

# “Factors influencing debt financing decisions of corporations – theoretical and empirical literature review”

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## Factors influencing debt financing decisions of corporations – theoretical and empirical literature review

### Abstract

Over the past half century, there has been an increasing interest on identifying the factors influencing debt financing within corporations. Based on available literature, both from developed and developing economies, this literature review paper examined the factors influencing debt financing decisions within corporations. Applying desktop research methodology, the paper used a three-thronged approach: theoretical, methodological and empirical. The theoretical approach reviewed the key theories proposed with respect to corporations' debt financing decisions. The methodology approach helped in identifying the common applicable conceptual models and the empirical findings related to the factors affecting debt financing of corporations. The factors identified were both firm specific and macroeconomic factors, and the empirical findings showed either positive or negative relationship results.

**Keywords:** debt financing, financial leverage, debt financing theories, firm specific factors, macroeconomic factors.

**JEL Classification:** G32.

### Introduction

Debt financing is the main element of external financing for corporations raising extra funds after creation (Baltacı and Ayaydın, 2014). There has been a major increase in external financing over the years, particularly evident during the periods of economic expansion of corporations (Mizruchi and Stearns, 1994). The majority of corporations looking for external financing options use debt financing rather than equity financing (Goswami and Shrikhande, 2001). They argue that this is the case for most corporations from different industrialized economies of the world since expansion of productive activities, both in local and foreign countries, gives multinational corporations the choice of financing with debt in local and international capital markets. According to O'Brien and David (2010), Mayer (1988), in his study of new issues in corporate finance, estimated debt financing at 90% percent of all new external financing.

Debt financing has both an advantage and a disadvantage on the growth of corporations and for its strategic investments (O'Brien and David, 2010). According to Fama and French (2002), the benefits of debt financing include the tax deductibility of interest and the reduction of free cash flow problems, while the costs of debt financing include potential bankruptcy costs and agency conflicts between stockholders and debt holders. Therefore, in making debt financing decisions, managers try to create a balance between the corporate tax advantages of debt financing and the costs of financial distress that arise from bankruptcy risks (Kraus and Litzenberger, 1973) and agency costs

(Jensen and Meckling, 1976). Extensive research has been done, trying to give an explanation on how to create the best level of debt financing that takes into account the advantages and the risks, but none has come up with a conclusive theory so far (Baltacı and Ayaydın, 2014; Myers, 1984). However, financial management literature has accepted some conditional theories of debt financing.

On the other hand, there has been an increasing interest on identifying the factors that influence debt financing within corporations. From the initial work of Modigliani and Miller (1958) to the recent studies like Jõeveer (2013), Jiraporn, Kim and Kitsabunnarat (2012), Kayo and Kimura (2011) and Fan, Titman and Twite (2012), determinants of debt financing continue to be a topic of interest in financial economics and have produced an enormous volume of research. Frank and Goyal (2009) argued that the factors that influence debt financing decisions remain indefinable even though there is a lot of theoretical literature and decades of empirical tests. In support of Frank and Goyal's argument, Stearns and Mizruchi (1993) recognized that, while debt financing is supposed to be an activity universally acceptable to corporations, little is known about its main determinants.

### 1. Theories of debt financing

The argument for the existence of optimal debt financing levels has kept researchers long in the field for decades. Studies have analyzed debt finance to determine whether optimal debt finance levels exist. An optimal debt finance level would be one that will minimize the cost of capital of a corporation while maximizing the value of the corporation. According to Miller (2012), the balancing of the bankruptcy costs against the tax gains on debt financing gives rise to an optimal

capital structure. Therefore, decisions on debt finance level have an impact on the success of the corporation. Precisely how corporations decide the amount of debt in their capital structures remains a puzzle (Rao, Al-Yahyaee and Syed, 2007).

Myers (2001) argued that there is no universally accepted theory of debt financing choice and there is no reason to expect one. However, he consents to the fact that there are several conditional theories which have been accepted. Most corporate finance literature point to the “trade-off theory”, in which taxation and deadweight bankruptcy costs are taken into consideration (Frank and Goyal, 2009). According to this theory, corporations seek debt finance levels that balance the tax advantages of additional debt against the possible bankruptcy costs (Myers, 2001). Myers (1984) proposed the “pecking-order theory” in which there is preference of retained earnings, debt and then equity. Frank and Goyal (2009) argued that the idea that firms engage in “market timing” has also become popular. Finally, the “agency theory” lurks in the background of much of the theoretical discussion. Agency concerns are normally included in the trade-off framework when deduced broadly. Each theory attempted to explain the reasons behind the choice between debt financing and other forms of financing.

There are other recent theories which have been proposed. Jensen (1986) developed the free cash flow theory in which he argues that free cash flows allowed firms’ managers to finance projects earning low returns which might not be funded by the equity or bond markets, hence reducing debt financing. Myers and Majluf (1984), contributed to the asymmetric information hypothesis in debt financing. They argued that asymmetric information problems drive the capital structure of firms since managers know more than the rest of the market about their firm’s value (information asymmetry) and the market penalizes the issuance of securities, including debt, whose benefits related to the assessment of such information. The theory argues that managers will issue securities in regard to their sensitivity towards information, issue more securities that are insensitive to information and fewer securities sensitive to information.

Berger, Ofek and Yermack (2012) highlighted that there are theoretical arguments and some empirical evidence that point to the possibility that managers can become entrenched, and that they may deviate from choosing optimal debt financing as a result. The argument is referred to as managerial entrenchment theory, which suggests that entrenchment motives may cause managers to increase debt financing level

beyond the optimal point, in order to inflate the voting power of their equity stakes and reduce the possibility of takeover attempts (Harris and Raviv, 1988). Research on debt financing theories is yet to be concluded (Myers, 2001).

## 2. Factors influencing debt financing

The factors that influence debt financing choice remain indefinite despite much theoretical literature and decades of empirical tests exist (Frank and Goyal, 2009). A number of studies, like Jõeveer (2013), De Jong et al. (2008), Kayo and Kimura (2011) and Frank and Goyal (2009), categorize the factors influencing debt financing into characteristics or specific factors of a corporation, macroeconomic factors or country specific factors. These factors empirically influence debt financing decisions of corporations, either positively or negatively.

**2.1. Corporation specific factors.** Corporation specific factors have remained the main focus of debt financing studies (Kayo and Kimura, 2011) from the second proposition of Modigliani and Miller (1963) to the current studies, like Jõeveer (2013), Majumdar (2012), Frank and Goyal (2009), Antoniou et al. (2008) and Deesomsak, Paudyal and Pescetto (2004). The corporation specific factors influencing debt financing from the above studies, include corporation profitability, corporation size and growth, nature of assets, non-debt tax shields, liquidity and probability of bankruptcy. Other corporation factors like corporation tax rates, business risk, access to capital markets, the finance manager’s gender and the composition of the board of directors, are also considered to have influence on debt financing (Jõeveer, 2013; Antoniou et al., 2008).

*2.1.1. Profitability.* Profitable corporations are believed to face reduced expected costs of financial distress and find interest tax benefits more important (Frank and Goyal, 2009). Therefore, the tax benefit and the bankruptcy costs perspective predict that profitable corporations should use more debt. In addition, the perception of agency costs is expected that the restraint provided by debt financing is more valuable for profitable corporations since these corporations are prone to having stern free cash flow problems (Jensen, 1986).

On the other hand, Deesomsak, Paudyal and Pescetto (2004) argued that they expect an inverse relation between profitability and debt financing levels since the pecking-order theory suggests that managers prefer to finance investments internally because of the informational asymmetry between managers and outside investors. Thus, profitable corporations will prefer not to raise external funding

in order to avoid potential dilution of ownership and additional external monitoring. The theory of debt financing and profitability, therefore, predicts both a positive relationship, which supports trade-off theory, and a negative relationship which supports the pecking order theory (Kayo and Kimura, 2011).

*2.1.2. Debt financing and corporation size.* The corporation size is also a very important factor that influences a corporation's debt financing decision (Kayo and Kimura, 2011). The trade-off theory suggests a positive relation between corporation size and debt financing level, since larger corporations have been revealed to have lower bankruptcy risk and relatively lower bankruptcy cost (Deesomsak et al., 2004) and may be more diversified (Titman and Wessels, 2012). In addition, Deesomsak, Paudyal and Pescetto argued that large corporations have lower agency costs of debt, relatively smaller monitoring costs, less volatile cash flows, easier access to credit market, and require more debt to fully benefit from the tax shield. Therefore, according to this hypothesis, corporation size is expected to have a positive impact on the debt financing level. Furthermore, larger companies are believed to be more transparent and tend to have larger debt levels since they can issue larger amounts of debt, thus allowing them to spread the issuing costs (Byoun, 2008).

However, Rajan and Zingales (1995) argued that this relationship could be either positive or negative. Their positive relationship argument supports the above trade-off suggestion, while for the negative relationship, the asymmetric information problems are likely to be smaller in larger corporations. Thus, it would be possible for larger corporations to issue new shares instead of debt financing without a reduction in their market values. Again, by testing the relationship between firm size and debt financing, there are two possible results supported by different theoretical perceptions. A positive relationship indicates the importance of diversification and the negative relationship advocates for the role of information asymmetry.

*2.1.3. Corporation nature of asset (tangibility).* It is believed that corporations operating with more tangible assets have a higher debt capacity (Byoun, 2008). Kayo and Kimura (2011) suggested that asset tangibility plays an important role on debt financing decisions since the collateral capability of tangible assets in place tend to increase debt financing levels. In addition, agency theory proposes that corporations with high debt financing levels tend to under invest, or invest below their optimal investment levels, and thus transfer wealth away from debt holders to equity holders (Deesomsak et

al., 2004). They argue that these expected behaviors of under investment cause debt holders to require collateral because the use of secured debts can help alleviate this problem. They also argue that the liquidation value of the firm increases with the tangibility of assets and decreases the probability of mispricing in the event of bankruptcy. Therefore, the existence of tangible assets within the assets of a corporation serves two critical purposes: it enables the corporation to pledge the assets as collateral, thereby reducing the agency costs of debt, like risk shifting; and, at the same time, protects the debt holder in the event of liquidation (Rajan and Zingales, 1995). It means that corporations with difficulties in providing collaterals are prone to pay higher interest, or may be forced to issue equity instead of debt finance, which implies a positive relationship between tangibility of assets and debt financing.

Asset tangibility can also discourage debt financing since a larger proportion of tangible assets in the asset portfolio of a corporation is expected to reduce supply side constraints (Majumdar, 2012). According to Frank and Goyal (2009), the pecking order theory makes opposite predictions since low information asymmetry associated with tangible assets makes equity issuances less costly. Thus, debt financing levels should be lower for firms with higher tangibility.

*2.1.4. Corporation growth.* Generally, theoretical studies suggest that corporation growth opportunities are negatively related with debt financing levels (Huang and Song, 2006). Growth increases costs of financial distress, reduces free cash flow problems, which the managers of corporations tend to protect, hence making worse debt financing related agency problems (Frank and Goyal, 2009). According to these authors, growing corporations place a lot of emphasis on investments that benefit the shareholders; hence, the trade-off theory predicts that growth reduces debt financing levels. Titman and Wessels (2012) agreed with this argument and suggest that the cost associated with the agency relationship is expected to be higher for corporations in growing industries, which have more flexibility in their choice of future investments. They, therefore, propose that expected future growth should be negatively related to debt financing levels. Deesomsak et al. (2004) indicated that higher growth opportunities provide more benefits to invest sub-optimally, or to accept risky projects that take wealth from debt holders. These opportunities raise the cost of borrowing. Consequently, growing corporations tend to use internal resources or equity capital rather than debt.

In addition, they stated that corporations with high growth and whose value comes from intangible growth opportunities may not want to commit themselves to debt servicing as their revenue may not be available when needed.

Nevertheless, growth opportunities can also compare positively with leverage, in line with the pecking order presumption (Kayo and Kimura, 2011). According to Frank and Goyal (2009), the pecking order theory implies that corporations with more investments, holding profitability constant, should accumulate more debt over time. Thus, growth opportunities and debt financing are positively related under the pecking order theory. In addition, the pecking order of debt financing decisions derives from the asymmetric information between managers and investors (Kayo and Kimura, 2011). Asymmetric information propositions fronted by Myers and Majluf (1984) argued that managers tend to issue new shares when prices are overvalued, thus benefiting old shareholders. This scenario may cause new shareholders to demand a discount on the new prices of shares. Consequently, managers avoid issuing new shares, even though this decision may result in firms ignoring profitable investments. This behavior, therefore, may increase the issue of debt instead of equity, thus increasing debt financing levels.

*2.1.5. Corporation risk.* Corporation risk or volatility is a measure for the probability of financial distress and it is generally expected to be inversely related with debt financing level (Huang and Song, 2006). According to Frank and Goyal (2009), corporations with more volatile cash flows face higher expected costs of financial distress and should use less debt. They argued that more volatile cash flows are capable of reducing the probability of tax benefits being used. Therefore, higher risk may result in less debt financing under the trade-off theory. Deesomsak et al. (2004), looking at corporation risk from the point of earning of corporations, argued that higher volatility of earnings increases the probability of financial distress, since corporations may not be able to fulfil their debt servicing contacts. This implies that the debt financing level of corporations decreases with increase in earnings volatility, leading to an expected inverse relationship.

In their further analysis of corporation's risk, Frank and Goyal (2009) suggested that it should be expected that corporations with volatile equity shares are those which are very risky and such corporations may suffer more from adverse selection in the stock markets. Therefore, according to the pecking order theory, these corporations,

being riskier because of their volatile stocks, would predict a higher debt financing level. In addition, Frank and Goyal (2009) argued that even corporations with volatile cash flows might need to periodically access the external capital markets, thereby increasing debt financing levels.

*2.1.6. Corporation tax rate.* Corporation tax rates should influence debt financing since debt interest payments are typically tax deductible, whereas dividend payments are not (Antonczyk and Salzmann, 2014). It is, therefore, logical that higher tax rates will imply greater interest tax shield benefits, and, consequently, induce more debt financing rather than equity financing (Jõeveer, 2013). This reasoning is the main theme of the pioneering study by Modigliani and Miller (1963) and almost all researchers now believe that corporation taxes should be significant to debt financing decisions of corporations (Huang and Song, 2006).

*2.1.7. Liquidity.* Theoretically, corporations with more liquid assets can use them as another internal source of funds instead of debt, leading to lower debt financing levels according to the pecking order theory (Öztekin and Flannery, 2012). 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 reduces debt financing levels (Deesomsak et al., 2004).

*2.1.8. Non-debt tax shield.* Other items, apart from interest expenses, that contribute to tax payments decrease, for example, the tax deduction for depreciation and provision for bad debts, are labelled as non-debt tax shields (Bauer, 2004). According to DeAngelo and Masulis (1980), corporations that have non-debt tax shields are likely not to use fully the debt tax shield that comes from debt interests. In other words, corporations with sufficient tax credits from investments or depreciation deductions are likely to use less debt financing (Kouki and Said, 2012). The argument is that non-debt tax shields are substitutes for a debt related-tax shield. Therefore, the relationship between non-debt tax shields and debt financing should be negative (Lim, 2012).

*2.1.9. Probability of bankruptcy.* Higher probability of bankruptcy implies high bankruptcy costs; hence, trade-off hypothesis predicts a negative relationship between probability of bankruptcy and debt financing (Kayo and Kimura, 2011). However, larger corporations are often more diversified and have more stable cash flow. Therefore, the probability of bankruptcy for large firms is smaller in comparison with smaller ones (Titman and

Wessels, 2012). Thus, according to the pecking order hypothesis, larger profitable firms should use more of their internally generated funds, thereby reducing the debt financing levels. The pecking order argument implies that large corporations with less probability of bankruptcy can have less debt financing levels.

**2.2. Macroeconomic factors.** Macroeconomic factors are regional or national economic factors which externally influence the financial strategies of corporations, including debt financing decisions. Financial management literature recognizes the important role that macroeconomic factors play in the determination of capital structure decisions of firms (Lemma and Negash, 2013). Recent and past literature identifies the gross domestic product (GDP), inflation rate, interest rate, activities of financial institutions and industry median as the common macroeconomic factors which have an influence on the debt financing decisions of corporations (Mokhova and Zinecker, 2014; Baltaci and Ayaydin, 2014; Lemma and Negash, 2013; Jõeveer, 2013; Kayo and Kimura, 2011; Frank and Goyal, 2009; Deesomsak et al., 2004). The following macroeconomic factors influence debt financing decisions of corporations.

*2.2.1. Gross domestic product.* It is believed that the economic development levels of countries reflect wealth disparity between them and, hence, access to finance including debt financing (Lemma and Negash, 2013). During expansions, stock prices go up, expected bankruptcy costs go down, taxable income goes up, and cash increases result in more debt financing within corporations (Frank and Goyal, 2009). Frank and Goyal (2009) further argued that, during expansion, the assets of corporations will increase. If corporations borrow against collateral, then debt financing levels should increase. Therefore, according to Jõeveer (2013), the gross domestic product rate, which is used as a proxy for growth opportunities, should have a positive relationship with the debt financing levels corporations. However, Mokhova and Zinecker (2014) argued that the boost in economy, and, consequently, growth in gross domestic product will lead to increase in the profits of corporations. According to the pecking order theory, corporations will prefer internal sources of financing, thereby causing reduction in debt financing levels. Frank and Goyal (2009) also noted that, if the pecking order theory holds, debt financing should decline during expansions since internal funds increase during expansions and agency problems between shareholders and managers are less severe. Consequently, corporations should issue less debt.

*2.2.2. Inflation rate.* Inflation is considered one of the main indicators of a country's stability. An increase in the inflation rate causes uncertainty in economic conditions (Baltaci and Ayaydin, 2014). They argued that this uncertainty causes the inability of corporations to repay their debts. Gungoraydinoglu and Öztekin (2011) also argued that higher inflation decreases the benefits of debt financing because of higher bankruptcy costs of debt imposed on corporations. In addition, Drobetz, Gounopoulos, Merikas and Schröder (2013) argued that, in periods with higher inflation rates, corporations use currently weak currencies to repay debt and, in turn, lower their debt financing levels. It is, therefore, expected that inflation rates should be negatively related to the debt financing levels of corporations. On the other hand, Jõeveer (2013) maintained that the expected inflation is predicted to be positively related to debt financing due to higher real value of tax deductions on debt. In support of the positive relationship, Frank and Goyal (2009) argued that market timing in debt markets also results in a positive relationship between expected inflation and debt financing if managers issue debt when expected inflation is high relative to current interest rates.

*2.2.3. Interest rates.* In the presence of other variables, such as taxation and bankruptcy costs, changes in interest rates can influence debt financing levels within a corporation, since corporations are more likely to use debt when the cost of borrowing is low (Deesomsak et al., 2004). They argued that under this hypothesis, the level of interest rates is expected to be negatively related to debt financing levels. Deesomsak et al. (2004) further noted that interest rates also incorporate inflation expectations. Therefore, corporations could be expected to change from equity to debt financing when interest rates are increasing. In this case, the level of interest rates is expected to be positively related to leverage.

*2.2.4. Industry median.* It would be logical to expect that specific characteristics of a given industry could also influence the debt financing decisions of corporations (Baltaci and Ayaydin, 2014). Frank and Goyal (2009) argued that corporations in an industry face common factors that affect their financing decisions and these could reflect on product market interactions or the nature of competition. It could also reflect on industry heterogeneity in the types of assets, business risk, technology, or regulation. Therefore, according to them, while looking at industry median in terms of growth, trade-off theory predicts that higher industry median growth should result in less

corporation debt financing. However, in terms of industry debt financing levels, higher industry median debt levels should result in more corporation debt financing.

Frank and Goyal (2009) further looked at the corporations in terms of industry regulations. They argued that regulated corporations have stable cash flows and lower expected costs of financial distress. Therefore, they should have more debt. However, managers have less discretion in regulated corporations, which reduces the severity of shareholder-manager conflicts and makes debt financing less desirable from a control perspective. They concluded that the trade-off theory makes an ambiguous prediction on the effect of regulation on leverage. Secondly, under a pure pecking order perception, the industry should only matter to the extent that it serves as a proxy for the firm's financing deficit, making it an indirect link. Thirdly, under the market timing theory, the industry should matter only if valuations are correlated across firms in an industry.

*2.2.5. Financial or debt markets conditions.* The literature also considers the level of conditions of financial institutions as another important factor that influences debt financing decisions of corporations (Lemma and Negash, 2013). De Jong et al. (2008) argued that when the bond market in a given country is highly developed, then issuing and trading these bonds are easier and will lead to higher levels of corporate debt financing. In contrast, they also acknowledged that when the stock market is developed, the debt financing level of corporations tends to be lower because the broader supply of funds decreases the cost of equity. Deesomsak et al. (2004) also noted that financial market development plays an important role in the debt financing choice of corporations. They argued that as stock market activity increases, preference of corporations for equity over debt also increases. Therefore, activity of stock markets is expected to be inversely related to debt financing.

*2.2.6. Other factors.* Additional institutional factors should be included as alternative measures of the severity of asymmetric information (Jõeveer, 2013). Jõeveer (2013) included the corruption index of a corporation in his study. He argued that it is expected that the higher the corruption perception index (means lower corruption), the less severe is the asymmetric information problem. Hence, the positive relation between the corruption index and the debt financing level is expected. Jõeveer (2013) and Bassey et al. (2014) also studied the effect of age and debt financing of corporations and found that they are negatively correlated. This study

investigated the above mentioned macroeconomic factors and corporation specific factors.

### 3. Methodology

**3.1. Conceptual model.** Most studies on factors influencing debt financing of corporations, like Gaud et al. (2005), Oyesola (2007), Daskalakis and Psillaki (2008), Frank and Goyal (2009), Kayo and Kimura (2011), Cortez and Susanto (2012), Drobetz et al. (2013), Dang (2013) and Alzomaia (2014), used a combination of longitudinal and cross-sectional data, i.e., panel data. This kind of data is best analyzed using the panel data regression model since the model incorporates both longitudinal and cross-sectional measures (Daskalakis and Psillaki, 2008). According to them, the panel data regression model reduces co-linearity among the explanatory variables, thus improving the efficiency of econometric estimates. Secondly, they argued that panel data models can take into account a greater degree of the heterogeneity that characterizes corporations. Thirdly, panel models also allow for the presence of dynamic effects. According to Kayo and Kimura (2011) studies on the factors of debt financing of corporations use the simple regression or empty model to analyze the panel data. Cortez and Susanto (2012) argued that panel data regressions are run in order to test the strength of the relationship between debt financing and the potential factors influencing it within the corporations. The data is grouped into their respective source (i.e., panel variable: corporation) and listed according to their respective time period (i.e., time variable: years).

The panel regression model is further believed to give a small standard error of estimate compared to ordinary least squares method (Petersen, 2009). The general form of the model can be specified as:

$$Y_{it} = \alpha + \beta X_{it} + \varepsilon_{it}, \quad (1)$$

where the subscript  $i$  denotes the cross-sectional dimension and  $t$  represents the time-series dimension (Petersen, 2009). The left-hand variable,  $Y$ , represents the dependent variable in the model. This variable represents the corporation's debt financing measures (financial leverage) and  $X$  contains the independent (explanatory) variables which represent the firm specific factors and macroeconomic factors,  $\alpha$  is the constant and  $\beta$  represents the coefficient which measures the association between debt financing factors and debt (financial leverage) ratios. Finally,  $\varepsilon$  is the error disturbance term.

Other studies, such as Deesomsak et al. (2004), Huang and Song (2006), Oyesola (2007), Antoniou

et al. (2008), Gungoraydinoglu and Öztekin (2011), Cortez and Susanto (2012), Lim (2012), Moosa and Li (2012), Smith (2012), Chakraborty (2013), Drobetz et al. (2013), Lemma and Negash (2013), Alzomaia (2014) and Bassegy et al. (2014) expanded the above general model into a multiple linear regression model of the form:

$$Y_{it} = \alpha_0 + \sum_{k=1}^N \beta_k X_{kit} + \mu_{it} + \varepsilon_{it}, \quad (2)$$

where  $Y_{it}$  is a measure of debt financing (financial leverage) of firm  $i$  in year  $t$  and  $X$  represents the measure of explanatory variables (firm specific factors and macroeconomic factors).  $\mu$  represents unobserved factors (either firm-specific or macroeconomic) and  $\alpha_0$  is the constant.  $\beta$  from  $k = 1$  to  $N$  are unknown parameters to be estimated. The measure of explanatory variables  $X$  includes  $k$  factors, which total the number of all studied factors influencing debt financing. The explanatory variables include both the firm-specific factors and macroeconomic factors. The regression model can, therefore, be presented as:

$$\begin{aligned} \text{financial leverage} = & \int (\sum \text{firm - specific factors} + \\ & + \sum \text{macroeconomic factors}). \end{aligned} \quad (3)$$

In doing the regression analysis, most of the studies, such as Gaud et al. (2005), Gaud et al. (2007), Antoniou et al. (2008), Gungoraydinoglu and Öztekin (2011), Öztekin and Flannery (2012), Dang (2013), Mateev et al. (2013) and Baltaci and Ayaydin (2014) used the generalized method of moments (GMM) by Blundell and Bond (1998). Other studies, like Huang and Song (2006), Oyesola (2007), De Jong et al. (2008), Frank and Goyal (2009), Jõeveer (2013), Alzomaia (2014) and Bassegy et al. (2014), on the other hand, have used the pooled ordinary least squares (OLS) method to analyze the debt financing (financial leverage) regression models. Few studies, like Chakraborty (2013) and Forte et al. (2013), have used both pooled OLS and GMM in analyzing the financial leverage regression models. Other econometric regression methods have also been used by other studies. Oyesola (2007) and Lemma and Negash (2013), in addition to pooled OLS, also used the fixed effect model and random effect model in their analysis. Chakraborty (2013) added to the pooled OLS and GMM a time series analysis method known as “lagged” time series analysis. Drobetz et al. (2013) also used pooled OLS and fixed effect regression model analysis in their study. Foster and Young (2013) argued that an alternative to the methods used in previous research is the use of a logistic transformation to correct the problems introduced by the use of proportional variables.

They observed that, since the use of proportional dependent variables lends itself to the use of logistic transformation, their study used a regression analysis method referred to as a logistic transformed regression.

### 3.2. Variables and measures. 3.2.1. Dependent variable.

Many diverse empirical measures have been used to show the debt financing (dependent variable) levels within corporations (Frank and Goyal, 2009). They argued that some scholars advocate for book leverage, which is the proportion of corporation debt finance to the total book value of the corporation assets. Other scholars advocate for market leverage, which is the proportion of corporation debt to market value of the corporation. According to Frank and Goyal (2009), the opinions of the researchers on the best measure of debt financing level differ. They argued that supporters of the book leverage approach believe that financial markets swing so much and managers tend to have a notion that market leverage figures may be unreliable as a guide to corporate financial policy. Since the calculation of book leverage relies on the book value of the corporation, which is an accounting measure (Chen, 2013), managers tend to put more attention on book leverage because debt is better supported by assets in place than it is by growth opportunities. Calculation of the market value of corporations is easier for stock exchange listed corporations; this may make book value leverage popular for studies on unlisted corporations (Brav, 2009).

In support of market leverage, Knaup and Wagner (2012) argued that the statement of financial position might provide an inaccurate assessment of the true value of a corporation since many of the assets listed on the statement of financial position are mostly valued based on their historical cost rather than their current value. Markets are generally believed to be futuristic and numbers generated from them in the calculation of market leverage may be more relevant to managers’ decisions of corporations (Frank and Goyal, 2009). In addition to the above debate on debt financing level measure, varied studies also use different definitions of debt. Brav (2009); Fan, Titman and Twite (2012) and others use total debt as the numerator while De Jong et al. (2008) use long-term debt. There are other studies like Huang and Song (2006) and Jõeveer (2013) which use both-long term debt and total debt as numerators of the leverage ratio.

3.2.2. Explanatory variables. Explanatory variables, being factors influencing debt financing decisions within corporations, have been measured using different proxies by different studies. Bauer (2004),



Deesomsak et al. (2004), Gaud et al. (2005), Huang and Song (2006), Gaud et al. (2007), Daskalakis and Psillaki (2008), Gungoraydinoglu and Öztekin (2011), Cortez and Susanto (2012), Forte et al. (2013) and Bassey et al. (2014) measured profitability as the corporation's operating profit divided by its total assets for each year. Other studies like Chang et al. (2009), in addition, used operating profit divided by annual sales. Smith (2012), Alzomaia (2014) and Baltaci and Ayaydin (2014) used profit after tax divided by total assets, while Chakraborty (2013) measured profitability as net annual cashflow divided by total assets.

Corporation size variable is measured as either a natural logarithm of sales or total assets by studies like Bauer (2004), Gaud et al. (2007), De Jong et al. (2008), Frank and Goyal (2009), Kayo and Kimura (2011), Lim (2012), Forte et al. (2013), Drobetz et al. (2013), Alzomaia (2014) and Baltaci and Ayaydin (2014). However, Daskalakis and Psillaki (2008) and Moosa and Li (2012) used tangible assets divided by total assets as a measure of corporation size. Smith (2012), on the other hand, used the natural logarithm of gross income.

The nature of corporation assets has been represented by asset tangibility by most studies such as Gaud et al. (2005), Huang and Song (2006), Oyesola (2007), De Jong et al. (2008), Frank and Goyal (2009), Kayo and Kimura (2011), Lim (2012), Chakraborty (2013) and Baltaci and Ayaydin (2014), and measured as tangible or fixed assets over total assets.

The corporation growth variable had different measures from various studies. Most studies, like Bauer (2004), Gaud et al. (2005), Gaud et al. (2007), De Jong et al. (2008), Kayo and Kimura (2011), Kouki and Said (2012), Dang (2013) and Drobetz et al. (2013), used the market to book value ratio which is measured as the market value of the corporation divided by its book value (total assets). Other studies, like Oyesola (2007), Daskalakis and Psillaki (2008), Cortez and Susanto (2012), Lim (2012), Smith (2012), Chakraborty (2013), Forte et al. (2013), Alzomaia (2014) and Bassey et al. (2014), used either the percentage change in total assets or in sales as a measure of corporation growth. Frank and Goyal (2009) and Chang et al. (2009), in addition to the change in total assets, used capital expenditure divided by total assets and research and development expenditure divided by sales. Baltacı and Ayaydin (2014) used rate of change of gross domestic product (GDP) as a measure of corporation growth.

Standard deviation of operating profit over total assets has been the dominant measure of the risk or

volatility of corporations in debt financing studies, like Bauer (2004), Huang and Song (2006), Lim (2012), Moosa and Li (2012), Forte et al. (2013) and Alzomaia (2014). Deesomsak et al. (2004) used absolute change in annual operating profits, while Chang et al. (2009) used standard deviation of percentage change in annual operating income. Baltaci and Ayaydin (2014), on the other hand, used the corporation financial risk index and Bassey et al. (2014) used the absolute coefficient of variation of annual operating profit as their measure of corporation risk variable.

Few studies included the corporation tax rate as a variable. The few that included it as a variable, such as Huang and Song (2006) and De Jong et al. (2008), used the measure of average tax rate for the period of study. Frank and Goyal (2009) used the prior year tax rate, while Öztekin and Flannery (2012) and Bassey et al. (2014) used current income tax charges divided by the profit before tax as a measure of corporation tax rate variable.

The common measure of liquidity is current assets divided by current liability. Studies such as Deesomsak et al. (2004), De Jong et al. (2008), Moosa and Li (2012) and Öztekin and Flannery (2012) applied this common measure. However, Smith (2012) used the measure of current assets as a percentage of total assets to measure the liquidity of corporation.

Non-debt tax shield is a common variable, especially where corporation tax rate is ignored. Studies such as Bauer (2004), Deesomsak et al. (2004), Huang and Song (2006), Gaud et al. (2007), Chang et al. (2009), Cortez and Susanto (2012), Lim (2012), Chakraborty (2013) and Dang (2013) who used depreciation and amortization charge divided by total assets as the measure of non-debt tax shield variable with the exception of Forte et al. (2013) who used the depreciation charge divided by operating profit.

Corporation's probability of bankruptcy, as an explanatory variable, has been used in a few studies. In cases where it has been used, the measure is interest expense divided by operating profit (Kouki and Said, 2012). Gaud et al. (2005) and Kayo and Kimura (2011) used Altman's Z score, which is a good measure of financial distress.

Gross domestic product (GDP) variable, being a macroeconomic factor, has been measured using the country's measure of GDP. De Jong et al. (2008), studying corporations around the world, used GDP figures from the World Bank database. Other studies such as Frank and Goyal (2009), Öztekin and Flannery (2012) and Baltacı and Ayaydin (2014) used annual change or growth on the GDP of the country.

Studies used inflation rate and interest rates interchangeably. Booth et al. (2001) and Frank and Goyal (2009) used the country's expected inflation rates, while Öztekin and Flannery (2012) and Baltacı and Ayaydin (2014) used the country's consumer index as a measure for the inflation rate variable in their respective studies. The country's interest lending rate was used by Deesomsak et al. (2004) to measure interest rate variable.

Other variables, such as industry influence, referred to as industry median, has been measured using the mean of financial leverage values within the corporation's industry by studies like Titman and Wessels (1988), Frank and Goyal (2009) and Öztekin and Flannery (2012). The financial market condition has not been a popular variable. However, Deesomsak et al. (2004) and Kayo and Kimura (2011) used the county's value of market capitalization. De Jong et al. (2008) used the average of normalized values of market base and stock to measure stock market development. Frank and Goyal (2009) used the cumulative market returns measure for the stock market condition. Studies such as Moosa and Li (2012), Forte et al. (2013) and Bassey et al. (2014) used the number of years of existence of corporations since incorporation as a measure for the age variable of corporations. The newly introduced corruption variable has been measured by Jõeveer (2013) using the corruption perception index.

## 4. Empirical results

**4.1. Corporation specific factors.** *4.1.1. Profitability.* There is no consensus regarding the empirical findings on factors influencing debt financing within corporations. Different studies have given different results depending on the types of corporations, nature of the industry and the countries' economic environment (Mokhova and Zinecker, 2014). For example, the pecking order theory assumes that corporations with higher profitability will prefer internal financing to debt financing and, hence, a negative relationship is expected between profitability and debt financing levels (Baltacı and Ayaydin, 2014). The majority of studies such as Deesomsak et al. (2004), Gaud et al. (2005), Huang and Song (2006), Antoniou et al. (2008), Frank and Goyal (2009), Kayo and Kimura (2011), Moosa and Li (2012), Lemma and Negash (2013), Bassey et al. (2014) and Baltacı and Ayaydin (2014) have confirmed this expected positive relationship.

On the other hand, according to the trade-off theory, more profitable corporations are expected to have more debt repayment capacity and more tax saving from debt tax shield (Baltacı and Ayaydin, 2014). Therefore, according to the trade-off theory, when

corporations are profitable they may prefer debt to other sources in order to benefit from the tax shield. Hence, a positive relationship between debt financing and profitability is expected (Chakraborty, 2013). Few studies like Oyesola (2007), Chang et al. (2009), Gungoraydinoglu and Öztekin (2011), Kouki and Said (2012) and Chakraborty (2013) have confirmed this positive relationship, especially when two different measures of profitability are used.

*4.1.2. Corporation size.* Most of the empirical findings on the size of the corporation, as a factor influencing debt financing, are consistent with the trade-off theory. According to Dang (2013), the trade-off theory suggests that large corporations face lower financial distress and agency costs and, thus, are able to borrow more than small corporations. The proposition of this theory is that the size of corporations has a positive effect on debt financing levels. In addition, this expectation conforms to the fact that large-sized corporations, with high tangible assets, are known to access credits easier than smaller corporations with a lack of tangible assets which can be used to secure long-term debts (Bassey et al., 2014). The studies that have found a positive relationship between corporation size and debt financing include Bauer (2004), Gaud et al. (2005); Huang and Song (2006), Oyesola (2007), De Jong et al. (2008), Kayo and Kimura (2011), Kouki and Said (2012), Jõeveer (2013), Forte et al. (2013), Dang (2013), Bassey et al. (2014) and Baltacı and Ayaydin (2014).

However, according to Baltacı and Ayaydin (2014), the larger corporations face lower information costs and can raise equity capital more easily than the smaller corporations. Therefore, according to the asymmetric information theory, corporation size and the debt financing level may have a negative relationship. Furthermore, the pecking order theory of debt financing predicts that larger corporations, which are more diversified, will use less debt and, hence, expects that the size of the corporation will be negatively related to debt financing. Some studies, like Rajan and Zingales (1995), Titman and Wessels (1988), Gaud et al. (2007), Smith (2012), Majumdar (2012) and Chakraborty (2013), have observed this negative relation of debt financing and corporation size for instance.

*4.1.3. Asset tangibility.* The pecking order theory recognizes a negative relationship between the asset tangibility and debt financing level, whereas the trade-off theory supports a positive one (Baltacı and Ayaydin, 2014). Baltacı and Ayaydin (2014) argued that, from a trade-off perception, one expects that corporations with a higher ratio of tangible assets-

to-total assets are subject to lower costs of financial distress, as tangible assets suffer from a lesser loss of value in case of bankruptcy. Also, tangible assets are easier to price for outsiders, resulting in lower information asymmetry, a smaller amount of pronounced agency costs of debt, and a higher debt capacity.

On the other hand, the pecking order theory predicts that firms with less collateral face higher information costs and, therefore, favors debt financing to equity financing. Some studies like, Deesomsak et al. (2004), Gaud et al. (2005), Huang and Song (2006), Antoniou et al. (2008), Frank and Goyal (2009), Gungoraydinoglu and Öztekin (2011), Kayo and Kimura (2011), Smith (2012), Dang (2013), Drobetz et al. (2013), Lemma and Negash (2013), Antonczyk and Salzmann (2014) and Bassey et al. (2014), have reported a positive relationship between tangibility and debt financing. On the contrary, other studies, like Bauer (2004), Huang and Song (2006), Daskalakis and Psillaki (2008), Öztekin and Flannery (2012), Kouki and Said (2012), Lemma and Negash (2013), Jõeveer (2013) and Baltaci and Ayaydin (2014), reported a negative relationship, especially when more than one measure is used for debt financing levels.

*4.1.4. Corporation growth.* The expected theoretical relationship between corporation growth opportunities and debt is negative in line with trade-off and agency theories since growth of corporations reduces financial distress and agency cost of debt (Deesomsak et al., 2004). They also argued that, to a small extent, a positive relationship is also expected in line with the pecking order and signalling theories. Most observations have supported the negative relationship between corporation growth opportunities and debt financing level (Bauer, 2004; Gaud et al., 2005; Huang and Song, 2006; Gaud et al., 2007; Oyesola, 2007; Antoniou et al., 2008; De Jong et al., 2008; Gungoraydinoglu and Öztekin, 2011; Kayo and Kimura, 2011; Chakraborty, 2013; Dang, 2013; Mateev et al., 2013; and Lemma and Negash, 2013). On the other hand, some observations by Daskalakis and Psillaki (2008), Chang et al. (2009), Kouki and Said (2012), Majumdar (2012), Cortez and Susanto (2012), Forte et al. (2013), Alzomaia (2014), Antonczyk and Salzmann (2014) and Bassey et al. (2014) have shown a positive relationship.

*4.1.5. Corporation risk.* The debt financing of corporations is expected to decrease with increase in earnings volatility, which is used as a measure of risk, since higher volatility of earnings increases the probability of financial distress as corporations may not be able to fulfil their debt servicing contacts (Deesomsak et al., 2004). This implies that debt

financing level of corporations decrease with increase in the risk of corporations, leading to an expected inverse relationship. Bauer (2004) also accepted the fact that the relationship can be positive, especially when the variance of the assets of corporations increase and, in turn, reduces the systematic risk of the equity.

Studies like Bauer (2004), Deesomsak et al. (2004), Huang and Song (2006), Antoniou et al. (2008), De Jong et al. (2008), Frank and Goyal (2009), Lim (2012), Drobetz et al. (2013), Forte et al. (2013), Alzomaia (2014) and Baltaci and Ayaydin (2014) have found a negative relationship between corporation risk and debt financing. On the contrary, Gaud et al. (2005), Foster and Young (2013) and Lemma and Negash (2013) found both positive and negative relationships when they used different measures of debt financing level. Most of the studies, as highlighted above, showed a negative relationship, although most of them were not strong and statistically significant (Bauer, 2004; Deesomsak et al., 2004; and Frank and Goyal, 2009).

*4.1.6. Corporation tax rate.* Most studies fail to find plausible or significant tax effects on debt financing behavior since debt financing measures of debt/equity ratios are the cumulative result of years of separate decisions and tax shields have a negligible effect on the marginal tax rate for most corporations (De Jong et al., 2008). Studies by Huang and Song (2006), Antoniou et al. (2008), De Jong et al. (2008), Foster and Young (2013) and Jõeveer (2013) have found reasonable results that have established a negative relationship. However, Antonczyk and Salzmann (2014), studying corporations across different countries, identified a positive relationship, and Lemma and Negash (2013) observed both positive and negative relationships from corporations of different African countries.

*4.1.7. Liquidity.* The negative relation between debt financing and liquidity is commonly found in the capital structure literature (Smith, 2012). The author argued that this negativity arises because more profitable corporations try to shun the adverse selection costs of outside debt, or because those that are profitable and rich in growth options seek to avoid the debt overhang problem. Empirically, studies, such as Deesomsak et al. (2004), Smith (2012) and Mateev et al. (2013), confirmed this negative theoretical relationship, while Gungoraydinoglu and Öztekin (2011), looking at some new international evidence, found a positive relationship between liquidity and debt financing.

*4.1.8. Non-debt tax shield.* As mentioned previously, the theoretical argument is that non-debt

tax shields are substitutes for a debt-related tax shield and, therefore, the relationship between non-debt tax shields and debt financing should be negative (Lim, 2012). This fact has been confirmed by studies such as Bauer (2004), Deesomsak et al. (2004), Huang and Song (2006), Cortez and Susanto (2012), Lim (2012) and Lemma and Negash (2013). Contrary to this finding, studies like Oyesola (2007), Antoniou et al. (2008), Kouki and Said (2012), Chakraborty (2013), Dang (2013) and Antonczyk and Salzmann (2014), found a positive relationship between non-debt tax shields and debt financing.

**4.1.9. Probability of bankruptcy.** Higher probability of bankruptcy implies high bankruptcy costs. Hence, the trade-off hypothesis predicts a negative relationship between probability of bankruptcy and debt financing (Kayo and Kimura, 2011). Justifying this hypothesis, Smith (2012) found a negative relationship using total debt to total assets as a measure of debt financing level, while Gaud et al. (2005) and Kouki and Said (2012) found a positive relationship in support of the pecking order theory of debt financing (Titman and Wessels, 1988).

**4.2. Macroeconomic factors.** **4.2.1. Gross domestic product.** Most studies on macroeconomic factors of debt financing have found statistically significant results between the gross domestic products (GDP) of counties and the debt financing levels of corporations. Good examples are De Jong et al. (2008), Gungoraydinoglu and Öztekin (2011) and Baltacı and Ayaydın (2014) who found statistically significant positive relationships between the GDP and debt financing levels of corporations. In contrast, Kayo and Kimura (2011), Drobetz et al. (2013) and Jõeveer (2013) also found statistically significant results but with a negative relationship.

**4.2.2. Inflation rate.** Another widely investigated macroeconomic factor is the inflation rate. However, the empirical results have not been consistent (Mokhova and Zinecker, 2014). Studies by Gungoraydinoglu and Öztekin (2011), Drobetz et al.

(2013), Jõeveer (2013), Antonczyk and Salzmann (2014) and Baltacı and Ayaydın (2014) have observed a negative relationship between inflation and debt financing. This implies that higher inflation decreases the benefits of debt financing since higher bankruptcy costs of debt are imposed on corporations during high inflation levels. Interestingly, Frank and Goyal (2009) found a positive relationship between inflation and debt financing.

**4.2.3. Interest rate.** It is believed that the effects of interest rates are incorporated within the inflation rate (Deesomsak et al., 2004). Therefore, few studies only have found any statistically significant relationship between interest rates and debt financing. From the reviewed literature, Antoniou et al. (2008) and Mokhova and Zinecker (2014) found a negative relationship while studying the macroeconomic factors of debt financing levels of the corporations of European countries.

**4.2.4. Other factors.** Other studies have attempted to find observations on other factors which have not been frequently studied. For instance, Welch (2004), Frank and Goyal (2009) and Baltacı and Ayaydın (2014) found a positive relationship between the industries' mean debt financing level with the debt financing level of corporations. De Jong et al. (2008) found a positive relationship between development of financial institutions and debt financing of corporations, while Kayo and Kimura (2011) found a positive relationship between the two. Smith (2012) and Basse et al. (2014) also observed a negative relationship between the age of corporations and their debt financing levels. This finding is consistent with the theoretical expectation of the pecking order theory of debt financing. Jõeveer (2013) incorporated the corruption perception index of corporations in his study and found that it was positively related to the debt financing level of corporations.

Table 1 below presents a summary of the reviewed theoretical factors that influence debt financing of corporations with their empirical and expected results.

Table 1. Summary of theoretical and empirical findings

Factor	Measure	Theoretical prediction	Most empirical findings
Profitability	PROF	+/-	-
Corporation size	SIZ	+/-	+
Asset tangibility	TANG	+/-	+
Corporation growth	GROW	+/-	-
Corporation risk	RISK	+/-	-
Corporation tax rate	TAX	+	-
Liquidity	LIQ	-	-
Non-debt tax shield	NDTS	-	-/+
Probability of bankruptcy	BKCY	+/-	+
Gross domestic product	GDP	+/-	+

Table 1 (cont.). Summary of theoretical and empirical findings

Factor	Measure	Theoretical prediction	Most empirical findings
Inflation rate	INFL	+/-	-
Interest rates	INT	+/-	
Industry median	INDM	+/-	+
Financial markets conditions	FMC	+/-	+
Corruption perception index	CORR	-	
Age	AGE	-	+

Source: self generated.

In Table 1, the + sign shows a positive relationship, whereas the – sign denotes a negative relationship.

## Conclusion

In summary of the reviewed literature, it can be concluded that debt financing decisions within the corporations are influenced by both firm-specific factors and macroeconomic factors. The firm specific factors include profitability, corporation size, nature of asset, growth opportunity, corporation risk, corporation tax rate, liquidity, non-debt tax shield, probability of bankruptcy, corporation age and its corruption perception index. The macroeconomic factors include gross domestic product, inflation rate, interest rates, industry influence and financial

markets conditions. These factors will influence the debt financing decisions of corporations either positively or negatively. Most empirical studies have found a positive relationship between debt financing of corporations and factors, such as, size, asset tangibility, probability of bankruptcy, gross domestic product, industry median and financial markets conditions. Consequently, the negative relationship between debt financing of corporations and profitability, growth, risk, tax rate, liquidity, and inflation rate was also found by most empirical studies. The literature has also analyzed the debt financing theories that explain how the debt financing strategy will be identified in response to the changes in these factors.

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