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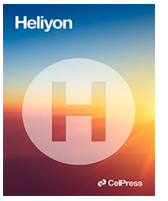

Research article

Why companies have low debt? An empirical evidence in Korea

Youngsoo Ra

Geumgang University, 522 Sangwol-ro, Sangwol-myeon, Nonsan-si, Chungnam, 32906, South Korea

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ABSTRACT

The aim of this study is to examine the reasons why companies have been borrowing less, which has become increasingly popular recently. The study uses the method developed by Agrawal and Nagarajan (1990) [13] to select unlevered and levered companies for comparison to identify the causes of low leverage. The results of empirical analysis indicate that first, companies with low debt levels are relatively profitable, have high internal reserves, and possess future growth opportunities. Second, unlevered companies exhibit higher economic value compared to levered companies. Debt does not improve company value through low cost of capital or higher cash flow via tax shield. Third, family ownership tends to prefer low debt levels. Finally, unlevered companies have higher cash holding compared to levered companies, and this trend is maintained over long period of time. The preference for higher cash among unlevered companies has a historical basis. The companies are maintaining low debt levels for future growth opportunities and their management preference for high level of cash has remained consistent over time.

1. Introduction

Does debt increase firm value or is it just a means of financing? Many companies are reducing their reliance on debt financing these days, whereas there was a time when companies welcomed it. Leverage Buyouts (LBOs) were an innovative way of merging companies from the 1980s, allowing firms to expand their size through wise financing with debt. Daewoo, one of the Korean conglomerates, expanded its business using exquisite financing skills. During the development stage of the Korean economy, accompanied by a stroke of luck due to sound world economy, debt financing was common for Korean companies. However, in the late 1990s, when the Korean economy collapsed, the debt-to-equity ratio was as high as around 589 %, with major financing sources being debt, usually from financial institutions. The major factor for development caused the economy to plunge. In the mid-2010s, statistics show that the debt ratio dropped to under 200 % in Korea. This drop in debt is viewed positively in the market as a sign of relative financial health. This represents current perception that debt financing is seen as undesirable, and using less of it makes companies more solid and sound.

In the financial theory, debt is considered a relatively cheaper and more accessible source of financing. However, convenient capital can lead to financial distress as it is increased in the financial structure of a company. Many studies have attempted to determine the optimal level of debt and suggest a target capital ratio that can maximize company value. Since MM's seminal work in 1958, many researchers have sought to identify the determinants of debt to establish a logical basis for the validity of debt financing. The trade-off theory links financial variables to the level of debt, suggesting that higher profit-earning and larger-sized firms have a greater debt capability and can sustain a higher debt level. However, these profitable and large sized firms tend to use less debt than their optimal levels [1], and companies often maintain capital structures that deviate from the theory. In practice, managers may not be highly concerned with adhering to logical level of debt or maintaining a particular capital structure, as it may not be crucial for the company's

E-mail address: yr207@ggu.ac.kr.

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survival [2].

Companies may not prefer debt financing due to the burden of periodic interest and repayment of the principal over the contracted duration. While debt financing can be convenient, a high debt ratio can lead to an under -investment problem, ultimately decreasing the value of the company [3,4]. There are societal issues that can also impact financing decisions, because companies are contracted with stakeholders, one of which is the agency problem between manager and stockholders or stockholders and bondholders. Opportunistic human behaviour and selfishness can interfere in the official organization, where the economic solution is debt discipline. Information asymmetry can lead investors to demand compensation, causing companies to avoid equity financing and instead reserve cash for future investment opportunities. The pecking order theory posits that internal reserves are the best choice for investment financing, followed by debt. This theory is consistent with the recent trend of conservative debt financing, but empirical results does not always support it [5]. It may be that the theory is not applicable to company management, and that extemporaneous behavior and management preferences are better explanations [2,6,7].

The aim of this study is to examine the determinants of the debt and investigate why companies are using less debt recently. For the empirical analysis, the study compares two groups of company: the levered group and the unlevered group, all-equity group. The rest of the paper is organized as follows, the next section discusses the literature on capital theory. In section 3, the methodology of the paper is presented, including the sample selection, variables used, and the economic model. Section 4 provides a description of the data, as well as the results of the statistical and regression analysis of leverage and financial variables. Finally, the last section presents the conclusion and discussion including implications.

2. Literature review

MM(1958) argued leverage has nothing to do with corporate value when not considering tax. They asserted that the value of a firm increases only with its investment opportunities, and that its capital structure does not affect its value. MM(1963) later revised their arguments to account for the tax shield effect of debt, which can increase a firm value. In the real world, various factors must be considered when examining the optimal level of debt financing. The static trade-off theory (STT, hereafter) asserts that the level of debt financing that is optimal for a company depends on its debt capacity, which is determined by its financial status. Companies with high profits, more tangible assets, and larger size are positioned to access more debt. The volatility of earning is related to less debt to reduce the possibility of value loss. Debt financing can increase the value of a company due to the tax shield effect. The benefit of tax varies with leverage, so more profitable companies use more debt [8,9]. In this context, the level of leverage is influenced by non-debt tax shield (NDTS) [10–12]. However, there are costs associated with using debt, such as the increased risk of bankruptcy, the burden of periodic payment and repayment of principal, and the possibility of financial distress (Stiglitz, 1972; [13]). The benefits and costs of using debt are traded off to determine the target debt-equity ratio that maximizes the value of the company [14]. STT suggests that the adequate debt level for a company should be determined based on its financial status, but decision-making can be complicated by the involvement of stakeholders. The agency theory focuses on political issues that can affect firm value. This theory suggests that companies with surplus funds are more likely to experience conflict between the principal and agent, which can decrease corporate value. To deter managers from exploitations, the discretionary power of the agent must be limited. The manager may waste free cashflow developed by earnings from assets-in-place, exacerbating the conflict between the two parties and resulting in a loss of company value. The board may demand an increase in debt when free cashflow increases to act as a buffer of the conflict between the principal and agent [15]. As a result, the leverage is higher with high free cashflow [16,17]. Agency problems can be mediated if managers are compensated with stock options thereby become owners of the company. Family-owned and operated or stock owned manager companies show less debt status [18].

On the other hand, agency problems between bondholders and shareholder explain underinvestment problems. Shareholders of companies with more debt are less inclined to invest in prospective investments unless the payout is large enough; otherwise, the wealth of the investment is transferred to bondholders. Therefore, companies with more investment opportunities have less leverage [5].

Debt is influenced by the type of assets companies hold. According to transaction cost economics (TCE, hereafter), the decision of whether to use debt or equity to finance an asset depends on its specificity. Assets that can be easily replaced and are highly tradable are better suited for debt financing, while those that are unique to a particular company and not easily tradable are less suitable for debt. TCE asserts that debt is preferable for investments in assets that can be easily redeployed, while equity is better for assets whose value is difficult to evaluate due to high uncertainty and therefore not suitable as collateral (Williamson, 1988; [19]). STT asserts companies engaging in research and development (R&D) tend to use less debt because of the tax benefits associated with such investments and the potential for value loss from risky assets. Companies that hold intangible assets or innovative properties, such as R&D, are thus better suited for equity financing.

Pecking order theory (POT, hereafter) suggests that companies follow a specific order of financing choices. They used their retained internal funds first, followed by debt financing, and only turn to equity as a last resort. POT is based on the problem of information asymmetry, where external investors lack sufficient information require discounted price for new issues. As a result, companies with higher levels of information asymmetry find it more difficult to obtain equity financing. Companies with investment opportunities prefer to use their internal reserves first, which have the lowest capital cost. They turn to debt financing when their investment needs exceed their internal fund, the equity financing is the last choice [3,20–22]. Companies prefers to use their internal fund to finance investments because of their low capital cost and to avoid issues with information asymmetry. According to POT, larger and more profitable companies tend to use less debt financing [2,5,23]. This theory provides a good explanation for the recent trend of under-leveraged company behavior. However, the theory is complex and requires specific circumstances and interpretations.

The recent trend of large cash holdings by companies seems to go against financial theories that recommend avoiding holding non-profit bearing assets. One explanation for this behavior is that companies are holding cash for precautionary and transactional purposes [24–27,28] with a view to using the resources to capitalize future investment opportunities. Alternatively, to avoid cost of leverage effect on financial distress, companies may opt to use less debt, as the cost is higher than the tax shield offered by debt [29]. Innovative investments tend to create intangible assets, and companies are willing to make such investments because they believe that innovation leads to higher performance [30,31,32]. One challenge with R&D investments is the uncertainty of success and return on investment, leading to the possibility of sunk cost. Thus, such investments are limited and often require internal fund. ([33]; Bates et al., 2009).

Empirical evidence suggests that low levels of debt in companies are caused by several internal factors. Agrawal and Nagarajan [18], for instance, matched all equity firms and levered firms by size and industry and compared both groups. Their findings showed that management ownership was for avoiding debt for cost reduction purposes. Additionally, the long traditions and preferences of companies can be factors in determining their preferred debt level [6]. Companies may also take strategic actions to adjust their financial performance, such as to reduce cost of financial distress, to maintain financial flexibility and to improve creditworthiness, leading to capital restructuring. Therefore, on average, leverage decrease when profits increase [34]. Korteweg [35] argued that debt is beneficial to firm value, and small and profitable companies tend to have high leverage. However, the prevalence of underleverage can be attributed to the existence of zero-leverage firms. To avoid the cost of leverage effect on financial distress, companies may opt to use less debt, as the cost is higher than the tax shield offered by debt [29].

The reduction in leverage predicted by theoretical arguments, such as the STT, can be attributed to lower debt capacity resulting from factors, such as lower profitability, smaller size, and greater risk. Agency theory suggests that debt can serve as a means of limiting the use of free cashflow to mitigate conflicts between bondholders and shareholders. However, this approach may be less effective under owner-controlled governance. High growth firms maintain larger cash reserves with less debt. TCE is pointing to specific assets such as intangible assets or risky investments like R&D expenditures as key drivers of this behavior. As companies invest more in intangible assets or innovation, they tend to take on less leverage. Finally, the POT predicts that companies will retain cash flows to pursue future investment opportunities, with firms possessing greater growth opportunities, profitability and size holding less debt.

As seen above, financial theories state a causal relationship between capital structure and financial determinants. Can these insights still be applied to decreasing leverage in Korea?

3. Methodology

3.1. Sample selection and data

The companies used in this analysis are all manufacturing companies listed on the KRX (Korea Exchange) market. Financial data from 2011 to 2021, a period of 11 years, were collected to analyze the determinants of decreasing debt financing. The study primarily compares the features of levered and unlevered companies. The sample selection method used is the similar to that used in Agrawal and Nagarajan [18]. Unlevered companies, all-equity companies, are defined as those with no long-term debt over a consecutive five-year period from 2015 to 2019. Observations with major missing data are all excluded from the sample, resulting in 92 unlevered companies. For comparison purposes, levered companies are selected whose size and industry match with selected unlevered companies with above criteria. Specifically, 56 levered companies were identified that were matched in size and industry. The size of companies is matched if it is within 10 % difference from total book value of the assets of unlevered companies. The empirical analysis covers the period from 2011 to 2021 for the regression analysis. The financial data of the sample is collected from KIS-VALUE database.

3.2. Variables and expected relationship

The dependent variable is long-term debt (Debt), which is composed of long-term bonds and long-term debt. Long-term bonds refer to corporate bonds issued by companies that are traded in the financial market, while, long-term debt is debt from financial institutions with a maturity longer than a year. The independent variables are profit, internal reserves, size, growth opportunities, investment, collateral assets, risky assets, risk, capital cost and types of ownership.

Profit (Profit) is net income to total assets. POT and STT has different view on profit and debt relationship. POT expects inverse relationship but STT expects positive relationship between two variables. For internal reserves, cash holding (Cash) and free cashflow (FCF) are used in this analysis. Cash holding is namely cash reserve in liquid asset. More cash is expected to be related to less debt. Free cashflow (FCF) is internal free cash reserved for future expenditure, but this variable also shows the performance of the company. Free cashflow is standardized by total asset. Size (Size) is measured by the natural logarithm of total assets. STT asserts that debt and size are positively related, but POT asserts an inverse relationship between the two variables. For Growth opportunities, two variables are used: market-to-book ratio (MB) and sales growth (Salesgrowth). The market-to-book ratio is measured by the market value of equity plus total debt divided by book value of equity plus total debt. The market value of equity is an objective measure of growth opportunities by market participants. Sales growth is the actual growth in the real commodity market, measured as proportion of marginal sales growth to sales of the previous year. STT expects a positive relationship, whereas POT expects negative relationship between growth opportunities and debt. Agency theory also expects an inverse relationship. Investment is measured by tangible asset change divided by the tangible asset of the previous year. Tangible assets are less liquid but redeployable, and their value is assessed in the market without great effort. These assets can be good sources of collateral for the companies. Tangible assets are expected to be positively related to

debt without any disruption. Risky assets, unlike tangible assets, are related to innovative assets that are not easily deployed to other companies. The market finds it hard to assess their value. This study uses R&D expenditure and intangible assets. Both variables are standardized to total assets. Debt is expected to be inversely related. POT is complicated. If the size of the investment is large, then it is expected to be positively related. Risk is measure by the standard deviation of net income over 5 years. Risk is inversely related to debt. Weighted average cost of capital (WACC) is weighted average of fund sources of the company. This variable is used to see if the cost of capital is related to debt financing. The finding may imply how cost of capital affects debt decision. Finally, this study considers two types of ownership; family ownership and financial institution ownership (hereafter, bank ownership). Korean companies are mostly family-owned and controlled. High family ownership is one of the major features in Korean corporate governance. Bank ownership is due to debt covenant violation usually by financial distress. The family ownership and bank ownership are measured from 5 top owners of the company.

3.3. Economic model

This study employs panel data analysis with a fixed effects model to examine the determinants of long-term debt. While the financial data illustrate cross-sectional patterns, they are collected over a time-series spanning 11 years, making panel data analysis more suitable for such data set. The decision to use a fixed model regression is validated by the Hausman test, indicating a more efficient outcome from the fixed effect model compared to the random effect model. The econometric model is as below equation (1).

$$Y_{it} = \beta_i + \beta' X_i + \varepsilon_{it} \quad (1)$$

Y_{it} represents the dependent variable, the long-term debt ratio (Debt), where X_i denotes set of independent variables including profitability, cash, tangible and intangible assets, investment, free cash flow, R&D expenses, size, market-to-book ratio, volatility, sales growth, WACC, family ownership and bank ownership. ε_i is the error term.

4. Result

4.1. Variable description and summary statistics

Descriptive statistics are summarized in Table 1. The total number of the samples is 4741 cases over the 11-year study period, consisting of 1012 cases of unlevered firms and 3729 cases of levered firms. This statistical description suggests that unlevered companies exhibit better management performance. The table demonstrates that unlevered companies show features of relatively higher profitability with greater internal reserves, as indicated by the value of cash (Cash) and free cash flow (FCF). The mean value of the total debt ratio (TDebt) for levered firms is approximately double that of the unlevered firms. Unlevered firms exhibit higher values in profit, cash, investment (INV), free cashflow (FCF), market-to-book ratio (MB) and sales growth. The weighted average cost of capital (WACC) is slightly lower than that of levered firms. Sales growth (Salesgrowth) is higher in the unlevered group. In terms of ownership structure, family ownership and the bank ownership ratio are higher than those of levered firms. The size of the unlevered companies is relatively smaller than that of the levered companies. While the size increases level of debt capacity, it also reduces information asymmetry, and thus, the need for debt. The investment (INV) is also higher in the unlevered group. This suggests that

Table 1
Descriptive Statistics This table is the summary of descriptive statistics. Each variable is measured by the equations in the second column. The "Total Sample" in the third column demonstrates mean and standard deviations of total samples of the manufacturing companies. The 'Unlevered' comprises companies whose long-term debt level is "0" for 5 consecutive years from 2015 to 2019. The 'Levered' comprises companies from the total sample that are not classified as the unlevered companies.

Variables	Measure	Total Sample		Unlevered		Levered	
		N	Mean (SD)	N	Mean (SD)	N	Mean (SD)
Debt	Long-term Debt/Total Assets	4741	0.0647 (0.0867)	1012	0.005 (0.0243)	3729	0.0807 (0.0904)
TDebt	Total Debt/Total Assets	4741	0.4115 (0.2101)	1012	0.2326 (0.1641)	3729	0.4601 (0.1943)
SDebt	Short-term Debt/Total Assets	4741	0.1144 (0.1194)	1012	0.0523 (0.0915)	3729	0.1312 (0.1205)
Profit	Net Income/Total Assets	4741	0.0193 (0.1031)	1012	0.0426 (0.1225)	3729	0.0130 (0.0962)
Cash	Cash/Total Assets	4741	0.05852 (0.0648)	1012	0.0842 (0.0841)	3729	0.0511 (0.0566)
Tan	Tangible asset/Total Assets	4741	0.3196 (0.1762)	1012	0.2350 (0.1650)	3729	0.3425 (0.1721)
Intan	Intangible Asset/Total Assets	4741	0.0172 (0.0366)	1012	0.0136 (0.0276)	3729	0.0182 (0.0386)
INV	△Tan/Tan(t-1)	4741	0.0869 (0.7267))	1012	0.1714 (2.3688)	3729	0.0824 (0.6490)
FCF	Free Cash Flow/Total Assets	4741	0.0133 (0.1200)	1012	0.0231 (0.1257)	3729	0.0106 (0.1183)
RND	RND expenditure/Total Assets	4741	0.0051 (0.0147)	1012	0.0050 (0.0180)	3729	0.0052 (0.0137)
Size	LN(Asset)	4741	26.7108 (1.4208)	1012	26.36 (1.0959)	3729	26.7962 (1.4855)
MB	(Book Debt + Market Equity)/Book (Debt + Equity)	4741	2.8486 (2.4977)	1012	4.4416 (3.2797)	3729	2.4281 (2.0496)
Volatility	STDEV (5-year profit)	4741	0.0449 (0.0730)	1012	0.0427 (0.0809)	3729	0.0455 (0.0707)
Sales-growth	△Sales/Sales (t-1)	4741	0.0500 (0.2973))	1012	0.0516 (0.3589)	3729	0.0493 (0.2784)
WACC	Cost of capital	4741	0.0440 (0.0195)	1012	0.0436 (0.0171)	3729	0.0442 (0.0201)
Fowner	Family ownership in 5 top owners	4741	0.4365 (0.1898)	1012	0.4566 (0.1674)	3729	0.4311 (0.1951)
Bowner	Bank ownership in 5 top owners	4741	0.0475 (0.0932)	1012	0.0518 (0.0899)	3729	0.0464 (0.0941)

unlevered companies have enough internal reserves to carry out investment without debt, which complies with the POT. The level of R&D (RND) is similar in both groups. Profit volatility (Volatility) and cost of capital (WACC) are slightly lower in the unlevered group than in the levered group, implying less uncertainty or cost. At a glance, the table indicates that the level of debt does not comply with arguments by STT.

To conduct a more detailed comparison of the financial features between levered and unlevered firms, the levered companies are matched by industry and size to the previously selected unlevered companies, using the defined criteria. The companies in the levered group are of similar size to those in the unlevered group within the same industry. The initial number of unlevered companies was 92, but the sample was reduced to 53 companies based on the specified criteria. The comparison of financial data, using a *t*-test of two groups of levered and unlevered companies matched by industry and size is, summarized in Table 2.

Debt is extremely low for the unlevered group, even during 2011 and 2021. Short-term debt (SDebt) is approximately 4.4 % in the unlevered group while in the levered group, it is 14.6 %. Table 2 exhibits a similar trend to Table 1, with cash holding (Cash) being almost twice as large in the unlevered group compared to the levered group. This feature aligns with higher profit, cash and growth opportunities (MB) observed in the unlevered group. R&D, free cashflow (FCF), investment (INV), profit volatility (Volatility), sales growth (Salesgrowth) and size (Size) show no significant differences between the two groups. Finally, among the five major owners, family ownership and bank ownership are larger in the unlevered group than in the unlevered group. Jensen [15] suggested that debt can mediate agency problems. Additionally, managers with stock ownership can also reduce agency problems resulting in a decrease in debt (Agrawal & Nagarajan, 1990). In most Korean firms, founder family ownership and control are strong, and it is generally assumed that agency problem are less likely to occur. On the other hand, bank ownership is about 7 % in the unlevered group which is larger than 5 % in the levered group. Bank ownership exerts relatively strong obligatory power over management if the companies are unable to meet the covenant. Larger possession in unlevered group reflects an emphasis on investment rather than control over the company.

The correlation values between the variables are in Table 3. The correlation coefficients remain at low values, suggesting that multicollinearity is unlikely to be an issue in the regression analysis.

Both Fig. 1 and Fig. 2 is generated using the Stata 13.0 software package. Fig. 1 displays the trends in long-term debt, cash, and MB ratio for two matched groups - unlevered and levered - of the same size and industry. Long-term debt has decreased over time since 2000 when Korea was on the verge of leaving IMF bailout program, and relatively large-sized firms were advised by the government and IMF to reduce their debt. Long-term debt was less utilized for five years but it began to grow again in 2010 especially during the

Table 2
Descriptive data for the levered and unlevered firms – matched for similar size and industry This table is the summary of descriptive statistics. The "Unlevered" comprises companies whose long-term debt level is "0" for 5 consecutive years from 2015 to 2019. The "Levered" comprises companies that are similar in size with the unlevered companies in the same industry. The variable "Debt" is long-term debt, "TDebt" is total debt and "SDebt" is short-term debt.

Period	2011~2021				*t*-test	2015~2019				*t*-test
Variables	Unlevered		Levered			Unlevered		Levered		
	N	Mean (SD)	N	Mean (SD)		N	Mean (SD)	N	Mean (SD)	
Debt	616	0.0053 (0.0259)	616	0.0670 (0.0754)	−20.10***	280	0.0000 (0.0000)	280	0.0656 (0.0045)	−14.45***
TDebt	616	0.2074 (0.1527)	616	0.4533 (0.1893)	−25.37***	280	0.1791 (0.0072)	280	0.4367 (0.0114)	−19.05***
SDebt	616	0.0441 (0.0794)	616	0.1455 (0.1278)	−15.72***	280	0.0349 (0.0043)	280	0.1314 (0.0075)	−11.15***
Profit	616	0.04469 (0.1412)	616	0.0228 (0.1045)	3.09***	280	0.0426 (0.0043)	280	0.0275 (0.0080)	1.66*
Cash	616	0.0804 (0.0737)	616	0.0499 (0.0607)	7.94***	280	0.0835 (0.0047)	280	0.0477 (0.0035)	6.13***
Tan	616	0.2203 (0.1599)	616	0.3004 (0.1649)	−8.66***	280	0.2132 (0.0093)	280	0.2974 (0.0102)	−6.09***
Intan	616	0.0108 (0.0261)	616	0.0141 (0.0203)	−2.51***	280	0.0098 (0.0013)	280	0.0148 (0.0013)	−2.66***
INV	616	0.0971 (1.0172)	616	0.0987 (0.7418)	−0.03	280	0.1320 (0.0702)	280	0.1024 (0.0318)	0.39
FCF	616	0.0275 (0.1376)	616	0.0104 (0.1726)	1.93**	280	0.0190 (0.060)	280	0.0229 (0.0141)	−0.25
RND	616	0.0052 (0.0185)	616	0.0055 (0.0139)	−0.32	280	0.0058 (0.0012)	280	0.0056 (0.0008)	0.11
Size	616	26.58 (0.8395)	616	26.5078 (0.87)	1.59*	280	26.59 (0.0495)	280	26.56 (0.0496)	0.53
MB	616	4.3555 (2.9329)	616	2.4700 (2.0745)	12.93***	280	4.6746 (0.1729)	280	2.7199 (0.1414)	8.79***
Volatility	616	0.0463 (0.0977)	616	0.0393 (0.0614)	1.51*	280	0.04716 (0.0055)	280	0.0411 (0.0775)	0.84
Sales-growth	616	0.0589 (0.4062)	616	0.0488 (0.2017)	0.55	280	0.0364 (0.0227)	280	0.0345 (0.0117)	0.06
WACC	616	0.0432 (0.0166)	616	0.0430 (0.0189)	0.28	280	0.0397 (0.0009)	280	0.0416 (0.0010)	−1.36*
Fowner	616	0.4719 (0.1576)	616	0.4356 (0.2130)	3.39***	280	0.4812 (0.0092)	280	0.4363 (0.0124)	2.89***
Bowner	616	0.0588 (0.0988)	616	0.0413 (0.0745)	3.50***	280	0.0695 (0.0062)	280	0.0511 (0.0046)	2.38***

*p < 0.1, **p < 0.05, ***p < 0.01

Table 3
The Correlation between the variables.

	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12	V13	V14
V1	1.0000													
V2	0.1153***	1.0000												
V3	−0.0855***	−0.2527***	1.0000											
V4	−0.0553***	0.0281*	−0.0545*	1.0000										
V5	0.0446***	0.0113	−0.0222	0.0343**	1.0000									
V6	0.2992***	−0.0269*	−0.0879***	−0.0656***	−0.1807***	1.0000								
V7	0.0012	0.1035	−0.0918***	0.1538***	0.0138	−0.0121	1.0000							
V8	0.1240***	−0.0958***	−0.0014	0.1025***	−0.0314**	0.0317**	0.0614***	1.0000						
V9	−0.1023***	0.0751***	−0.0009	0.0049	0.0078	0.1431***	0.0049	−0.1256***	1.0000					
V10	0.2679***	0.0402***	−0.0532***	0.0847***	0.0788***	−0.0242*	0.0356**	0.0111	0.0259*	1.0000				
V11	0.2094***	0.2458***	−0.2601***	0.0707***	0.0620***	0.0839***	0.1417***	0.0699***	−0.0266*	0.0287*	1.0000			
V12	−0.1514***	−0.0047	−0.0014	0.0506***	−0.0277*	0.0049	0.0459**	0.0908***	0.1209***	−0.0162	0.0620***	1.0000		
V13	0.1434***	−0.0561***	0.0117	−0.0935***	0.0284*	0.0245*	−0.1152***	−0.1046***	−0.1334***	0.0628***	−0.0052	−0.2317***	1.0000	
V14	0.0559***	0.0396***	−0.0264*	0.0153	−0.0192	0.0381	0.0097	0.2465***	0.0434***	−0.0171	0.0833***	−0.0291**	−0.2351***	1.0000

*p < 0.1, **p < 0.05, ***p < 0.01.
V1: Profit, V2:Cash, V3: Tan, V4: Intan, V5:INV, V6; FCF,V7: RND, V8: Size, V9:Volatility,V10: Salesgrowth, V11:MB, V12:WACC, V13:Fowner, V14:VBowner.

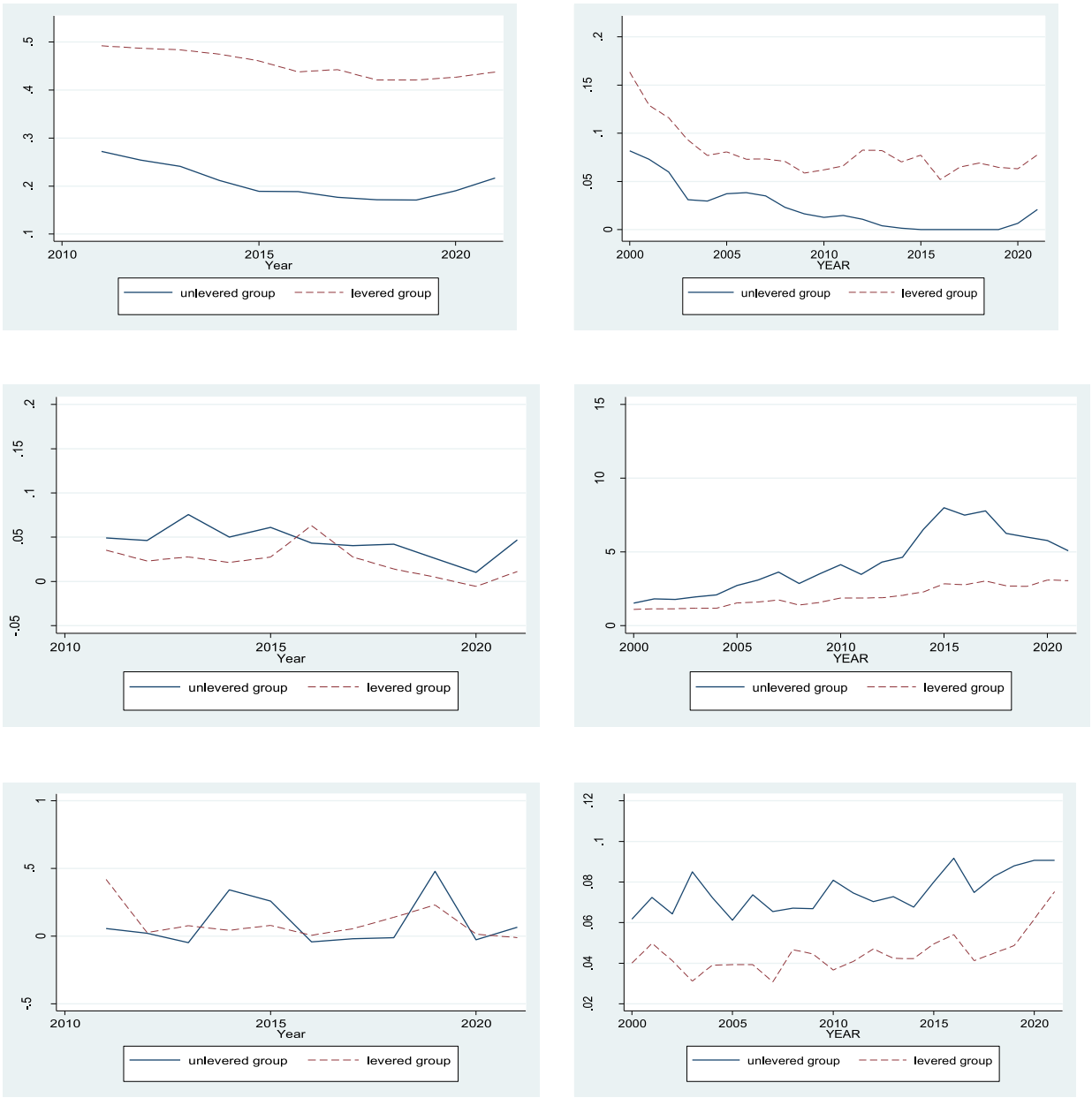

Fig. 1. Total Debt, Longterm Debt, Profit, Market to Book Ratio, Invest and Cash trend of levered and unlevered group (siz and industry adusted). All the figures are standardized by total assets as described in the Table. 1

pandemic period due to high liquidity in the market and low interest rates.

The trend of cash holding (CASH) is similar in both groups. Notably, the higher cash holding in the unlevered group has been maintained for 20 years from 2000, as shown in Fig. 1. The MB ratio is higher in the unlevered group, and the trend rose dramatically during the period from 2012. The gap between the levered and unlevered groups started to grow, peaking around year 2015–2017. The MB ratio peaks while the long-term debt is lowest. Profit and investment are higher in the unlevered group compared to that of levered.

Fig. 2 shows the trends in long-term debt, borrowed from financial institutions, long-term bonds, total equity, equity level, family ownership and bank ownership. In Fig. 1, long-term debt has been decreasing for the last 2 decades, and from year 2011–2021, the trend has remained nearly stable. For the industry and size matched group, the trend is similar. The equity and total equity used in the figure are not ratios but actual monetary value. The equity level of unlevered group stayed stable, but that of levered group increased gradually. The average increase in equity is 2 %, while long-term debt (bank) increased by 4.7 % and long-term bonds by 4.3 %. The total equity level increased by an average of 6 %. Focusing only on the size of the equity, that of levered companies are larger than unlevered companies. However, unlevered companies have a higher total equity level, including retained earnings and capital surplus.

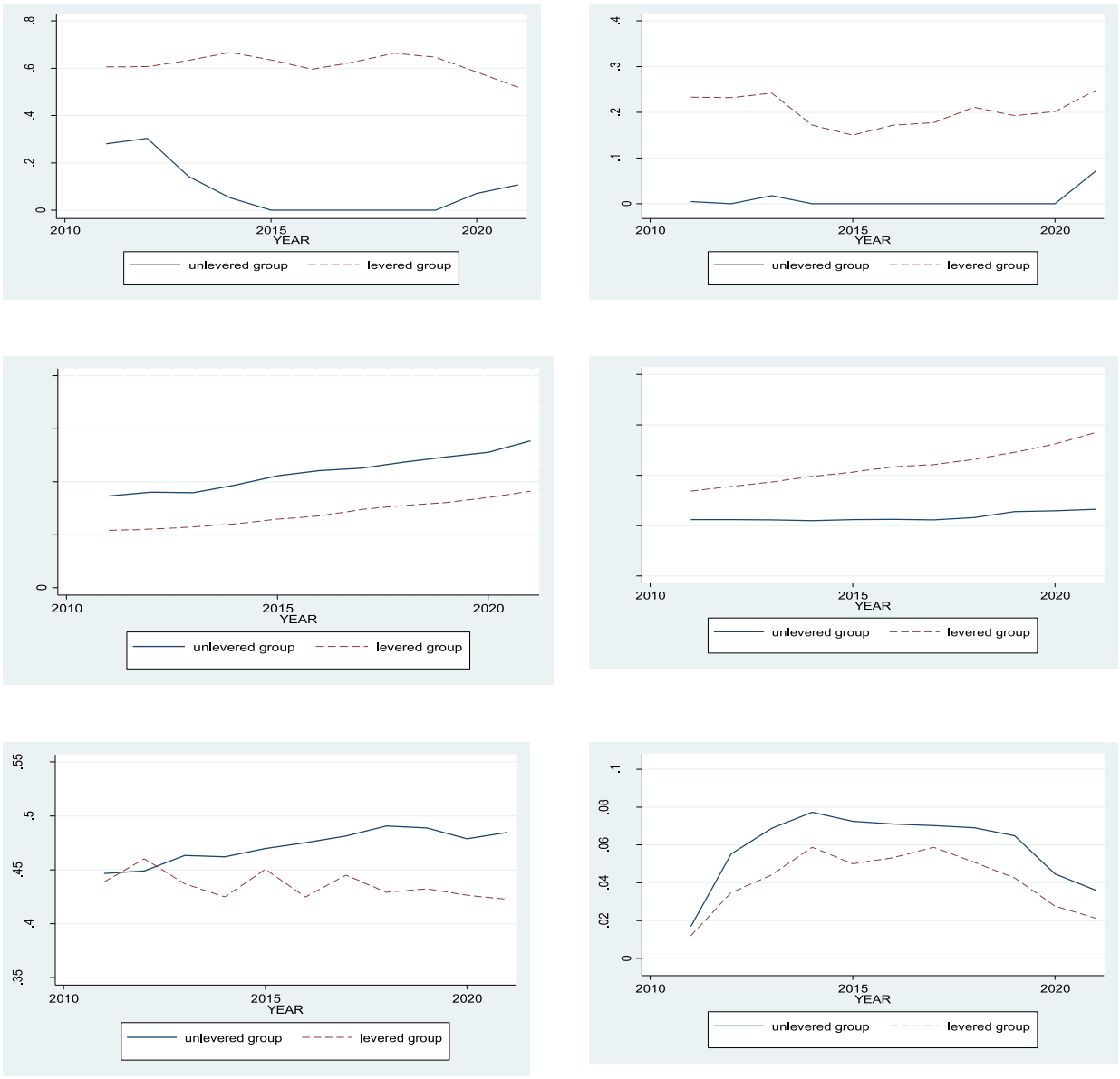

Fig. 2. Longterm Debt (bank) and Long-term Bonds, Total Equity and Equity, Family Owner, and Bank Owner trend of levered and unlevered group (siz and industry adjusted)). All the figures, except Total Equity and Equity are standardized by total assets as described in the Table.1

This implies that the outstanding stock of unlevered companies is smaller in size, but their performances is higher than that of levered companies. Restructuring the capital according to profit is not a general trend in the market. In terms of ownership, both family owners and bank owners are higher in the unlevered group. Family ownership gradually increases in the unlevered group but decreases gradually in the levered group. Bank ownership displays an interesting feature, peaking around 2014 then decreasing. It may that the owners of the unlevered group purchased ownership from the bank owners with the intention of investment rather than control over the firm.

4.2. Empirical results

The panel data is regressed by fixed effect model, with the Hausman test supporting that the fixed effect is more efficient than random effect model. Table 4, summarizes the results of the panel data regression analysis between long-term debt and independent variables. The purpose of this analysis is to observe the coefficient of variables on the long-term debt. The analysis first examines the period between 2011 and 2021 to see how the determinants affected debt. The period from 2011 to 2014 is also analyzed separately to see the if there was any influence before the companies became unlevered. The total sample of all firms is examined, and industry and

Table 4
Estimation results from panel data analysis on debt ratio (year 2011–2021) This table summarizes the result of the panel data regression analysis. The value in the parenthesis is the t-value of the coefficient. The "Unlevered" comprises companies whose long-term debt level is "0" for 5 consecutive years from 2015 to 2019. The "Levered" comprises companies that are similar in size with the unlevered companies in the same industry.

Variables	Total sample	Total sample	Industry and Size Match		Industry and Size Match	
			Levered	Unlevered	Levered	Unlevered
Period	2011–2021	2011–2014	2011–2021		2011–2014	
Independent Dependent	Long-term Debt	Long-term Debt	Long-term Debt	Long-term Debt	Long-term Debt	Long-term Debt
Profit	−0.0268 (−2.43)***	−0.0493 (−3.05)***	0.0210 (0.62)	−0.0467 (−4.31)***	0.0228 (0.32)	−0.0038 (−0.29)
Cash	0.0232 (1.11)	0.0147 (0.43)	0.0499 (0.93)	0.0260 (1.19)	−0.1567 (−1.84)*	−0.0183 (−0.55)
Tan	0.0916 (5.94)***	0.0423 (1.57)	0.2310 (5.81)***	0.0611 (2.81)***	0.0292 (0.40)	0.0779 (2.70)***
Intan	0.0123 (0.26)	0.1426 (1.12)	0.4559 (2.39)**	0.09385 (1.87)*	0.6132 (1.45)	0.4737 (2.84)***
INV	0.0383 (2.96)***	0.0017 (1.05)	0.0175 (0.54)	−0.0014 (−0.11)	0.0071 (2.13)**	−0.0007 (−0.76)
FCF	−0.0267 (−3.21)***	−0.0271 (−2.16)**	−0.1473 (−0.75)	0.0092 (0.93)	−0.0599 (−1.68)*	−0.0057 (−0.50)
RND	−0.0271 (−0.21)	0.0904 (0.35)	−0.6792 (−1.87)*	−0.1554 (−1.26)	−0.5461 (−0.51)	−0.1628 (−0.57)
Size	0.0336 (9.31)***	0.0367 (4.19)***	0.0465 (5.07)***	0.0206 (3.60)***	0.0952 (3.93)***	0.0123 (0.96)
Volatility	0.0342 (1.86)*	0.1997 (5.48)***	0.0477 (0.80)	0.0316 (1.61)	0.0936 (0.47)	−0.0233 (−0.68)
Salesgrowth	0.0020 (0.51)	−0.0026 (−0.47)	−0.0017 (−0.15)	0.0046 (1.64)	−0.0161 (−0.95)	0.0056 (1.41)
MB	−0.0056 (−9.16)***	−0.0036 (−3.28)***	−0.0065 (−4.12)***	−0.0022 (−3.75)***	−0.0026 (−0.82)	−0.0007 (−0.81)
WACC	−0.0484 (−0.88)	−0.1095 (−1.31)	0.0289 (0.20)	0.0661 (0.96)	−0.4277 (−2.06)**	0.1387 (1.80)*
Fowner	0.0220 (2.48)**	0.0031 (0.24)	−0.0021 (−0.11)	−0.1385 (−8.28)***	0.0298 (1.09)	−0.0164 (−0.75)
Bowner	0.0591 (3.79)***	0.0403 (1.79)*	−0.2696 (−0.52)	−0.0054 (−0.24)	−0.1070 (−1.52)	−0.0081 (−0.32)
Cons.	−0.8650 (−8.99)***	−0.9203 (−3.92)***	−1.2253 (−5.15)***	−0.4836 (−3.16)***	−2.4332 (−3.78)***	−0.3359 (−0.98)
F-value	9.40***	7.84***	8.22***	3.45***	7.76***	3.29***
Within R^2	0.0595	0.0403	0.1779	0.1971	0.1729	0.2189
Between R^2	0.2406	0.1986	0.2373	0.0000	0.1755	0.0163
Overall R^2	0.1587	0.1542	0.1856	0.0195	0.1557	0.0520
N	4664	2131	613	595	279	272

*p < 0.1, **p < 0.05, ***p < 0.01.

size matched pairs are analyzed.

The panel data regression analysis suggests that factors such as profit (Profit), tangible asset (Tan), size (Size) and growth opportunities (MB) are significant determinants of long-term debt. The significance of other variables varies by group and period of analysis. There are no influential differences between the two periods. The analysis of the entire period, involving more samples and a longer time frame, demonstrates statistical significance. The differences between the two periods - the entire period and 2011 to 2014- are tangible asset (Tan), investment (INV) and family ownership.

The profit (Profit) is a major variable that distinguishes between STT and POT, and is strongly negatively related to debt. This relationship is also observed in unlevered companies; however, levered companies do not show any statistically significant relationship. Frank and Goyal (2015) asserted that an increase in profit increases total asset value, therefore, debt ratio relatively decreases. However, the trend of the long-term debt in the unlevered firms and in levered firms decreases or remains stable over time that profit increase is not the sole cause of the leverage ratio. Profitable companies tend to rely on internal reserves rather than external financing, especially debt. This can be seen in the influence of free cash flow (FCF) on debt as well, which is negatively related to long-term debt. Cash (Cash) does not show any particular significance. The negative relationship between FCF and debt suggests that free cash flow, a profit-based cash flow, functions as an internal reserve rather than an indicator of agency problems.

Tangible assets (Tan) and intangible assets (Intan) have a positive relationship with debt. These two types of assets have different characteristics: the former is a deployable and thus suitable for debt financing, while the latter requires equity financing in theory. However, both tangible assets and intangible assets can be used as collateral when obtaining debt financing. Investment (Inv) is positively related to debt, particularly in the levered group, implying that levered firms tend to finance investments with debt. This can be observed more clearly by examining a company's internal reserves of cash and free cash flow.

Size (Size) is a significant determinant of debt levels for both STT and POT. Larger firms generally have greater debt capacity and lower information asymmetry. The regression results show positive relationship with debt. The size variable has a particular strong impact on debt capacity. The risk represented by profit volatility (Volatility) is positively related to long-term debt, indicating that more risky companies tend to rely on debt financing.

Market-to-book ratio (MB), a measure of growth opportunities, is inversely related to long-term debt. The more the growth opportunities companies have, the less they tend to borrow. Companies with growth potentials and lower debt may imply that more cash is being reserved for future growth. This result is consistent with the findings of Opler et al.[24] and Myers (1984), who asserted that higher debt levels may lead to underinvestment fears for high growth opportunity companies. FCF is not always welcomed by shareholders, as it may cause management discretion to decrease in value or lead to over-investment problems that result in value loss [36,37]. The regression results show an inverse relationship between FCF and long-term debt, meaning that the more FCF a company has, the less it tends to borrow without any particular political reason interfering.

The cost of capital (WACC) only exhibits statistical significance between 2011 and 2014. During this period unlevered companies demonstrates positive relationship between long-term debt and WACC, while levered companies show negative relationship.

Unlevered companies enjoy lower financing costs, implying that they possess greater debt capacity than their levered counterparts. The high financing costs may have deterred debt financing in the levered group, and this trend holds true for the entire period between 2011 and 2021.

Lastly, with respect to ownership structure, family ownership (Fowner) does not appear to have a preference for debt financing in the unlevered group. Bank ownership does not insist on debt financing and shows no statistical significance. But in the whole period analysis, it can be inferred that bank owners invest in unlevered companies as institutional investor, while in the levered group, they are more like controllers. Bank owners may be pressure-sensitive on average but for the two groups of levered and unlevered, they are pressure insensitive [38]. In Fig. 2, family ownership increases over time and bank ownership tracks inverted U shape. Unlevered companies have larger family and bank ownership compared to levered companies.

In summary, financial decision-making is similar between the groups. The difference of the levered and unlevered group lies in the extent to which they possess the resources. The empirical findings are consistent with POT rather than STT. Profit does not support the arguments put forth by STT but rather align with the POT perspective. Regardless of whether they are levered or unlevered, companies set aside resources for future investments. Cash holding may not necessarily reflect company performance,and the regression analysis does not indicate any statistical significance. Tangible assets (Tan) and intangible assets (Intan), which are two distinct assets , are both associated with debt financing. Investment (INV) is positively related to long-term debt for the entire sample, contradicting STT assertion that companies avoid debt due to underinvestment concerns, while the agency problem is no longer an issue [5,15]. The positive relationship implies that the internally reserved funds are insufficient to cover investment expenditure, hence the remainder is financed through debt, resulting in an increase in debt levels. The lack of a significant relationship between the long-term debt and investment in the unlevered group indicates that such companies possess ample slack resources to fund investment through internal reserves. With respect to innovative investments, research development (R&D) expenditure has little impact on debt, except for the levered group, where an inverse relationship supports both STT and TCE. R&D investments are risky and uncertain, and companies' innovative investment strategies often require equity financing. R&D expenditure in the unlevered group increases gradually over time, while in the levered group, the upward trend breaks after 2015 and trends downwards. In Table 4, levered companies (year 2011–2021) exhibit an inverse relationship between debt and R&D (RND), indicating that companies finance R&D investments with less debt. Unlevered companies show no statistical relationship since they are well-reserved with internal funds.

The lack of a statistically significant relationship between cash and debt in Table 4 does not necessarily mean that cash is not relevant to financing. There are several possible explanations for this result. One explanation is that unlevered companies have had no long-term debt for 5 consecutive years from 2014 and if any debt exists the level is low. In such cases, cash does not emerge as a determinant for debt. Companies may hold cash for precautionary or transaction reasons. Cash holdings might be a strategy for companies facing financial distress or anticipating future uncertainty, stemming from reasons such as economic downturns, unexpected expenses, or changes in the market. Holding cash can provide a buffer and help companies weather unexpected events [24,26,27,39,40]. Companies with more investment opportunities hold cash for the similar reasons [24,26].

Table 5 examines the relationship between growth opportunities (MB) and cash holdings. The results show that companies with greater growth opportunities tend to hold more cash, which is consistent with the notion that cash is held as a precautionary measure in the face of future uncertainty. Additionally, the results suggest that companies with more growth opportunities tend to finance their investments with less debt, supporting the idea that they rely more on internal reserves for future investments. The lack of statistical significance in the unlevered group may be due to the low explanatory power indicated by the low R^2. Future growth opportunity demands more cash, and companies finance with less debt.

The empirical regression results imply that the more profit, size and growth opportunities a company possesses the less debt it holds. The different behaviours of the levered and unlevered group are only seen in the ownership structure, as company ownership determines the debt level. In Korean manufacturing companies listed on the KRX, POT has a better explanation than STT. Companies tend to reserve internal finance.

When do companies decide to finance through debt? What motivates them to use debt? To answer this question, the study focuses

Table 5

Estimation results from panel data analysis on growth opportunities and cash (year 2011–2021) This table is the summary of panel data regression analysis result. The value in the parenthesis is the t-value of the coefficient. The "Levered" in the second column is companies from all the sample not classified as the "unlevered". The "Unlevered" comprises companies whose long-term debt level is "0" for 5 consecutive years from 2015 to 2019. The "Levered" comprises companies that are similar in size with the unlevered companies in the same industry.

Variables	Total sample	Levered	Unlevered	Industry and Size Matched	
				Levered	Unlevered
Independent Dependent	Cash	Cash	Cash	Cash	Cash
MB	0.0042 (9.16)***	0.0057 (10.41)***	0.0019 (2.16)**	0.088 (6.96)***	0.0002 (0.15)
Cons.	0.0460 (31.52)***	0.0370 (24.53)***	0.0760 (17.85)***	0.0281 (7.77)***	0.0796 (13.47)***
F-value	10.36***	8.25***	13.94***	8.75***	11.70***
Within R^2	0.0193	0.0312	0.0052	0.0801	0.0000
Between R^2	0.0880	0.0425	0.0398	0.0036	0.0008
Overall R^2	0.0604	0.0364	0.0373	0.0336	0.0034
N	4687	3708	979	613	595

*p < 0.1, **p < 0.05, ***p < 0.01.

on period between 2019 and 2021 when long-term debt starts to demonstrate increasing trend. Among the unlevered companies, 9 companies increased their long-term debt in 2020, and 5 more companies increased their long-term debt in 2021. The results of the regression analysis between the period 2020 and 2021 in Table 6, suggest that the major variables affecting debt are R&D investment (RND) and the cost of capital (WACC). The explanatory power may be weak due to limited sample size and time frame. R&D investment is risky and uncertain that companies finance it with their slack resources or equity [41–43]. Unlevered companies invest more in R&D than levered companies with internal slack resources. The cost of capital (WACC) incurred from the financing sources is inversely related to long-term debt. Since 2020, the pandemic has locked down the entire economy, but the money supply in the market has been abundant, pushing down the interest rate on debt. This has made the cost of capital even lower, and companies have had easy access to long-term funds at relatively low interest rates.

MM(1958) initially argued that the level of leverage is irrelevant to the value of the firm, but later they revised their opinion and acknowledged a positive effect of debt on firm value. They asserted the core activity that impacts firm value is investment. This study suggests that companies with more growth opportunities tend to hold more internal funds and have lower debt levels. Unlevered companies, which are more profitable, tend to have higher levels of internal reserves and more growth opportunities.

This study shows that growth opportunities, not debt level, contribute to firm value. Firm value is estimated using by two ways, free cashflow (FCF) and earnings before interest and tax (EBIT) divided by the cost of capital (WACC). Table 7, compares the value of levered and unlevered firms. In the whole period analysis, 2011 to 2021, the average value of unlevered group is 0.6394 compared to 0.3467 for the total sample and 0.2708 for levered firms. In the period between 2014 and 2019, the value gap was much higher, with the unlevered companies having a value about six times higher than that of the levered companies. Between 2015 and 2019, when the unlevered companies with no long-term debt, the estimated values were similar between the two groups. The stable income guaranteed by zero debt is a merit, but the leverage effect is missing in the unlevered group. During the pandemic, the unlevered companies still exhibit higher value. The trend is similar for the value estimated by EBIT divided by WACC in the in the 5th column and below.

Finally, to investigate whether family owners prefer equity financing, this study conducted a panel data regression analysis summarized in Table 8. The dependent variables, equity (Equity) and natural logarithm of equity (LN (Equity)), are used. The former is measured by the share capital, defined as paid-in capital less share premium divided by total assets. In the total sample, family ownership is negatively related to equity (Equity) and significant only for the size of the equity measured in natural logarithm. When comparing levered and unlevered companies, levered companies are negatively related to equity, while unlevered companies increase equity as they increase ownership. The family ownership of the unlevered companies increases size of the equity. On the other hand, bank ownership is negatively related to equity, decreasing its proportion to equity. Family owners prefer equity financing, but its impacts are limited. Bank owners prefer debt financing, but recent companies with less debt preference did not substitute equity financing but relied on internal reserves for future growth opportunities.

Table 6
Estimation results from panel data analysis on long-term debt ratio (year 2020–2021) This table is the summary of panel data regression analysis result. The value in the parenthesis is the t-value of the coefficient. The "Levered" in the second column is companies from all the sample not classified as the "unlevered". The "Unlevered" comprises companies whose long-term debt level is "0" for 5 consecutive years from 2015 to 2019. The "Levered" comprises companies that are similar in size with the unlevered companies in the same industry.

Variables	Total sample	Levered	Unlevered	Industry and Size Adjusted	
				Levered	Unlevered
Independent Dependent	Debt	Debt	Debt	Debt	Debt
Profit	−0.0949 (−2.45)**	−0.0852 (−1.81)*	−0.0647 (0.266)	−0.2456 (−1.66)	−0.0601 (−0.76)
Cash	0.0155 (0.29)	0.0284 (0.40)	0.0273 (0.46)	0.0657 (0.37)	0.0069 (0.07)
Tan	0.0792 (1.22)	0.0793 (0.94)	0.0695 (0.85)	0.0504 (0.25)	−0.1310 (−0.74)
Intan	−0.0967 (0.2367)	−0.0539 (−0.20)	−0.5772 (−0.91)	−0.8310 (−0.46)	−1.7578 (−1.77)*
INV	0.0041 (0.50)	0.0011 (0.08)	0.0093 (1.12)	−0.0244 (−0.36)	0.0576 (1.94)*
FCF	−0.0451 (−1.80)*	−0.0654 (−2.17)**	0.0204 (0.46)	−0.0203 (−0.21)	0.0261 (0.37)
RND	−0.3970 (−0.65)	0.0980 (0.13)	−2.5413 (−2.59)**	−1.1395 (−0.31)	−2.5789 (−2.06)**
Size	0.0355 (1.56)	0.0284 (1.01)	0.0268 (0.83)	0.1940 (2.23)**	−0.0613 (−1.05)
Volatility	−0.0586 (−0.79)	−0.0468 (−0.53)	−0.1682 (−1.24)	0.0705 (0.53)	−0.1686 (−1.08)
Salesgrowth	0.0040 (0.55)	0.0031 (0.31)	0.0055 (0.77)	−0.0723 (−2.27)**	0.0181 (1.44)
MB	−0.0029 (−1.55)	−0.0028 (−1.06)	−0.0044 (−2.50)**	0.0018 (0.26)	−0.0067 (−2.50)**
WACC	−0.4353 (−1.80)*	−0.4336 (−1.42)	−0.6738 (−2.35)**	−0.5187 (−0.68)	−0.6019 (−1.37)
Fowner	−0.0333 (−0.67)	−0.0582 (−1.02)	0.0724 (0.72)	−0.0440 (−0.27)	0.1458 (1.03)
Bowner	0.0304 (0.38)	0.0733 (0.72)	−0.1214 (−1.38)	−0.1154 (−0.38)	−0.1825 (−1.29)
Cons.	−0.8694 (−1.39)	−0.6654 (−0.86)	−0.6717 (−0.78)	−5.0699 (−2.13)**	1.7124 (1.09)
F-value	6.03***	5.27***	5.72***	4.07***	5.10***
Within R^2	0.0710	0.0655	0.3686	0.3403	0.4929
Between R^2	0.1480	0.1462	0.0045	0.0260	0.0040
Overall R^2	0.1366	0.1341	0.0009	0.0298	0.00014
N	840	663	177	110	109

*p < 0.1, **p < 0.05, ***p < 0.01.

Table 7
Comparison of estimated firm value This table demonstrates mean value of estimated firm value by using FCF(free cash flow) divided by WACC (Weighted Average of Cost of Capital) in the first row, and EBIT (Earning Before Interest and Tax) divided by WACC(Weighted Average of Cost of Capital) in the 5th row. The two estimated firm values from the 'Levered' and 'Unlevered' are t-tested to analyze the difference between the two groups. The second column is analysis of total period. The third column represents the period between 2011 and 2014, that is before the period of based years to select unlevered companies. The 4th column is the base year. The 5th column is the years after the base year, pandemic period. The value in the parenthesis is the Standard deviation.

Variable: FCF/WACC	Year: 2011–2021	Year: 2011–2014	Year: 2015–2019	Year: 2020–2021
Total Sample	0.3467 (2.9080)	0.2961 (2.5723)	0.4756 (3.0729)	0.1944 (2.900)
Matched Industry and Size	0.2708 (4.0187)	0.1565 (1.7479)	0.5891 (0.3453)	−0.0018 (0.2111)
Levered	0.6394 (3.6048)	0.9016 (4.3284)	0.54311 (0.1478)	0.1049 (0.3277)
Unlevered				
T-Test	1.6388*	2.4994***	−0.1241	
Variable: EBIT/WACC	Year: 2011–2021	Year: 2011–2014	Year: 2015–2019	Year: 2020–2021
Total Sample	0.7962 (1.3854)	0.7194 (1.1520)	0.8357 (1.3888)	0.8541 (1.7495)
Matched Industry and Size	0.79014 (1.3379)	0.7225 (0.0662)	0.9233 (0.0687)	0.6882 (0.1190)
Levered	0.9354 (1.1082)	0.9508 (0.0667)	0.9571 (0.0751)	0.8592 (0.1852)
Unlevered				
T-Test	1.990**	2.4232***	0.3309	0.7787

*p < 0.1, **p < 0.05, ***p < 0.01.

Table 8
Estimation results from panel data analysis on Equity This table is the summary of panel data logistic regression analysis result. The value in the parenthesis is the t-value of the coefficient. The "Levered" in the second column is companies from all the sample not classified as the "unlevered". The "Unlevered" comprises companies whose long-term debt level is "0" for 5 consecutive years from 2015 to 2019. The "Levered" comprises companies that are similar in size with the unlevered companies in the same industry.

Variables	Total Sample	Total Sample	Industry and Size Adjusted		Industry and Size Adjusted	
			Levered	Unlevered	Levered	Unlevered
Independent Dependent	Equity	LN (Equity)	Equity	Equity	LN (Equity)	LN (Equity)
Fowner	−0.0025 (−0.29)	−0.1307 (−3.02)***	−0.0062 (−0.47)	−0.0156 (−1.47)	−0.2890 (−3.01)***	0.1727 (1.74)*
Bowner	−0.0432 (−2.79)***	−0.0509 (−0.65)	−0.0457 (−1.27)	−0.0390 (−2.62)***	−0.1418 (−0.54)	−0.0985 (−0.71)
MB	−0.0031 (−5.35)***	0.0141 (4.85)***	0.0004 (0.39)	−0.0006 (−1.58)	0.0265 (3.55)***	–0.0145 (−4.08)***
Constant	0.1110 (25.13)***	23.9136 (1076.82)***	0.0977 (14.12)***	0.0761 (14.24)***	23.785 (472.90)***	23.35 (468.12)***
F-value	30.52***	204.66***	60.74***	157.76***	129.16***	350.50***
Within R^2	0.0088	0.0080	0.0033	0.0240	0.0435	0.0393
Between R^2	0.0521	0.0051	0.0000	0.0430	0.0079	0.0226
Overall R^2	0.0361	0.0039	0.0001	0.0276	0.0100	0.0007
N	4687	4687	616	616	616	616

*p < 0.1, **p < 0.05, ***p < 0.01.
Independent Variable Equity is pain-in capital less share premium/total asset. LN(Equity) is Log natural (paid-in capital less share premium).

5. Conclusions and discussions

The purpose of this study is to compare the determinants of debt for levered and unlevered companies, especially analyzing two groups of companies matched by size and industry. The recent market trend of decreasing debt levels contradicts conventional theories that suggesting that debt financing is related to the economic value of companies, with an optimal level of debt that maximizes value.

To examine the effects of less debt on firm value, this study focuses on unlevered companies defined as having no long-term debt for five consecutive years (2015–2019) and analyzes financial data from 2011 to 2021 (11 years) to identify the factors affecting long-term debt. The results of regression analysis suggest, first, unlevered companies tend to be more profitable, with higher internal reserves, cash flow, and future growth opportunities, compared to levered companies. Second, the value of unlevered companies is higher, due to their higher free cash flow and EBIT and lower cost of capital. This implies a higher economic value for unlevered companies suggesting that debt does not seem to increase firm value, or at most has only a minor influence compared to other factors, during the period of analysis. Third, ownership has an influence on financing decisions. In Korea, where companies are mostly family-controlled, there is less increase in equity value to avoid dilution of ownership during the period of analysis. With fewer agency problems, they require less debt levels when they have internal reserves. This type of ownership invites less risk and cost, making more internal reserves preferable to management. Finally, multiple complicated factors influence financing decision, making it difficult to establish a general rational idea. Unlevered companies maintain higher cash levels compared to levered companies. It doesn't seem that companies are pegging their cash to certain financial variables, but the level of cash is a long historical trend for certain companies, especially for unlevered ones. Macro-economic factors play a significant role in debt financing, as Korean companies have experienced severe economic downturn in the late 1990s suffering from credit crunches. The lessons for managers are to stick with stable capital not

vulnerable to external economic situations while building their internal capacity.

The findings include that unlevered companies are related to profitability whose market value higher than their levered counterparts in the same industry with same asset size. The results also indicate that unlevered companies possess high cash holdings, which is a long trend for the unlevered companies.

Debt is a useful source of capital, but all the lessons the managers have learned, though not much explained in the theories, point to internal reserve being preferable while debt is less desirable. This may indicate that cost incurred by the risk of using debt financing is larger than cost of internal reserve, which may be due to uncertain economic environment of the companies.

This study makes a contribution by examining recent behaviours of manufacturing companies, especially the trend of avoiding debt financing. Companies find debt financing to be costly compared to internal reserves, especially in economic environment where uncertainty is high, and globalization is prevalent. Companies consider internal reserves to be a better source for future growth for they prioritize less risk and safe assets over profitability. This would provide a useful benchmark for companies to make financial decisions.

The limitations of this study are twofold. Firstly, the research method employed focused on interactions between financial factors and long-term debt but did not utilize innovative methodologies to address the research question. A more meticulous approach is necessary to enhance the analysis results. Secondly, the dataset utilized in the analysis might have been provided better explanatory power had it spanned more than 20 years. These limitations will be addressed in future research.

CRediT authorship contribution statement

Youngsoo Ra: Writing – review & editing, Writing – original draft, Visualization, Validation, Resources, Methodology, Investigation, Formal analysis, Data curation, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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