

Determinants of Capital Structure for Firms that Provide High Quality Sustainability Reporting

Cigdem Vural-Yavas¹

¹ Department of Management, Bogazici University, Istanbul, Turkey

Correspondence: Cigdem Vural-Yavas, Department of Management, Bogazici University, Istanbul, Turkey.
E-mail: crocusr@gmail.com

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Abstract

The main objective of this chapter is to understand the determinants of the capital structure of the firms that provide high quality corporate-sustainability reporting. First, all the non-financial companies quoted in Borsa Istanbul (BIST) will be studied in order to see the full picture of the market. Second, all the firms that are included in the computation of the BIST Sustainability Index (XUSRD) will be analyzed as the firms that provide high quality corporate-sustainability reporting. In line with the literature on capital structure variables such as profitability, size, risk, growth, tangibility, non-debt tax shield and ownership structure were picked as the possible determinants of capital structure. Moreover, long- and short-term debt ratios were selected as the proxies for capital structure. Our findings indicate that when capital structure is measured by long-term debt, profitability, size, tangibility, the ratio of free-float outstanding value to total assets, and institutional ownership percentage become the main determinants of capital structure for the whole market. For sustainability index firms, when capital structure is measured by the long-term debt ratio, the main determinants of capital structure become non-debt tax shield and tangibility. On the other hand, for the same type of firms, when capital structure is measured by the short-term debt ratio, tangibility and the ratio of free-float outstanding value to total assets become the main determinants of capital structure.

Keywords: sustainability, capital structure, agency theory, information asymmetry, trade-off theory, sustainability reporting, free-float outstanding value

1. Introduction

With the rise of awareness of corporate sustainability among investors, firms have started to pay more attention to sustainability. Corporate sustainability is defined as a business approach that creates long-term value for stakeholders by managing environmental, social and governance issues with high performance. Firms show how much they care about corporate sustainability through their sustainability disclosure.

Under this definition, firms manage their risk in economic, social and environmental activities and create value. These risk management activities are somehow a mechanism that firms use to signal their future. In fact, corporate sustainability is shown to be a value-increasing strategy for firms (Lo, & Sheu, 2007).

Because Turkey tries to attract more foreign investors than ever, as a result of the surge of awareness in corporate sustainability in the world, it aims to “increase the awareness, knowledge and practice of sustainability in Turkey”. In line with this purpose, Borsa Istanbul created the BIST Sustainability Index. By this index, Borsa Istanbul provides a benchmark for companies with high performance in corporate sustainability. In order to create the sustainability index, Borsa Istanbul has signed an agreement with Ethical Investment Research Services Limited (EIRIS), which is a global research organization specialized on environment, social and governance issues. EIRIS assesses companies based on internationally accepted sustainability criteria, using publicly available information about them.

BIST Sustainability Index has been available since 2014. Although a sustainability index is a new concept for Turkey, the Dow Jones Sustainability Index has been computed and reported since 1999. Today, there is a family of Dow Jones Sustainability Indices, including global and regional broad market indices such as Europe, North America, Nordic Countries, Asia/Pacific, Eurozone, Europe, Chile, Australia, Korea, Emerging Markets, and the Developed World. This wide range of sustainability indices show that investors do not only care about domestic firms' sustainability, but the sustainability of firms all around the world. Thus, firms in the Emerging Markets are

more motivated than ever to follow sustainable development strategies, because for them, foreign direct investment is crucial.

Studies in recent years show that sustainable firms are rewarded positively by investors (Lo, & Sheu, 2007). Sustainability disclosure of firms is a way that investors follow the actions of corporates. Therefore, the quality of sustainability reporting is important for shareholders and stakeholders (Dilling, 2010).

The main objective of this study is to understand the determinants of capital structure of firms that provide high-quality corporate-sustainability reporting. First, all the non-financial companies quoted in Borsa Istanbul (BIST) will be studied in order to see the full picture of the market. Second, all the firms that are included in the computation of the BIST Sustainability Index (XUSRD) will be analyzed as the firms that provide high quality corporate-sustainability reporting.

2. Literature

The capital structure of a firm is the usage of debt and equity in order to finance their investment activities. Firms try to approach an optimal capital structure to maximize their firm value. There are several theories that try to explain the capital structure choice of firms, such as the capital structure irrelevance theory, trade-off theory, agency theory, pecking order theory, and information asymmetry theory. Modigliani & Miller (1958) stated that the choice of financing does not affect the value of the firm. According to their Proposition 1, which is also known as “the capital structure irrelevance principle”, under certain market conditions, firm value is independent of its debt-to-equity ratio. On the other hand, after including the effect of tax in this ideal world, the choice of using debt is not irrelevant anymore. Modigliani & Miller (1963) consider the tax benefit that firms can take advantage of when they use leverage. They claim that firms should use as much debt as possible in order to take advantage of taxes. However, in the real world, debt usage is not limitless. Usage of debt leads to some costs that limit the firm to use unlimited leverage. Here, the trade-off theory comes in handy. According to this theory, the trade-off between the benefits and the costs of debt determines the optimal debt-to-equity ratio, which is also known as the optimal capital structure. Not only the bankruptcy cost, but also the liquidation cost is important in this trade-off. Agency theory mentions another benefit of leverage. Debt can also be seen as a discipline mechanism for managers.

Jensen & Meckling (1976) present the agency theory in their well-known article “Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure”. They introduce the concepts of the agency cost of equity and the agency cost of debt. According to agency theory, there exists a conflict of interest between shareholders and bondholders as well as a conflict of interest between shareholders and managers. On the other hand, when managers act in the interest of shareholders, debt usage to finance the investments of the firm creates agency cost of debt since managers prefer to transfer wealth from bondholders to shareholders. Managers tend to choose riskier projects in this case, since bondholders bear the cost of failure. Moreover, in case of success, bondholders only receive interest payments, whereas shareholders benefit from all excess return. Agency cost of debt includes bankruptcy and reorganization costs, monitoring and bonding expenditures and the opportunity wealth loss caused by the effect of debt on the investment decisions. The trade-off between the agency cost of debt and the agency cost of equity determines the optimal capital structure. From this point of view, the agency theory is similar to the trade-off theory.

In addition to the agency perspective, managers also have more information than outsiders. Information asymmetry theory uses the information differences between insiders and outsiders to explain the capital structure of a firm. According to this theory, managers can reveal information to shareholders through some investment policies. This information can be the quality of the firm’s investments (Leland & Pyle, 1977), the quality of the firm (Ross, 1977; Heinkel, 1982), the firm’s future growth opportunities (Myers & Majluf, 1984), expected cash flows (Bhattacharya, 1979; Brennan & Hughes, 1991), or the future prospects of the firm (Copeland & Brennan, 1988). The fraction of manager ownership, dividend payouts, using debt or equity for financing and stock splits are some of the signaling mechanisms mentioned in the literature. By way of these signaling mechanisms managers are able to reveal information to shareholders. For example, Bhattacharya (1979) developed a model, in which dividends are used for signaling the cash flows of the firm’s project. Signaling can be costly or cost free. There are many costly and cost free signaling models in the literature. The information asymmetry between managers and finance providers (e.g., shareholders, creditors) cause the variation between the costs of different sources of financing. Therefore, managers try to give clear signals to outsiders in order to decrease the cost of financing.

Myers & Majluf (1984) examine what would happen when managers act in the interest of old shareholders. They show that when managers issue equity with the old shareholders’ benefit being higher than the new shareholders’

benefit, the value increment obtained by the old shareholders should be greater than the value obtained by the new shareholders. On the other hand, as the investors are rational and are aware of this fact, issuing equity causes a drop in stock price. Therefore, stock issue conveys bad information to the market in this model. Myers & Majluf (1984) analyze the effect of debt financing. They conclude that a firm should never issue equity. Moreover, if it is necessary to issue and invest, then the firm should prefer debt to equity, regardless of whether it is overvalued or undervalued. This conclusion leads to the pecking order theory, which states that firms should first use internal financing for their investments, and, if internal financing is not enough, then the second source should be riskless debt before the risky debt. Finally, the last source should be equity financing.

Besides the theoretical background, there are many empirical studies on capital structure. Empirical literature uses many firm-specific factors that influence the level of leverage, such as profitability, growth, size, non-debt tax shield, nature of assets, risk and ownership structure. These leverage factors and related empirical literature is discussed in the following section.

2.1 Leverage Factors

2.1.1 Profitability

Myers & Majluf (1984) claimed that firms should prefer retained-earnings; in other words, internal financing if it is available under the condition of asymmetric information, and debt should be the second source of financing. According to pecking order theory, profitable firms should have a low level of debt usage. In other words, there is a negative relationship between debt ratio and profitability. In addition to pecking order theory, agency theory, laid down by Jensen & Meckling (1976), also supports the negative relationship between debt ratio and profitability. Jensen (1986) highlights the possible free cash flow cost. Managers tend to spend higher perquisites, and also, they can invest in low-return projects when they have a high amount of free cash flow. Moreover, high free cash flow firms are the target of take overs. In order not to be a target, high free cash flow firms tend to use this cash for their investments, which leads to less debt usage. Therefore, according to agency theory, profitability is negatively related to the debt ratio.

In line with these theories, many empirical studies in the literature support the negative relationship between profitability and leverage. Friend & Lang (1988), Wald (1999) and Frank & Goyal (2009) found a negative relationship between profitability and debt/asset ratio. Titman & Wessels (1988) found a negative relationship between profitability and both long-term and short-term debt, but a positive relationship with convertible debt. Moreover, Demirgüç-Kunt, & Maksimovic (1999) and Schmukler & Vesporoni (2001) found that a negative relationship is valid for firms in both market-based and bank-based economies. The impact of profitability to debt ratio is negative for Turkish firms in Durukan (1997)'s and Sayılğan, Karabacak, & Küçükkocaoğlu (2006)'s studies. EBIT to total assets and the return on assets are the two profitability proxies in this study. It is expected to have a negative relationship between profitability and debt ratio, which would support pecking order theory.

2.1.2 Growth

The growth opportunities of a firm are like real options (Myers, 1977). When a firm with a real option decides to issue debt, it may not choose the debt level that maximizes the firm value since this would reduce the existing shareholders' wealth. Myers (1977) states that a firm's value of debt is inversely related to the value of its growth opportunities and concludes that the existence of growth assets cause less debt financing. In fact, Myers (1977) concluded that assets-in-place should be financed with more debt than growth opportunities. As high-growth firms have more future opportunity than low-growth firms, there should be a negative relationship between growth and debt ratio according to agency theory. On the other hand, internal funds may not be enough for high growth firms. So, according to pecking order theory, high growth firms may move on to the second source of financing, which is debt, to finance their opportunities. Therefore, the expected relationship would be positive from the perspective of pecking order theory.

Empirical studies also show conflicting results for the relationship between leverage and growth. Eriotis et al. (2007) found a negative relationship between growth and debt ratio in his study about firm characteristics affecting capital structure, with empirical support from Greek firms. Wald (1999) also found a negative relationship. On the other hand, Titman & Wessels (1988) found a negative relationship when they use the market value of equity to estimated debt-to-equity ratio, but a positive relationship when they use the book value of equity. However, the effects are insignificant. So, Titman & Wessels (1988) conclude that future growth is not a factor that influences debt ratios. Moreover, Frank & Goyal (2009) found a positive relationship between growth and debt ratio. Durukan (1997) studied companies listed in the Turkish stock exchange and found a positive relationship. Sayılğan, Karabacak, & Küçükkocaoğlu (2006) found a positive relationship when the

growth of total assets is used as a proxy, but a negative relationship when the growth of plant, property and equipment is used as a proxy. Sales growth is the growth proxy in this research.

2.1.3 Size of a Firm

Size of a firm is another important variable that might affect the debt level. Larger firms may reduce the transaction costs that are mostly related to long-term debt issuance. So, large firms can issue long-term debt more easily than small firms due to economies of scale. Thus, it is natural that large firms have higher long-term debt to equity ratio than small firms. Small firms prefer short-term debt. Also, it would be easier for large firms to attract analysts to provide public information than it would be for small firms. Moreover, the probability of default and the cost of bankruptcy would be lower for large firms. Therefore, trade-off theory predicts a positive relationship between the size of a firm and its debt-to-equity ratio.

Schmukler & Vesperoni (2001) found a positive relationship between size of a firm and the total debt-to-equity ratio, as well as between the size of a firm and the long-term debt-to-equity ratio, for both bank-based and market-based economies. Interestingly, the relationship between short-term debt-to-equity ratio and size are negative in market-based economies, whereas this relationship is positive for bank-based economies. Frank & Goyal (2009) and Eriotis et al. (2007) found a positive relationship between size and debt ratio. Durukan's (1997) and Sayilgan et al. (2006)'s results support the positive relationship for Turkish firms. Natural logarithm of total assets is the proxy for size in this research. A positive relationship is expected between the size and the leverage level, which would support trade-off theory.

2.1.4 Non-Debt Tax Shield

Modigliani & Miller (1963) state that firms can benefit through tax deductions by using debt as a financing source. Following Modigliani & Miller, there are many studies about the effects of tax on capital structure. DeAngelo & Masulis (1980) show that non-debt corporate tax shields are evidence for the relevance of financing choice. Their model predicts a negative relationship between corporate tax shield substitutes and debt level. DeAngelo & Masulis (1980) used depreciation deductions and investment tax credits as a measure of non-debt tax shield.

MacKie-Mason (1990) and Wald (1999) found a negative coefficient for the non-debt tax shield variable. On the other hand, Bradley et al. (1984) found a positive relationship. Moreover, Titman & Wessels (1988) found no significant effect of the non-debt tax shield on debt ratios. For Turkish firms, the findings of Durukan (1997) and Sayilgan et al. (2006) support the negative relationship between non-debt tax shield and debt ratios. The ratio of depreciation to total assets is the proxy for non-debt tax shield in this study, as in the papers of Bradley et al. (1984), Titman & Wessels (1988), Wald (1999) and Durukan (1997). It is expected that non-debt tax shield and debt ratio are inversely related for Turkish firms.

2.1.5 Nature of Assets

For outsiders, a firm's intangible assets are more difficult to evaluate than its tangible assets. The difficulty of valuing intangible assets increases the information asymmetry between insiders and outsiders, for firms with large intangible assets. Myers & Majluf (1984) suggest issuing secure debt when information asymmetry is high, not risky debt. Thus, in line with pecking order theory, there would be a negative relationship between intangible assets and debt ratio, since there is a high information asymmetry for these firms. On the other hand, from the asset structure, one can reach the liquidation of the firm. As asset structure as measured by the ratio of fixed assets to total assets also indicates the liquidation of the firm. As bankruptcy cost is negatively related to liquidation value, a high liquidation value would favor debt financing. In other words, similar to pecking order theory, trade-off theory predicts a positive relationship between tangibility and debt ratio.

There are some contradictory results in the empirical literature about the effect of tangibility on debt ratio. For example, Titman & Wessel (1988) found no significant effect of collateral value of assets which is measured by two proxies: the ratio of intangible assets to total assets and the ratio of inventory plus gross plant and equipment to total assets; whereas, Frank & Goyal (2009) found a significant positive effect of tangibility on debt ratio. On the other hand, Pandey (2001) found a negative relationship between tangibility and debt ratio in emerging markets. However, Jong, Kabir, & Nguyen (2008) studied 42 countries and found a positive coefficient for tangibility for 40 countries. Only Croatia and Poland have a negative coefficient for tangibility. Interestingly, some studies have contradictory results within their findings: For example, Schmuckler & Vesperoni (2001) found a positive relationship for total debt to equity ratio, but a negative relationship for short-term debt to equity and long-term debt to equity ratios. Wijst & Thurnik (1993) studied small firms and found a positive relationship between tangibility and the long-term debt ratio, but a negative relationship between tangibility and the short-term debt ratio. Sayilgan et al. (2006) found a negative relationship for Turkish firms, which supports both

pecking order and agency theories. The ratio of fixed assets to total assets is the proxy for tangibility in this research.

2.1.6 Risk

Volatility of earnings increases financial borrowing costs and makes borrowing harder. So, it is expected to have a lower debt ratio for firms that have larger variance in earnings. Although Titman & Wessels (1988) found no effect of volatility on debt ratios, Wald (1999), Pandey (2001) and Bancel & Mittoo (2004) found a negative relationship. Also, Durukan (1997) showed that risk, measured by either the criterion of “standard deviation of earnings before interest and tax” or “the ratio of standard deviation of sales to average sales”, is inversely related to debt ratios. The risk measure in this research is the standard deviation of the percentage change in EBIT.

2.1.7 Ownership Structure

Jensen & Mecking (1976) stated that there is a conflict of interest between insiders and outsiders. Conflicts of interest between shareholders and managers as well as between bondholders and shareholders affect many firm decisions, including the financing choice, the investment choice, etc. One way of reducing the conflict of interest between managers and shareholders is to make the managers also owners of the firm. For this purpose, some companies give share ownership to their managers. When managers are also shareholders of firms, they will be interested in the firm’s long term benefits and therefore reduce their perquisite consumption. The interest of managers and shareholders will coincide with managerial ownership. Unfortunately, managerial ownership is not very common in Turkey. Furthermore, information about such ownership is not reported.

On the other hand, as firms become more transparent to the market, their agency cost of equity and debt will change. Not only the creditors, but also the shareholders become more interested in the firms’ financing and investment decisions as well as firm’s future value. Moreover, managers are more sensitive to the market valuation of their firm since this would affect their reputation in the job market. In other words, the success or failure of managers affects their future job opportunities, hence, their future wealth. As the free-float rate increases, the market becomes more sensitive to firm’s actions, which is a signal of managers’ success or failure. Therefore, it is expected that the free-float outstanding value to have a significant effect on a firm’s financing choice.

The ratio of free-float-outstanding-value to total assets is an indicator of stock market influence on a firm. The higher the free-float outstanding value is, the higher the stock market influence is on a firm’s decision. A positive effect of the free-float outstanding value is expected on the debt ratio, since it is claimed that as the firm’s transparency to the market increases, the information asymmetry decreases. Thus, outsiders, especially the creditors, can evaluate a firm more easily, and the agency cost of debt decreases.

Institutional ownership is another important ownership variable. Institutional investors reduce the myopic investment pressure on management and encourage long-term investments (Edmans, 2009; Hansen & Hill, 1991; Bushee, 1998; Eng & Shackell, 2001). Moreover, institutional ownership serves the monitoring function on management (Edmans, 2009). Monitoring is a mechanism that disciplines management and reduces the information asymmetry (Agrawal & Mandelker, 1990; Chung & Zhang, 2011). Therefore, institutional ownership is a different kind of ownership variable, one that is also considered to be a possible determinant of capital structure.

As a summary, based on related literature on the capital structure, the possible determinants of capital structure are profitability, size, risk, growth, tangibility, non-debt tax shield, and ownership structure. The empirical findings in the literature about the influence of these variables are mixed. In fact, capital structure theories include contradictory implications about the relationships between a firm’s characteristics and its capital structure.

3. Method

3.1 Data

For empirical analysis, the fundamental data related to the firms that were listed at Borsa Istanbul between 2005 and 2015 were collected from two main sources: The FINNET database for the secondary data of financial statements and the Central Registry Agency (e-MKK) Information Portal for the ownership data. Financial institutions and intermediaries, banks, insurance companies, financial leasing and factoring companies, real estate investment trusts and investment trusts were not included due to their specific nature of financial statements. The retrieved sample includes fundamental and ownership data for manufacturing, electric, gas and water, construction and public work, wholesale and retail trade, hotels and restaurants, transportation, communication and storage, and technology industries.

Although the time period is between 2005 and 2015, to evaluate some variables such as risk, and growth, two years of observations have been used. Therefore, in the empirical analysis, time period is between 2007 and 2015. Moreover, firms that do not have at least 3 years observations are excluded in order not to have missing data problem. As a consequence of this process, the panel data consists of nine-year periods and 336 cross sections; hence, 2284 firm-year observations.

The primary purpose of this study is to understand the determinants of capital structure of firms that provide high quality sustainability reporting. Before studying these firms, the analysis is conducted with all listed firms at Borsa Istanbul in order to understand the market as a whole and to see the differences between the firms following the sustainability business approach and the others. All the firms in the BIST Sustainability Index are chosen as firms that provide high quality sustainability reporting. This index is available only since 2014. So, for this part of the analysis, the time period can be only between 2014 and 2015. After excluding financial firms, the panel data for the second set of analysis includes 44 firm-year observations.

3.2 Measures

3.2.1 Dependent Variable

Based on the literature previously stated, to understand the determinants of capital structure, debt ratio is used as a proxy for capital structure. Due to the differences of long- and short-term debt preferences, two debt ratios: long-term debt to total assets and short-term debt to total assets are used in the empirical analyses.

3.2.2 Independent Variables

In line with the literature, Table 1 presents the variables used in the regression analysis. Table 1 also includes the calculations and the possible effects of each independent variable on the dependent variable.

Table 1. Variables

Variable	Calculation	Symbol	Variable Type	Expected Impact
Long-term debt ratio	Long-term debt / Total Assets	LTD/TA	Dependent	-
Short-term debt ratio	Short-term debt / Total Assets	STD/TA	Dependent	-
Profitability	EBIT / Total Assets	PROFIT	Independent	Negative
Return on Assets	Net Income / Total Assets	ROA	Independent	Negative
Sales Growth	$(Sales_t - Sales_{t-1}) / Sales_{t-1}$	GROWTH	Independent	Positive
Size	Natural logarithm of total assets	SIZE	Independent	Positive
Non-debt tax shield	Depreciation / Total Assets	TAX-SHIELD	Independent	Negative
Nature of Assets	Fixed Assets / Total Assets	TANGIBILITY	Independent	Positive
Risk	Standard deviation of percentage change in EBIT	RISK	Independent	Negative
Ownership Structure	Free-float outstanding value / Total Assets	OWNERSHIP	Independent	Negative
Information Asymmetry	Institutional Ownership Percentage	INSTITUTION	Independent	Positive

3.3 Analysis

In order to analyze the determinants of capital structure, panel data analysis is used. The empirical analysis includes six different regressions with the full sample of non-financial listed companies at *Borsa Istanbul* between 2007 and 2015 and four different regressions with the firms that provide high quality sustainability reporting. The second part of the regression set includes 44 firm-year observations between 2014 and 2015. Although the sample size is small for the second set of regressions, it satisfies the requirement of at least five observations for each regressor (Hair et al., 2010). All the regressions are estimated using ordinary least squares panel data analysis.

The aim of the first set of regressions is to fully understand the general framework of the capital structure determinants of the whole market. The purpose of the second set of regressions, which uses a sample of firms in the BIST Sustainability Index, is to investigate the capital structure determinants of firms providing high quality sustainability reporting and to discover whether any differences exist between firms following sustainability business activities and the others.

The empirical model is expressed as,

$$\begin{aligned} Debt/TA_{it} = & \beta_1 z_{it} + \beta_2 Profitability_{it} + \beta_3 Growth_{it} + \beta_4 Size_{it} + \beta_5 TaxShield_{it} + \beta_6 Tangibility_{it} + \\ & \beta_7 Risk_{it} + \beta_8 Ownership_{it} + \beta_9 Institution_{it} + \epsilon_{it} \end{aligned} \quad (1)$$

Additionally, it will be interesting to investigate whether the capital structure choice differs for the firms that are in the sustainability index, or not. In other words, whether the firms following sustainability business activities hold more debt or not will be the other question that the first set of regressions tries to answer. In order to investigate the effect of being a sustainability index firm on its capital structure, a dummy variable BIST_SRD is used. BIST_SRD dummy variable is equal to 1 if the firm is in the Borsa Istanbul Sustainability Index and, 0 otherwise. Two regressions are estimated with this dummy variable, but in this case, the analysis is between 2014 and 2015 due the availability of the sustainability index. Then, the empirical model can be expressed as,

$$\begin{aligned} Debt/TA_{it} = & \beta_1 z_{it} + \beta_2 Profitability_{it} + \beta_3 Growth_{it} + \beta_4 Size_{it} + \beta_5 TaxShield_{it} + \beta_6 Tangibility_{it} + \\ & \beta_7 Risk_{it} + \beta_8 Ownership_{it} + \beta_9 Institution_{it} + \beta_{10} BIST_SRD_{it} + \epsilon_{it} \end{aligned} \quad (2)$$

Before analyzing the model, it is necessary to check the existence of a possible multicollinearity problem. The preliminary analysis of multicollinearity is done via a correlation analysis. When the correlation between two independent variables is high, there is a possibility of collinearity. Table 2 shows the Pearson correlations. Two profitability measures, EBIT/ (total assets) and return on assets, are highly positively correlated as expected, but since profitability measures are not used in the regression simultaneously, this high correlation is not a problem. Most of the correlations are significant, but the only relatively high correlation is between size and institutional ownership percentage, which is 0.596. Although the correlations between the independent variables are very low, except size and institutional ownership, it is not enough to ensure the lack of multicollinearity, since it may occur because of the combined effect of two or more independent variables. In order to check multicollinearity, tolerance and variance inflation factor (VIF) measures are used. Tolerance needs to be high and VIF needs to be low enough in order not to have a multicollinearity problem. For tolerance, the cutoff threshold value is 0.10, so for VIF, the cutoff threshold value is 10 (Hair, Black, Babin, & Anderson, 2010). All of the tolerance values for the independent variables are higher than the threshold value 0.10. The smallest tolerance value is 0.554 which is still high enough to conclude that multicollinearity is not a problem for these independent variables. Moreover, all the VIF values are smaller than 10. Although the correlation between size and institutional ownership is 0.596, the VIF value is 1.031, which is smaller than the threshold value 10 and tolerance is 0.970, which is greater than the threshold value 0.10. Therefore, the requirement of non-existing multicollinearity is met, and we can proceed.

Table 2. Correlation matrix

Variables	PROFIT	ROA	GROWTH	RISK	SIZE	TAX-SHIELD	TANGIBILITY	OWN.	INST.
PROFIT	1.000								
ROA	0.994***	1.000							
GROWTH	0.042***	0.043***	1.000						
RISK	0.014	0.015	-0.002	1.000					
SIZE	0.122***	0.124***	0.004	0.011	1.000				
TAX-SHIELD	0.005	-0.008	-0.049*	-0.021	0.036*	1.000			
TANGIBILITY	-0.085***	-0.079***	0.000	-0.030	0.161***	0.193***	1.000		
OWNERSHIP	0.043**	0.025	-0.014	-0.013	-0.220***	0.081***	-0.057***	1.000	
INSTITUTION	0.128***	0.121***	0.012	-0.024	0.596***	0.115***	0.059***	0.035*	1.000

*** Significant at 1%; ** Significant at 5%; * Significant at 10%

4. Results

4.1 Descriptive Statistics

According to the descriptive statistics given in Table 3, long-term debt is 13% of the total assets while short-term debt is 30%. This shows that firms prefer short-term borrowing than long-term borrowing. For sustainability index firms, average long- and short-term borrowing ratios are closer to each other. In fact, average long-term debt is 29% of the total assets and average short-term debt borrowing is 35% of total assets. Long-term debt financing is higher for sustainability index firms than the other firms. The average return on asset is 3% which is close to the average of EBIT to total assets. The average institutional ownership in this market is 37% and the average free-float outstanding value to total assets is 25%. In the sustainability index, institutional ownership is much higher, in fact, it is 80%. Institutional investors may prefer firms that follow sustainability business activities. Firms in the sustainability index are less risky than the firms in the whole sample.

Table 3. Descriptive statistics

	Variables	LTD/TA	STD/TA	PROFIT	ROA	GROWTH	SIZE	TAX-SLD	TANG.	RISK	OWN.	INST.
All Sample	N	3306	3774	3310	3300	2878	3305	3312	3306	2600	3774	2686
	Min	0.00	0.00	-5.74	-5.52	-1.00	9.80	-0.01	0.00	0.01	0.00	0.00
	Max	7.97	8.62	9.03	9.04	313.08	26.30	1.50	1.00	389.95	22.56	0.99
	Mean	0.13	0.30	0.04	0.03	0.49	18.97	0.03	0.47	4.97	0.25	0.38
	Std.Dev.	0.22	0.33	0.29	0.28	7.73	1.97	0.04	0.25	18.78	0.52	0.31
sustainability index firms	N	44	44	44	44	44	44	44	44	44	44	44
	Min	0.02	0.12	-0.06	-0.06	-0.12	20.93	0.00	0.25	0.02	0.03	0.27
	Max	0.59	0.73	0.13	0.13	0.42	26.30	0.10	0.85	9.95	0.60	0.98
	Mean	0.29	0.35	0.06	0.06	0.12	23.10	0.03	0.56	1.07	0.22	0.80
	Std.Dev.	0.13	0.16	0.05	0.05	0.11	1.19	0.02	0.15	1.89	0.12	0.19

4.2 Multivariate Analysis Results

The results of the regression analyses for the whole market can be found in Table 4. In the first three regressions with the long-term debt ratio as dependent variable, profitability (either estimated by return on assets or the ratio of EBIT to total assets) has a significantly negative effect on the capital structure. It is in line with the related literature as profitable firms have enough free-cash flow, which managers try to use in order not to be a target of a takeover. Also, profitable firms have enough internal sources to finance their investments.

Similarly, tangibility has a significantly positive impact on the capital structure in the first three regressions. Firms with a high amount of fixed assets can be more easily valued by investors and creditors. Therefore, the information asymmetry will be lower for firms with a high ratio of fixed assets to total assets. So, the financing cost of debt will be lower for these firms. Interestingly, the effect of tangibility is significantly negative for short-term debt. That may be due to the firm's longer maturity debt preference. Firms with high tangible-to-intangible asset ratios may prefer long-term investments rather than short-term, hence in order to match the maturities, they may prefer longer maturity debt.

Ownership is the other independent variable, which is significant for the first three regressions. The positive impact of the ratio of free-float outstanding value to total assets is yet another support for information asymmetry theory. That is, firms that are more transparent to the market can be more easily monitored by creditors and shareholders. Hence, the cost of debt financing will be lower. Similarly, another ownership variable, institutional ownership has a positive impact on the long-term debt ratio in the first three regressions. On the contrary, institutional ownership has a negative effect on the short-term debt ratio. As it is reviewed above in the leverage factors section, institutional investors reduce the myopic investment pressure on the management and encourage long-term investments (Edmans, 2009; Hansen & Hill, 1991; Bushee, 1998; Eng & Shackell, 2001). Therefore, in order to match the maturities, firms, which are highly owned by institutional owners, may prefer long-term debt instead of short term debt.

Table 4. Regression results

Variable	LTD / TA	LTD / TA	LTD / TA	STD / TA	STD / TA	STD / TA
PROFIT		-0.2429***	-0.6057***		-0.0915***	-0.0916***
ROA	-0.2496***			-0.0944***		
GROWTH	-0.0009	-0.0011	0.0490**	-0.0042	-0.0043	0.0215
RISK	4.51E-06	4.46E-06	5.29E-06	-3.33E-06	-3.35E-06	-3.15E-06
SIZE	0.0021***	0.0022***	0.0020	0.02887***	0.0289***	0.0274***
TAX-SHIELD	0.0631	0.0958	0.3145	0.4946	0.5072	0.8909**
TANGIBILITY	0.1568***	0.1565***	0.1277***	-0.3112***	-0.3111***	-0.3271***
OWNERSHIP	0.0652***	0.0648***	0.2094***	0.0150	0.0148	0.0371***
INSTITUTION	0.0298**	0.0304**	0.0019	-0.1868***	-0.1865***	-0.1560***
BIST SRD			0.1422**			-0.0132
R²	0.1393	0.1429	0.4854	0.0532	0.0533	0.1385
Adj. R²	0.1367	0.1404	0.4790	0.0503	0.0504	0.1278
N	2284	2284	655	2284	2284	655
Sample	2007 2015	2007 2015	2014 2015	2007 2015	2007 2015	2014 2015

*** Significant at 1%; ** Significant at 5%; * Significant at 10%.

Non-debt tax shield, growth and risk are insignificant in most of the regressions. Growth is only significant in the third regression with a long-term debt ratio as dependent variable and BIST_SRD dummy as independent

variable, and its effect is positive, which is in line with the related literature.

Interestingly, the BIST_SRD dummy is significant for the long-term debt ratio, whereas it is insignificant for the short-term debt ratio. Firms following sustainability business activities use more long-term debt than other firms. This may be in line with their long term perspective, which can be concluded from the definition of corporate sustainability, where long-term value is aimed for the benefit of stakeholders by managing environmental, governance and social issues with high performance.

Table 5. Regression results for firms providing high quality sustainability reporting

Variable	LTD / TA	LTD / TA	STD / TA	STD / TA
PROFIT	-0.5736		-0.4637	
ROA		-0.6383		-0.4519
GROWTH	0.1734	0.1813	0.0135	0.0147
RISK	-0.0016	0.0009	0.0049	0.0070
SIZE	-0.0027	-0.0023	0.0401***	0.0403***
TAX-SHIELD	1.9323**	1.7853**	-0.7257	-0.8657
TANGIBILITY	0.4139**	0.4024**	-0.5696***	-0.5738***
OWNERSHIP	0.2332	0.2395	-0.4137**	-0.4171**
INSTITUTION	-1.52E-05	-0.0014	-0.1487	-0.1511
R ²	0.3854	0.3896	0.4699	0.4688
Adj. R ²	0.2624	0.2675	0.3639	0.3626
N	44	44	44	44
Sample	2014 2015	2014 2015	2014 2015	2014 2015

*** Significant at 1%; ** Significant at 5%; * Significant at 10%.

Based on the regression results with the sample, including all non-financial listed firms at Borsa Istanbul, the main capital structure determinants are profitability, size, tangibility, institutional ownership and the ratio of free-float outstanding value to total assets. In order to explore the capital structure determinants of firms that provide high quality sustainability reporting, a model is built for the firms in the Borsa Istanbul Sustainability Index. The regression results are given on Table 5.

Interestingly, non-debt tax shield variable has a significant positive effect on the long-term debt ratio which is an insignificant variable in the other regressions. Firms, in the sustainability index, prefer to use long-term debt in order to benefit from the tax deductions.

Tangibility is the other significant capital structure determinant for the sustainability index firms. Similar to the regression results for the whole sample, tangibility has a positive impact on long-term debt ratio, whereas it has a negative impact on short-term debt ratio.

Ownership and size of firm are the other two capital structure determinants for the short-term debt ratio. Similar to the previous regressions, size has a positive effect on short-term debt. On the other hand, contrary to the whole sample regressions, the ownership effect is negative for sustainability index firms.

To wrap up, tangibility and tax-shield are the two determinants of long-term debt whereas tangibility, size and free-float outstanding value are determinants of short-term debt for the firms providing sustainability reporting in Turkey. The two main capital structure determinants for the whole sample, namely profitability and institutional ownership, are not significant for the sustainability index firms.

5. Conclusion and Discussion

The main objective of this research is to investigate the capital structure determinants of firms that provide high quality sustainability reporting. Before going through this analysis, to understand the full picture, the analysis is conducted for all the non-financial firms trading at Borsa Istanbul between 2006 and 2015. For the main part of the study, firms in the Borsa Istanbul Sustainability Index are accepted as the firms that provide high quality sustainability reporting; hence, the time period is between 2014 and 2015.

With the ultimate aim of analyzing the capital structure determinants, debt ratio is considered the dependent variable, but it is divided into two parts as long-term debt and short-term debt. Companies' short- and long-term borrowing purposes are different, so the driving force for holding long- and short-term debt is expected to be different. In line with the related literature, in the empirical analyses, profitability (measured by both EBIT/Total Assets, and return on assets), tangibility, growth of the firm, size, risk, non-debt tax shield, and ownership structure of the firms (measured by both the free-float-outstanding-value/total-assets and institutional ownership

percentage) are considered to be the main possible capital structure determinants. A dummy variable for the firms in the sustainability index is also used in empirical tests conducted for the whole market sample, in order to explore a possible effect of being a sustainability index firm on capital structure.

The main determinants of capital structure, when measured by long-term debt, are profitability, size, tangibility, the ratio of free-float outstanding value to total assets (which, in a way, measures the stock market transparency of a firm), and institutional ownership percentage. All of these variables have a positive impact on the long-term debt ratio, except for profitability, which has a negative effect. On the other hand, when capital structure is measured by the short-term debt ratio, profitability, size, tangibility and institutional ownership percentage become the main determinants. In this case, tangibility and institutional ownership has an opposite effect on the short-term debt. Interestingly, being a sustainability index firm is only significant for long-term debt. Sustainability index firms are holding more long-term debt than other firms.

Based on the empirical analyses conducted for the sustainability index firm sample, one can conclude that the main determinants of capital structure (when measured by long-term debt ratio) are non-debt tax shield and tangibility. Note that size, tangibility and the ratio of free-float outstanding value to total assets are significant variables when capital structure is measured by short-term debt. Interestingly, for sustainability index firms, non-debt tax shield is important. In other words, firms providing high quality sustainability reporting hold more long-term debt in order to benefit from tax deductions. Furthermore, when the tangibility of a firm increases, its long-term debt rises, while its short-term debt decreases.

In a nutshell, based on the empirical analyses conducted above, the determinants of capital structure are different for long-term debt and short-term debt as well as for firms providing high quality sustainability reporting and the other (non-financial) firms.

The most important limitation of this research is the small sample size for the firms providing sustainability disclosure. BIST Sustainability Index (XUSRD) is used for analysis. This index is being reported since the beginning of 2014. So, it is available for only two years. For the empirical tests there are 44 firm-year observations, which satisfy the minimum observation requirement for regression analysis, but unfortunately, it is small to conclude healthy results. On the other hand, this is a preliminary study for future research. In fact, in order to validate the results for Turkish firms, the analyses would need to be repeated after collecting enough data for firms providing sustainability reporting. Obviously, this can only be possible as the XUSRD ages. Moreover, to understand the full picture, other emerging markets would also need to be included. We hope that this study will be a pathfinder for future researchers who are interested in the effects of sustainability activities on firms' financing and investing decisions.

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