Do the Firm-level Variables and Human Capital Impact Capital Structure Decisions? A Study of Non-financial Firms in Pakistan

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Abstract: In this study firm’s capital structure decisions have been tried to examine theoretically and empirically. By testing the determinants of capital structure, i.e., size, tangibility, profitability, growth, non-debt tax shield, business risk and liquidity on firm’s leverage (capital structure decisions) have been tried to determine. Size, profitability, non-debt tax shield, liquidity and human capital have been found significant and negatively related to capital structure decisions. Our analysis consists of 176 non-financial Pakistani companies listed on Karachi Stock Exchange over the period of 2003-2012.

Keywords: Corporate finance, capital structure, human capital, pecking order theory, trade-off theory

INTRODUCTION

For an extensive period, the framework of capital structure has been reviewed without having any considerable experimental tests or acceptable hypothetical model (Harris and Raviv, 1991; Frank and Goyal, 2008). As stated by Myers (1984), under this direction of research, up till now, stays as a mystery in the view that financial theory is not capable of exactly explaining the behaviour of firms. In such circumstances, to explicate the genuine determinants of debt of firms, the results are unsatisfactory (Ahmadimousaabad et al., 2013). It is found by Harris and Raviv (1991) that experimental test of leverage behavior of firms is loaded with difficulties in relation to computing the capital structure’s explanatory variables. It is indicated by Rajan and Zingales (1995) that earlier empirical tests and literature are not sufficient to spell out the importance of the diverse theories. The hypothetical framework which was built up by classical theory (Modigliani and Miller, 1958) was distinguished by various impracticable suppositions that have congregated numerous criticisms. Certainly, a lot of financial behaviors stay improperly explicated by financial theory. The significance of business taxation is underlined by Modigliani and Miller (1963) and Myers (1977) in clarifying the high leverage of firms. It is revealed by Fama and Miller (1972), Stiglitz (1974) and Scott (1977) that bankruptcy charges and risk possibly will restrict the advantage of the probable tax shield received from deductibility of expense of interest. It is argued by DeAngelo and Masulis (1980) that non interest tax shield that is drawn from credit tax and depreciation permits firms to make use of minimum debt in their capital structure.

LITERATURE REVIEW

An essential matter in corporate finance involves understanding of how firms choose their financing choices and it is apparent that there is no consensus on theories that explains a firm's perfect capital structure (Seifert and Gonenc, 2008). Modigliani and Miller (1958) initiated the first study on capital structure which concludes that capital structure is immaterial in a corporate world without taxes, transaction costs or other market imperfections. As theory of Modigliani and Miller (1958) lacks practicality in its assumptions, the next generation of researchers explored into meticulous conception of capital structure that made it possible for other prominent theories in capital structure to emerge.

Modigliani-miller theorem: Modigliani and Miller (1958) presented the ground-breaking study over a supposition that market perfection is present in the capital market. Hence, the market continues to function with no bankruptcy costs, transaction costs and information is accessible for everybody in the marketplace. In different words, Modigliani and Miller (1958) declared that firms’ financing decisions are commenced with the same rate of interest and with no tax. Consequently, equity cost is similar in favour of firms which are both, non-leveraged and leveraged. Premium is incorporated for financial risk in support of non-leveraged firms. Eventually, these suppositions are indicating that the firm’s value is not dependent on its
capital structure. This revolutionary effort on capital structure was first instigated by Modigliani and Miller (1958) in the area of Corporate Finance. In accordance with MM Theorem, leverage asserts no impact on the value of firm in ideal capital market. This theorem acknowledged that the value of firm is not influenced by ratio of debt-equity.

**Trade-off theory:** By drawing its attention on benefit and cost analysis of debt, Static trade-off theory envisages that there is the most favourable ratio of debt which assists in maximizing the firm’s value. The most advantageous point can be stricken when the returns of debt issuance counteracts the mounting current value of costs in relation to more debt issuance (Myers, 2001). The prime advantage of debt is to reduce the payments of interest. Such advantages motivate firms to utilize debt. It is clarified by Miller (1977) that this plain reaction gets multifaceted when there is the presence of personal taxes and at times by means of non-debt tax shields (DeAngelo and Masulis, 1980). Furthermore, equity issuance denotes to deviate from best so this can be deemed as appalling news. It is further recognized by Myers (1984) that they would decide to issue equity if they sense it is not fairly priced in the market. In contrast, investors turn out to be attentive that the equity issuance is mispriced or fairly priced. As a result, equity issuance shows investors the way to respond depressingly and administration doesn’t demonstrate any concern to issue equity (Jahanzeb et al., 2014).

**Pecking order theory:** Myers (1984) proposed the Pecking order theory which elucidates that firms most probably have a preference to fund new investments, primary with internally lifted finances, i.e., preserved earnings, after that by means of debt and issue equity as a last alternative. The best capital structure is not easy to describe as equity accompanies at the bottom and top of the ‘pecking order’, as disputed by Myers. He furthermore disputes that debt issuance protected by collateral helps to reduce asymmetric information concerning financing costs. The firms’ financial decision making is explicated by this theory. It is stated by Shyam-Sunder and Myers (1999) that the impacts of earnings are appropriately estimated by the pecking order theory. While, in accordance with Fama and French (2002) and Frank and Goyal (2003) a small number of complications are incorporated in the theory as well. At present, in administering the financial resources of firms, it is not that much supportive.

**EXPLANATORY VARIABLES**

With respect to explanatory variables, we follow the literature and consider the five most commonly-used variables for determining leverage, namely (asset) tangibility, growth opportunities, non-debt tax shields, profitability and firm size (Rajan and Zingales, 1995; Lemmon et al., 2008). In addition, two more variables, i.e., business risk and liquidity have also been added to make the study more comprehensive and to have a closer look into capital structure decisions’ phenomenon. Further description of the variables is as follows:

**Firm size:** In order to determine a firm’s capital structure, size occupies a vital role (Booth et al., 2001; Amidu, 2007). Harris and Raviv (1991) and Rajan and Zingales (1995) present verification that higher leverage is usually possessed by larger firms. In addition, the cost of equity and debt financing is negatively linked with the size of the firm. Lower estimated costs of bankruptcy facilitate larger firms to employ more debts, as they are capable of borrowing at superior conditions and they encompass easier way in to the market. On the other hand, few researches have furthermore delineated negative association between capital structure and size (Titman and Wessels, 1988; Kouki and Said, 2012).

Study carried out by Frank and Goyal (2003) proposes the facts that in general size is compatible with trade-off theory. A slight support has been discovered by Newman et al. (2011) between pecking order theory of capital structure and size. A positive association is anticipated between the leverage and size of the firm (Hernadi and Ormos, 2012). In order to determine the size of the firm (SIZE) natural logarithm of total assets will be employed as an alternate (Chen, 2004; Lim, 2012).

**Tangibility:** Tangibility is furthermore deemed as a significant capital structure determinant. As said by Harris and Raviv (1991) that asset structure of firm has enormous value of liquidation. On the other hand, added collateral would out-turn if more tangible assets are possessed by the firm. In accordance with pecking order theory, having more tangible assets would assist the firm in decreasing agency cost and problems of information asymmetry provided that the firm possess more tangible assets. Secured debt holds lesser costs of agency in comparison to unsecured debt. It is being disclosed by few researchers that tangibility of firm is in agreement with pecking order theory (Amidu, 2007). Consistent with the static trade-off approach, firms in the company of higher fixed assets ratio provide as collateral in favour of new loans, supporting debt (Hijazi and Tariq, 2006).

We anticipate positive association between leverage and tangibility (TANG) (Rajan and Zingales, 1995). We make use of fixed assets over total assets (FA/TA) as an alternative to find out firms’ tangibility of Chakraborty (2013).

**Profitability:** The results of Chen and Chen (2011) propose that profitability can be deemed as an
explanatory capital structure variable. Impact of profitability over leverage is vague. Highly lucrative firms encompass sound accessibility of internal resources of finance. This advocates that firms look for debt funding when they lacks internal funds and this is associated with theory of pecking order (Gaud et al., 2005; Amidu, 2007).

The trade-off model demonstrates that firms that are profitable will make use of more debt, because they are more apt to encompass low risk of bankruptcy and a high burden of tax (Ooi, 1999). We anticipate negative association between leverage and profitability; empirical facts have revealed that profitability and debt ratios are negatively correlated (Saarani and Shahadan, 2013). Profitability (PROF) is calculated as earnings before interest and tax over Total Assets (EBIT/TA) as earlier calculated by Booth et al. (2001) and Tongkong (2012).

**Growth:** The market-to-book ratio of equity plays a dual role in empirical studies. It is used as a measure of market mis-valueation (over or under-pricing) and is utilized as a proxy for future growth opportunities in the trade-off framework. Firms with higher growth opportunities, which typically have higher valuations, may prefer to lower their leverage to maintain their financial flexibility (Myers, 1977). Myers (1977) pointed out that high-growth companies will give up investment programs with a positive net present value to increase corporate value and shareholder wealth. Therefore, the company's growth opportunities have a significantly positive impact on corporate value (Tongkong, 2012). According to trade-off theory, if companies with greater growth opportunities have more retained earnings, then, they issue more debt to maintain the target debt ratio and thus, they will tend to have a higher capital structure.

In accordance with Harris and Raviv (1991), we also use the Market to Book ratio (MB) as a measure of firm’s growth opportunities. We assume that this variable is negatively correlated with capital structure decisions (Flannery and Rangan, 2006).

**Non-debt tax shield:** Non-debt tax shield like investment credits of tax and depreciation tax deduction are alternatives for the tax benefit of debt financing (DeAngelo and Masulis, 1980). Consequently, when other tax deduction increases, the leverage tax advantage increases. As such, between financial leverage and Non-Debt Tax Shield (NDTS) a negative association takes place under the theory of Pecking Order. However, Moore (1986) and Scott (1977) have made an argument that considerable NDS can be able to work as attractive collateral and as a result high debt levels can be induced by NDS. As a result, a positive association is anticipated in this case.


We anticipate negative association between leverage and Non-Debt Tax Shield (NDTS) (Hernádi and Ormos, 2012). Next to Akhtar and Oliver (2009), we delineate non-debt tax shield as total annual depreciation expense divided by book value of total assets.

**Business risk:** As stated by Bauer (2004), volatility or business risk may be considered as the proxy for firm’s risk. Leverage ratio can be less if a firm has less risky position. Therefore, generally, there is a presumption of inverse relation between capital structure and volatility. On the basis of the results presented by Hsia (1981) and Huang and Song (2002) state, “As the variance of the value of the firm’s assets increases the systematic risk of equity decreases. So the business risk is expected to be positively related to leverage”. Kim and Sorensen (1986) and Huang and Song (2002) also confirm this relation. However, Bradley et al. (1984) and Titman and Wessels (1988) demonstrated the negative relation.

This study also expects the negative Relation between Business Risk (RISK) and capital structure (Dang et al., 2012). Standard deviation of return on assets over three years has been used as the proxy to measure business risk (Booth et al., 2001; Hernadi and Ormos, 2012).

**Liquidity:** Net effect of liquidity on capital structure is unidentified and it has both the positive and negative impacts (Mouamer, 2011). Firms having high liquidity ratio may have high debt level because of their need to meet debt obligations. This suggests a positive relation between liquidity and capital structure. On the other hand, having more liquid assets, shows that these assets would be utilized as the financing source in future. Hence, this suggests negative relation between capital structure and liquidity.

This study hypothesizes negative relation between the capital structure and liquidity (De Jong et al., 2008). To measure liquidity, this study employs the ratio of current assets over current liabilities (Mouamer, 2011).

**Human capital:** Although, the theoretical and empirical literature on the relation between human capital and capital structure is still rare, but there are quite a few recent studies available. The main finding of study presented by Akyol and Verwijmeren (2013) is that there is a positive relation between wages paid to the employees and leverage, which means firms with higher leverage must pay higher wages to their employees or it will be difficult for them to hire
employee in a competitive labor market (Berk et al., 2010). Furthermore, another recent study by Chemmanur et al. (2013) tests the theoretical propositions presented by Berk et al. (2010). Chemmanur et al. (2013) conclude that there is a significant and positive relationship between average employee pay and leverage. In addition, there is a significant and positive effect of leverage on average employee pay for those firms which are financially safe, but insignificant effect for those firms which are financially distressed. They also conclude that in nontechnology firms the impact of leverage on average employee pay is greater than in technology firms, because the employees working in nontechnology firms can be viewed as more defensible (Berk et al., 2010; Naslmosavi et al., 2013).

This study measures human capital by total salaries and wages of a firm (Ting and Lean, 2009):

\[ HC = \text{Total salaries and wages of a firm} \]

**RESEARCH METHODOLOGY**

**Dependent variable:** The term capital structure may be very comprehensive and can be defined and measured differently. However, from the chapters which have been explained earlier should clarify this that the measure of capital structure decisions here in this study will be total debt ratio.

Following Mateev et al. (2013), we measure Capital Structure Decisions (CSD) with total debt ratio, that is, total debt to total assets:

\[
\text{Total Debt Ratio} = \frac{\text{Short } - \text{term debt } + \text{Long } - \text{term debt}}{\text{Total Assets}}
\]

**Sample and variables:** Our sample of the panel data consists of 176 non-financial firms listed on Karachi Stock Exchange for the period of ten (10) years from 2003-2012. Data has been collected from DataStream of Thomson Reuters.

**Regressions model:** The penal data model includes multiple regression model applied in this study. In order to determine the factors that influence capital structure decisions, the model is being elaborated as follows:

\[
CSD = \beta_0 + \beta_1 \cdot (SIZE)_{it} + \beta_2 \cdot (TANG)_{it} + \beta_3 \cdot (PROF)_{it} + \beta_4 \cdot (GROW)_{it} + \beta_5 \cdot (NDTS)_{it} + \beta_6 \cdot (RISK)_{it} + \beta_7 \cdot (LIQ) + \beta_8 \cdot (HC) + \epsilon_{it}
\]

where,

\[
i = \text{The cross-section dimension} \\
t = \text{The time dimension} \\
\epsilon = \text{An error term} \\
LEV = \text{Leverage ratio of a firm} \\
SIZE = \text{Size of a firm} \\
TANG = \text{Tangibility} \\
PROF = \text{Profitability of a firm} \\
GROW = \text{Growth of a firm} \\
NDTS = \text{Non-debt tax shields of a firm} \\
RISK = \text{Business risk} \\
LIQ = \text{Liquidity of a firm} \\
HC = \text{Human capital of a firm}
\]

### Table 1: Descriptive statistics of capital structure determinants and human capital

<table>
<thead>
<tr>
<th>Variable</th>
<th>Min</th>
<th>Max</th>
<th>Mean</th>
<th>S.D</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSD</td>
<td>0.00</td>
<td>1.570</td>
<td>0.53910</td>
<td>0.24326</td>
</tr>
<tr>
<td>SIZE</td>
<td>6.15</td>
<td>20.12</td>
<td>14.8333</td>
<td>1.93090</td>
</tr>
<tr>
<td>TANG</td>
<td>0.00</td>
<td>1.090</td>
<td>0.49600</td>
<td>0.25988</td>
</tr>
<tr>
<td>PROF</td>
<td>-0.77</td>
<td>0.930</td>
<td>0.10850</td>
<td>0.15460</td>
</tr>
<tr>
<td>GROW</td>
<td>-1.50</td>
<td>1.230</td>
<td>0.11410</td>
<td>0.40361</td>
</tr>
<tr>
<td>NDTs</td>
<td>0.00</td>
<td>0.130</td>
<td>0.03870</td>
<td>0.02057</td>
</tr>
<tr>
<td>RISK</td>
<td>0.00</td>
<td>0.190</td>
<td>0.04380</td>
<td>0.02862</td>
</tr>
<tr>
<td>LIQ</td>
<td>-0.91</td>
<td>2.620</td>
<td>1.02560</td>
<td>0.49774</td>
</tr>
<tr>
<td>HC</td>
<td>0.00</td>
<td>0.210</td>
<td>0.05080</td>
<td>0.03960</td>
</tr>
</tbody>
</table>

**Table 2: Regression analysis of capital structure determinants and human capital**

<table>
<thead>
<tr>
<th>Independent variable</th>
<th>( \beta )-value</th>
<th>t-value</th>
<th>Adjusted ( R^2 )</th>
<th>F-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIZE</td>
<td>0.003</td>
<td>0.985</td>
<td>0.145</td>
<td>37.07**</td>
</tr>
<tr>
<td>TANG</td>
<td>-0.091**</td>
<td>-4.061</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>PROF</td>
<td>-0.136**</td>
<td>-3.615</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>GROW</td>
<td>-0.011</td>
<td>-0.8470</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>NDTs</td>
<td>-0.758**</td>
<td>-2.8370</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>RISK</td>
<td>-0.221</td>
<td>-1.1650</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>LIQ</td>
<td>-0.171**</td>
<td>-14.233</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>HC</td>
<td>-0.368**</td>
<td>-2.6110</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

**Table 3: Correlation**

<table>
<thead>
<tr>
<th>Variable</th>
<th>CSD</th>
<th>SIZE</th>
<th>TANG</th>
<th>PROF</th>
<th>GROW</th>
<th>NDTs</th>
<th>RISK</th>
<th>LIQ</th>
<th>HC</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSD</td>
<td>1</td>
<td>-0.053*</td>
<td>-0.203**</td>
<td>1</td>
<td>-0.182**</td>
<td>0.225**</td>
<td>-0.107**</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>SIZE</td>
<td>-0.053*</td>
<td>1</td>
<td>-0.203**</td>
<td>1</td>
<td>-0.182**</td>
<td>0.225**</td>
<td>-0.107**</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>TANG</td>
<td>-0.028</td>
<td>-0.203**</td>
<td>1</td>
<td>-0.182**</td>
<td>0.225**</td>
<td>-0.107**</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PROF</td>
<td>-0.182**</td>
<td>0.225**</td>
<td>-0.107**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GROW</td>
<td>-0.020</td>
<td>0.092**</td>
<td>-0.018</td>
<td>0.154**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NDTs</td>
<td>-0.090**</td>
<td>-0.043</td>
<td>0.105**</td>
<td>0.109**</td>
<td>-0.009</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RISK</td>
<td>-0.032</td>
<td>-0.017</td>
<td>-0.042</td>
<td>0.062**</td>
<td>-0.021</td>
<td>0.044</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LIQ</td>
<td>-0.341**</td>
<td>0.227**</td>
<td>-0.338**</td>
<td>0.261**</td>
<td>-0.027</td>
<td>-0.008</td>
<td>-0.012</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>HC</td>
<td>-0.117**</td>
<td>-0.023</td>
<td>-0.140**</td>
<td>0.146**</td>
<td>0.030</td>
<td>0.120**</td>
<td>0.105**</td>
<td>0.132**</td>
<td>1</td>
</tr>
</tbody>
</table>

*: Correlation is significant at the 0.05 level (2-tailed); **: Correlation is significant at the 0.01 level (2-tailed)
Descriptive statistics: The Table 1 to 3 demonstrates the estimation results. Summary of statistics for dependent and explanatory variables have been presented below. During the period of this study, the statistics show that the 53.91 percent of assets have been financed by debt. While comparing this statistic, according to Rajan and Zingales (1995), Pakistani firms seem to be more leveraged than those of Thailand, Zimbabwe Brazil, Jordan, Mexico and Malaysia.

CONCLUSION AND DISCUSSION

This study tried to examine the determinants of capital structure of Pakistani non-financial firms and the factors that influence capital structure decisions. This enlightens the knowledge on explanatory variables and assists to understand the problems related to capital structure. We conducted the empirical tests that help us to clarify the puzzling results of determinants. Capital structure decisions are influenced by many variables, i.e. firm size, profitability, non-debt tax shield and liquidity. All those significant variables were negatively related to CSD. It can be said that highly profitable and large firms having more liquid assets in Pakistan reduce their debt ratio.

Furthermore, this research employed a unique variable which has not been tested yet on capital structure, i.e., human capital. The impact of human capital on capital structure remained negative, which means that the firms which invest more on employees tend to lessen their debts and rely on their internal financing first.

Further research can be made by employing short – and long-term debt ratios along with total debt ratio to examine the different behaviours of firms with respect to debt levels. In addition, more firm-level variables (e.g., dividend, firm age and uniqueness) and country-level determinants (stock market development, gross domestic production, interest rate and inflation) may also be employed to have a better insight on capital structure.

REFERENCES


