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Impacts of Financial Constraints on Firm Value for KONEX Listed Firms*

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Abstract

Purpose: This study empirically investigates what factors contribute to corporate value in the Korea New Exchange (KONEX) market and determines whether financial constraints contribute any effect on it. **Research design, data and methodology**: A fixed-effect panel regression model was utilized to analyze financial constraints on firm value for KONEX listed firms through the fiscal period from 2013 to 2020. **Results**: we find that firms' research and development, volatility, size, and sales growth give significant impacts to firm value, but the significance and direction are different. In addition, no significant relationship exists between the largest shareholder's equity ratio and firm value in all models. The debt-to-equity ratio did not show a significant relationship with corporate value. A significant negative relationship was found between R&D and corporate value in the entire sample. Volitility exhibited a positive relationship with corporate value in the entire sample and financially unconstrained companies. Firm size presented a significant negative relationship with company value in all models. Sales growth showed a significant negative relationship with corporate value in financially constrained companies. **Conclusions**: No difference is found between financially constrained and unconstrained companies in the KONEX market. We can infer that KONEX companies have a large difference with KOSPI or KOSDAQ. Further analysis is needed on the differences among these markets.

Keywords : KONEX, financial constraints, KZ index, fixed effect model, panel regression

JEL Classification Code: G10, G14, G32

1. Introduction

According to the statistical data of the Ministry of Small and Medium-sized Enterprises (SMEs) and Startups (as of 2017), SMEs in Korea accounted for 99.9% of the total companies, and the number of SMEs was 82.9% of the total company employees. SMEs play an important role in national economic development, such as job creation and employment expansion, technological innovation, and economic revitalization. Specifically, the development of technologically innovative SMEs can not only create high added value but also have a positive effect on economic growth.

However, the external managerial situation of Korean companies is difficult, as exhibited in concerns about a global economic recession aggravated by the foreign exchange crisis in 1997, the global financial crisis in 2008, and the Greek debt crisis in 2011 and the recent slowdown in exports due to the deepening trade friction between the US and China (Kang, 2019). In addition, the development of SMEs in the early stages of establishment often experiences difficulties due to

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restrictions on various uncertain sources, such as the COVID-19 pandemic that started at the end of 2019. Among them, financing is the largest problem that limits the survival and development of SMEs. The reason is that SMEs require more costs than large companies to raise funds such as loans, and they face greater obstacles, limiting their development and greatly affecting their value (Beck et al., 2005).

Therefore, the Korea New Exchange (KONEX) market, as a secondary market, aims to relieve the Korean government's restrictions on corporate financing, activating the financing of SMEs and venture businesses through the capital market in the form of direct stock issuance and helping SMEs in the initial stage of establishment. The KONEX, a stock market dedicated to small and medium-sized venture companies, was opened in July 2013.

Although the number of listed companies and market capitalization have grown steadily since the launch of the KONEX market, the proportion of individual investors is still very high, whereas that of institutional investors and venture capitalists is low (Hwang, 2017). In the early stage of the KONEX market opening, studies on market revitalization methods (Kim, 2012; Kim, 2013; Lee et al., 2014; Hwang, 2017; Kim, Woo, 2017) were predominant. Recently, research has been conducted in various fields on the KONEX market (Kim and Ma, 2016; Shin and Yu, 2017; Lee et al., 2019), determinants of IPOs (Kim and Lee, 2016), factors of delisting (Choi, 2019), and the effects of transfer listing from KONEX to KOSDAQ (Lee and Jeong, 2021). However, only few empirical studies have been conducted on the financial constraints of KONEX listed companies.

Considering the financial constraints of companies, managers will be conservative when making investment decisions, giving up valuable investment opportunities due to high financing costs; in unstable environments, such as an economic crisis, many SMEs are in financial trouble due to financial constraints. Being in such a situation can significantly reduce company value. Therefore, applying the financial constraint hypothesis is necessary, considering various environmental factors and unstable economic conditions (Ra and Lee, 2012).

By analyzing the financing situations and characteristics of KONEX listed companies, which are in the early stage of establishment and particularly vulnerable to financial restrictions, understanding how financial restrictions will affect the value of KONEX companies is possible in the present study. By classifying financially and nonfinancially constrained companies, the analysis of financial factors, which affect corporate value, can also suggest what kind of effort should be made to increase corporate value.

The structure of this paper is as follows: Chapter I discusses the research purpose. Chapter II presents the theoretical background and previous studies. Chapter III discusses the study period, sample selection, variable definition, and research model for the empirical analysis. Chapter IV provides the empirical results. Finally, Chapter V presents the conclusions and limitations.

2. Literature Review

As a market for small and medium-sized venture companies, the KONEX market has been growing since its launch in 2013. Looking at the data in Table 1, the number of listed companies more than tripled from 45 in 2013, when they were initially launched, to 143 in 2020. In addition, the market capitalization, transaction amount, and transaction volume continued to grow. A total of 72 companies (KONEX Monthly Market Brief, June 2021) completed the transfer from the KONEX market to the KOSDAQ market at the end of June 2021. However, as shown in Table 1, the number of KONEX listed companies and market trading volume have also been stagnant since 2018.

Table 1: Key Indicators of KONEX Listed Firms

Year	2013	2014	2015	2016	2017	2018	2019	2020
Number of Companies	45	71	108	141	154	153	151	143
Market Capitalization (Billion Won)	923	1,425	3,947	4,308	4,908	6,250	5,325	5,611
Trading Value (Billion Won)	49	58	341	509	413	1,035	536	955
Trading Volume (Thousand Share)	7,528	9,858	29,048	41,082	56,083	73,433	71,479	130,729

In the analysis of the KONEX market, Hwang (2017) found that it had low market liquidity because the average daily trading volume and transaction value were still lower than the market size. The proportion of individual investors was 78%, and most of the transactions were made by individual investors. Therefore, the proportion of institutional investors and venture capitalists was weak. As individual investors accounted for 91% of the trading volume in June 2021 (KONEX Monthly Market Brief, June 2021), no improvement has been made in this area. In the early stage of the KONEX market opening, studies on market revitalization methods (Kim, 2012; Kim, 2013; Lee et al., 2014; Hwang, 2017; Kim and Woo, 2017) were predominant. The Financial Services Commission announced a plan for revitalizing KONEX to boost liquidity, strengthen its role of nurturing SMEs and venture companies to help them move to KOSDAQ, and enhance investors' trust in the KONEX market (KIF Financial Brief, February 22, 2019, Vol. 19, No. 04).

Research has been recently conducted in various fields on earnings management in the KONEX market (Kim and Ma, 2016; Shin and Yu, 2017; Lee et al., 2019), determinants of IPOs (Kim and Lee, 2016), factors of delisting (Choi, 2019), and effects of transfer listing from KOSDAQ to KOSDAQ (Lee and Jeong, 2021). However, only few empirical studies on financial constraints in KONEX listed companies have been conducted.

As the uncertainty of changes in the environment surrounding companies increases, the importance of securing liquidity, represented by cash, has grown in importance. As a result of examining the cash demand holding strategies of Korean companies before and after the Asian financial crisis, Han (2008) found various cash holding patterns according to the degree of financial constraints. Specifically, the cash–cash flow sensitivity of small-scale manufacturing companies without credit ratings decreased sharply after the Asian financial crisis, suggesting the possibility that the financial constraints of these companies might have been relaxed. In the study of Lee and Byun (2017), who investigated the agency problem and cash use in the context of financial constraints, excellent corporate governance increased the efficiency of cash use in nonfinancially constrained firms but had no effect on financially constrained firms. Similarly, the disciplinary effect of financial constraints was found to be concentrated in companies with weak governance structures. Lee and Kim (2017) examined the relationship between financial constraints and stock price returns. The stronger the financial constraint of a company, the higher the future share price return. The difference in excess return between the portfolio with the strongest financial constraint and the weakest was explained by the Fama-French three-factor model. Lee and Kim (2017) found that financial constraints are not new risk factors that are differentiated from existing risk factors. Kim (2017) looked into financial constraints and corporate value in crisis situations. Capital markets gave a high value of excess cash to firms with improved governance in terms of market instability. In addition, among financially constrained companies during the financial crisis, for companies with good governance, excess cash holdings contributed more to the increase in corporate value; but in financially constrained companies with poor corporate governance, the additional cash holdings did not increase company value. These results suggest that if the corporate governance structure is poor, then additional cash holdings do not help increase corporate value even during a financial crisis. Considering the financial constraints of companies, managers will be conservative when making investment decisions, giving up valuable investment opportunities due to high financing costs; in unstable environments, such as an economic crisis, many SMEs are in financial trouble due to financial constraints. Being in such a situation can significantly reduce company value. Therefore, applying the financial constraint hypothesis is necessary, considering various environmental factors and unstable economic conditions (Ra and Lee, 2012).

This study aims to understand how financial constraints affect the value of listed companies in KONEX, which is a listed market for small and medium-sized ventures. In addition, it intends to determine whether corporate governance affects corporate value in these financial constraints.

3. Sample and Methodology

This study selected nonfinancial companies listed on the KONEX market from its launch in 2013 to the end of 2019 as a sample. During the analysis period, companies whose settlement month was not December, financial institutions and companies for which data could not be obtained were excluded. The financial data used were from KisValue, and DataGuide was used for the data on the largest shareholder's share (OWN). The Stata 16.0 version of statistical software was used for the empirical analysis of the selected sample. This research adopted the panel regression model with random effects.

To analyze the factors affecting the corporate value of KONEX listed companies from the perspective of financial and nonfinancial constraints, the sample companies were classified into financially and nonfinancially constrained. The classification criteria were taken from Kaplan and Zingales (1997) who suggested a measurement index, the Kaplan–

Zingales (KZ) index, developed by comprehensively considering free cash flow, future investment opportunities, leverage ratio, dividend rate, and cash holdings for the possibility that companies will be financially constrained. The higher the KZ index, the higher the possibility of financial constraints. The KZ index has been evaluated by several researchers (Min-Shik Shin & Soo-Eun Kim, 2008; Young-Soo Ra & Yoon-Goo Lee, 2012; Shin-Ae Kang, 2019, etc.) After ranking the analysis target companies on the basis of the KZ index above, the group belonging to the top 30% KZ index was defined as financially constrained firms, whereas the group belonging to the bottom 30% KZ index value was defined as nonfinancially constrained firms. The definition and calculation methods of the KZ index are as follows:

$$KZ\ \ index\ \ =\ \ -1.002 \times Cashflow + 0.283 \times TobinQ + 3.319 \times Leverage - 39.368 \times Dividends - 1.135 \times Cashholdings \quad (1)$$

An empirical analysis was performed by adding variables that are traditionally used to affect firm value in financially and nonfinancial constrained firms. The definitions of models and variables are as follows:

$$TobinQ = \beta 0 + \beta 1 Div + \beta 2 Rnd + \beta 3 Debt + \beta 4 Std + \beta 5 Size + \beta 6 Ebit + \beta 7 Sale + \beta 8 Own \quad (2)$$

The Tobin Q variable was used as the dependent variable representing firm value. The independent variables were dividend payout ratio (Div), research and development (R&D) ratio to sales (RND), debt ratio (DEBT), volatility index (STD), company size (SIZE), profitability index (EBIT), sales growth (SALE), and shares of the largest shareholder and related party (M). Div was calculated by dividing the cash dividend of common stock by net income. RND, which represents a company's investment level, refers to the ratio of R&D to sales and was obtained by dividing the amount obtained by subtracting the development cost for the first half of the current period from the R&D expenses, current development expenses, amortization of intangible assets, and development expenses for this term. R&D investment can be a factor in reducing company proifit due to continuous capital input, long-term investment, and uncertain performance but is expected to have a positive (+) relationship with corporate value as a factor that can increase corporate value. DEBT was calculated as total debt divided by total assets. If DEBT is high, then the company will have high external financing costs; thus, actively participating in dividends and investments to reduce these costs is difficult. DEBT is expected to have a negative effect on corporate value. The STD uses the standard deviation of the profit margin of sales for the previous three years; the condition where the greater the volatility of a company's earnings, the lower company value, is also expected. SIZE means to control the size of the company. EBIT is the value of operating profit divided by total assets, and when profitability is high, a positive relationship with firm value is expected. SALE is calculated as the sales growth of the current year compared with that of the previous year. To remove the effect of extreme values, values obtained by windsorizing at 1% and 99% of all variables were used.

[Table 2] shows the summary statistics of the variables. In the study of Kang (2019), who focused on companies listed on KOSPI with December settlement, the Tobin Q was 1.077, OWN was 41.58%, and the standard deviation of the net profit margin of sales for the previous three years was 0.115. In the present study, Tobin Q (3.453) and OWN (56.3%) increased for companies listed on KONEX, and the volatility increased (0.671). In the study of Shin and Kim (2008), who investigated the KOSPI and KOSDAQ markets from 1987 to 2006, the average M/B ratio was 1.058, which was lower than the Tobin Q value of 3.453 in the current study, and the profitability ratio was 0.0539, which was higher than −0.090 in the present research. Therefore, KONEX companies have higher growth potential than KOSPI listed companies but have low returns and high volatility. The average corporate DEBT is 63.1%, lower than 120.30% in Kang (2019), suggesting that KONEX listed companies are inferior to the stock market in raising capital.

Table 2: Summary Statistics

DIV = (cash dividends / net income); RND = research and development (R&D) expenditures / sales; DEBT = (total liabilities / total stockholders' equity); Std = standard deviation of the operating income for the past three years; SIZE = log (total asset); Ebit = (operating profit / total assets); Sale = (Sales(t)-Sales(t-1))/Sales(t-1); Own = the ownership ratio of majority shareholders and affiliated parties

Variables	Count	Mean	Standard Deviation	Minimum	Maximum
TobinQ	396	3.453	5.755	0.476	42.573

Div	398	0.016	0.059	0.000	0.325
RnD	392	0.052	0.341	-0.694	3.030
Debt	397	0.631	0.393	0.040	2.393
Std	390	0.671	2.667	0.002	18.178
Size	397	23.584	0.921	19.218	25.243
Ebit	397	-0.090	0.295	-1.427	0.372
Sale	390	0.185	0.944	-0.978	9.999
Own	356	0.563	0.202	0.217	1.000

[Table 3] displays the results of correlation among variables. Tobin Q showed a significant negative (−) correlation with OWN, SIZE, and EBIT and a significant positive (+) correlation with RND and STD. A significant negative relationship between the shareholding ratio of the largest shareholder and corporate value was also shown in Shin and Kim (2008) and Kang (2019). Analyzing through panel regression analysis whether the significant correlation between Tobin Q, which represents corporate value, and other variables appears to be a significant causal relationship is necessary.

Table 3: Correlation among variables

	1	2	3	4	5	6	7	8	9
1.TobinQ	1								
2.Div	-0.084	1							
3.RnD	0.277***	-0.031	1						
4.Debt	-0.062	-0.081	-0.110**	1					
5.Std	0.364***	-0.059	0.524***	-0.033	1				
6.Size	-0.266***	0.158***	-0.124**	-0.094*	-0.276***	1			
7.Ebit	-0.321***	0.120**	-0.207***	-0.325***	-0.384***	0.497***	1		
8.Sale	0.059	-0.03	0.014	0.011	0.079	-0.067	0.161***	1	
9.Own	-0.176***	0.012	-0.104*	0.075	-0.157***	0.180***	0.173***	0.006	1

Note: *p < 0.10, **p < 0.05, ***p < 0.001.

4. Results and Discussion

This study aims to test the effect of financial constraints on corporate value in the KONEX market and the influence of controlling shareholders on them. [Table 4] presents the mean difference analysis results for each explanatory variable of the sample companies. An independent sample T-test was performed to examine the difference in mean values for each variable in financially and nonfinancially constrained companies. On the basis of the KZ index, companies with the top 30% KZ index were classified as financially constrained, whereas those with the bottom 30% KZ index were classified as nonfinancially constrained. From [Table 4], financially constrained companies showed significantly higher Tobin Q, DEBT, STD, and SALE at the 1% level, whereas Div, SIZE, EBIT, and OWN were all significantly smaller at the 1% level

compared with nonfinancially constrained companies. According to the results of this study targeting KONEX companies, Shin and Kim (2008), and Kang (2019), financially constrained companies have higher DEBT, SIZE, and growth potential and lower profitability than nonfinancially constrained companies.

Table 4: T-test between financially constrained and unconstrained firms

	Financially Constrained Firms	Financially Unconstrained Firms	Mean Difference	P-Value
TobinQ	8.174	1.904	6.27	0.000***
Div	0.001	0.035	-0.034	0.000***
RnD	0.102	0.07	0.032	0.512
Debt	0.81	0.32	0.489	0.000***
Std	1.392	0.501	0.891	0.010**
Size	23.072	23.537	-0.465	0.000***
Ebit	-0.225	0.037	-0.261	0.000***
Sale	0.493	0.219	0.274	0.073*
Own	0.538	0.592	-0.054	0.030**

Note: *$p < 0.10$, **$p < 0.05$, ***$p < 0.001$.

[Table 5] analyzes the determinants of corporate value in financially constrained and unconstrained companies. The panel regression analysis was selected through the Lagrangian Multiplier test, and as a result of the Hausman test, the fixed effect model was adopted for all models. The result showed no significant relationship between OWN and firm value in all models. Comparing these results with those obtained by Lee and Byun (2017), who examined whether financial constraints play a role in substituting corporate governance by regulating managers, the discipline of financial constraints was not observed in the present study. Kang and Min (2010) investigated KOSPI listed companies and found that when OWN is high, the tendency to pursue the private interests of the largest shareholder remains. We can infer that KONEX companies have a large difference with KOSPI or KOSDAQ, and no difference exists between financially constrained and unconstrained companies in the KONEX market. Further analysis on the differences among these markets is necessary.

A high debt-to-equity ratio is expected to affect corporate value in two ways. First, the cost of external financing will be high, and actively participating in dividends and investments will be difficult due to these costs. Second, it actively utilizes debt and participates in dividend payments to increase corporate value. However, from the results of the empirical analysis of which these effects appear, the debt-to-equity ratio did not show a significant relationship with corporate value. Due to the nature of R&D investment, the risk is high, the uncertainty of the outcome is large, and being reluctant to disclose technical information to external competitors is highly possible. A significant negative relationship was observed between RND and corporate value in the entire sample. STD showed a positive (+) relationship with corporate value in the entire sample and financially unconstrained companies. SIZE revealed a significant negative relationship with company value in all models. SALE presented a significant negative relationship with corporate value in financially constrained companies. These research results are different from those of studies on KOSPI and KOSDAQ listed companies, and such differences seem to be greater among listed markets than the differences due to financial restrictions within KONEX companies.

Table 5: Factors Affecting Firm Value Depending on Financial Constraints

	(1)	(2)	(3)
	Total Firms	Financially Constrained Firms	Financially Unconstrained Firms
Rnd	-3.136***	0.951	-5.066
	(-2.75)	-0.7	(-1.05)
Debt	-0.377	-0.098	1.119
	(-0.40)	(-0.07)	-0.52
Std	0.615***	-0.117	1.615*
	-3.89	(-1.09)	-1.92
Size	-2.800***	-1.205**	-3.538**

	(-4.38)	(-2.19)	(-2.03)
EBIT	-3.239***	2.077	-3.041
	(-2.63)	-1.32	(-0.87)
Sale	0.276	-0.318*	0.376
	-1.63	(-1.68)	-0.89
Own	1.784	3.103	1.703
	-0.82	-1.37	-0.3
cons.	68.00***	28.16**	85.28**
	-4.43	-2.09	-2.12
N	349	99	99
R^2	0.221	0.369	0.271
AIC	1568.9	190.9	529.4

Note: *p < 0.10, **p < 0.05, ***p < 0.001.

5. Conclusions

This research empirically investigates what factors contribute to firm value in the KONEX market, especially in the financially constrained condition. We used KONEX listed firms without financial firms from 2013 to 2020. The KZ index was also used as a financially constraint indicator. From the T-test, financially constrained companies showed significantly higher Tobin Q, DEBT, STD, and SALE at the 1% level; Div, SIZE, EBIT, and OWN were all significantly smaller at the 1% level compared with nonfinancially constrained companies. These results of T-test using KONEX companies have similar characteristics using KOSPI and KOSDAQ samples.

However, in the fixed-effect panel regression, no significant relationship was observed between OWN and firm value in all models. The debt-to-equity ratio did not show a significant relationship with corporate value. A significant negative relationship was found between RND and corporate value in the entire sample. STD exhibited a positive (+) relationship with corporate value in the entire sample and financially unconstrained companies. SIZE presented a significant negative relationship with company value in all models. SALE showed a significant negative relationship with corporate value in financially constrained companies. We can infer that KONEX companies have a large difference with KOSPI or KOSDAQ listed firms. In addition, no difference was observed between financially constrained and unconstrained companies in the KONEX market. We suggest conducting further analysis on the differences among these markets.

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