THE DETERMINANTS OF CAPITAL STRUCTURE: EVIDENDCE FROM MACEDONIAN LISTED AND UNLISTED COMPANIES

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Abstract

In this article we analyze factors influencing companies' leverage. We selected two samples. The first one is from Macedonian non-financial companies registered on Macedonian Stock Exchange covering the period of 2005-2007 and comprised 32 listed companies. The second one is from Macedonian small and medium businesses covering the period of 2005-2007 and comprised 30 companies. The data used for the empirical analysis were derived from companies' annual reports. We analyze whether the decision of the companies concerning the leverage is in conformity with the theoretical expectations proclaimed in previous studies and is there any disparity between listed and unlisted companies. Profitability, Tangibility, Size, Growth rate and Non-debt tax shield are used as independent variables, while Leverage is the dependent variable.

1. Introduction

The theories of capital structure are among the most interesting in the field of finance. They give explanations in questions like how much companies should borrow, what is the relationship between capital structure and company value, how companies choose their capital structure, and so on. Even there is no exact formula available for the establishing optimal target debt and capital ratio, empirical studies indicate that profitability, types of assets, taxes, differences across industries, uncertainty of operating income, etc. should consider when formulating capital structure policy.

The subject matter of leverage decisions and the factors influencing these decisions has been attracting attention, since the pioneering work of Modigliani and Miller in 50's. Modigliani and Miller [1958] stated that the valuation of a company will be independent from its financial structure under certain key assumptions. In their frictionless world there is no optimal capital structure since debt-equity decisions made by the company can be imitated by the investors. Studies developed since then have gradually incorporated new variables not considered by MM in that initial study and consolidating the idea that there should indeed be

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an optimal capital structure to maximize the firm value and that this optimal structure should be pursued through long-term policies [Martin et al., 2001].

The purpose of this article is to analyze the determinants of capital structure of Macedonian listed companies and unlisted companies (Pollog region), in the light of the Static Trade-Off theory, Pecking Order theory and Agency cost theory. We attempt to find whether companies' features are important concerning financial borrowing (companies view) or financial lending (banks view).

This article is organized as follows: Section 2 introduces the theoretical framework concerning capital structure and determinants of company leverage. Section 3 presents the regression model and methodology. Section 4 presents analysis and discussion of results. Section 5 presents some conclusions.

2. Theoretical framework concerning capital structure and determinants of company leverage

Since Modigliani and Miller published their seminal paper in 1958, the issue of capital structure has generated unforeseen interest among financial researchers. Hence it has fulfilment with new elements over the years, such as taxes [Modigliani and Miller, 1963; Miller, 1977], bankruptcy costs [Stiglitz, 1972; Titman, 1984), agency costs [Jensen and Meckling, 1976; Myers, 1977] and the information asymmetry [Myers and Majluf, 1984], the results of which suggested over time that the determination of the optimal capital structure should take into consideration a trade-off between benefits and costs derived from debts. Thus, theories suggest that the capital structure affects company's value. Among them, we are going to discuss briefly static trade-off theory, pecking order theory and agency cost theory.

Trade-Off theory, imply that company's capital structure decisions involve a trade-off between the tax benefits of debt financing and the costs of financial distress. Cost of financial distress depends on the likelihood of distress and cost of bankruptcy. The implication is that there is no an optimum amount of debt for any individual company. Thus, optimal debt ratio (debt capacity) varies from company to company. Company having safe and tangible assets and plenty of taxable income have high debt ratio. According to Titman and Wessels [1988], tangible assets end up helping companies to accumulate debts, as if the investment proves a failure, the creditor will charge the guarantee offered. The trade-off theory also clarify that profitable companies take more benefit of the tax shield by debt financing because there is fewer chance for them to go bankrupt. Thus, profitable companies are capable to raise theirs debt ratio more than a less profitable companies.

Although the trade-off theory has dominated corporate finance circles for a long time, interest is also being paid to the pecking-order theory. Pecking order theory is proposed by Myers and Majluf [1984], by explaining the affects of the information asymmetries between insiders and outsiders of company. According to theory, companies follow a preferential order of financing sources, and that before seeking debts, they would use internal funds. Thus, the more profitable companies would tend to have fewer debts and conversely low profitable companies use debt financing due to insufficient resources generated internally.

When a company has debt, conflicts of interest arise between stockholders and bondholders. Because of this, stockholders are tempted to follow self-seeking strategies. These conflicts of interest, which are overblown when financial distress is incurred, impose agency cost of the company. Jensen [1986] argues that debt has to be paid back in cash. Therefore, the amount of free cash flow that could be derived by the manager is reduced by debt. Thus,

debt serves as a mechanism to discipline the manager from encouraging in self-serving activities e.g. perquisite consumption, empire building, etc.

2.1. Determinants of company leverage

We use five explanatory attributes as proxy for the determinants of Macedonian companies' capital structure and by using them as independent variables in our regression model, we attempt to analyze the reliance of leverage (dependent variable) on these proxies.

Following Rajan and Zingales [1995], we calculate leverage of company as the ratio of total liabilities to total assets.

The proxy used in this study to measure the company profitability is the ratio of earnings before tax (EBT) scaled by total assets.

The proxy used in this study to measure the value of tangible assets of the company is the ratio of fixed assets to total assets.

The proxy used in this study as measure to calculate the company size is the natural logarithm of revenues sale.

The proxy used in this study to measure the company growth rate is the percent change of total assets.

Wald [1999] uses the ratio of depreciation to total assets to measure non-debt tax shield. In this study, we use the same ratio, i.e. depreciation over total assets as proxy to measure non-debt tax shield.

We use also qualitative variable (dummy). Hence we give 0 for listed companies on Macedonian Stock Exchange and 1 for unlisted companies, i.e. Pollog region.

3. The regression model and methodology

Using panel data methodology, we attempt to analyze some factors that supposedly determine the level of leverage of companies. Panel data analysis is performed by regression model for both samples separately. It makes combinations of data in cross section with time series data, for treatment of the variables analyzed in this article. We use the same model for listed and unlisted companies. Generalized form of the regression model is:

$$LEV_{it} = \alpha + \sum_{i}^{n} \beta_i X_{it} + \varepsilon_{it} \tag{1}$$

Where Lev_{it} is the dependent variable and it is the leverage of company (i) to the period t, respectively to the year 2005, 2006 and 2007. α is the intercept of the equation. β is the slope coefficient for X_{it} independent variables. X_{it} represents to five independent variables. ε represents the error term. We can transfer equation (1) to more detailed equation (2) as below:

$$LEV_{it} = \alpha + \beta_1 \, \text{Pr ofitability}_{it} + \beta_2 \text{Tangibility}_{it} + \beta_3 \text{Size}_{it} + \beta_4 \text{Growth}_{it} + \\ + \beta_5 \text{Non - debt tax shield}_{it} + \varepsilon_{it} \tag{2}$$

Where i = 1, 2, 3, …, 32 for the first sample (listed companies) and i = 1, 2, 3, …, 30 for the second sample (unlisted companies), and t = 1, 2, 3 for both samples.

The analysis uses a data panel originating from annual reports of the 32 companies listed in Macedonian Stock Exchange and 30 small and medium companies from the Pollog region (Macedonia). For analysing data we have used the program Stata 9.0.

3.1. Hypothesis

In this section we formulate three capital structure respective hypotheses, in light of Agency cost theory, Static Trade-Off theory and Pecking Order theory. First hypothesis is formulated for Agency cost theory. Second hypothesis is formulated for Static Trade-Off theory. Third hypothesis is formulated for Pecking Order theory.

We test these hypotheses to find which of those theories are relevant for Macedonian companies. Null hypothesis (Ho) is rejected if result is significant at 1 percent or 5 percent, otherwise alternative hypothesis (Hi) is accepted.

Hypothesis 1
Hi: There is positive relationship between leverage and size.
Ho: There is negative relationship between leverage and size.
Hypothesis 2
H2a
Hi: There is positive relationship between leverage and size.
Ho: There is negative relationship between leverage and size.
H2b
Hi: There is positive relationship between leverage and value of tangible assets.
Ho: There is negative relationship between leverage and value of tangible assets.
H2c
Hi: There is positive relationship between leverage and non-debt tax shield.
Ho: There is negative relationship between leverage and non-debt tax shield.
Hypothesis 3
H3a
Hi: There is positive relationship between leverage and growth.
Ho: There is negative relationship between leverage and growth.
H3b
Hi: There is negative relationship between leverage and profitability.
Ho: There is positive relationship between leverage and profitability.
H3c
Hi: There is negative relationship between leverage and value of tangible assets.
Ho: There is positive relationship between leverage and value of tangible assets.

4. Analysis and discussion of results

This section describes descriptive the statistics summary, testing hypothesis, regression tests and discussion of results. The determinants of capital structure for Macedonian listed and unlisted companies are studied separately.

4.1. Descriptive statistics and analysis

Descriptive statistics includes the mean, standard deviation, minimum and maximum values for the period 2005-2007. The data contain the 32 listed companies, respectively 30 unlisted companies.

Both tables below show that there are negative values at minimums values, i.e. some companies have operated with losses during the period 2005-2007.

Table no. 1 – Descriptive statistics of 32 listed companies

Variable	Mean	Std. Dev.	Min	Max
Lev	.4169926	.2627791	.03723	1.86611
Tang	.4876893	.2087219	.10442	.87425
Profit	-.009362	.173898	-1.07935	.15423
Size	5.847029	.6056435	4.19712	7.29599
Nondebtax	.0333247	.0197036	.0087	.13181
Growth	5.139136	19.29243	-44.21245	104.3237

Table no. 2 – Descriptive statistics of 30 unlisted companies

Variable	Mean	Std. Dev.	Min	Max
Lev	.4876719	.3263788	.00639	1.65754
Tang	.523748	.270651	.00324	.98051
Profit	.0440319	.1132186	-.17159	.72537
Size	6.429344	.5171426	4.77009	7.76213
Nondebtax	.0313817	.0291108	.00034	.14634
Growth	21.889	54.58501	-35.54507	157.4696

A correlation analysis was performed to verify a possible association between and among the variables, in order to test whether there is any linear correlation between and among the variables. Collinearity explains the dependence of one variable to other. When variables are highly correlated they both express essentially the same information.

In general, independent variables having collinearity at 0.70 or greater should not include in regression analysis. Table no. 3 and table no. 4 show that highest correlation value is -0.5278 for listed companies, respectively 0.3327 for unlisted companies. Hence collinearity should not appear problem in our regression analysis.

Table no. 3 – Correlation matrix-listed companies

	Lev	Tang	Profit	Size	Nondebttax	Growth
Lev	1.0000					
Tang	-0.2770	1.0000				
Profit	-0.5278	0.0446	1.0000			
Size	0.2113	-0.3253	0.0287	1.0000		
Nondebttax	0.0036	0.3827	-0.1796	0.0106	1.0000	
Growth	0.0997	-0.1293	0.4320	0.0669	-0.1458	1.0000

Table no. 4 – Correlation matrix-unlisted companies

	Lev	Tang	Profit	Size	Nondebttax	Growth
Lev	1.0000					
Tang	-0.2669	1.0000				
Profit	0.2775	-0.1081	1.0000			

Size	-0.0378	0.1542	-0.0851	1.0000		
Nondebttax	0.0805	0.3193	0.2351	-0.0307	1.0000	
Growth	0.3327	-0.0703	0.0141	0.0257	-0.0648	1.0000

To test hypotheses that we formulated above, we perform regression test. Results below show that while tangibility, profitability and non-debt tax shield are negatively correlated with leverage in listed companies, tangibility and size are negatively correlated with leverage in unlisted companies. But, growth is positively correlated for both in listed and unlisted companies.

$P > |t|$ provides an alternative approach to reporting the significance or regression coefficients. The figures in columns below give the probability of obtaining the corresponding t statistics as a matter of chance, if null hypothesis Ho: $\beta_{1,2,3,4,5} = 0$ were true. A p-value of less than 0.01 means that the probability is less than 1 percent, which in turn means that the null hypothesis would be rejected at the 1 percent level; a p value between 0.01 and 0.05 means that the null hypothesis would be rejected at the 5 percent, but not the 1 percent level; and a p-value of 0.05 or more means that it would not be rejected at the 5 percent level [Dougherty, 2002, 98-100]. Usually, p-values of 0.05 or lower are considered low enough for researcher to be confident that the estimated is statistically significant.

Table no. 5 shows that p-value of tangibility is 0.075. This means that there are only 750 in 10,000 chances that the true coefficient of tangibility is actually zero. So, the coefficient of tangibility implies that it is statistically significant at the 7.5 percent level. Thus, we can say that based on p-values, in our model for listed companies just profitability is statistically significant, and rest determinants are statistically insignificant. This is verified also by t-statistics.

Results in table no.5 and table no. 6 show that t-statistics for parameters estimated are lower than 2 in absolute values, except profitability at listed and unlisted companies, and tangibility and growth at unlisted companies. This is in conformity with rule of thumb for using t-statistic which declares that if the absolute value of a t-statistic is greater than or equal to 2, then the corresponding parameter estimate is statistically different from zero.

For listed companies we have $\beta_1 = -0.8711869$, $\beta_2 = -0.2229747$, $\beta_3 = 0.0706576$, $\beta_4 = 0.0015388$, and $\beta_5 = -0.2313482$, and the interception of equation is statistically insignificant.

Table no. 5 – Results of regression analysis-listed companies

	Coef.	**Std. Err.**	**t**	**P>|t|**
Tang	-.2229747	.1238255	-1.80	0.075
Profit	-.8711869	.1432103	-6.08	0.000
Size	.0706576	.0387883	1.82	0.072
Nondebttax	-.2313482	1.247757	-0.19	0.853
Growth	.0015388	.0012747	1.21	0.231
_cons	.1042437	.2490291	0.42	0.677

Table no. 6 shows that p-values of tangibility, profitability, and growth are lower than 0.05, which in turn mean that are statistically significant. Size has p-value of 0.487 and it is higher than 0.05, which in turn mean that is not statistically significant. For non-debt tax shield we have 0.184>0.05 and it is not statistically significant.

While tangibility, profitability, and growth have *t*-statistics greater than 2 in absolute value, size and non-debt tax shield have *t*-statistics lower than 2 in absolute value. Thus, unlisted companies' tangibility, profitability, and growth are statistically significant at the 5 percent level and size and non-debt tax shield are not statistically significant.

For unlisted companies we have $\beta_1 = 0.5893419$, $\beta_2 = -0.334221$, $\beta_3 = -0.0423693$, $\beta_4 = 0.0019199$, and $\beta_5 = 1.565271$, and the interception of equation is statistically significant.

Table no. 6 – Results of regression analysis-unlisted companies

	Coef.	Std. Err.	t	P>|t|
Tang	-.334221	.124564	-2.68	0.009
Profit	.5893419	.2876598	2.05	0.044
Size	-.0423693	.0607229	-0.70	0.487
Nondebttax	1.565271	1.168689	1.34	0.184
Growth	.0019199	.0005667	3.39	0.001
_cons	.8180304	.4073462	2.01	0.048

R-square (coefficient determination) measures the proportion of the variance jointly explained be the explanatory variables, and generally increases, if we add another variable to a regression equation. Adjusted *R*-square attempts to compensate for this automatic upward shift by imposing a penalty for increasing the number of explanatory variables.

The maximum value of *R*-square is 1. This occurs when the regression line fits the observations exactly. The closer the *R*-square is to 1, the "better" the overall fit of the estimated regression equation to the actual data.

With time series data, *R*-squared are often in excess of .9; with the cross-sectional data, .5 might be considered a reasonable good fit [Baye, 2005]. In our case, R-square explains that 37.65 percent of the variation in leverage can be captured by independent variables for listed companies, respectively 25.13 percent for unlisted companies. The rest of leverage's variance is due to factors other than determinants studied in this article.

F-statistic provides a measure of the total variation explained by the regression relative to the total unexplained variation. The greater the *F*-statistic, the better the overall fit of the regression line through the actual data. Regression that have *F*-statistics with significance values of 5 percent or less are generally considered significant. In our case, *F*-statistic shows that overall models are significant.

Table no. 7 – Regression statistics-listed and unlisted companies

	Listed companies	Unlisted companies
Number of obs	96	90
R-squared	0.3765	0.2513
Adj R-squared	0.3765	0.2067

4.2. Testing hypothesis

In this section we test hypothesis formulated above (section 3.1). We compare whether *p*-values are less than 0.01, between 0.01 and 0.05, and 0.05 or more.

Hypothesis 1-Agency cost theory

Hi: There is positive relationship between leverage and size.

Ho: There is negative relationship between leverage and size.

Since p-value of $0.072>0.05$, means that the null hypothesis would not be rejected at the 5 percent level for listed companies. Since p-value of $0.487>0.05$, means that the null hypothesis would not be rejected too at the 5 percent level for unlisted companies.

Hypothesis 2-Static Trade-Off theory

H2a

Hi: There is positive relationship between leverage and size.

Ho: There is negative relationship between leverage and size.

Results here are same with Agency cost theory. It finds out that larger companies tend to borrow less than smaller companies, and it holds for both, listed and unlisted companies.

H2b

Hi: There is positive relationship between leverage and value of tangible assets.

Ho: There is negative relationship between leverage and value of tangible assets.

Since p-value of $0.075>0.05$, means that the null hypothesis would not be rejected at the 5 percent level for listed companies. On other hand, p-value of $0.009<0.01$, means that the null hypothesis would be rejected in favour of Hi at the 1 percent level for unlisted companies. This conform that while at listed companies tangible assets are not considerable for borrowing, at unlisted companies are.

H2c

Hi: There is positive relationship between leverage and non-debt tax shield.

Ho: There is negative relationship between leverage and non-debt tax shield.

Since p-value of $0.853>0.05$ for listed and $0.184>0.05$ for unlisted companies, means that the null hypothesis would not be rejected at the 5 percent level.

Hypothesis 3-Pecking Order theory

H3a

Hi: There is positive relationship between leverage and growth.

Ho: There is negative relationship between leverage and growth.

Since p-value of $0.231>0.05$, means that the null hypothesis would not be rejected at the 5 percent level for listed companies. On other hand, p-value of $0.001<0.01$, means that the null hypothesis would be rejected in favour of Hi at the 1 percent level for unlisted companies. This conform that while listed companies with high growth rate borrow less those with low growth rate, unlisted companies with high rate borrow more than companies with low growth rate.

H3b

Hi: There is negative relationship between leverage and profitability.

Ho: There is positive relationship between leverage and profitability.

Since p-value of $0.000<0.01$, means that the null hypothesis would be rejected at the 1 percent level for listed companies. On other hand, p-value of $0.01<0.044<0.05$, means that the null hypothesis would be rejected in favour of Hi at the 5 percent, but not the 1 percent level for unlisted companies. It implies that high profitable listed and unlisted companies borrow less. It seems that they prefer more internal funds and equity to finance their business activities compared to debt.

H3c

Hi: There is negative relationship between leverage and value of tangible assets.

Ho: There is positive relationship between leverage and value of tangible assets.

In this case, null hypothesis would not be rejected at the 5 percent level for listed companies and it would be rejected in favour of Hi at the 1 percent level for unlisted companies.

4.3. Discussion of results

In this section we discuss obtained results in term of the signs and statistically significance of the coefficients for independent variables.

Tables below show obtained observed signs for five independent variables at listed and unlisted companies. As we can see, while listed companies' profitability is negatively associated with leverage, it is converse for unlisted companies. At listed companies result is consistent with implication of Pecking order theory and at unlisted companies with Statistic-trade off theory. This in turn mean that listed companies follow a preferential order of financing sources, and that before seeking debts, they would use internal funds. Thus, the more profitable companies would tend to have fewer debts and this is consistent with tested hypothesis. It is in line with other studies as Rajan and Zingales [1995], Booth et al., [2002] and Gaud et al., [2005]. On the other hand, profitable unlisted companies are capable to raise their debt ratio more than a less profitable companies. Profitability was statistically significant for both, listed and unlisted companies. Consequently, we can claim that profitability does have significant role in making debt ratio and determining the capital structure of Macedonian companies.

Table no. 8 – Expected and observed theoretical signs with independent variables–listed companies

Proxy	Static-trade off	Pecking order	Agency cost	Observed sign
Profitability	+	-	?	-
Tangibility	+	-/+	+	-
Size	+	-	+	+
Growth	-	+	-	+
Non-debt tax shield	+/-	?	?	-

Table no. 9 – Expected and observed theoretical signs with independent variables–unlisted companies

Proxy	Static-trade off	Pecking order	Agency cost	Observed sign
Profitability	+	-	?	+
Tangibility	+	-/+	+	-
Size	+	-	+	-
Growth	-	+	-	+
Non-debt tax shield	+/-	?	?	+

Tangibility is negatively associated with leverage, and is consistent with implication of Pecking order theory for listed and unlisted companies. According to Gaud et al., [2005] a possible explanation for a negative relation between tangibility assets and leverage could be based on the assumption of Pecking order theory. The authors believe that companies with lower level of tangible assets are more subject to information asymmetry problems, and consequently, more willing to use debts to finance their activities. In our case this is true, because Macedonian listed companies are evaluated from lenders not just based on tangibility assets, but also from others perspectives, i.e. goodwill, etc. In a questionnaire realized with managers of unlisted companies, major of them believe that for approving loans, in their business plan profitability and growth are onward than tangibility. Their access to financial market is difficult in terms of cost and technical difficulties. In the same questionnaire, in question if they are aware for financial market in Macedonia, major of them gave negative answers. For them is very important trade credit. Trade credit (differ-

ence between accounts payable and account receivable) is considered relevant source in business financing at Macedonian unlisted companies, i.e. small and medium businesses. Trade credit is the highest short-term financing and represents about half of short-term liabilities at trade businesses [Ciceri and Xhafa, 2007]. Hence in our case we claim that while tangibility doesn't have significant role in determining the capital structure of Macedonian listed companies, it has at unlisted companies. Thus, we confirm tested hypothesis for unlisted companies.

Size is estimated to have positive impact on leverage, but is not significant at listed and unlisted companies. This is consistent with implication of Pecking order theory and Agency cost theory for listed companies, respectively with implication of Pecking order theory. Since our observations don't have significant statistics, we claim that size doesn't have significant role for deciding the capital structures decisions.

Growth is positively associated with leverage for both, Macedonian listed and unlisted companies. It is not significant at listed companies and tested hypothesis cannot be confirmed. At unlisted companies, growth is significant and tested hypothesis is confirmed. Thus unlisted companies with high growth rate borrow more than companies with low growth rate.

Non-debt tax shield is negatively associated with leverage at listed companies, and positively at unlisted companies. Non-debt tax shield is found insignificant at listed and unlisted companies, and is verified tested hypothesis for listed, but not for unlisted companies.

5. Concluding remarks

This study sought to analyze some determinants of the capital structure decisions of the Macedonian listed companies and a sample of Macedonian unlisted companies from the Pollog region in light of the Static-trade off theory, Pecking order theory, and Agency cost theory. We have selected five independent variables with purpose to see their effect on capital structure.

The analysis was conducted based on panel of data obtained from the financial annual reports for the period 2005-2007. Lack of data is a reason that we fail to test other variables and to cover others Macedonian regions for unlisted companies.

The results are consistent with implications first of all of Pecking order theory and then of Static-trade off theory. Agency cost theory was not confirmed in our results, except at size variable for listed companies. It seems that poorness of financial market and absence of bondholders in Macedonia are reflected in our study. Thus, they don't prefer to issue bonds to borrow money. Macedonian listed companies prefer internal funds more than external funds. This explain that Macedonian listed companies prefer and have access to equity financing once they go public as most companies enjoy a favourable high stock price. Another possible explanation is the fact that the Macedonian financial market is still in an infant stage of development.

Profitability was confirmed relevant determinant for Macedonian listed and unlisted companies. Creditors seem to be very careful in line of companies' profitability. More profitable listed companies would tend to have fewer debts and profitable unlisted companies are capable to raise their debt ratio more than a less profitable companies. Banks are the major or event the only source of companies' external debt, and trade credit is very important

source for unlisted companies. On average, Macedonian unlisted companies were confirmed to use more debts than listed companies.

Tangibility, size, non-debt tax shield, and growth were confirmed not to have effect in capital structures decisions for Macedonian listed companies.

Size and non-debt tax shield were confirmed not to have effect in capital structures decisions for Macedonian unlisted companies.

Finally, we can conclude that Macedonian companies have to rely on equity financing and trade credit. In order to provide more financing opportunities for Macedonian companies, it is desirable for Macedonia to accelerate the development of its financial markets.

For future studies it might be interesting to focus on following aspects:
- Company age and industrial feature should be included as new variables,
- Differentiating between long term and short term debt,
- Covering others Macedonian regions for unlisted companies and adding public municipal companies, and
- Extension of the data series and macro economic factors should be included.

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