Borsa İstanbul'da Kayıtlı Türk Firmaların Firmaya Özgü Sermaye Yapısı Belirleyicileri: Bir Yapısal Eşitlik Modellemesi Yaklaşımı

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ÖZ

Bu çalışma, en önemli sermaye yapısı teorilerinin açıklayıcı gücünü test etmektedir. Çalışma ampirik çalışmalara üç faklı açıdan katkı sağlamaktadır. Birincisi, çoğu daha önce ampirik olarak değerlendirilmemiş daha geniş bir dizi teoriyi test etmektedir. İkincisi, sermaye yapısı teorilerinin farklı borç yapılarına göre farklı ampirik sonuçları olduğundan, bu çalışma toplam borç yapısından çok, uzun vadeli borç yapısını, kısa vadeli borç yapısını ve kısa-uzun vadeli borç yapılarını ayrı modeller üzerinde test etmektedir. Ampirik sonuçlar, likidite, varlık yapısı, büyüklük, karlılık, büyüme ve oynaklık faktörlerinin sermaye yapılarını açıklamada anlamlı faktörler olduğunu ve vergi düzeyi ile borç-dışı vergi kalkanının tüm modellerde önemsiz faktörler olduğunu göstermektedir. Tüm modellerde sermaye yapısı ile firma büyüklüğü ve büyüme faktörleri arasında pozitif yönlü; oynaklık ve karlılık faktörleri arasında negatif yönlü ilişkiler söz konusudur. Ancak, likidite ve aktif yapısı faktörleri işletmelerin kısa vadeli borç yapılarını negatif yönde ve uzun vadeli borç yapılarını ise pozitif olumlu yönde etkilediği görülmüştür.

Anahtar Kelimeler: Sermaye Yapısı, Ödünleşme Teorisi, Finansal Hiyerarşi Teorisi, Yapısal Eşitlik Modellemesi.

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The Firm Specific Capital Structure Determinants of Turkish Firms Listed in Istanbul Stock Exchange: A Structural Equation Approach

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ABSTRACT

This study tests the explanatory power of the most important capital structure theories. The study extends empirical studies in three ways. First, it tests a much broader set of theories, many of which have not previously been evaluated empirically. Second, since the capital structure theories have different empirical implications in respect to different types of debt structures, this study analyzes measures of short-term, long-term and short-term with long-term debt structure rather than an aggregate measure of total debt structure. The empirical results show that liquidity, asset structure, size, profitability, growth and volatility are the statistically significant factors and tax level, non-debt tax shield are the insignificant factors in all models. Firm size and growth are positive; volatility and profitability are the factors that are effective in the negative direction in all models. However, liquidity and asset structure were found to affect short-term debt structure negatively, and long-term debt structure positively.

Keywords: Capital Structure, Trade-off Theory, Pecking Order Theory, Structural Equation Modeling.

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1. INTRODUCTION

Until today, a number of theories have been proposed to explain the variation in capital structures across firms. The theories suggest that firms select capital structures depending on attributes that determine the various costs and benefits associated with debt and equity financing. Empirical studies in this area has covered behind the theoretical research, perhaps because the relevant firm attributes are expressed in terms of theoretical concepts that are not directly observable. But these theoretical structures (latent variables/attributes) can be described by some observable financial indicators. These observable indicators or proxy's variables can then be viewed as measures of latent attributes with measurement errors. Conventionally, researchers use either one or more observable variables to form a proxy to measure a single latent theoretical attribute. However, the use of these indicators as theoretical explanatory variables in both cases may cause errors in variables problems (Maddala & Nimalendran, 1996).

The basic method used in previous empirical studies has been to estimate by regression analyses with observable variables to form for these latent attributes. This approach has several problems. There may be no unique representation of the construct we wish to measure. There are often many possible proxy variables for a particular construct, so biasing their interpretation of the significance levels of tests. Second, it is often difficult to find measures of particular attributes that are unrelated to other attributes that are of interest. Thus, selected observable variables may be measuring the effects of several different attributes (Titman & Wessels, 1988). Third, observable indicators might not completely present the characteristics under measurement so considering measurement errors, they can be used as a scale for latent constructs but this fact may create problems in empirical studies. A more appropriate multivariate technique is SEM to analyze such a complex model. SEM is a general and powerful multivariate technique related to multivariable regression and it is the developed version of the general linear model, which let the researchers to test a set of regression equations simultaneously. Variables of this equation set may be as observable variables or as latent variables, which are not measurable, but they are in association with observable variables (Hooman, 2008). By applying SEM in financial structure studies, the mentioned problem will be removed. By using SEM technique, we can use several observable indicators for latent theoretical structures without encountering multicollinearity issues in independent variables, which are a common problem in regression analysis (Chang & Sudipto, 2009).

In this study, using SEM, we analyzed the determinants of capital structure in Istanbul Stock Exchange and measure the effects of firm's specific characteristics including liquidity, asset structure, firm size, profitability, growth opportunities, tax level, non-debt tax shield and volatility on four different capital structure models.

The study extends empirical studies on capital structure theories in three ways. First, it tests a much broader set of capital structure theories, many of which have not previously been evaluated empirically. Second, since the capital structure theories have different empirical implications in respect to different types of debt structures, this study analyzes measures of short-term, long-term and short-term with long-term debt structure models rather than an aggregate measure of total debt structure. Third, this study uses a SEM technique that diminishes the measurement error problems encountered when working with proxy variables.

2. THE TWO MAJOR COMPETING THEORIES OF CAPITAL STRUCTURE

More than 50 years have passed since the seminal work of Modigliani and Miller (1958, 1963) concerning the importance of optimal capital structure. However, the seemingly simple question as to how firms should best finance their fixed assets remains a contentious issue. The empirical evidence about a firm's optimal mixture of financing during this period is both voluminous and mixed together. Although there is no consensus, two competing theories (the Trade-off and the Pecking Order Theory) have emerged as the finance profession's best explanations for the capital structure decisions. The theories that have been trying to determine the optimal capital structure of firms more realistically, taking into account the "imaginary world" that has been created by Modigliani and Miller since 1958, and other factors such as tax,

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bankruptcy costs, information asymmetry and agency costs. This section gives a simply brief summary of these theories.

2.1. The Trade-off Theory

In the static trade-off theory, as originally introduced by Kraus and Litzenberger (1973), firms balance the tax benefits of debt against the deadweight costs of financial distress and bankruptcy (Kraus & Litzenberger, 1973). Because firms are allowed to deduct interest paid on debt from their tax liability, they favor debt over equity. The present value of the resulting gains from choosing debt over equity, called tax shield, increases firm value. Without any additional and offsetting cost of debt, this tax advantage would imply full debt financing (Baker & Martin, 2011, p. 18).

An obvious candidate for an offsetting cost of debt is bankruptcy. In fact, debt increases the risk of financial distress, potentially avoiding a firm's excessive debt financing. The higher a firm's debt ratio, the higher will be the associated probability of bankruptcy. The resulting costs of financial distress can be divided into direct and indirect costs (Haugen & Senbet, 1978). Direct costs of bankruptcy are comprised of legal fees, restructuring costs, and credit costs among others. Indirect costs include losses in customer confidence, declining vendor relationships, and the loss of employees.

2.2. The Pecking Order Theory

The pecking order theory (Myers & Majluf, 1984) relies upon the concept of asymmetric information between managers and investors that guides managers in their preference for raising funds. According to this theory, firms select for funding from sources with the lowest degrees of asymmetric information because the cost of borrowing rises with this metric. This leads the firm to a "pecking order" in its search for funding, first using internally generated funds (primarily retained earnings), then tapping private debt (primarily in the form of loans from financial institutions), and seeking equity from outside sources only as a last resort. Hence, a firm's capital structure is simply the result of previous independent decisions to raise capital. Consequently, there is no "optimal" ratio of debt to equity under the Pecking-Order Theory.

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3. DETERMINANTS OF CAPITAL STRUCTURE

The financial theories of capital structure suggest eight most important attributes that may affect the choice of a firm's capital structure. These eight latent attributes are derived from a variety of theories and they are liquidity, asset structure, firm size, profitability, growth, tax, non-debt tax shield and volatility (business risk). This section briefly reviews how these latent attributes may affect the choice of capital structure and the adoption of indicators for each attribute, as discussed in Titman and Wessels (1988) and other literature. Among the studies aiming to determine the optimal capital structures of firms in finance literature are Modigliani and Miller (1958, 1963), Taggart (1980), Pozdena (1987) and Titman and Wessels (1988), Michaelas et al. (1999), Sogorb-Mira (2005), Huang and Song (2006).

3.1. Endogenous Attributes and Their Observable Indicators

Debt ratios are widely used as variables that define capital structure in the finance literature. In this study, debt ratios are used according to the total debt, long-term debt and short-term debt level, as it would be meaningful to distinguish between short and long-term debt as well as the total debt within the capital structures of firms. The observed variables used to define the latent total debt structure (*TD*) are Total Debts / Total Assets (*CS1*), Total Debts / Market Value of Total Assets (*CS2*), Total Debts / Equity (*CS11*) and Total Debts / Market Value of Equity (*CS12*). The observed variables used to define the latent-long-term debt structure (*LTD*) are Long Term Debts / Total Assets (*CS3*), Long Term Debts / Market Value of Total Assets (*CS4*), Long Term Debts / Equity (*CS13*), Long Term Debts / Market Value of Equity (*CS14*). The observed variables used to define the latent short-term debt structure (*STD*) are Short Term Debts / Total Assets (*CS5*), Short Term Debts / Market Value of Total Assets (*CS6*), Short Term Debts / Equity (*CS15*), Short Term Debts / Market Value of Equity (*CS16*). The observed and latent variables used in this study summarized in Table-2 (Line number: 1-12).

3.2. Exogenous Attributes and Their Observable Indicators

In this section, we present a brief discussion of the attributes that different theories of capital structure suggest may affect the firm's debt-equity choice. These attributes are denoted Liquidity (*LQ*), asset structure (*AS*), firm size (*SZ*), profitability (*PR*), growth opportunities (*GR*), tax level (*TX*), non-debt tax shield (*TS*) and volatility (*VL*) that are considered to have the most effect on capital structure in theoretical and empirical studies in the literature (Bradley, Jarrell, & Kim, 1984; Kester, 1986; Titman and Wessels, 1988; Sogorb-Mira, 2005; Michaelas et al., 1999). The attributes, their relation to the capital structure choice, and their observable indicators are discussed below.

1. Liquidity (*LQ*)

In theory, firms with more liquid resources can use them as another inside source of funds instead of debt, leading to lower debt levels according to the pecking order theory. The adverse relationship between liquidity and debt ratio argued also by information asymmetry theory. In addition, managers can manipulate liquid assets in favor of shareholders against the interest of debt holders. Such manipulations increase the agency costs of debt financing and reduce debt-financing levels.

Firms should issue more debt to prevent managers from wasting free cash flow, which implies a positive relationship between debt and liquidity in terms of trade-off theory (Jensen, 1986). Trade-off theory implies a positive relationship between liquidity and debt ratios: due to more liquidity is associated with better ability to meet interest obligations; better liquidity position is associated with more debt. Decomposing debt ratios into secured and unsecured types, (Sibilkov, 2009) reports that assets liquidity is positively associated with secured debt while the relationship with unsecured debt is curvilinear; consistent with pecking order theory, (Anderson & Carverhill, 2012) find that corporate cash holding can be explained by pecking order theory. Similarly, the Dutch evidences show strong consistency a negative relationship between liquidity and leverage (De Jong & Veld, 2001; De Haan & Hinloopen, 2003; De Jong & Van Dijk, 2007).

The liquidity indicators used in this study are Current Ratio, [*LQ1*=Current Assets / Short Term Debts], Liquidity Ratio [*LQ2*=Liquid Assets / Short Term Debts] and Cash Ratio [*LQ3*=Liquid Assets + Securities) / Short Term Debts]. The liquidity observed variables used in this study listed in Table-2 (Line number: 13-15).

2. Asset Structure (*AS*)

Many empirical studies argue that the capital structure of the firm owned assets have mixed impacts on borrowing decisions, among which the arguments for positive relationship between debt structure and asset structure (Frank & Goyal, 2009); Titman and Wessel, 1988). Based on agency costs theory high debt ratio has a penalizing role in consumption of supervisory advantage because of increased bankruptcy costs and bondholder monitoring costs. This idea is supported by Grossman and Hart (1982) who report that due to the monitoring costs of firms with less collateral assets are indeed higher. As a result, those firms try to issue more debt to discipline managers. Scott (1977) further supports this view by showing that firms have incentives to issue secured debt to induce higher equity value when current creditors are not guaranteed with collaterals. Alternatively, based on the trade-off theory of capital structure, firms with lower bankruptcy cost would have higher target debt ratios. Therefore, the greater the proportion of tangible assets on the firms' balance sheet, the more willing lenders will be to supply loans, leading to these firms' higher debt ratio. Myers and Majluf (1984) find that firms with high debt ratio tend to borrow more to take advantage of lower issuance costs.

Oppositely, *Information Asymmetry Theory* suggests a negative relationship between asset structure and debt ratios. (Harris & Raviv, 1991) articulate that firms with low tangible assets are more sensitive to information asymmetry. In order to avoid the signaling effect, they prefer to issue debt over equity when external financing is required. Additionally, bondholder-shareholder conflicts also suggest a negative asset structure-debt ratio relationship. The assets replacement hypothesis discusses that shareholders have reasons to do risky investment so that the wealth transferred from bondholders to shareholders.

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Asset structure indicators used in this study are Fixed Assets / Continuing Capital (*AS1*), Tangible Fixed Assets / Continuing Capital (*AS2*) and Fixed Assets / Equity (*AS3*). Observed and latent (*AS*) asset structure variables used in this study is listed in Table-2 (Line #: 16-18).

3. Firm Size (*SZ*)

Many studies emphasize a positive relationship between firm size and capital structure. As indicated by (Marsh, 1982), Titman and Wessels (1988) and Michaelas (1999), there is a positive relationship between firm size and capital structure. This relationship can be explained by the possibility of funding from capital markets as firms grow the ability to borrow at lower interest rates and the more stable income. In addition, many theoretical studies by (Noe, 1988) (Poitevin, 1989), (Harris & Raviv, 1991) and (Stulz, 1990) show that firms owe more as they grow. Another word, larger firms usually have credit and reputation in debt market and the creditors will pay lower debt for the agency costs. Larger firms have a lower risk of bankruptcy and they are more diversified. Therefore, according to trade-off theory, they can issue more debt (Kimiagari & Einali, 1998). This implies a positive relationship between capital structures and firm size. Therefore, there is a positive relationship between financial debt ratios and the size of the firm based on agency cost and trade-off theories.

Firm size influences the probability of financial distress. Larger firms are more diversified and have been shown empirically to have lower probabilities of default. Information asymmetries are smaller for large firms (Myers and Majluf, 1984). Therefore, according to pecking order theory, the relationship should be negative.

Indicators of firm size (*SZ*) used in this study are LN [Total Assets; *SZ1*], LN [Equity; *SZ2*], LN [Market Value; *SZ3*]. The observed firm size variables used in this study listed in Table-2 (Line #: 19-21).

4. Profitability (*PR*)

In finance literature, there is generally a negative relationship between profitability and capital structure. This is because firms generally prefer internal sources of funding (Michaelas, 1999, Huang and Song, 2006). However, although a number of theoretical studies have been carried out, such as Modigliani and Miller (1958), there is no consistent relationship between capital structure and profitability levels (Huang and Song, 2006: 14-36). According to *trade-off theory* (TOT), agency, tax and bankruptcy costs lead the profitable firms to use the leverage. By increasing the profitability, the bankruptcy costs will decrease. The less the firm pays for interest, using tax profit, it would be more profitable. Therefore, it mainly uses debts to finance. For both reasons, the *trade-off theory* predicts a positive relation between capital structures and firm profitability. Thus according to TOT theory there is a negative relationship between the profitability and the debt ratio.

In contrast, firm profitability strongly influences the probability of financial distress. The more profitable is the firm, the less likely it is to default on its liabilities. In addition, the more profitable is the firm, the more taxes it can avoid by employing higher debt ratios. The more profitable is the firm, the greater is the availability of internally generated funds. Therefore, the *pecking order theory* (POT) also predicts a negative relation between capital structures and profitability. According to pecking order theory (Myers, 1984), firms prefer internal finance. If external finance is required, firms issue the safest security first. That is, they start with debts, then possibly hybrid securities such as convertible bonds, and lastly common equity as a last resort. The pecking order explains that the most profitable firms generally borrow less, not because they have low target debt ratios but because they do not need external funds. Less profitable firms issue debts because they do not have internal funds sufficient for their capital investment programs and hence use debt financing as first priority according to the pecking order of external financing. Thus, there should be a negative relation between profitability and capital structures. Thus according to POT theory there is a positive relationship between the profitability and the debt ratio.

We used Net Profit / Net Sales (Net Profit Margin; *PR1*), Net Profit / Total Assets (Asset Profitability; *PR2*), Net Profit / Equity (Equity Profitability; *PR3*), Profit before Tax / Equity (*PR4*) as profitability indicators. The profitability observed variables used in this study listed in Table-2 (Line #: 22-25).

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5. Growth Rate (*GR*)

The expected costs of financial distress are greater for a firm with better growth opportunities because the value of these opportunities is an intangible asset, and much of the value of these growth opportunities is lost in financial distress because they cannot be financed and realized. If the trade-off theory is correct, then there should be a negative relation between proxies for growth opportunities and firm debt ratio levels (Cole, 2013).

The predictions of the pecking order are not clear-cut. In its simplest form, it suggests a positive relationship between debt ratio levels and growth opportunities. Debt level typically grows when investment exceeds retained earnings and falls when investment is less than retained earnings. Therefore, given profitability, debt ratio is predicted to be higher for firms with more investment opportunities (Baker & Martin, 2011, p. 25). Growth opportunities are notoriously difficult to value, but especially so by observers outside the firm, so that asymmetric information should be more severe when a firm has more growth opportunities. In this case, the firm with better growth prospects would find it more difficult to borrow from a bank or other source of credit. Thus, the pecking order theory also predicts a negative relation between debt ratio and growth opportunities (Cole, 2013). As a result, a positive or negative relationship with debt ratio is expected in terms of pecking order theory.

Empirical studies also show a positive relationship between growth rate indicators and capital structure (Huang and Song, 2006; Michaelas et al., 1999; Michaelas et al. 1999; Bevan and Danbolt, 2002; Eriotis, 2007). As the firms grow, their requirement of finance tends to increase. This is explained by the inability of firms to meet their financial needs from their internal sources as they grow and prefer to borrow for this reason.

Indicators of growth opportunities (*GR*) used in this study are Assets Growth Rate (*GR1*), Net Profit Growth Rate (*GR2*), Net Sales Growth Rate (*GR3*) and Equity Growth Rate (*GR4*). The observed growth rate variables used in this study listed in Table-2 (Line #: 26-29).

6. Tax Level (*TX*)

The effect of the level of tax on the capital structure is one of the fundamental issues discussed in the Modigliani-Miller perspective. Today, almost all researchers believe that the tax factor is important in determining optimum capital structure. Studies show that the direction of the relationship between tax level indicators and capital structure is generally positive. This is explained by the increase in the tax shield as the relative tax increases (Huang and Song, 2006). However, in many empirical studies on capital structure in financial literature, it is indicated that there is a meaningful relationship between the tax level indicators and the capital structure, the results that do not coincide with the theoretical expectations cannot be obtained (MacKie-Mason, 1990; Huang & Song, 2006).

Firms will exploit the tax deductibility of interest payments to reduce their tax payments, and hence the trade-off theory predicts that firms tend to issue more debt when corporate tax rates are higher. However, firms with other tax shields, such as net operating loss carry-forwards, depreciation expenses, and investment tax credits, have less need to exploit the debt tax shield. Ross (1985) argues that if such firms issue excessive debt, they may become "tax-exhausted" in the sense that they are unable to use all their potential tax shields. Debt is then "crowded out," and the incentive to use debt financing diminishes as non-debt tax shields increase. Accordingly, in the framework of the trade-off theory, one would expect a negative relationship between debt and non-debt tax shields. In contrast, Scott (1977) and Moore (1986) argue that firms with substantial non-debt tax shields should also have considerable collateral assets that can be used to secure debt. Secured debt is less risky than unsecured debt, and hence one could hypothesize a positive relationship between debt ratio levels and non-debt tax shields (Baker & Martin, 2011, p. 27).

As tax level indicators, Paid Tax / Net Profit (*TX1*), Paid Tax / EBIT (*TX2*) and Paid Tax / Operating Profit (*TX3*) are used. The tax level observed variables used in this study listed in Table-2 (Line #: 30-32).

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7. Non-Debt Tax Shield (*TS*)

As stated earlier, companies are exempted from the tax burden arising out of their debts, and on the other hand, the companies that prefer to borrow money from profit sharing payments that do not benefit from this exemption and the tax advantage provided by this way are defined as "tax shields". In addition, the depreciation that provides the tax advantage to the firm is also considered as a non-debt tax shield. There is generally a positive relationship between the non-debt tax shield and the capital structure in the studies carried out. In other words, the increase in the non-debt tax shield opportunities of firms increases the relative importance of foreign resources in capital structures.

Bradley et al. (1984) have found a positive relationship between capital structure and non-debt tax shields in their studies. Empirical studies generally confirm a positive relationship between capital structure and non-debt tax shield (Huang & Song , 2006). However, many researchers such as (Chaplinsky & Niehaus, 1993; Wald, 1999) found a negative relationship between the tax structure and the non-debt tax shield.

Depreciation / Total Assets (*TS1*), Depreciation / Fixed Assets (*TS2*) and Depreciation / Tangible Fixed Assets (*TS3*) used as non-debt tax shield indicators in this study. The non-debt tax shield observed variables used in this study listed in Table-2 (Line #: 33-35).

8. Volatility (*VL*)

The volatility of profitability is related with business risk, which is proved to be inversely related to debt ratio without any difference for pecking order or trade-off theory. Firms with volatile cash flows experience higher expected costs of financial distress, and the debt-related agency costs are more pronounced with increasing volatility. Additionally, more volatile cash flows reduce the probability that the tax shield will be fully utilized. Therefore, the trade-off theory implies a negative relationship between debt ratios and the volatility of cash flows.

Volatility is an indicator of the firm capital structure and is generally expected to be negatively related to the firm debt ratio levels. According to Titman and Wessels (1988) there is a negative relationship between volatility and capital structure. In other words, business risk is expected to diminish the relative level of debtors in capital structure. However, (Hisia, 1981) shows that asymmetry risk is reduced as the volatility of the firm's assets increases by combining the option and capital-pricing model with the Modigliani-Miller theorem. In other words, there is a positive relationship between operational risk and capital structure (Huang and Song, 2006: 14-36). This relationship is generally expected for capital structures of SME firms (Michaelas et al., 1999; Hsia, 1981).

VL1=LN [EBIT / Standard Deviation of Percentage Change in Net Sales], *VL2*=LN [EBIT / Standard Deviation of Percentage Change in Total Assets], *VL3*=LN [(EBIT + Depreciation) / Standard Deviation of Percent Change in Total Assets] and *VL4*=LN [Standard Deviation of Percent Change in Operating Profit] are used as volatility indicators. The observed volatility variables used in this study listed in Table-2 (Line #: 36-39).

4. LITERATURE REVIEW

Titman and Wessels (1988), introduced problems of regression analysis in connection with parameters estimation through indicators of latent theoretical characteristics, at the same time they used SEM approach to determine the effective factors on financial structure for the first time. They, applying SEM, tested the effects of eight theoretical latent structures including non-debt tax shield, growth, uniqueness, type of industry, firm size, asset structure, volatility and profitability on leverage latent structure. They used six measures of capital structure (long-term, short-term, and convertible debt divided by market and by book values of equity). The results showed that there is no significant relation between non-debt tax shield, volatility, asset structure and the firm future growth opportunities.

Rajan and Zingales (1995) studied the determinants of public stock firm's capital structure at seven great countries in the world such as USA, England, Canada, France, Germany, Italy and Japan. The results showed that there is a negative relation between the financial leverage with profitability and book-to-

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market ratio and there is a positive relation with tangible fixed assets and size of the firm (Rajan & Zingales, 1995). Bhole and Mahakud (2004) studied the trends and determinants of cooperate capital structure in India during the years 1966 to 2000, the results proved that there is a negative relation between financial structure and costs of debts and non-debt tax shield and a positive relation with the size of the firm and collateral value of assets (Bhole & Mahakud, 2004).

Chang et al., (2009), also using SEM approach, studied the determinants of capital structure. In their study, they proposed that a reason for not existing meaningful relation between earning volatility, collateral value of assets and the firm growth with capital structure in Titman and Wessel's study (1988) and its poor outcomes shall be the fact that the indicators used do not sufficiently introduce the nature of characteristics proposed by the financial theories. While improving the indicators, in order to improve the results, they used *Multiple Indicators* Multiple Causes (*MIMIC*) method which is a special method in SEM. The results of their studies indicated that the eight variables which were studied in Titman and Wessel's study (1988) have influence on the firms' capital structure. This study also showed that the firm growth is the most important determinant of capital structure and the long-term debts ratio is the most significant indicator of the firms' capital structure. Yang et al (2010) in their research, using SEM, studied effective factors on capital structure and stock return and determined the relations between them in Taiwan simultaneously. The researchers come up with the result that in the condition that the debt ratio has a positive influence on stock return, the stock return has a negative influence on capital structure. The research also showed that the growth opportunities, profitability and the exclusivity of the firm's products have a negative influence on leverage and assets structure; moreover, the size of the firm has a positive influence on financial leverage.

Yousefzadeh et al., (2014), studied the effective factors on capital structures. In line with achieving this objective, financial information of 97 companies, accepted in Tehran Stock Exchange during the research period (2003 to 2011) was analyzed using the SEM approach. In study, in order to measure the capital structure, it is used from the long-term debts to assets market value ratio and studied the influence of the variables including growth, uniqueness, assets structures, profitability, earnings volatility, size, stock returns and industry classification on capital structure, the results indicated that growth, uniqueness and the profitability has a negative effect on the capital structure, but assets structure and size has a positive effect on the capital structure. The current studies also showed that there is no significant relation between earning volatility, the firm stock returns and the capital structure (Yousefzadeh, Aazami, Shamsadini, & Abousaiedi, 2014).

Acaravcı (2015) investigated the determinants of capital structure in Turkey by using panel data methods. The sample period from 1993 to 2010 for 79 firms in the manufacturing sector traded on the Istanbul Stock Exchange. The base model was expanded with firm size and sector specific effects. This study compares also effects on capital structure according to sectors and firm size of variables used in models. Growth opportunities, size, profitability, tangibility and non-debt tax shields are used as the firm-specific variables that affect a firm's capital structure decision. Empirical results present that there are significant relationships between growth opportunities, size, profitability, tangibility and leverage variables. But non-debt tax shields explanatory variable has insignificant effect on book value of total debt / total assets variable. Growth opportunity has effect on capital structure that this result supports the trade-off theory. Size, profitability and tangibility have effects and support the pecking order theory. On the other hand, profitability and growth opportunity variables have more significant effects than other variables on book value of total debt / total assets and book value of total debt / book value of equity for all sectors. Furthermore, in two leverage models, profitability variable of small and large firm groups has effect on capital structure and there is no a significant difference between two groups (Kakıllı Acaravcı, 2015).

Matias et. all. (2018), studied capital structure determinants for Portuguese hotel firms between 2006 and 2014. Secondary data from 356 hotel units was analyzed using the partial least squares (PLS) technique. The results show that the explanatory variables proposed as capital structure determinants have an impact on the financing and debt decisions made by the firms in the sample. Overall, the results support the trade-off and pecking-order theories are important in explaining the capital structure of the Portuguese hotel firms (Matias, Salsa, & Afonso, 2018).

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5. DATA AND METHODOLOGY

This study uses a SEM technique that reduces the measurement error problems encountered when working with proxy variables. For this purpose, the financial ratios of 203 companies selected among 282 companies operating in the Istanbul Stock Exchange (excluding financial enterprises) were analyzed using the SEM approach. In order to test the most important recent capital structure theories, it is defined four different models, namely total debt structure (*TD*), long term debt structure (*LTD*), short term debt structure (*STD*) and combined long term and short term debt structure (*LTD & STD*) and studied the influence of the eight most important firm specific latent factors including liquidity (*LQ*), asset structure (*AS*), firm size (*SZ*), profitability (*PR*), growth (*GR*), tax level (*TX*), none-debt tax shield (*TS*) and volatility (*VL*) on four different capital structure models. 12 observable variables are used for describing 3 endogenous latent variables (*TD*, *STD* and *LTD*) and 27 observable variables to define 8 exogenous latent variables (*LQ*, *AS*, *SZ*, *PR*, *GR*, *TX*, *TS* and *VL*). Symbols and description of observed and latent variables used in this study is summarized in Table-2.

In this study, LISREL 8.8 program is used to analyze capital structure models. If the data are ordinal, categorical or mixed, then the diagonally weighted least squares (DWLS) method with polychoric correlation matrices is recommended. This method will require an estimate of the asymptotic covariance matrix of the sample correlations. If the data are continuous and approximately follow a multivariate normal distribution, then the maximum likelihood (ML) method is recommended. If the data are continuous and approximately do not follow a multivariate normal distribution and the sample size is not large, then the robust maximum likelihood (RML) method is suggested. This method will require an estimate of the asymptotic covariance matrix of the sample variances and covariances. Robust maximum likelihood (RML) method is used for analyzing our four different capital structure models.

In this study, normalized variables (normalized scores) were used for approximation to multivariate normal distribution. In addition, the data were analyzed with robust maximum likelihood method because the sample size was small and the sample data did not follow multivariate normal distribution. Thus, we normalize the variables before analysis by transforming the data into normal scores so that the robust maximum likelihood method can be applied more appropriately. Based on the normal scores, the covariance matrix is then calculated for each of the observable variable. The covariance matrix is used instead of the correlation matrix as an input to estimate the parameters in LISREL since the analysis of the correlation matrix is problematic in several ways. Such an analysis may (1) modify the specified model, (2) produce incorrect goodness-of-fit measures, and (3) provide incorrect standard errors (Chang, Lee, & Lee, 2009, p. 207).

Multiple observed indicators of unobserved latent structures are used to explain relations among the latent variables. This study provides a measurement model and a structural model. In the measurement model of 27 observable variables are utilized to describe 8 latent constructs. To assess the suitability of multivariable measures, first employed confirmatory factor analysis (CFA) to check the convergence of the measures of each construct. These factor loadings (lambdas) in the measurement model then may be interpreted as validity of coefficients reflecting the degree to which the observed variables adequately measure the relevant latent construct. In the structural model, measured leverage ratio is specified as function of the attributes defined in the measurement model. In the structural model, the endogenous (capital structures) and eight exogenous latent variables are involved. The model estimates the impact of each of the attributes on debt ratio.

In theory and practice NNFI, CFI and IFI are strongly recommended for goodness-of-fit (Hu & Bentler, 1999). The cutoff criteria follow conventional rules of thumb: RMSEA≤0.08; SRMR≤0.08; NNFI≥0.90; CFI≥0.90; and IFI≥0.90 (Hooman, 2008). The estimated goodness-of-fit indices of structural models are shown in Table-3. The measurement and structural models have met all goodness-of-fit criteria. With the support of acceptable goodness-of-fit measures, we have great confidence in the interpretation of results. RMSEA is strongly recommended by statisticians such as Browne and Cudeck (1993), Hu and Bentler (1999), and Steiger (1990); alternatively, SRMR is recommended by Hu and Bentler (1999).

Table-1 gives some guidelines for using fit indices in different situations. The guidelines are based primarily on simulation research that considers different sample sizes, model complexity, and degrees of error in model specification to examine how accurately various fit indices perform (Hair, Black, Babin, & Anderson, 2014). One key point across the results is that simpler models and smaller samples should be subject to stricter evaluation than are more complex models with larger samples. Likewise, more complex models with smaller samples may require somewhat less strict criteria for evaluation with the multiple fit indices (Hair, Black, Babin, & Anderson, 2014). For example, based on a sample size last than 250 and a 10-construct model with only 31 total observable variables, evidence of good fit would include a significant chi-square statistic, a CFI and NNFI of at least 0.92, a SRMR of 0,09 or lower, and a RMSEA of 0.08 or lower. It is essential to evoke that Table-1 is provided more to give the researcher an idea of how fit indices can be used than to suggest absolute rules for standards separating good and bad fit.

Table-1. Charachteristics of Different Fit Indeces Demonstrating Goodness-of-Fit Across Different Model Situations (Hair, Black, Babin, & Anderson, 2014, p. 584)

Fit Indices	$n \leq 250$			$n > 250$		
	$m \leq 12$	$12 < m < 30$	$m \geq 30$	$m \leq 12$	$12 < m < 30$	$m \geq 30$
Chi-Square	Insignificant p-values expected	Significant p-values even with good fit	Significant p-values expected	Insignificant p-values even with good fit	Significant p-values expected	Significant p-values expected
CFI	0.97 or better	0.95 or better	Above 0.92	0.95 or better	Above 0.92	Above 0.90
NNFI	0.97 or better	0.95 or better	Above 0.92	0.95 or better	Above 0.92	Above 0.90
SRMR	Biased upward, use other indices	0.08 or less (with CFI of 0.95 or higher)	Less than 0.09 (with CFI above 0.92)	Biased upward; use other indices	0.08 or less (with CFI above 0.92)	0.08 or less (with CFI above 0.92)
RMSEA	Values<0.08 with CFI=0.97 or higher	Values<0.08 with CFI of 0.95 or higher	Values<0.08 with CFI above 0.92	Values<0.07 with CFI of 0.97 or higher	Values<0.07 with CFI of 0.92 or higher	Values<0.07 with CFI of 0.90 or higher

Note: m=number of observed variables; n= number of observations per group when applying CFA to multiple groups at the same time.

The goodness-of-fit indices in Table-3 is used to evaluate four capital structure models: Root Mean Square Error Adjusted (RMSEA), Standardized Root Mean Square Residual (SRMR), Non-Normed Fit Index (NNFI), Comparative Fit Index (CFI), and Incremental Fit Index (IFI). There are three types of goodness-of-fit indices: absolute fit indices, incremental fit indices and parsimonious fit indices. As adopted in this study, the absolute fit indices include RMSEA and SRMR; incremental fit indices include NNFI, CFI, and IFI; while parsimonious fit indices are normalized chi-square (chi-square/df).

6. RESULTS AND DISCUSSION

The primary purpose of this study is better to understand how capital structure determinants effect short term, long term and total debt structures of firm. As described above, financial ratios of 203 companies selected from Istanbul Stock Exchange (ISE) analyzed using SEM approach. In order to test the most important capital structure theories, it is used four different models, namely total debt structure (Model-1=*TD*), long term debt structure (Model-2=*LTD*), short term debt structure (Model-3=*STD*) and combined long term and short term debt structure (Model-4=*LTD&STD*) and studied the influence of the eight most important firm specific latent factors including liquidity (*LQ*), asset structure (*AS*), firm size (*SZ*), profitability (*PR*), growth opportunities (*GR*), tax level (*TX*), none-debt tax shield (*TS*) and volatility (*VL*) on capital structure. It used 27 observable variables to define 8 exogenous latent construct including liquidity (*LQ*), asset structure (*AS*), firm size (*SZ*), profitability (*PR*), growth opportunities (*GR*), tax level (*TX*), none-debt tax shield (*TS*) and volatility (*VL*) and 12 observable variables for describing 3 endogenous latent construct namely total debt (*TD*), long term debt (L*TD*) and short term debt (*STD*) structures. Symbols and description of observed and latent endogenous and exogenous variables used in this study is shown in Table-2 in detail. Having developed a set of causal capital structure relationships, we next portray the relationships in path diagrams. In all model, 8 latent construct act as the exogenous

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variables, each related to the capital structure levels, which is the endogenous variable of capital structure models.

Table-2. Symbols and Description of Observed and Latent Variables Used in This Study

#	Observed	Latent	Description of Variable
1	*CS1*	*TD*	Total Debts / Total Assets
2	*CS2*		Total Debts / Market Value of Total Assets
3	*CS11*		Total Debts / Equity
4	*CS12*		Total Debts / Market Value of Equity
5	*CS3*	*LTD*	Long Term Debts / Total Assets
6	*CS4*		Long Term Debts / Market Value of Total Assets
7	*CS13*		Long Term Debts / Equity
8	*CS14*		Long Term Debts / Market Value of Equity
9	*CS5*	*STD*	Short Term Debts / Total Assets
10	*CS6*		Short Term Debts / Market Value of Total Assets
11	*CS15*		Short Term Debts / Equity
12	*CS16*		Short Term Debts / Market Value of Equity
13	*LQ1*	*LQ*	Current Ratio=Current Assets / Short Term Debts
14	*LQ2*		Liquidity Ratio=Liquid Assets / Short Term Debts
15	*LQ3*		Cash Ratio=(Liquid Assets + Securities) / Short Term Debts
16	*AS1*	*AS*	Fixed Assets / Continuing Capital
17	*AS2*		Tangible Fixed Assets / Continuing Capital
18	*AS3*		Fixed Assets / Equity
19	*SZ1*	*SZ*	LN [Total Assets]
20	*SZ2*		LN [Equity]
21	*SZ3*		LN [Market Value]
22	*PR1*	*PR*	Net Profit / Net Sales (Net Profit Margin)
23	*PR2*		Net Profit / Total Assets (Net Asset Profitability)
24	*PR3*		Net Profit / Equity (Equity Profitability)
25	*PR4*		Profit Before Tax / Equity
26	*GR1*	*GR*	Assets Growth Rate
27	*GR2*		Net Profit Growth Rate
28	*GR3*		Net Sales Growth Rate
29	*GR4*		Equity Growth Rate
30	*TX1*	*TX*	Paid Tax / Net Profit
31	*TX2*		Paid Tax / EBIT
32	*TX3*		Paid Tax / Operating Profit
33	*TS1*	*TS*	Depreciation / Total Assets
34	*TS2*		Depreciation / Fixed Assets
35	*TS3*		Depreciation / Tangible Fixed Assets
36	*VL1*	*VL*	LN [EBIT / Standard Deviation of Percentage Change in Net Sales]
37	*VL2*		LN [EBIT / Standard Deviation of Percentage Change in Total Assets]
38	*VL3*		LN [(EBIT+Depreciation) / Standard Deviation of Percent Change in Total Assets]
39	*VL4*		LN [Standard Deviation of Percent Change in Operating Profit]

*TD=Total Debts, LTD=Long Term Debts, STD=Short Term Debts, CS=Capital Structure, LQ=Liquidity, AS=Asset Structure, SZ=Size, PR=Profitability, GR=Growth, TX= Tax, TS=None-Debt Tax Shield and VL=Volatility.

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The path diagrams also indicate that the 8 exogenous latent constructs are all proposed to be inter-correlated. Although the evaluative constructs are proposed to be distinct, it is recognized that some perceptions are shared, and thus there are correlations among latent construct.

Being assured that the capital structures models are correctly specified and the estimation process is not constrained by identification problems, it can be proceeded to evaluate the specific results for the proposed capital structures models. If the assumptions underlying SEM are met, the estimated coefficients are evaluated along with the overall models fit. Before evaluating the structural and measurement capital structure models, it must be assessed the overall fit of the models to ensure that it is an adequate representation of the entire set of causal relationships. Each of the three types of goodness-of-fit measured are used to evaluate models: Absolute fit measure, incremental fir measures and parsimonious fit measures. All three type goodness-of-fit indices for capital structure models are given in Table-3.

Two most widely used absolute fit indices are Root Mean Squared Error Adjusted (RMSEA) and Standardized Root Mean Residual (SRMR). Both absolute fit statistics for all capital structure models are fall inside the acceptable range of 0.08 or less and upper threshold value of 0.10. Absolute fit indices indicate that all capital structure models are acceptable.

Table-3. Goodness-of-Fit Indices for Measurement and Structural Models

Fit Index	Model-1	Model-2	Model-3	Model-4
	CS=TD	CS=LTD	CS=STD	CS=LTD & STD
Absolute Fit Measures				
RMSEA	0.07	0.06	0.07	0.08
SRMR	0.07	0.07	0.07	0.07
Incremental Fit Measures				
NNFI	0.94	0.96	0.94	0.93
NFI	0.91	0.92	0.91	0.90
IFI	0.95	0.97	0.95	0.94
CFI	0.95	0.96	0.95	0.94
Parsimonious Fit Measures				
Normed Chi-Square=Chi-Square/*df*	2.08	1.76	2.00	2.22

In addition to the overall measures of fit, capital structure models can be evaluated in comparison to a baseline or null models. In this instance the null model is a single-factor model with no measurement error. One of the more popular measures is the normed fit index (NFI) (Bentler & Bonnet, 1980). The incremental fit index (IFI) and the comparative fit index (CFI) are most widely used other incremental fir measures and all represent comparison between the estimated model and a null or independence model. The value lies 0 and 1, and a larger values indicate higher levels of goodness-of-fit. The CFI has been found to be more appropriate in the model development strategy or when a small sample is available (Rigdon, 1996). Table-4 shows that incremental fit indices for all capital structure model are between 0.90 and 0.97 and all fall above the desired threshold value of 0.90.

The final parsimonious measure of fit provides a basis for comparison between models differing complexity and objectives. Jöreskog proposed that chi-square be adjusted by the degrees of freedom to assess model fit for various model (Jöroskog, 1970). This measure can be termed the normed chi-square, and is the ratio of the chi-square statistics divided by the model degrees of freedom. This measure provides two ways to assess inappropriate models: (I) a model that may be "over-fitted," thereby capitalizing on change, typified values less than 1, and (II) models that are not yet representative of the observed data and thus need to improvement, having values greater than an upper threshold 3 (Carmines & Mclver, 1995), or a more reliable limit of 5 (Jöroskog, 1970). However, because the chi-square statistics is the major component of this measure, it is subject to the sample size effects. The normed chi-square,

however, has been shown to be somewhat unreliable (Hayduk, 1987; Wheaton, 1987), so researchers should always combine it with other goodness-of fit measures (Joseph, Anderson, Tatham, & Black, 1998). As can be seen from Table-3, the normed chi-squares statistics for all capital structures models lies between 1.76 and 2.22, which are in all acceptable limits. A review of three types of overall measures of fit reveals a consistent pattern of support for the capital structures models proposed.

Briefly, Table-3 presents a summary of goodness-off-fit measures for the structural capital structure models estimated. The researcher looks to the various fit measures to evaluate differing aspects of the models, and one hopes that all measures would indicate agreement on the level of model acceptability. As indicated earlier, the researcher should evaluate the proposed models on a series of measures for each type. A consensus should be reached on the acceptability of the model only after examination of the results from the entire goodness-off-fit measures.

Table-4. Composite Reliability and Average Variance Extracted for Measurement Models

	Composite Reliability (CR*)				Average Variance Extracted (AVE*)			
	Model-1	Model-2	Model-3	Model-4	Model-1	Model-2	Model-3	Model-4
	CS=TD	CS=LTD	CS=STD	CS=LTD & STD	CS=TD	CS=LTD	CS=STD	CS=LTD & STD
LQ	0.89	0.89	0.89	0.88	0.73	0.73	0.73	0.73
AS	0.85	0.85	0.85	0.85	0.66	0.66	0.66	0.66
SZ	0.93	0.93	0.93	0.93	0.83	0.83	0.83	0.83
PR	0.95	0.95	0.95	0.95	0.77	0.77	0.77	0.77
GR	0.80	0.81	0.80	0.81	0.60	0.61	0.60	0.61
TX	0.88	0.88	0.88	0.88	0.72	0.72	0.72	0.72
TS	0.89	0.89	0.89	0.89	0.73	0.73	0.73	0.73
VL	0.93	0.93	0.93	0.93	0.74	0.74	0.74	0.74
CS#	0.93	0.95	0.86	LTD=0.98	0.68	0.78	0.52	LTD=0.84
CS#				STD=0.82				STD=0.62

* CR, should exceed 0.70 and AVE should be greater than 0.50 (Hair et all. 1998: 612).
\# The *CS* shows the latent endogenous attributes (*TD*, *LTD* or *STD*) in the corresponding model.

After evaluating the overall goodness-off-fit of the capital structure models, it was deemed sufficient to proceed and assess the measurement model fit as well. The first step is an examination of the loadings, particularly focusing on any insignificant loadings. Referring to the Table-5, Table-6, Table-7 and Table-8, we see that all observed financial capital structure indicators are all statistically significant for the proposed latent construct. Because no indicators have loading so low that they should be deleted and the model reestimated, the reliability and variance extracted measures need to be computed.

Table-4 contains the average composite reliability and the variance extracted measures computed for all capital structures models. In terms of composite reliability (CR), all ten constructs exceeding the suggested level of 70 percent and in terms of average variance extracted (AVE), all ten constructs exceeding the suggested level of 50 percent. Thus, for all ten constructs, the observed indicators are sufficient in term of how the measurement models are specified.

Having assessed the overall capital structure models and aspects of measurement models, it is prepared to examine the estimated coefficients themselves for both practical and theoretical implications. Review of Table-5, Table-6, Table-7 and Table-8 reveals that all SEM models contain statistically significant coefficients.

Table-5. Unstandardized Factor Loadings for Independent X-Variables (LAMBDA-X)

	Model-1=TD $[\eta_1]$								Model-2=LTD $[\eta_2]$							
	LQ	AS	SZ	PR	GR	TX	TS	VL	LQ	AS	SZ	PR	GR	TX	TS	VL
LQ1	1.00								1.00							
LQ2	0.01 (27.2)								0.01 (26.3)							
LQ3	0.01 (8.8)								0.01 (8.8)							
AS1		0.20 (17.0)								0.17 (18.5)						
AS2		0.12 (7.6)								0.10 (7.5)						
AS3		1.00								1.00						
SZ1			0.80 (23.5)								0.79 (23.4)					
SZ2			0.52 (25.1)								0.52 (25.5)					
SZ3			1.00								1.00					
PR1				0.55 (17.2)								0.54 (17.2)				
PR2				0.04 (28.5)								0.04 (28.2)				
PR3				1.00								1.00				
PR4				0.91 (14.6)								0.91 (14.6)				
GR1					0.03 (8.3)								0.03 (8.5)			
GR2					0.54 (7.7)								0.53 (7.6)			
GR3					1.00								1.00			
GR4					0.08 (7.4)								0.08 (7.3)			
TX1						0.63 (10.5)								0.63 (10.5)		
TX2						0.53 (23.0)								0.53 (23.1)		
TX3						1.00								1.00		
TS1							0.02 (11.9)								0.02 (11.9)	
TS2							0.10 (14.4)								0.10 (14.2)	
TS3							1.00								1.00	
VL1								1.00 (12.9)								1.00 (12.8)
VL2								1.00								1.00
VL3								0.86 (19.7)								0.86 (19.8)
VL4								0.82 (13.6)								0.82 (13.6)

Note: *t*-statistics are in parenthesis

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Table-5 (Continued).Unstandardized Factor Loadings for Independent X-Variables (LAMBDA-X)

	Model-3=*STD* $[\eta_3]$								Model-4=*STD & LTD* $[\eta_2, \eta_3]$							
	LQ	*AS*	*SZ*	*PR*	*GR*	*TX*	*TS*	*VL*	*LQ*	*AS*	*SZ*	*PR*	*GR*	*TX*	*TS*	*VL*
LQ1	1.00								1.00							
LQ2	0.01 (28.3)								0.01 (28.3)							
LQ3	0.01 (8.8)								0.01 (8.9)							
AS1		0.20 (17.2)								0.18 (19.1)						
AS2		0.12 (7.6)								0.11 (7.7)						
AS3		1.00								1.00						
SZ1			0.79 (23.2)								0.80 (23.4)					
SZ2			0.52 (25.2)								0.52 (25.3)					
SZ3			1.00								1.00					
PR1				0.55 (17.1)								0.55 (17.2)				
PR2				0.04 (28.3)								0.04 (28.3)				
PR3				1.00								1.00				
PR4				0.91 (14.6)								0.91 (14.5)				
GR1					0.03 (8.2)								0.03 (8.6)			
GR2					0.54 (7.7)								0.53 (7.9)			
GR3					1.00								1.00			
GR4					0.08 (7.4)								0.08 (7.5)			
TX1						0.63 (10.6)								0.63 (10.5)		
TX2						0.53 (22.0)								0.53 (23.1)		
TX3						1.00								1.00		
TS1							0.02 (11.9)								0.02 (11.9)	
TS2							0.10 (14.2)								0.10 (14.3)	
TS3							1.00								1.00	
VL1								1.00 (12.9)								1.00 (12.8)
VL2								1.00								1.00
VL3								0.86 (19.7)								0.86 (19.7)
VL4								0.82 (13.6)								0.82 (13.6)

Note: *t*-statistics are in parenthesis

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Table-6. Unstandardized Factor Loadings for Independent Y-Variables (LAMBDA-Y)

Independent Y-Variable	Dependent Attributes			
	Model-1=TD [η_1]	Model-2=LTD [η_2]	Model-3=STD [η_3]	Model-4=LTD & STD [η_2, η_3]
CS1	1.00			
CS2	0.82 (17.5)			
CS11	80.17 (12.4)			
CS12	12.24 (18.1)			
CS3		1.00		1.00
CS4		0.86 (39.2)		0.86 (24.7)
CS13		67.21 (21.6)		66.34 (20.8)
CS14		6.64 (18.2)		
CS5			1.00	1.00
CS6			0.23 (8.1)	0.22 (6.7)
CS15			58.45 (9.7)	
CS16			10.96 (16.4)	10.34 (12.4)

Note: *t*-statistics are in parentheses.

Table-7. Standardized Factor Loadings and Error Terms for Independent Y-Variables

Independent Y-Variable	Dependent (Endogenous) Attributes and Error Variances [σ_δ^2]							
	Model-1		Model-2		Model-3		Model-4		
	TD [η_1]	σ_δ^2	LTD [η_2]	σ_δ^2	STD [η_3]	σ_δ^2	LTD [η_2]	STD [η_3]	σ_δ^2
CS1	0.80	0.36							
CS2	0.95	0.10							
CS11	0.71	0.49							
CS12	0.99	0.01							
CS3			0.94	0.11			0.95		0.11
CS4			0.97	0.06			0.98		0.05
CS13			0.83	0.31			0.82		0.33
CS14			0.87	0.24			-		-
CS5					0.85	0.29		0.96	0.26
CS6					0.58	0.66		0.56	0.68
CS15					0.76	0.43		-	-
CS16					0.92	0.15		0.89	0.20

Table-8. Standardized Factor Loadings and Error Terms for Independent X-Variables

	Model-1=TD [η_1]									Model-2=LTD [η_2]								
	LQ	*AS*	*SZ*	*PR*	*GR*	*TX*	*TS*	*VL*	σ_δ^2	*LQ*	*AS*	*SZ*	*PR*	*GR*	*TX*	*TS*	*VL*	σ_δ^2
LQ1	0.95								0.10	0.94								0.12
LQ2	0.95								0.10	0.96								0.08
LQ3	0.62								0.61	0.63								0.61
AS1		0.89							0.21		0.83							0.31
AS2		0.62							0.19		0.60							0.64
AS3		0.90							0.13		0.97							0.07
SZ1			0.93						0.13			0.93						0.13
SZ2			0.90						0.19			0.90						0.19
SZ3			0.89						0.20			0.90						0.20
PR1				0.84					0.29				0.84					0.30
PR2				0.97					0.06				0.97					0.06
PR3				0.94					0.12				0.94					0.12
PR4				0.85					0.28				0.85					0.27
GR1					0.73				0.47					0.74				0.46
GR2					0.72				0.48					0.71				0.49
GR3					0.59				0.65					0.60				0.64
GR4					0.80				0.36					0.80				0.36
TX1						0.64			0.59						0.64			0.59
TX2						0.97			0.07						0.96			0.07
TX3						0.90			0.19						0.91			0.18
TS1							0.72		0.49							0.72		0.49
TS2							0.99		0.01							0.99		0.01
TS3							0.83		0.32							0.83		0.32
VL1								0.88	0.23								0.88	0.23
VL2								0.98	0.04								0.98	0.04
VL3								0.88	0.22								0.88	0.22
VL4								0.78	0.39								0.78	0.39

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Table-8. (Continued). Standardized Factor Loadings for Independent X-Variables

| | Model-3=STD [η_3] | | | | | | | | | Model-4=STD & LTD [η_2, η_3] | | | | | | | | |
	LQ	AS	SZ	PR	GR	TX	TS	VL	σ_δ^2	LQ	AS	SZ	PR	GR	TX	TS	VL	σ_δ^2
LQ1	0.96								0.08	0.96								0.08
LQ2	0.94								0.12	0.94								0.12
LQ3	0.62								0.62	0.62								0.62
AS1		0.90							0.19		0.88							0.27
AS2		0.62							0.61		0.61							0.63
AS3		0.89							0.21		0.94							0.12
SZ1			0.93						0.14			0.94						0.13
SZ2			0.90						0.19			0.90						0.19
SZ3			0.90						0.19			0.89						0.20
PR1				0.84					0.29				0.84					0.29
PR2				0.97					0.06				0.97					0.06
PR3				0.94					0.12				0.93					0.13
PR4				0.85					0.28				0.85					0.28
GR1					0.73				0.47					0.73				0.47
GR2					0.72				0.48					0.73				0.47
GR3					0.59				0.65					0.61				0.63
GR4					0.80				0.36					0.78				0.39
TX1						0.64			0.59						0.64			0.59
TX2						0.97			0.07						0.96			0.07
TX3						0.90			0.19						0.90			0.18
TS1							0.72		0.49							0.72		0.49
TS2							0.99		0.01							0.99		0.01
TS3							0.83		0.32							0.83		0.32
VL1								0.88	0.23								0.88	0.23
VL2								0.98	0.04								0.98	0.04
VL3								0.88	0.22								0.88	0.22
VL4								0.78	0.39								0.78	0.39

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6.1. Empirical Findings for Total Debt Capital Structure Model (Model-1=TD)

The estimates of the structural coefficients for total debt structure model (Model-1=*TD*) are presented in Figure-1 (standardized regression coefficient) and Table-9 (*t*-statistics). These coefficients specify the estimated impact of the unobserved latent attributes on the unobserved latent total debt ratio (*TD*). Many of the estimated coefficients are fairly large in magnitude and are statistically significant. In particular, the attributes representing liquidity (*LQ=-4.15*), size (*SZ*=2.43), profitability (*PR*=-5,23), growth opportunities (*GR*=2.34), volatility (*VL*=-1,74) are statistically significant latent factors at %10 significance level[1].

Figure-1: Standardized Total Capital Structure Model (Model-1=TD)

Chi-Square=827.34, df=398, P-value=0.00000, RMSEA=0.073
*Significant latent factor at 10% significance level.
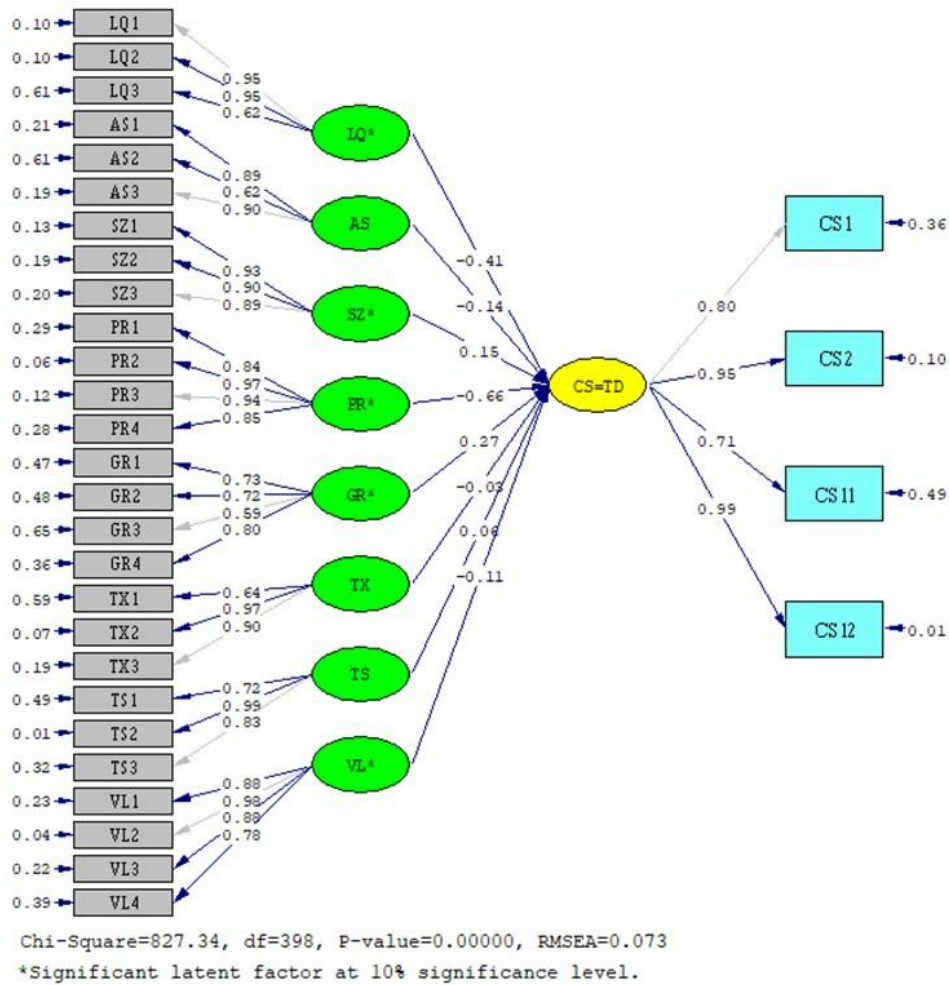
The large negative coefficient estimate for the liquidity (*LQ*=-4.15) indicates that firms characterized as having relatively large current ratio (*LQ1*), liquidity ratio (*LQ2*) and cash ratio (*LQ3*), tend to have relatively low total debt ratios (*TD*). Similarly, the large negative coefficient estimate for the profitability (*PR*=-5.23) indicates that firms characterized as having relatively large net profit margin (*PR1*), net asset profitability (*PR2*), net equity profitability (*PR3*) and profit before tax/equity ratio (*PR4*), tend to have relatively low total debt ratios (TD). Some of the coefficient estimates are both small in magnitude and statistically insignificant. The latent attributes representing asset structure (*AS=-1.51*), tax level (*TX=-0.42*) and non-debt tax shield (*TS=1.06*) do not appear to be related to the total debt structure (*TD*) and thus these factors are statistically insignificant factors in total debt structure model (Model-1).

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[1] Test statistics (*t*-values) are given in parenthesis for particular latent attributes.

The standardized estimate of -0.41 for the liquidity latent attribute in the equation with total debt (*TD*) indicates that firms that differ in liquidity by one variance are expected to have total debt ratios that differ by 0.41 variances (See Figure-1).
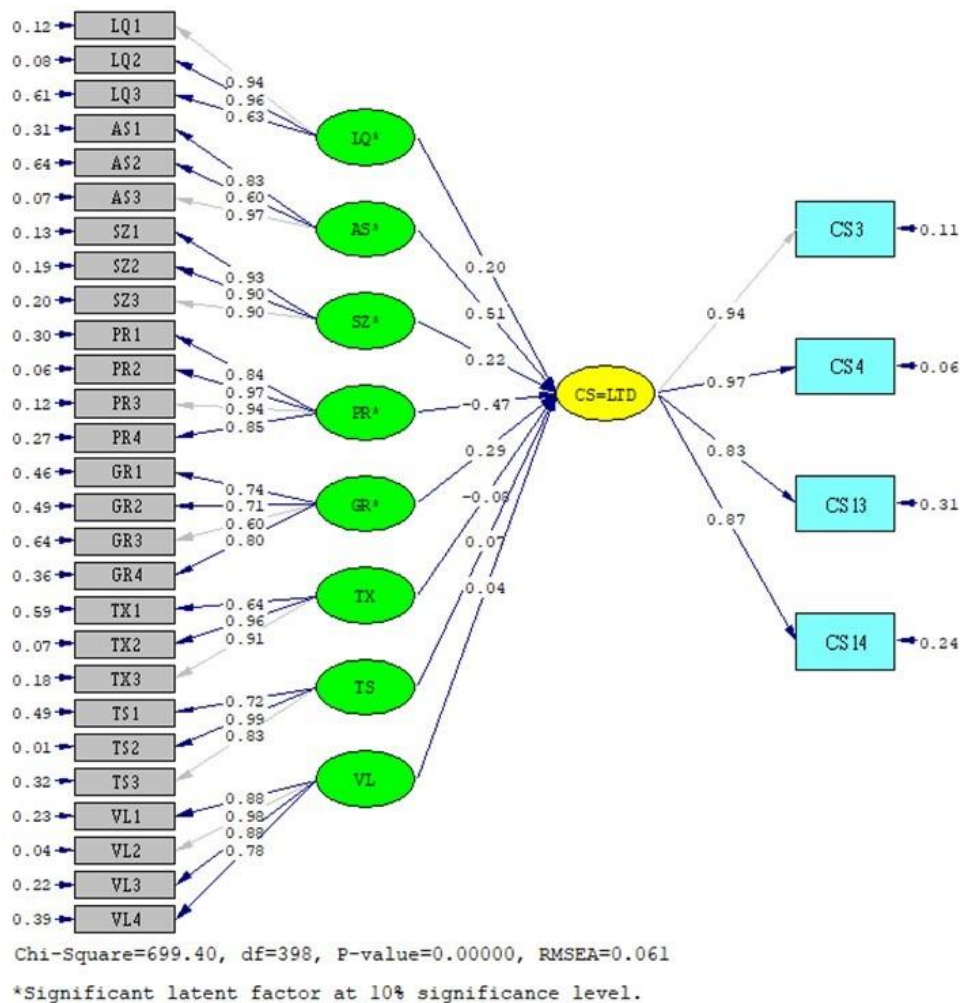
As shown in Table-9, it is understood that 55% of the total variability in the total debt ratios of firms can be explained by 8 latent endogenous attributes such as liquidity, asset structure, size, profitability, growth, tax level, none-debt tax shield and volatility (*R*-Square = 0.55).

The results for the asset structure, profitability and growth opportunities and volatility give support for the Pecking order theory (POT), and size and volatility results provide evidence for the trade-off theory (TOT).

6.2. Empirical Findings for Long Term Debt Capital Structure Model (Model-2=LTD)

The estimates of the structural coefficients for long-term debt structure model (Model-2=*LTD*) are presented in Figure-2 (standardized regression coefficient) and Table-9 (*t*-statistics). These coefficients specify the estimated impact of the unobserved latent attributes on the unobserved latent long-term debt ratio (*TD*). Most of the estimated coefficients are fairly large in magnitude and are statistically significant. In particular, the attributes representing liquidity (*LQ=1.94*), asset structure (*AS=4.30*), size (*SZ=3.11*), profitability (*PR=-3.64*) and growth opportunities (*GR=2.65*) are statistically significant latent attributes at 10% level[2].

Figure-2: Standardized Long Term Capital Structure Model (Model-2=LTD)

Chi-Square=699.40, df=398, P-value=0.00000, RMSEA=0.061

*Significant latent factor at 10% significance level.

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[2] Test statistics (*t*-values) are given in parenthesis for particular latent attributes.

For example, the significance estimate for the growth attribute (*GR*=2.65) indicates that firms characterized as having relatively large assets growth rate ratio (*GR1*), net profit growth (*GR2*), net sales growth rate (*GR3*) and equity growth rate (*GR4*), tend to have relatively high long-term debt ratios (*LTD*). Similarly, the large negative coefficient estimate for the profitability (*PR*=-3.64) indicates that firms characterized as having relatively large net profit margin (*PR1*), net asset profitability (*PR2*), net equity profitability (*PR3*) and profit before tax/equity ratio (*PR4*), tend to have relatively low long-term debt ratios (*LTD*). The large negative coefficient estimate for the liquidity (*LQ*=1.94) indicates that firms characterized as having relatively large current ratio (*LQ1*), liquidity ratio (*LQ2*) and cash ratio (*LQ3*), tend to have relatively large long-term debt (*TD*) ratios (see Table-9 and Figure-2).

Some of the coefficient estimates are both small in magnitude and statistically insignificant. The latent attributes representing tax level (*TX=-1.20*), non-debt tax shield (*TS=1.11*) and volatility (*VL=0.66*) do not appear to be related to the long-term debt structure and thus these factors are statistically insignificant factors in long-term debt structure model (see Model-2 results in Table-9 and Figure-2).

For example, the standardized estimate coefficient of -0.47 for the profitability latent attribute in the equation with long-term debt structure (*LTD*) indicates that firms that differ in profitability by one variance are expected to have long-term debt ratios that differ by 0.47 variances (See Figure-2).

As shown in Table-9, it is understood that 49% of the total variability in the long-term debt ratios of firms can be explained by 8 latent exogenous attributes such as liquidity, asset structure, size, profitability, growth, tax level, none-debt tax shield and volatility (R-Square = 0.49).

The results for the liquidity (*LQ*), asset structure (*AS*), and size (*SZ*) give support for the Trade-Off Theory (TOT). And profitability (*PR*) and growth opportunities (*GR*) results provide evidence for the pecking order theory (POT).

6.3. Empirical Findings for Short Term Debt Capital Structure Model (Model-3=STD)

The estimates of the structural coefficients for short-term debt structure model (Model-3=*STD*) are presented in Figure-3 (standardized regression coefficient) and Table-9 (*t*-statistics). These coefficients specify the estimated impact of the unobserved latent attributes on the unobserved latent short-term debt ratio (*STD*). Five of the estimated coefficients are fairly large in magnitude and are statistically significant. Particularly, the attributes representing liquidity (*LQ*=-5.36), asset structure (*AS*=-2.60), profitability (*PR*=-3.91), growth opportunities (*GR*=1.92) and volatility (*VL*=-2.49) are statistically significant latent attributes at 10% level[3].

There is a statistically significant negative relationship between liquidity (*LQ*=-5.36), asset structure (*AS*=-2.60), profitability (*PR*=-3.91) and volatility (*VL*=-2.49) exogenous latent attributes and endogenous short-term debt (*STD*) attributes. For example, the large negative coefficient estimate for the liquidity (*LQ*=-5.36) indicates that firms characterized as having relatively large current ratio (*LQ1*), liquidity ratio (*LQ2*) and cash ratio (*LQ3*), tend to have relatively lover short-term debt (*STD*) ratios (see Table-9 and Figure-3). The large negative coefficient estimate for the profitability (*PR*=-3.91) indicates that firms characterized as having relatively large net profit margin (*PR1*), net asset profitability (*PR2*), equity profitability (*PR3*) and profit before tax/equity (*PR4*) ratio, tend to have relatively low short-term debt (*STD*) ratios. Similarly, the large negative coefficient estimate for the volatility (*VL*=-2.49) indicates that firms characterized as having relatively large net sales risk (*VL1*), total assets risk (*VL2* and *VL3*) and operating profit risk (*VL4*), tend to have relatively low short-term debt (*STD*) ratios. The empirical results for short-term debt structure model are totally consistent with pecking order theory (POT).
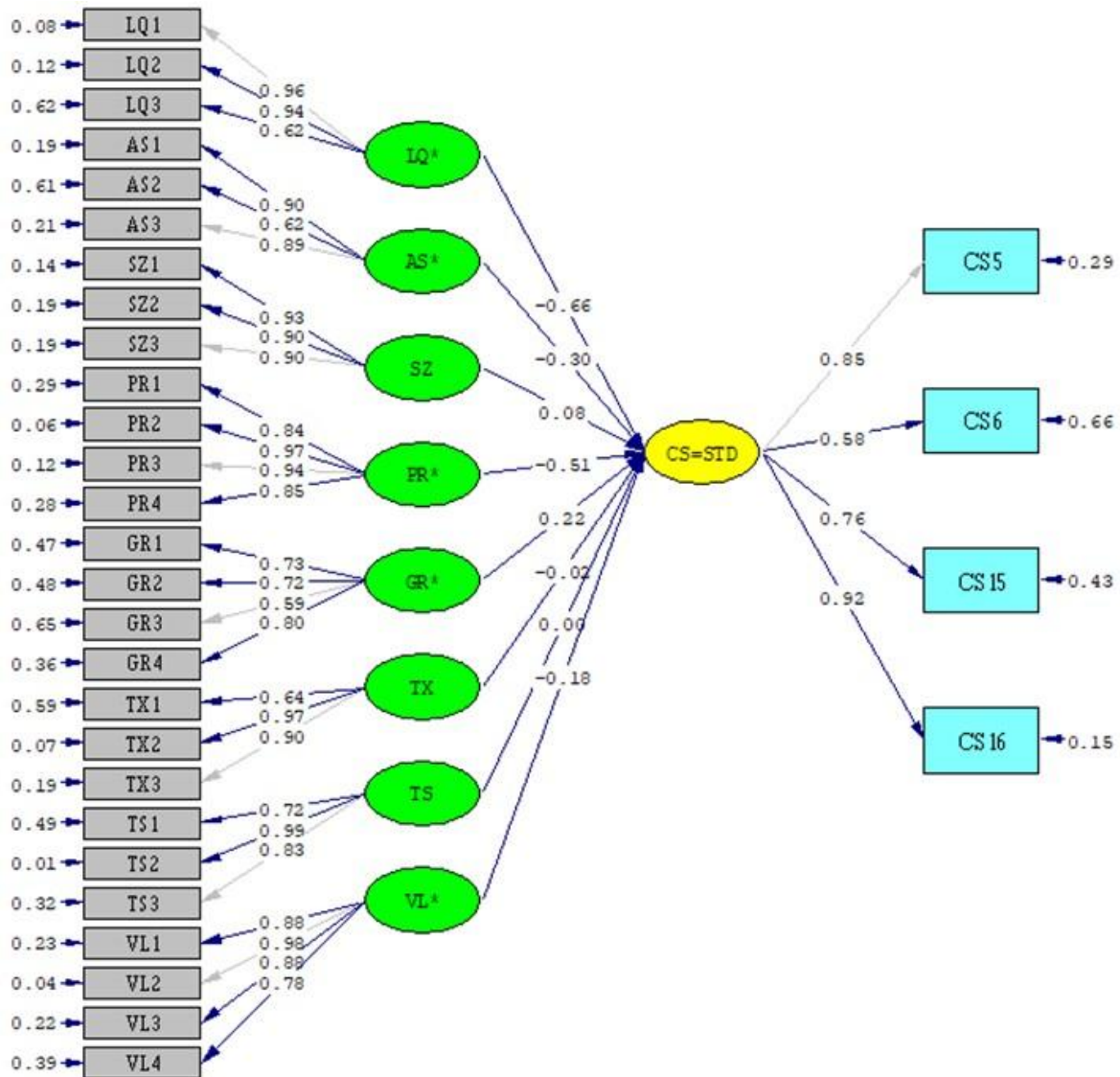
The significance estimate for the growth attribute (*GR*=1.92) indicates that firms characterized as having relatively large assets growth rate ratio (*GR1*), net profit growth rate (*GR2*), net sales growth rate (*GR3*) and equity growth rate (*GR4*), tend to have relatively high short-term debt (*STD*) ratios.

Some of the coefficient estimates in Model-3 are both small in magnitude and statistically insignificant. The latent attributes representing tax level (*TX=-0.40*), non-debt tax shield (*TS=0.05*) and size (*SZ=1.24*)

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[3] Test statistics (*t*-values) are given in parenthesis for particular latent attributes.

do not appear to be related to the short-term debt structure and thus these factors are statistically insignificant factors in short-term debt structure model also (see Model-3 results in Table-9 and Figure-3).

Figure-3: Standardized Short Term Capiatl Structure Model (Model-3=STD)

Chi-Square=798.33, df=398, P-value=0.00000, RMSEA=0.071

*Significant latent factor at 10% significance level.

For example, the standardized estimate coefficient of 0.22 for the growth latent attribute in the equation with short-term debt structure (*STD*) indicates that firms that differ in growth opportunities by one variance are expected to have short-term debt ratios that differ by 0.22 variances (see Figure-3).

As shown in Table-9, it is understood that 61% of the total variability in the short-term debt ratios of firms can be explained by 8 latent exogenous attributes such as liquidity, asset structure, size, profitability, growth, tax level, none-debt tax shield and volatility (R-Square = 0.61).

The significant results for the liquidity (*LQ*), asset structure (*AS*), profitability (*PR*) and growth opportunities (*GR*) in Table-9 (Model-3) give a strong and consistent support for the pecking order theory (POT).

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Table-9. Estimated Structural Coefficient Test Statistics (Calculated t-Statistics) for Capital Structure Models

Exogenous (Independent) Latent Attributes	Endogenous (Dependent) Latent Attributes				
	Model-1	Model-2	Model-3	Model-4	
	$TD\,[\eta_1]$	$LTD\,[\eta_2]$	$STD\,[\eta_3]$	$LTD\,[\eta_2]$	$STD\,[\eta_3]$
ξ_1: Liquidity (*LQ*)	**-4.15**	**1.94**	**-5.36**	**2.19**	**-6.62**
ξ_2: Asset Structure *(AS)*	-1.51	**4.30**	**-2.60**	**4.03**	**-3.96**
ξ_3: Size *(SZ)*	**2.43**	**3.11**	1.24	**3.19**	1.39
ξ_4: Profitability *(PR)*	**-5.23**	**-3.64**	**-3.91**	**-3.95**	**-4.07**
ξ_5: Growth *(GR)*	**2.34**	**2.65**	**1.92**	**2.96**	**2.24**
ξ_6: Tax *(TX)*	-0.42	-1.20	-0.40	-1.11	-0.26
ξ_7: None-Debt Tax Shield *(TS)*	1.06	1.11	0.05	1.21	0.11
ξ_8: Volatility *(VL)*	**-1.74**	0.66	**-2.49**	0.67	**-2.34**
R-Square	**0.55**	**0.49**	**0.61**	**0.48**	**0.67**

* Test statistics, which are bold underlined in the table, show a significant coefficient at the level of significance of 10%.

6.4. Empirical Findings for Capital Structure Model-4 (Model-4=LTD & STD)

The estimates of the structural coefficients for long-term debt structure model (Model-4=*LTD*) are presented in Figure-4 and Table-9. These coefficients specify the estimated impact of the unobserved latent attributes on the unobserved latent long-term debt ratio (*LTD*). Five of the estimated coefficients are fairly large in magnitude and are statistically significant. The attributes representing liquidity (*LQ=2.19*), asset structure (*AS=4.03*), size (*SZ=3.19*), profitability (*PR=-3.95*) and growth opportunities (*GR=2.96*) are statistically significant latent attributes at 10% level[4].

The large positive coefficient estimate for the liquidity (*LQ*=2.19) indicates that firms characterized as having relatively large current ratio (*LQ1*), liquidity ratio (*LQ2*) and cash ratio (*LQ3*), tend to have relatively large long-term debt (*LTD*) ratios (see Table-9 and Figure-4). The significance estimate for the firm size structure attribute (*SZ*=3.19) indicates that firms characterized as having relatively large total assets (*SZ1*), equity (*SZ2*) and market value (*SZ3*), tend to have relatively high long-term debt ratios (*LTD*). The large negative coefficient estimate for the profitability (*PR*=-3.95) indicates that firms characterized as having relatively large net profit margin (*PR1*), net asset profitability (*PR2*), equity profitability (*PR3*) and profit before tax/equity ratio (*PR4*), tend to have relatively low long-term debt ratios (*LTD*). The significance estimate for the growth attribute (*GR*=2.96) indicates that firms characterized as having relatively large asset growth rates ratio (*GR1*), net profit growth rate (*GR2*), net sales growth rate (*GR3*) and equity growth rate (*GR4*), tend to have relatively high long-term debt ratios (*LTD*).

As shown in Table-9, it is understood that 48% of the total variability in the long-term debt ratios of firms can be explained by 8 latent exogenous attributes such as liquidity, asset structure, size, profitability, growth, tax level, none-debt tax shield and volatility (*R*-Square = 0.48).

The positive significance results for the liquidity (*LQ*), asset structure (*AS*), size (*SZ*) and growth opportunities (*GR*) give strong support for the Trade-Off Theory (TOT). On the other hand, the negative significance effect for profitability attribute (*PR*) provide evidence for the pecking order theory (POT).

Some of the coefficient estimates for long-term debt in Model-4 are both small in magnitude and statistically insignificant. The latent attributes representing tax level (*TX=-1.11*), non-debt tax shield (*TS=1.21*) and volatility (*VL=0.67*) do not appear to be related to the long-term debt structure and thus these factors are statistically insignificant factors in long-term debt structure model (see Model-4 results in Table-9 and Figure-4).

The estimates of the structural coefficients for short-term debt structure in Model-4 (*STD*) are presented in Figure-4 and structural *t*-statistics Table-9. These coefficients specify the estimated impact of the ex-

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[4] Test statistics (*t*-values) are given in parenthesis for particular latent attributes.

ogenous latent attributes on the endogenous latent short-term debt attribute (*STD*). Five of the estimated coefficients are fairly large in magnitude and are statistically significant. The attributes representing liquidity (*LQ=-6.62*), asset structure (*AS=-3.96*), profitability (*PR=-4.07*), growth opportunities (*GR=2.24*) and volatility (*VL=-2.34*) are statistically significant latent attributes at 10% level.[5]

Figure-4: Stadardized Capital Structure Model-4 (Model-4=LTD & STD)
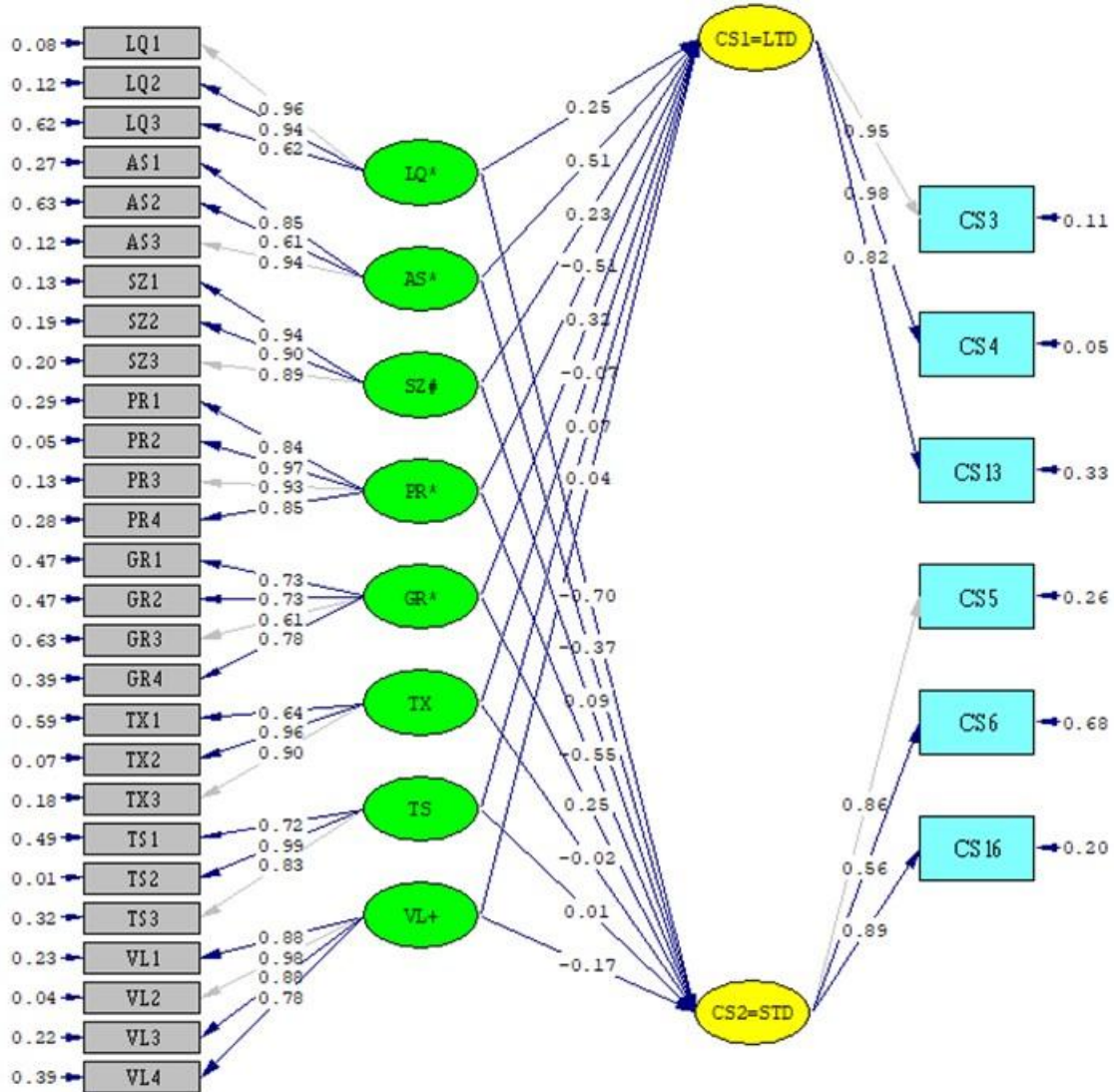
Chi-Square=1003.76, df=451, P-value=0.00000, RMSEA=0.078

*Significant latent factor at 10% significance level on LTD and STD.

+Significant latent factor at 10% significance level on STD.

#Significant latent factor at 10% significance level on LTD.

There is a statistically significant negative relationship between liquidity (*LQ=-6.62*), asset structure (*AS=-3.96*), profitability (*PR=-4.07*) and volatility (*VL=-2.34*) exogenous latent attributes and endogenous short-term debt (*STD*) attributes.

The large negative coefficient estimate for the liquidity (*LQ=-6.62*) indicates that firms characterized as having relatively large current ratio (*LQ1*), liquidity ratio (*LQ2*) and cash ratio (*LQ3*), tend to have relatively lower short-term debt (*STD*) ratios (see Model-4 results in Table-9 and Figure-4). The large negative coefficient estimate for the profitability (*PR=-4.07*) indicates that firms characterized as having relatively large net profit margin (*PR1*), net asset profitability (*PR2*), equity profitability (*PR3*) and profit

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[5] Test statistics (*t*-values) are given in parenthesis for particular latent attributes.

before tax/equity (*PR4*) ratio, tend to have relatively low short-term debt (*STD*) ratios. The significance estimate for the growth attribute (*GR*=2.24) indicates that firms characterized as having relatively large assets growth rate ratio (*GR1*), net profit growth (*GR2*), net sales growth rate (*GR3*) and equity growth rate (*GR4*), tend to have relatively high short-term debt (*STD*) ratios. Similarly, the large negative coefficient estimate for the volatility (*VL*=-2.34) indicates that firms characterized as having relatively large net sales risk (*VL1*), total assets risk (*VL2* and *VL3*) and operating profit risk (*VL4*), tend to have relatively low short-term debt (*STD*) ratios. The empirical results for short-term debt structure model are totally consistent with the pecking order theory (POT).

Some of the coefficient estimates for short-term debt structure in Model-4 are both small in magnitude and statistically insignificant. The latent attributes representing size (*SZ*=1.39), tax level (*TX*=-0.26) and non-debt tax shield (*TS*=0.11) do not appear to be related to the short-term debt structure in Model-4 and thus these factors are statistically insignificant factors (see Model-4 results in Table-9 and Figure-4).

As shown in Table-9, it is understood that 67% of the total variability in the short-term debt ratios of firms can be explained by 8 latent exogenous attributes such as liquidity, asset structure, size, profitability, growth, tax level, none-debt tax shield and volatility (*R*-Square = 0.67).

Overall, the results imply that the trade-off and pecking-order theories are not mutually exclusive and that both of these are important in explaining the capital structure found in the Istanbul Stock Exchange in Turkey. Table-10 provides a summary of central predictions of the trade-off theory and the pecking order theory regarding the relationship between leverage and selected capital structure factors.

Table-10. The Comparison of Two Major Capital Structure Competing Theories and This Study

Exogenous Latent Attributes	Trade-Off Theory (TOT)	Pecking Order Theory (POT)	Model-1 TD $[\eta_1]$	Model-2 LTD $[\eta_2]$	Model-3 STD $[\eta_3]$	Model-4 LTD $[\eta_2]$	Model-4 STD $[\eta_3]$
ξ_1: Liquidity (LQ)	Positive	Negative	Negative	Positive	Negative	Positive	Negative
ξ_2: Asset Structure (AS)	Positive	Negative	Negative*	Positive	Negative	Positive	Negative
ξ_3: Size (SZ)	Positive	Negative	Positive	Positive	Positive*	Positive	Positive*
ξ_4: Profitability (PR)	Positive	Negative	Negative	Negative	Negative	Negative	Negative
ξ_5: Growth (GR)	Negative	Positive / Negative	Positive	Positive	Positive	Positive	Positive
ξ_6: Tax (TX)	Positive / Negative	Positive / Negative	Negative*	Negative*	Negative*	Negative*	Negative*
ξ_7: None-Debt Tax Shield (TS)	Positive / Negative	Positive / Negative	Positive*	Positive*	Positive*	Positive*	Positive*
ξ_8: Volatility (VL)	Negative	Negative	Negative	Positive*	Negative	Positive*	Negative
*Insignificant latent factor.							

When Table-10 is examined, it can be said that the pecking order theory is more suitable in explaining the short-term debt structures of the companies operating in the Istanbul Stock Exchange, on the other hand the trade-off theory provides stronger evidence in explaining the long-term and total debt structures of the firms.

CONCLUSION

This study tries to explore the determinants of the capital structure of a sample of 203 listed firms on the Istanbul Stock Exchange in Turkey. The financial ratios of the firms in 2016 were used. Based on data availability, eight potential determinants of capital structure were analyzed. These determinants are liquidity (*LQ*), asset structure (*AS*), firm size (*SZ*), profitability (*PR*), growth opportunities (*GR*), tax level (*TX*), non-debt tax shields (*TS*) and volatility (*VL*).

The empirical findings of this study were compared with the trade-off theory and pecking order theory. These theories own different hypothesis to explain the corporate capital structure. The trade-off theory recommends that optimal capital structure is a trade-off between net tax benefit of debt financing and bankruptcy costs. The pecking order theory states that firms prefer internal financing to external financing (Kakıllı Acaravcı, 2015).

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The empirical results of this study show that liquidity (*LQ*), asset structure (*AS*), firm size (*SZ*), profitability (*PR*), growth (*GR*) and volatility (*VL*) are the statistically significant factors and tax level (*TX*), non-debt tax shield (*TS*) are the insignificant factors in all models. Firm size (*SZ*) and growth (*GR*) are positive; volatility (*VL*) and profitability (*PR*) are the factors that are effective in the negative direction in all capital structure models. But liquidity (*LQ*) and asset structure (*AS*) were found to affect short-term debt structure negatively and long-term debt structure positively. The results show that the exogenous latent variables proposed as capital structure determinants have an impact on different capital structure types and that liquidity and profitability has the greatest explanatory power of all models.

Liquidity (*LQ*) construct has a statistically significant negative effect on total debt structure (Model-1) and short-term debt structure (Model-3). On the other hand, liquidity has a positive effect on long-term structure (Model-2 and Model-4).

Asset structure (*AS*) latent construct has statistically significant positive effect on long-term debt structure (Model-2 and Model-4), and has a negative effect on short-term debt structure (Model-3 and Model-4). Additionally, there is a statistically insignificant negative relationship between asset structure and total debt structure at 0.10 significant level. The information inserted in Table-9 indicates that regarding the trade-off theory, assets structure has a positive and significant influence on long-term capital structure; the findings are in conformity with the studies done by Rajan and Zingales (1995), Chang et al (2009), Yang et al (2010) and Bagherzadeh (2003).

Firm size is positively correlated with leverage. Significant positive results are consistent with the trade-off theory. The trade-off theory predicts that larger firms tend to be more diversified, less risky and less prone to bankruptcy. Firms may prefer debt rather than equity financing for control. Control considerations support positive correlation between size and leverage. Thus, large firms should be more highly leveraged.

Profitability latent factor has a statistically significant negative effect on total debt, long-term debt and short-term debt structures (Model-1, Model-2, Model-3 and Model-4). These results show that while the profitability levels of firms are increasing, their levels of profitability decrease. Regarding the variant effect of the firm profitability on the capital structure, negative factor loading indicates that there is a negative and significant relation between profitability and capital structure and this effect verifies pecking order theory predictions; the findings are in conformity with the studies done by Titman and Wessels (1988), Rajan and Zingales (1995), Yang et al (2010). In all empirical findings, leverage is negatively correlated with profitability. This finding is consistent with the pecking order theory rather than with the trade-off theory. That is, higher profitable firms use less debt. High profit firms use internal financing, while low profit firms use more debt because their internal funds are not adequate.

Empirical findings suggest that the growth opportunities appear to have positive influence on all types of capital structure models (Model-1, Model-2, Model-3 and Model-4). This result is inconsistent with the theoretical prediction. But, it is consistent with some studies on the pecking order theory. This result shows that in Turkey, firms with high future growth opportunities use more debt financing.

There was no statistically significant relationship between the tax level and the non-tax tax shield factors of the firms' capital structures at the 10% significance level. This result shows that tax rate and non-debt tax shield are not the important determinant of capital structure for the Istanbul Stock Exchange in Turkey.

The results presented in Table-9 also indicate that contrary to the predictions in pecking order and trade-off theories, there is no significant relation between earning volatility and long-term capital structure. It seems that the earning volatility, as an index of bankruptcy possibility, is not of the interest of financial decision makers at the time of giving long-term debts; the findings are in conformity with the studies done by Titman and Wessels (1988) and Yang et al (2010). But contrary to long-term debt structure, volatility is an important determinant for short-term debt and total debt structure. In this case, there is a negative significant effect between volatility and short-term debt structure.

According to Table-8, the combined effect of eight latent factors (liquidity, asset structure, firm size, profitability, growth opportunities, tax level, none-debt tax shield and volatility) achieve an *R*-square value of 0.55 for total debt capital structure model (Model-1), 0.49 for long-term debt structure model (Model-2), 0.61 for short-term capital structure debt model (Model-3) and 0.48 for combined (long and short term) debt structure model (Model-4) respectively.

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