporate extinction rate is set to 12% using data from Statistics Korea's
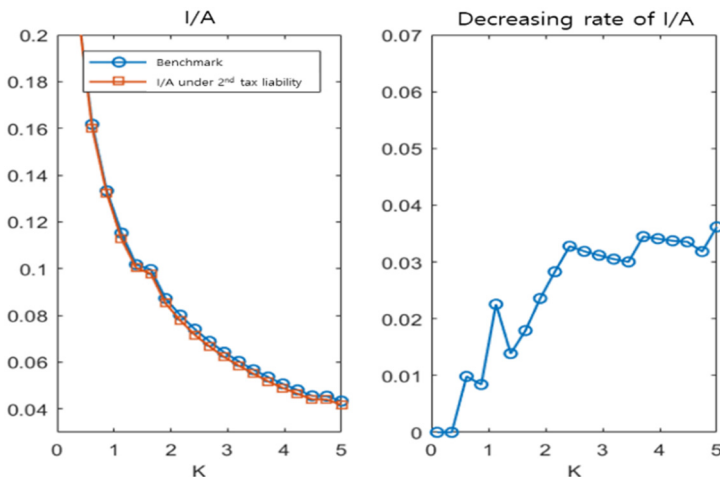

FIGURE 1. INVESTMENT RATE AND DECREASING RATE WITH A SECOND TAX LIABILITY

corporate survival and extinction administrative statistics. The attrition rate can differ if a company operates under difficult conditions. In particular, in new companies, the probability of extinction is much higher compared to established companies. Considering the investor's secondary tax liability as one of the factors hindering the start-up of a company, it is important to analyze secondary tax liabilities in companies with a high probability of extinction.

Figure 2 shows the investment rate when the bankruptcy rate is 24%. The figure on the left shows the investment rate according to the presence or absence of the secondary tax liability. That on the right depicts the investment reduction rate with the secondary tax liability. Compared to the benchmark case, the decline in investment rate nearly doubled when the extinction rate was 24%. If the asset size is small and the probability of paying taxes is low, the secondary tax liability has little effect on investment. However, as the size of the company increases, the secondary tax liability becomes a greater burden and can reduce the investment amount by approximately 7%. This marks a nearly double increase in the investment reduction rate compared to the mid-3% level in the benchmark case.

In short, as the expected burden of a company's secondary tax liability increases with an increase in the probability of a bankruptcy as well, the company reduces its investment. This implies that the secondary tax liability becomes a greater burden for corporate management of new companies or for companies who operate in risky industries.

If the limited liability principle is well observed, a firm makes investment decisions to maximize its value, but with a secondary tax liability, entrepreneurs ultimately make decisions to maximize their own expected profit, including that of the firm. When a company goes bankrupt, there is a burden on the business owner, which ultimately burdens the firm. This effect has not received attention in existing discussions regarding secondary tax liabilities. Existing discussions mainly focus on
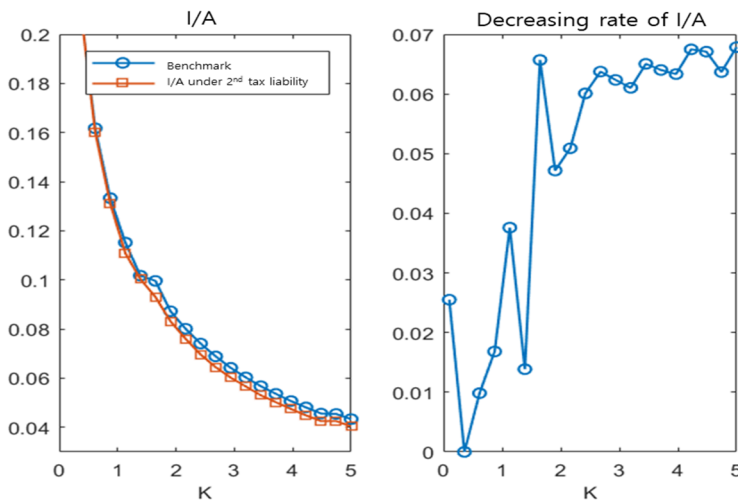

FIGURE 2. INVESTMENT RATE AND DECREASING RATE UNDER A SECOND TAX LIABILITY
(HIGH EXTINCTION RATE)[3]

[3]The jagged line of I/A in the figure on the left is due to numerical errors.

the problem of failed entrepreneurs becoming credit delinquents due to the secondary tax liability, but such an analysis proposes a reducing effect on firm investments.

IV. Estimation

In this section, I empirically analyze the impact of exceptions to the limited liability principle, the secondary tax liability, on firm investment outcomes. The secondary tax liability is applied to unlisted firms in which the largest shareholder and related parties have an ownership ratio that exceeds 50%. The critical point is that secondary tax liability is not imposed if the shareholding ratio is precisely 50%. Suppose the secondary tax liability affects the investment activities of companies. In such a case, one can find differences in investment scenarios between companies where the largest shareholder's shareholding ratio exceeds 50% and companies where the shareholding ratio is less than 50%. Using corporate ownership data and financial data, I analyze this and find evidence of the impact of investors' secondary tax liabilities on investments.

A. *Data*

The ownership data and financial data are obtained from Korea Enterprise Data (KED). KED provides information related to the governance structure of Korean companies. One can uncover who the company's largest shareholder is, what the shareholding ratio is, and who the CEO is. Unfortunately, this information is not provided as a time series of the ownership ratio. Only ownership information at a specific point in time is available. Therefore, it is not possible to construct panel ownership data. However, because it is possible to establish ownership information at a specific point in time, a cross-sectional analysis can be conducted by combining this information with financial data from companies. The data used in the analysis range from 2011 to 2016. Financial data are used up to the next year at the time that the ownership ratio is observed. Regarding the investment rate, data from the year following the year in which the shareholding ratio is noted are observed to consider the time leading to an actual investment under a specific shareholder composition.

The companies included in the data are general corporations and externally audited corporations, excluding listed companies and sole proprietorships. Observations where the company's CEO is the largest shareholder of the firm at the same time are included in the analysis because the secondary tax liability only applies to those with a shareholding exceeding 50% and who have a dominant influence on the corporation. Companies with total assets of less than 300 million won, deemed too small for the purpose here, are also excluded.

The secondary tax liability only applies to shareholders whose shareholding exceeds 50%, as noted above. In order to examine differences in investments between two groups where the largest shareholder and CEO have an ownership ratio of less than 50% and more than 50%, I utilize data with an ownership ratio of between 49% and 51% and investigate the differences between these two groups. The total number of observations is 4,373. Because the sample contains cross-

sectional data, there are 4,373 largest shareholder ownership ratio-company observations. One aspect to note is that the yearly distribution of each company varies from 2011 to 2016.

Table 6 reports summary statistics. I/A is the amount invested divided by the total assets of the previous year. The investment amount is the difference between the tangible assets of the current year and the previous year plus the depreciation in sales and administrative expenses and the depreciation in the manufacturing cost statement. LnTA is the natural logarithm of the total asset amount in thousand KRW. D/A is total debt divided by total assets. AG refers to the increase in total assets divided by the total assets of the previous period. The sample includes very small companies, meaning that extreme values have a strong impact on the statistics. Therefore, LnTA, D/A, and AG are winsorized to the 1% level.

The sample firms invest approximately 6.5% of their total assets on average. The standard deviation is about 18.6%, which shows that the investment deviation across firms is quite large. Figure 3 shows the distribution of I/A outcomes. In most cases, I/A is between 0 and 10%, but in some cases, it exceeds 100%. This occurs because the sample includes very small firms, such as those not externally audited. The average LnTA is 14.695, meaning that the average total asset amount is approximately 2.4 billion KRW. The minimum and maximum values of LnTA are correspondingly 12.726 and 18.236, meaning that the total asset amount ranges from 340 million KRW to a maximum of 83 billion KRW and implying that most firms in the sample are small and medium-sized enterprises.

The average of D/A is 0.543, and the standard deviation is 0.254. About half of the total assets of these companies are raised with debt capital, and the debt ratios vary widely. While some firms use debt for only about 4% of total assets, there are also cases where 96% of total assets are debt. AG equals approximately 35% on average. This is due to the fact that the firms in the sample are very small and have a high marginal return on capital, showing a high asset growth rate.

Figure 4 presents a scatter plot of the shareholding ratio and investment rate. It shows an interesting relationship between the largest shareholder's shareholding ratio and the investment rate. Observations of the shareholding ratio are highly concentrated around 50%; there is a wide variety of investment rates at a 50% shareholding ratio, and in companies that invest considerable amounts, there are many cases where the largest shareholder's shareholding is 50%.

Observations of the shareholding ratio are highly concentrated around 50%. It is important to note that there are numerous investment rate observations of cases in which the shareholding ratio is precisely 50%, suggesting that when companies set up corporate governance, they intentionally set the shareholding ratio of the largest

TABLE 6— SUMMARY STATISTICS

	Mean	S.D.	Min	Max
I/A	0.065	0.186	-0.213	1.123
Share Ratio (%)	49.985	0.211	49.01	50.99
LnTA	14.695	1.075	12.726	18.236
D/A	0.543	0.237	0.041	0.965
AG	0.349	0.833	-0.355	5.557

Note: LnTA, D/A, and AG are winsorized to the 1% level.

shareholder to 50% rather than exceeding 50%. If the shareholding ratio of the largest shareholder exceeds 50%, the largest shareholder must bear the additional burden of a secondary tax liability in case of a bankruptcy. From the perspective of the largest shareholder, it is better for them intentionally to avoid an ownership ratio exceeding50%. Of course, one cannot say that those intense observations of a shareholding ratio of 50% are solely due to the investor's secondary tax liability. However, the data here are consistent with the prediction by the model analysis in the previous section that such secondary tax liabilities reduce firm investments.
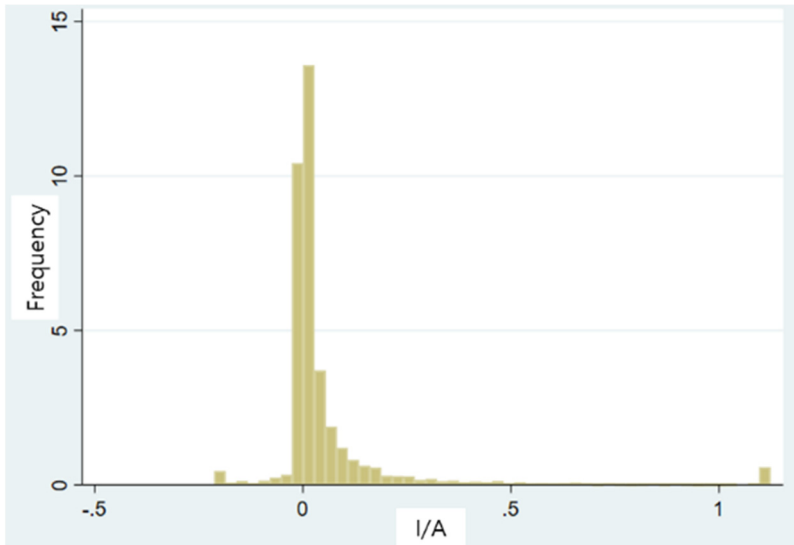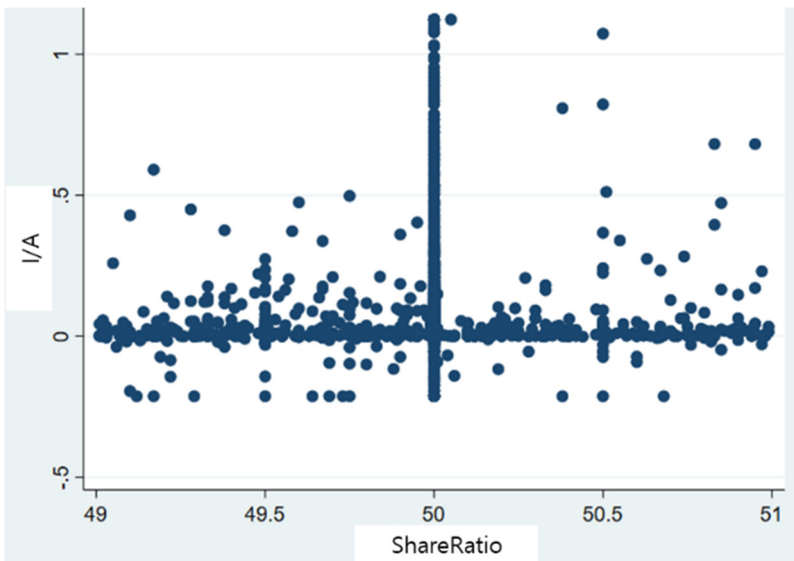

FIGURE 3. DISTRIBUTION OF THE INVESTMENT RATE

FIGURE 4. SCATTER PLOT OF THE SHAREHOLDING RATIO AND INVESTMENT RATE

B. *Empirical analysis*

In the empirical analysis, we examine whether there is a difference in the investment rate depending on the shareholding ratio of companies when the largest shareholder's shareholding ratio is between 49% and 51%. If the investor's secondary tax liability has no impact on investment, there should be no correlation between investments whether or not the largest shareholder's share exceeds 50%, the condition in which the investor's secondary tax liability applies. The model analysis in the previous section shows that the secondary tax liability discourages the investment willingness of entrepreneurs. I examine whether the effect can be confirmed through empirical data.

The unit of analysis is the shareholding ratio of the manager, who is both the largest shareholder and CEO at the same time, and the investment rate of the firm. The largest shareholder will have a dominant influence on the corporation. The largest shareholders are able to affect decisions on whether to invest in the company. If the largest shareholder's shareholding rate exceeds 50%, he or she must bear tax arrears in the event of a corporate bankruptcy, sacrificing their personal property, whereas if the shareholding ratio is less than 50%, the secondary tax liability is not imposed.

The first predictable action of the largest shareholder under the secondary tax liability is to set their shareholding ratio below 50%. There may be a variety of factors that affect a company's governance structure, but if the largest shareholder's stake is determined to be around 50%, there is an incentive to keep the stake below 50% to avoid the secondary tax liability. This pattern, as found earlier, is confirmed in Figure 3. The shareholding ratio of the largest shareholder is very high at precisely 50%, with much variance in the largest shareholders with shareholdings below 50% and above 50%.

If the majority shareholder's shareholding ratio is less than 50%, the secondary tax liability can be avoided. It would be rational for oligopolistic stockholders to have shares less or equal to 50%. However, due to various management conditions, there may be cases in which an oligopolistic shareholder holds a stake exceeding 50%. In cases where legal problems may arise in the future if management rights cannot be secured, securing management rights is advantageous, bearing the potential cost of the secondary tax liability. In such cases, the largest shareholder can choose to secure a stake exceeding 50%.

In the presence of the secondary tax liability, the largest shareholder with a stake exceeding 50% is likely to invest less due to the burden of potential tax payment costs. In this empirical analysis, I focus on these investment incentives and seek to determine whether there is a significant decrease in the investment rate in corporations in which the largest shareholder's shareholding exceeds 50%. The empirical specification is as follows:

$$(1) \quad Y_i = \beta_0 + \beta_1 Dum50_i + \beta_2 ShareRatio_i + control_i + timeFE_i + indFE_i + \varepsilon_i$$

The dependent variable Y_i refers to I/A for firm i. The dummy variable, $Dum50_i$, has a value of 1 if the largest shareholder's shareholding ratio exceeds 50% and has

a value of 0 if it is less than 50%. The independent variable, *ShareRatio_i* , refers to the shareholding ratio of the largest shareholder. The control variable, *control_i* , includes LnTA, D/A, and AG, which are variables that can affect a company's investments. As the asset size increases, the investment rate usually tends to decrease. It is known that if existing debt impedes additional capital raising efforts, the result can be a decrease in the investment rate (debt overhang). On the other hand, debt can increase investment levels due to the risk-taking incentive of managers (risk-shifting). Companies with a higher asset growth rate tend to have a higher return on investment, and their investment rate also tends to be higher. The analysis includes year-fixed effects, *timeFE_i* , and industry-fixed effects, *indFE_i* . Industries are categorized by the first English notation of the Standard Industrial Classification Code (KSIC 10th). A total of eighteen industries are considered in the analysis. The last term, ε_i , in the equation denotes the error.

In this analysis, I examine whether the coefficient of the dummy variable has a negative value. If there is a significant decrease in the investment rate in groups with a stake exceeding 50%, one can see that the secondary tax liability investors acts as a burden on the largest shareholders and reduces corporate investment levels. This can be interpreted in two ways. First, when a company seeks to make a large investment, it can be set such that the largest shareholder has an equity ratio of exactly 50% in order to avoid the secondary tax liability. Second, if the largest shareholder's shareholding ratio exceeds 50% for any reason, investments may be reduced to a limited extent in order to reduce the burden of the secondary tax liability. In either case, the results are consistent with the implications drawn from the model analysis.

C. *Results*

Table 7 reports the estimation results of equation (1). In the first column, firms for which the largest shareholder's shareholding exceeds 50% invest 5.3% points less than companies with a corresponding shareholding rate of less than 50%. Even after considering industry fixed effects in the second column, firms with the largest shareholder's shareholding rate exceeding 50% invest 4.7% points less. When controlling for management indicators that may affect investments, it is estimated that firms with the largest shareholder's shareholding rate exceeding 50% invest approximately 2.6%p less. As the total asset size increases, the investment rate decreases, and companies with a steep asset growth rate invest more. Leverage does not have a significant effect on the investment rate. The estimation results are consistent with the prediction that firms with the largest shareholder's shareholding rate exceeding 50% invest less due to the secondary tax liability.

The secondary tax liability is a national tax borne by the largest shareholder when a company goes bankrupt. The burden of the secondary tax liability on the largest shareholders is heavier in companies that are more likely to go bankrupt. If a firm has a high debt ratio, the risk of bankruptcy may increase as the interest burden increases. The largest shareholder of a firm with a high debt ratio is subject to a greater risk of the secondary tax liability. Therefore, if it is true that the secondary tax liability of investors has a significant impact on the investment rate, the difference

TABLE 7—EFFECTS OF OLIGOPOLISTIC STOCKHOLDERS ON INVESTMENTS

	(1)	(2)	(3)
Dum50	-0.053***	-0.047***	-0.026*
	0.015	0.015	0.015
Share Ratio	0.061***	0.052***	0.034**
	0.016	0.016	0.016
LnTA			-0.015***
			0.003
D/A			-0.018
			0.014
AG			0.024***
			0.003
timeFE	Y	Y	Y
indFE	N	Y	Y
R-squared	0.0046	0.0173	0.0353

in the investment rate depending on whether the secondary tax liability is imposed on investors may be more evident in companies with a high debt ratio. In this analysis, I sample only firms with a debt ratio of 30% or more relative to total assets and examine the impact on investment in cases in which the largest shareholder's shareholding exceeds 50%.

Table 8 shows summary statistics of the sample with firms with a debt ratio of 30% or more. Except for the minimum debt ratio of 0.3, there is no significant difference in its characteristics from the firms used in the previous analysis. Because this is a sample with a limited debt ratio, the debt ratio is somewhat higher and the asset growth rate is decreased slightly, but considering the standard deviation, the difference is not significant.

Table 9 shows the estimation results of equation (1) for firms with a debt ratio of 30% or more. In companies with a high debt ratio, whether the largest shareholder's shareholding ratio exceeds 50% has a greater impact on the investment rate as compared to this factor in the entire sample. In the first column in Table 9, the investment rate decreases by 5.8% points, which is approximately 10% greater than in the entire sample. In the second column, the investment rate is shown to decrease by 5.5% points, marking a 17% greater effect than in the entire sample. In the third column, the investment rate decreases by 3.1% points, also showing a greater effect than the entire sample. This suggests that the secondary tax liability is a greater burden on entrepreneurs in companies with a higher debt ratio, posing a greater risk of default.

TABLE 8— SUMMARY STATISTICS - FIRMS WITH HIGH DEBT RATIOS

	Mean	S.D.	Min	Max
I/A	0.071	0.197	-0.213	1.123
Share Ratio (%)	49.989	0.196	49.01	50.99
LnTA	14.740	1.078	12.726	18.236
D/A	0.627	0.171	0.300	0.965
AG	0.403	0.898	-0.355	5.557

TABLE 9—EFFECTS OF OLIGOPOLISTIC STOCKHOLDER ON INVESTMENTS (HIGH DEBT RATIO)

	(1)	(2)	(3)
Dum50	-0.058***	-0.055***	-0.031*
	0.018	0.018	0.018
Share Ratio	0.069***	0.065***	0.045***
	0.021	0.021	0.021
LnTA			-0.016***
			0.003
D/A			-0.058***
			0.021
AG			0.025***
			0.004
timeFE	Y	Y	Y
indFE	N	Y	Y
R-squared	0.0045	0.0146	0.0351

D. *Placebo Test*

Considering that second tax liability applies to companies where the largest shareholder's shareholding exceeds 50%, we looked at changes in the investment rate depending on whether the shareholding rate exceeds 50%. If the secondary tax liability does not affect the investment rate, but rather the shareholding ratio itself influences the investment rate, one should be able to find a break in the investment rate at a threshold other than 50%. I examine whether changes in the investment rate can be found by setting the largest shareholder's shareholding to 48% as a placebo test. The dummy variable dum48 has a value of 1 if the largest shareholder's shareholding ratio exceeds 48% and a value of 0 if it is less than 48%. The sample consists of firms with CEOs with ownership ratios greater than 47% and less than 49%. The remaining variables are identical to those in the previous analysis. Table 10 shows summary statistics pertaining to companies for which the largest shareholder's shareholding ratio exceeds 47% and for those where it is less than 49%. The total number of observations is 1,000, and the investment rate, debt ratio, and asset growth rate are all slightly lower than in the sample used for the main analysis.

Table 11 shows whether the investment rate changes significantly as the shareholding ratio increases from around 48% to over 48%. These results show that the investment rate does not change significantly when the investment rate exceeds 48%.

TABLE 10— SUMMARY STATISTICS FOR THE PLACEBO TEST

	Mean	S.D.	Min	Max
I/A	0.044	0.124	-0.213	1.123
Share Ratio (%)	48.000	0.449	47.04	48.98
LnTA	15.041	1.119	12.726	18.236
D/A	0.497	0.234	0.041	0.965
AG	0.234	0.622	-0.355	5.557

TABLE 11—EFFECTS OF OLIGOPOLISTIC STOCKHOLDERS ON INVESTMENTS (PLACEBO TEST)

	(1)	(2)	(3)
Dum48	-0.012	-0.010	-0.005
	0.013	0.013	0.013
Share Ratio	-0.001	-0.001	-0.004
	0.014	0.014	0.013
LnTA			0.001
			0.004
D/A			0.013
			0.019
AG			0.016***
			0.006
timeFE	Y	Y	Y
indFE	N	Y	Y
R-squared	0.0197	0.0442	0.0528

Not only is the coefficient not statistically significant, but the magnitude of the coefficient is also smaller than the coefficient in Table 7.

In this section, I investigate investments of firms with CEOs whose share ratio exceeds 50% of their firm. Consistent with the model predictions, the empirical analysis implies that the potential burden from the secondary tax liability on an entrepreneur can decrease the investments of such firms.

V. Conclusion

The principle of limited liability for shareholders is a core principle in many countries. The principle is crucial because it becomes easier to raise capital when the limited liability of stocks is recognized, and this allows large-scale projects that cannot be carried out at an individual level to be realized by dispersing risks.

This paper examines the impact of the current shareholder limited liability exception system on firm investment outcomes. First, it is widely known that the secondary tax liability makes it challenging for failed entrepreneurs to recover. This represents a limiting factor in actual entrepreneurship. This paper suggests that the secondary tax liability can act as a factor inhibiting investments even before a company goes bankrupt. The model analysis shows that if an entrepreneur must pay national taxes out of his personal property in the event of a corporate bankruptcy, he invests less. The empirical analysis also found a significant decrease in investment levels at the point where the company's largest shareholder's shareholding ratio exceeded 50%, which is the threshold at which the secondary tax liability applies.

In no country except Korea, shareholders of a stock company are not subject to national taxes beyond the scope of limited liability unless a criminal offense such as breach of trust or embezzlement has occurred. It appears better to hinder tax evasion attempts with clear criminal charges and to adhere to the principle of limited liability for shareholders. Observing the limited liability principle can improve the business start-up and investment environment and can failed entrepreneurs recover.

REFERENCES

Chung, Yun Sik. 2011. The Study on the Secondary Liability for Tax Payment of the Oligopolistic Stockholders, Tax Research, 11(1).

Hwang, Nam Seok & Yang, In-Jun. 2017「Secondary tax liability system improvement plan」, Korea Tax Research Forum.

Jun, Byung Wook. 2019. How to Relieve the Secondary Tax Liabilities of Failed Entrepreneurs of Small-and-Mid Sized Firms, Tax and Accounting Review, 8(2).

Kim, Jae-jin & Moon, Ye Young. 2021. In-depth evaluation of special tax treatments: exemption from secondary tax liability for investors in venture companies, Korea Institue of Public Finance.

Kim, Taehee & Lee, Gunhoon. 2018. The Scope of the Stockholder's Secondary Tax Liabilityunder Framework Act On National Taxes―Focusing on the so-called Serial Secondary Tax Liability, Seoul Tax Law Review, 24(2).

Kim, Taewan. 2016. A Study on the Secondary Tax Liability of Contributors. Journal of Business Research, 31(1).

Lee, Jangwook. 2018. R&D Tax Credit Analysis: Focusing on Financing , Korea Development Institute.

Lee, Jangwook. 2021. The Effects of the Exception to Limited Liability on Firm's Investment, Korea Development Institute.

LITERATURE IN KOREAN

국세청(https://www.nts.go.kr).

김재진·문예영. 2020.「조세특례 임의심층평가: 벤처기업 출자자의 제2차 납세의무 면제」, 한국조세재정연구원.

김태완 2016.「출자자의 제2차 납세의무제도의 고찰」,『경영연구』, 31(1).

김태희·이건훈. 2018.「국세기본법상 출자자의 제2차 납세의무의 범위 단계적 제2차 납세의무의 인정 여부를 중심으로」,『조세법연구』, 24(2).

이장욱. 2018.「연구개발비 세액공제효과에 관한 연구: 기업재무적 관점을 중심으로」, 한국개발연구원.

이장욱. 2021.「주주 유한책임원칙의 예외가 기업활동에 미치는 영향」, 한국개발연구원.

전병욱.2019.「중소기업 실패기업인의 제2차 납세의무 완화방안 연구 -출자자의 제2차 납세의무를 중심으로-」, 세무와 회계연구 8(2).

정연식. 2011.「과점주주의 제2차 납세의무에 관한 연구, 조세연구 11(1).

황남석·양인준. 2017「제2차 납세의무제 개선방안」, 기획재정부 연구용역, 한국조세연구포럼.