

# Determinants of Capital Structure in Non-Financial Companies of Pakistan

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## Abstract

This paper analyzes the various factors which determine capital structure in non-financial companies listed on Karachi Stock Exchange. Panel data of 113 companies spanning over a period of 10 years is used as our sample. Data is obtained from balance sheet analysis of non-financial listed companies, published by State Bank of Pakistan. Panel data estimation models are employed for data analysis. Our results reveal the factors contributing to determination of capital structure in Pakistan. Profitability and liquidity are negatively related to debt ratio, while free cash flows, interest rates and earnings volatility are positively related to debt ratio. Firm size, growth opportunities, non-debt tax shields and asset tangibility appear to have no significant impact on debt ratio.

**Keywords:** capital structure, debt ratio, profitability, liquidity, free cash flows, tangibility, firm size, earnings volatility, interest rate, non-debt tax shields, growth opportunities, Pakistan

## 1. Introduction

Decisions regarding the determination of optimal capital structure are very important for management. Capital structure can be defined as “the mix of securities and financing sources used to finance real investment by corporations” (Myers, 2003, p.2). Firms can be financed through debt or equity, each with its own unique characteristics. Debt has advantage in form of tax deductible nature of interest payments. However, this advantage is coupled with increased financial distress which may lead the firm into bankruptcy. Similarly, equity financing has its own pros and cons. Equity does not put financial burden on business but its issuance may convey a signal to investors that the stocks of company are overpriced.

Determining the firm value-maximizing capital structure is not easy because the extant theories of capital structure focus on differing aspects of debt and equity financing. Modigliani & Miller (1958) capital structure irrelevance proposition considers capital structure under perfect market conditions; trade-off theory focuses on tax advantage and financial distress; pecking-order is based upon the signaling effects of debt and equity issues and agency theory is about the role of debt financing in controlling the agency problems associated with free cash flows (Modigliani and Miller, 1958, 1963; Myers, 1977; Jensen & Meckling, 1976; Myers & Majluf, 1984). Hence no unified model for determination of optimal capital structure has been presented. Furthermore, the existing empirical studies show differing results about the determinants of capital structure in different contexts.

Finance literature is replete with research on determinants of capital structure. Many of these studies are empirical in nature showing the impact of different variables upon the level of debt used in capital structure. The results of these studies are divergent even with regard to same variables, the divergence being explained by different theories of financing. Myers (2003) had suggested that due to the severity of agency problems in developing economies, its impact on capital structure decisions should be studied in these economies. In Pakistan, there are few studies on capital structure determinants, the most recent being Sheikh & Wang (2011). These studies have emphasized on variables most commonly studied in other contexts e.g. profitability, firm size, growth opportunities, liquidity, tangibility of assets etc. However, there is no research which has also focused on the agency problem and its impact on financing choices made by Pakistani firms. This study is important

because it provides evidence how agency problems effect capital structure decisions in Pakistani firms. Furthermore, this study uses panel data over an extended period of 10 years as compared to previous studies in Pakistan which have covered 6 years at most.

This paper shows the impact of free cash flow (used a measure of agency problems), interest rates, profitability, firm size, growth opportunities, liquidity, asset tangibility, earnings volatility & non-debt tax shields on capital structure. It is a groundbreaking work in examining the effects of agency problems on financing decisions in Pakistani context. It provided insights about the impact of agency issues on capital structure. Moreover, it provides further empirical evidence about the factors which determine capital structure in Pakistan.

## 2. Literature Review

### 2.1 Capital Structure Theories

Firms' assets are financed either by equity or debt. It is this mix of debt and equity on the balance sheet which is called capital structure (Ross, et al, 2008). There has been an endless debate on the composition and optimality of capital structure in finance literature. Various explanations of the relative composition of debt and equity in balance sheet have been presented in capital structure theories (Myers, 2003).

Modigliani and Miller (1958) irrelevance proposition was the first in modern thought on capital structure. MM model (1958) proposed that debt and equity financing does not affect the value of the firm. But this happens only when the financing decision takes place under perfect market conditions. However, real market situation is not that ideal. When perfect market conditions are relaxed, the choice of debt and equity start making a difference. This is the point which Modigliani and Miller (1958) themselves concluded. In their second proposition, Modigliani and Miller (1963) considered the tax deductible nature of interest payments and the tax advantages.

The second theory of capital structure is the trade-off theory (Scott, 1977). It explains the financing behavior of firms in tax and bankruptcy risk conditions. The use of debt in capital structure has advantages (in form of tax deduction) and disadvantages (in form of financial distress or even bankruptcy) (Myers, 1977). The point where the advantages and disadvantages of debt balance out, is the firm value maximizing optimal capital structure which all firms move to achieve.

Another theory explaining capital structure of firms is Pecking order theory (Myers & Majluf, 1984). This theory explains capital structure decisions in terms of information asymmetry which means that managers are more informed about the financial condition of the firm than outside investors. In case a firm issues shares in capital market, the investors may construe the already outstanding shares of the firm as overvalued and may place less value on newly issued shares. This gives a negative signal and increases the cost of new equity issue. To avoid this situation, firms prefer internal financing to debt and use equity as the last resort.

Jensen and Meckling (1976) presented the agency theory which says that managers do not always act in the best interest of shareholders. Managers may use free cash flow for their own perquisites rather than investing it in positive NPV projects. Thus a clash of interests between principal (shareholders) and agents (managers) arises. This agency problem can be mitigated by the use of more debt in capital structure as the payment of interest will leave less free cash flow at managers' discretion (Jensen, 1986).

Despite the various theories presented in past, the financing behavior of firms is still puzzling. "There is no universal theory of capital structure and no reason to expect one" and that "all capital structure models are conditional" (Myers, 2003). This is partly responsible for a widespread use of cross-sectional tests and variables in recent empirical studies that can be justified using either trade-off or pecking order theory. (Huang & Song, 2006).

### 2.2 Independent Variables

There are various factors which affect the leverage level of firms. These factors vary in their influence on leverage. The most significant part of leverage variance is explained by intrinsic firm characteristics (42%), followed by time-level (36%), industry-level characteristics (12%) and country-level (3%). The remaining 7% variance in leverage is due to the combined effects of industry and country characteristics (Kayo & Kimura, 2011). Since firm-level determinants play the most dominant role in determination of capital structure, they are discussed in detail in various empirical studies.

#### 2.2.1 Profitability

Profitability is predicted by trade-off theory to be positively related to leverage because high profitability acts as a feed-forward for more use of debt and thus taking benefit of higher tax advantage. Pecking order theory predicts profitability has a negative impact on debt ratio because higher profits lead to greater availability of internal financing. This relationship is corroborated by several studies: (Rajan & Zingales, 1995; Huang & Song, 2006; Sheikh & Wang, 2011; Tang & Jang, 2007; Viviani, 2008; Chen, 2004; Deesomsak, et al. 2004; Serrasqueiro & Rogao, 2009). On the basis of predominant empirical research, we hypothesize:

H 1: Profitability negatively influences debt ratio.

### 2.2.2 Firm Size

Studies which show the impact of firm size on debt ratio also have contradictory results. Some studies have empirically shown that firm size and debt level have a positive relationship (Rajan & Zingales, 1995; Huang & Song, 2006; Sheikh & Wang, 2011; Deesomsak, et al. 2004; Serrasqueiro & Rogao, 2009). This finding fits well with trade off theory which says that there are much less chances of bankruptcy in larger firms as they are well diversified. However, according to pecking-order theory larger firms have less debt because information asymmetry problem is not severe in large firms resulting in greater tendency towards equity financing. This is empirically supported by Chen (2004) and Ooi (1999). Since large firms can easily raise funds from debt markets and have lower chances of bankruptcy, it is hypothesized:

H 2: Firm size positively influences debt ratio.

### 2.2.3 Tangibility

Myers and Majluf (1984) suggest a positive relationship between debt and tangibility of firms' assets because it reduces the costs associated with information asymmetry by giving collateral security to debt issue. This is shown by several empirical studies: (Huang & Song, 2006; Chen (2004); Deesomsak, et al. 2004; Serrasqueiro & Rogao, 2009). In contrary, studies such as Sheikh & Wang, 2011 show an inverse relationship of firm size with debt. Viviani (2008) has found no significant relationship between debt level and firm size. Since more fixed assets are hoped to increase the debt capacity of firms, we hypothesize:

H 3: Tangibility positively influences debt ratio.

### 2.2.4 Growth Opportunities

Firms with future growth opportunities tend to borrow less because growth opportunity can be considered as an intangible asset which cannot be collateralized. This is supported by Myers' (1977) prediction that growth opportunities create a conflict of interest between debt and equity holders. Empirical evidence is there to support this relationship: (Huang & Song, 2006; Ooi, 1999; Deesomsak, et al. 2004). Study conducted by Chen (2004) show a positive relationship between debt and growth opportunities. He considers the Chinese peculiar institutional structure responsible for this deviation. Sheikh & Wang (2011) found no significant impact of growth opportunities on leverage level in manufacturing industry of Pakistan. We hypothesize:

H 4: Growth opportunities negatively influence debt ratio.

### 2.2.5 Non-debt Tax Shields

Non-debt tax shield is shown by many empirical studies to have a negative impact on debt ratio (Huang & Song, 2006; Deesomsak, et al. 2004). However, Sheikh & Wang (2011) show it insignificant in Pakistani manufacturing industry context. Debt has advantage in the form of tax-savings but it also brings peril in the form of financial distress. Therefore, firms prefer methods other than debt for gaining tax benefits. Depreciation and other non-debt tax saving shields can take be used for this purpose. Therefore, we hypothesize:

H 5: Non-debt tax shields negatively influence debt ratio.

### 2.2.6 Earnings Volatility

Greater volatility of a firm's earnings imply that there will be a greater chances of a firm becoming unable to cover its fixed interest payments. This brings the firm on a more vulnerable position and reduces its debt capacity. Many empirical studies corroborate this negative relationship between earnings volatility and debt level (Sheikh & Wang, 2011; Delcours, 2007). While there are other studies which show no significant effect of volatility on firm's debt (Viviani, 2008; Deesomsak et al. 2004). Some studies have even suggested a negative impact of volatility on long-term debt level in software firms (Tang & Jang, 2007). So there is no consensus on the direction of relationship between earnings volatility and leverage. Since most of the empirical evidence point towards a negative relationship, we hypothesize:

H 6: Earnings volatility negatively influences debt ratio.

### 2.2.7 Free Cash Flow

The free cash flow encourages managers to expand the size of the business so that more resources come under their control. Debt acts as a regulating factor to control this agency problem (Jensen, 1986). Free cash flow has been used as a proxy of agency problem. Contradictory evidence can be found in literature about the effect of free cash flow on leverage. According to the trade-off theory, more free cash flow results in higher debt levels since it is easy for such firms to raise debt (Stulz, 1990). Tang & Jang (2007) and Karadeniz et al. (2009) found no significant effect of free cash flow on leverage. While Miguel & Pindado (2001) show an inverse relationship between free cash flow and debt leverage. This is in corroboration of pecking order theory which says that high free cash flow makes available internal financing which is always preferable for the business thus restraining the firm from taking debt. Debt is used as a regulating mechanism by the owners to restrict the management's discretion of using free cash flows in their own favor. Taking free cash flow as a proxy of agency problem, we hypothesize:

H 7: Free cash flows positively influences debt ratio.

### 2.2.8 Interest Rate

Interest rate has a direct bearing on the cost of debt financing. Higher the interest rate, higher will the interest

payments made by the indebted firm. Empirical evidence shows that firms decrease their debt level with increasing interest rates (Ooi, 1999). Moreover, the expectations of increasing interest rates make firms to switch from long term to short term debt (Bokpin, 2009). Hence we hypothesize:

H8: Interest rate negatively influences debt ratio.

### 3. Methodology

The population considered in this study is all the non-financial companies listed on Karachi Stock Exchange. Among the total population, 130 companies were randomly selected for analysis. 17 companies were dropped from the sample because complete data of certain variables was not available. The final sample consisted of 113 companies from various industries. The relevant data was obtained from Balance Sheet Analysis of Joint Stock Companies published by State Bank of Pakistan and from financial statements of the companies for a period of 10 years (2002-2011). State Bank Analysis provides pertinent figures of key accounts taken from financial statements of listed companies. Some of the figures were not directly available in SBP analysis so they were calculated from the data available in SBP analysis and financial statements of companies.

The dependent variable used in this study is debt ratio. The independent variables are: profitability, growth opportunities, liquidity, asset tangibility, firm size, non-debt tax shields, free cash flows, earnings volatility and interest rates. Their definitions are given in Table 1. Keeping in view the purpose of this paper, it is advisable to adopt the variables from existing literature since it will make the results of this study comparable with similar studies in other contexts. The book values are used for calculation of all variables as the data is based upon the financial statements.

**Table I** Measurement of Variables

Variables	Measurement
<i>Dependent Variables</i>	
Debt Ratio (DR)	Debt ratio is defined here as the total debt divided by total assets. Long term debt has been used to measure leverage, according to theories of capital structure. However, in Pakistan, the bond markets are not well developed and most of the firms are of medium sizes which have limited access to debt capital markets. Short-term debt constitutes the major portion (in our sample, on average 73.4%) of the total debt of Pakistani firms; therefore, this overwhelmingly high proportion of short-term debt cannot be ignored while studying the capital structure. That's why this study uses total debt instead of only long-term debt in measuring leverage.
<i>Independent Variables</i>	
Profitability (PROF)	Profitability is measured by net profit before taxes divided by total assets. Net profit before taxes has also been used in some studies including Sheikh & Wang (2011).
Size (SIZE)	Firm size is measured here by natural logarithm of total assets. "Total assets" has been used by many studies as a proxy of firm size e.g. Tang & Jang (2007) and Ooi (1999). In order to reduce the effect of large variation in values, we have used the natural log of total assets.
Growth Opportunities (GROW)	Growth opportunities are measure by sales growth divided by total assets growth (Sheikh & Wang, 2011)
Tangibility (TANG)	Ratio of net fixed assets to total assets (Sheikh & Wang, 2011)
Earnings Volatility (EVOL)	Standard deviation of EBIT during 3 years prior to time <i>t</i> . (Tang & Jang, 2007)
Non-debt tax shields (NDTS)	Ratio of depreciation expense to total assets. Depreciation is used since it is the major element in non-debt tax shields. (Sheikh & Wang, 2011)
Liquidity (LIQ)	Current ratio is used as a measure of liquidity (Jong et al., 2008; Sheikh & Wang, 2011)
Free Cash Flow (FCF)	Ratio of free cash flow to total assets (Tang & Jang, 2007)
Interest Rate (INT)	Risk free interest rate of 3-month T-bills

This studies uses panel data analysis techniques i.e. pooled OLS, fixed effects model and random effects model. Pooled OLS is used when the existence of group effects or individual effects in data are not considered. Since

this paper uses panel data which comprise of multiple cross sections and observations over several time periods, therefore, it is expected that cross section effects may be meddling in data. This problem can be overcome by using two popular econometric techniques namely, fixed effects model and random effects model.

In fixed effects model, different constants for each cross section are used while the betas of individual cross sections remain constant. While in random effects model, the cross sectional constants are random rather than fixed. In order to decide which model is best explaining our estimation, Hausman test (1978) was used. The results of Hausman show that fixed effects model has more explanatory power for our study. The models discussed above – pooled OLS, fixed effects and random effects – are specified as follows:

$$DR_{it} = \beta_0 + \beta_1 PROF_{it} + \beta_2 LIQ_{it} + \beta_3 FCF_{it} + \beta_4 INT_{it} + \beta_5 SIZ_{it} + \beta_6 TANG_{it} + \beta_7 EVOL_{it} + \beta_8 GROW_{it} + \beta_9 NDTS_{it} + \epsilon_{it}$$

$$DR_{it} = \beta_{0i} + \beta_1 PROF_{it} + \beta_2 LIQ_{it} + \beta_3 FCF_{it} + \beta_4 INT_{it} + \beta_5 SIZ_{it} + \beta_6 TANG_{it} + \beta_7 EVOL_{it} + \beta_8 GROW_{it} + \beta_9 NDTS_{it} + \mu_{it}$$

$$DR_{it} = \beta_0 + \beta_1 PROF_{it} + \beta_2 LIQ_{it} + \beta_3 FCF_{it} + \beta_4 INT_{it} + \beta_5 SIZ_{it} + \beta_6 TANG_{it} + \beta_7 EVOL_{it} + \beta_8 GROW_{it} + \beta_9 NDTS_{it} + \epsilon_{it} + \mu_{it}$$

where:

- $DR_{it}$  = debt ratio
- $PROF_{it}$  = profitability
- $LIQ_{it}$  = liquidity
- $FCF_{it}$  = free cash flows
- $INT_{it}$  = risk free interest rate
- $SIZ_{it}$  = firm size
- $TANG_{it}$  = assets tangibility
- $EVOL_{it}$  = earnings volatility
- $GROW_{it}$  = growth opportunities
- $NDTS_{it}$  = non-debt tax shields
- $\beta_0$  = y-intercept
- $\beta_1 - \beta_7$  = coefficients of independent variables
- $\beta_{0i}$  = firm's y-intercept
- $\epsilon_{it}$  = stochastic error term
- $\mu_{it}$  = error term
- $\epsilon_i$  = cross-sectional error components
- $i$  = firm  $i$
- $t$  = time  $t$

#### 4. Empirical Results

This section presents the results of different estimation models used in this study. The summary descriptive statistics of independent and dependent variables are presented in table II. The table shows that total debt constitutes 69 percent of the total assets financing.

**Table II** Summary Statistics

	Observations	Max	Min	Mean	SD
$DR_{it}$	1130	4.15	0.00	0.69	0.47
$NDTS_{it}$	1130	0.45	0.00	0.04	0.03
$TAN_{it}$	1130	0.97	0.00	0.48	0.23
$LIQ_{it}$	1130	875.04	0.03	2.44	28.55
$SIZ_{it}$	1130	12.20	3.48	7.92	1.55
$PROF_{it}$	1130	1.26	-0.54	0.07	0.15
$GROW_{it}$	1130	1026.41	-159.96	3.37	40.68
$EVOL_{it}$	1130	17016.39	0.00	416.57	1320.55
$FCF_{it}$	1130	2.65	-1.71	0.02	0.22
$INT_{it}$	1130	1.04	0.16	0.68	0.30

Table III shows the Pearson correlation matrix of variables. In order to check whether multicollinearity exists among independent variables or not, the correlation terms are checked. As can be seen from the table, the cross-correlation terms are very small for all independent variables and hence multicollinearity cannot be suspected. The VIFs shown in the last column of the table also confirm that no multicollinearity exists among the independent variables.



**Table III** Pearson correlation matrix

	$DR_{it}$	$NDTS_{it}$	$TAN_{it}$	$LIQ_{it}$	$SIZ_{it}$	$PROF_{it}$	$GROW_{it}$	$EVOL_{it}$	$FCF_{it}$	$INT_{it}$	$VIF$
$DR_{it}$	1										
$NDTS_{it}$	0.126	1									1.17
$TAN_{it}$	0.154	0.308	1								1.30
$LIQ_{it}$	-0.074	0.027	-0.008	1							1.02
$SIZ_{it}$	-0.607	-0.153	-0.526	0.356	1						1.36
$PROF_{it}$	-0.330	-0.065	-0.366	0.085	0.499	1					1.22
$GROW_{it}$	0.028	-0.002	0.045	-0.005	-0.052	-0.047	1				1.00
$EVOL_{it}$	0.028	0.060	0.003	-0.004	0.012	0.072	0.012	1			1.35
$FCF_{it}$	0.159	0.147	-0.107	-0.050	-0.062	0.170	-0.010	0.149	1		1.11
$INT_{it}$	0.096	-0.080	0.002	0.046	-0.012	-0.070	0.013	0.097	0.038	1	1.05

Having hypothesized that there are no cross-sectional differences among the data matrices, we first used pooled OLS regression model. The results of this model are presented in table IV. The  $R^2$  value is 0.1881 and F-statistic is significant.

**Table IV** The effect of independent variables on debt ratio( $DR_{it}$ ) using pooled OLS estimation model

Variable	$\beta$	Standard Error	$t$	Prob.
C	0.964451	0.083031	11.61562	0.0000
$EVOL_{it}$	3.21E-05	1.12E-05	2.867683	0.0042
$FCF_{it}$	0.398057	0.060366	6.594060	0.0000
$GROW_{it}$	7.71E-05	0.000313	0.245972	0.8057
$INT_{it}$	0.138109	0.042732	3.231949	0.0013
$LIQ_{it}$	-0.000822	0.000451	-1.824328	0.0684
$NDTS_{it}$	1.093241	0.516478	2.116725	0.0345
$PROF_{it}$	-1.042613	0.095602	-10.90576	0.0000
$SIZ_{it}$	-0.049998	0.009558	-5.231241	0.0000
$TAN_{it}$	0.076802	0.062775	1.223443	0.2214

**Notes:**  $R^2=0.1881$ ;  $adj R^2=0.1816$ ; SE of regression=0.4272; F-statistic=28.84; Prob(F-statistic)=0.0000

However, because our data is panel data, the existence of cross sectional effects on firms or groups of firms cannot be ignored. Therefore, panel data techniques called fixed and random effects models are used. Table V and VI present the results of these models. In table VII, the Hausman specification test results are reported. Since  $prob.(chi^2) = 0.0001$ , therefore the alternative hypothesis of Hausman test is accepted and we use fixed effects model because it will give better estimation.

**Table V** The effect of independent variables on debt ratio( $DR_{it}$ ) using fixed effects estimation model

Variable	$\beta$	Standard Error	$t$	Prob.
C	0.866655	0.129532	6.690644	0.0000
$EVOL_{it}$	4.21E-05	8.13E-06	5.179257	0.0000
$FCF_{it}$	0.291669	0.034715	8.401840	0.0000
$GROW_{it}$	6.35E-06	0.000181	0.035083	0.9720
$INT_{it}$	0.130660	0.026104	5.005384	0.0000
$LIQ_{it}$	-0.001051	0.000271	-3.884934	0.0001
$NDTS_{it}$	-0.532983	0.341767	-1.559491	0.1192
$PROF_{it}$	-0.373707	0.072847	-5.130000	0.0000
$SIZ_{it}$	-0.025728	0.016424	-1.566470	0.1176
$TAN_{it}$	-0.083013	0.079184	-1.048347	0.2947

**Notes:**  $R^2=0.7852$ ;  $Adj R^2=0.7594$ ; SE of regression= 0.2316; F-Statistic= 30.45; Prob(F-Statistic)= 0.0000

**Table VI** The effect of independent variables on debt ratio ( $DR_{it}$ ) using random effects estimation model

Variable	$\beta$	Standard Error	$t$	Prob.
C	0.940448	0.111517	8.433238	0.0000
$EVOL_{it}$	4.09E-05	7.96E-06	5.140513	0.0000
$FCF_{it}$	0.295842	0.034542	8.564820	0.0000
$GROW_{it}$	2.09E-05	0.000180	0.116107	0.9076
$INT_{it}$	0.139932	0.025068	5.582052	0.0000
$LIQ_{it}$	-0.001044	0.000269	-3.883847	0.0001
$NDTS_{it}$	-0.491763	0.336206	-1.462685	0.1438
$PROF_{it}$	-0.434048	0.071037	-6.110146	0.0000
$SIZ_{it}$	-0.039759	0.013338	-2.980942	0.0029
$TAN_{it}$	-0.012437	0.071566	-0.173780	0.8621

**Notes:**  $R^2=0.1613$ ;  $Adj R^2=0.1545$ ; SE of regression= 0.2343; F-Statistic= 23.92; Prob(F-Statistic)= 0.0000

**Table VII** Hausman Specification Test Results

Variable	Fixed	Random	Var(Diff.)	Prob.
C	0.000042	0.000041	0.000000	0.4772
EVOL <sub>it</sub>	0.291669	0.295842	0.000012	0.2284
FCF <sub>it</sub>	0.000006	0.000021	0.000000	0.3409
GROW <sub>it</sub>	0.130660	0.139932	0.000053	0.2028
INT <sub>it</sub>	-0.001051	-0.001044	0.000000	0.8207
LIQ <sub>it</sub>	-0.532983	-0.491763	0.003771	0.5020
NDTS <sub>it</sub>	-0.373707	-0.434048	0.000260	0.0002
PROF <sub>it</sub>	-0.025728	-0.039759	0.000092	0.1432
SIZ <sub>it</sub>	-0.083013	-0.012437	0.001148	0.0373

**Notes:** Chi<sup>2</sup> (9 df) = 33.93 Prob.> Chi<sup>2</sup> = 0.0001

As can be seen in table V & VI, earnings volatility (EVOL), free cash flows (FCF), interest rates (INT), liquidity (LIQ) and profitability (PROF) prove significant in results of both estimation models. While size (SIZ) is significant only in random effects model. Growth opportunities (GROW), tangibility (TAN) and non-debt tax shields (NDTS) are insignificant under both estimation models.

## 5. Discussion of Results

According to the empirical results of this study, debt ratio is significantly affected by profitability and liquidity. As expected, the signs of coefficients are negative, which means that firms with high profits and high liquidity use less debt in their financing. This finding is in line with pecking order theory (POT) which suggests that firms prefer using internally generated funds. Also it can be attributed to less developed capital markets in Pakistan and high information asymmetry.

Free cash flow has a positive relationship with debt ratio and is statistically significant. This relationship can be explained by agency theory of capital structure which suggests that firms with high free cash flows tend to be more leveraged. This is a tactic to limit the opportunistic behavior of managers who are inclined to use the free funds for their own well being, instead of employing them in the best interest of owners (Jensen, 1986). The high value of the coefficient (0.29) is indicative of the importance of agency issues in determining financing mix of the Pakistani firms.

Contrary to the expected negative relationship of interest rates with debt ratio, this study found a significant positive impact of interest rates on debt ratio. This can be because this study has considered total debt, instead of long-term debt, as a measure of leverage. As Bopkin (2009) has pointed out that interest rate is positively related to short-term debt. Since short-term debt constitute the major portion of debt composition (73.4 %) in Pakistani firms, therefore, this positive relationship can be justified.

The results also show that the effect of firm size (SIZ) on debt ratio is significant and negative under random effects model but it is insignificant in fixed effects model. These results can be explained in terms of pecking order theory, which considers information asymmetry as the foundation of capital structure decisions. Since information asymmetry is less severe in larger firms, they can issue sensitive securities like equity and, therefore, may issue less debt (Kester, 1986). The negative relationship can also be due to the fact that most of the firms in our sample are of small to medium size. The transaction costs borne by small firms to issue long term debt are relatively high which restricts them to financing through short term debts (Titman & Wessels, 1988). Since we have considered total debt (which is predominantly composed of short term debt in Pakistan) as a measure of leverage, the negative relationship of size and short term debt as indicated by Titman & Wessels (1988) is also an explanation of the results found in this study. Earlier, Shah & Khan (2007) have also found no significant effect of size on debt level. However, most of the industry specific studies in Pakistan have reported a positive relationship of size with debt ratio.

Earnings volatility (EVOL) is found to have a significant positive impact on debt ratio. In literature, a negative relationship has been established in many studies (Sheikh & Wang, 2011; Shah & Khan, 2007). The positive relationship found in this study can be attributed to a high short term debt to total debt ratio observed in Pakistani firms. This can be explained by economic theory as higher risk of bankruptcy makes it difficult for firms to obtain long-term debts. So they depend more on short term debts.

The variables growth (GROW), non-debt tax shields (NDTS) were found to be insignificant in both models. This result supports the findings of Sheikh & Wang (2011). Tangibility of assets is also insignificant according to the results of this study. Tangibility is generally considered to have positive relationship with debt ratio because tangible assets have comparatively less asset specificity and are collateralisable for long-term debt. This insignificant result may be because total debt has been considered in this study. In Pakistan total debt consists of a dominant portion of short term debt which does not need any collateral and hence the tangibility of a firm's asset does not matter much in Pakistani context.

## 6. Conclusion

Capital structure decisions are one of the most important areas of managerial decision making. Due to the heavy costs of bankruptcy and financial distress, it is important to make capital structure decisions on firm foundations of reason. As discussed in the introduction of this paper, there exists no single model which can explain all capital structure decisions in all contexts. Due to the context sensitive nature of capital structure decisions, it is important to study empirically which model best explains debt decisions in a particular context. This study is an attempt to examine the determinants of capital structure in KSE-listed non-financial companies of Pakistan and exploring some new variables that have been studied in other contexts but not in Pakistan. The study uses panel data of 113 companies over a period of 10 years (2002-2011).

The results of empirical analysis are as follows: Profitability and liquidity have a negative relationship with debt ratio. This is in alignment with pecking order theory. Free cash flows have a significant and positive impact on debt ratio, in accordance with agency theory. Interest rates are also positively related to debt ratio. The relationship of firm size with debt is negative but is significant only in random effects model. Earnings volatility was found to be positively related with debt level maintained by firms. This can be the result of considering total debt as a measure of leverage. The study could not find any significant relationship of NDTs, growth opportunities and asset tangibility with debt ratio.

## 7. Limitations and Future Directions

This study has the following limitations: This study has used total debt to measure leverage. Total debt includes both short term and long term debt. The strict concept of capital structure includes only long term debt. However, in Pakistan, the major portion (73.4% in our sample) of total debt is composed of short term debt. This is because most of the firms in Pakistan have medium sizes and thus have limited access to bond markets. Moreover, the debt markets in Pakistan are not well developed. In studying capital structure, this overwhelmingly high proportion of short term debt in total debt composition cannot be ignored. But including it also poses a problem as the behavior of some determinants like firm size, tangibility, volatility, may change. A comparative study of the relative impact of these determinants on the short term and long term debt levels, maintained by Pakistani companies, may unveil important results.

## References

- Bokpin, G. A. (2009). Macroeconomic development and capital structure decisions of firms: Evidence from emerging market economies. *Studies in Economics and Finance* , 26 (2), 129-142.
- Chen, J. J. (2004). Determinants of capital structure of Chinese-listed companies. *Journal of Business Research* , 57, 1341-1351.
- Deesomsak, R., Paudyal, K., & Pescetto, G. (2004). The determinants of capital structure: evidence from the Asia Pacific region. *Journal of Multinational Financial Management* , 14, 387-405.
- Delcours, N. (2007). The determinants of capital structure in transitional economies. *International Review of Economics and Finance* , 16, 400-415.
- Hausman, J. (1978). Specification tests in econometrics. *Econometrica* , 46, 1251-1271.
- Huang, G., & Song, F. M. (2006). The determinants of capital structure: evidence from China. *China Economic Review* , 17, 14-36.
- Jensen, M. C. (1986). Agency costs of free cash flow, corporate finance and takeovers. *American Economic Review* , 76 (2), 323-329.
- Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics* , 3 (4), 305-360.
- Jong, A. d., Kabir, R., & Nguyen, T. T. (2008). Capital structure around the world: The roles of firm- and country specific determinants. *Journal of Banking & Finance* , 32, 1954-1969.
- Karadeniz, E., Kandır, S. Y., Balcilar, M., & Onal, Y. B. (2009). Determinants of capital structure: evidence from Turkish lodging companies. *International Journal of Contemporary Hospitality Management* , 21 (5), 594-609.
- Kayo, E. K., & Kimura, H. (2011). Hierarchical determinants of capital structure. *Journal of Banking & Finance* , 35, 358-371.
- Kester, W. C. (1986). Capital and ownership structure: A comparison of United States and Japanese manufacturing corporations. *Financial Management* , 15 (1), 5-16.
- Miguel, A. d., & Pindado, J. (2001). Determinants of capital structure: new evidence from Spanish panel data. *Journal of Corporate Finance* , 7, 77-99.
- Modigliani, F., & Miller, M. H. (1963). Corporate income taxes and the cost of capital: A correction. *The American Economic Review* , 53 (3), 433-443.
- Modigliani, F., & Miller, M. H. (1958). The cost of capital, corporation finance and the theory of investment. *The American Economic Review* , 48 (3), 261-297.



- Myers, S. C. (1977). Determinants of corporate borrowing. *Journal of Financial Economics* , 5, 147-175.
- Myers, S. C. (2003). Financing of Corporations. *Handbook of the Economics of Finance* , 1, 215-253.
- Myers, S. C., & Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics* , 13, 187-221.
- Ooi, J. (1999). The determinants of capital structure: Evidence on UK property companies. *Journal of Property Investment & Finance* , 17 (5), 464-480.
- Rajan, R. G., & Zingales, L. (1995). What do we know about capital structure? Some evidence from international data. *The Journal of Finance* , 50 (5), 1421-1460.
- Ross, S. A., Westerfield, R. W., & Jaffe, J. (2008). *Corporate finance*. New York: McGraw Hill Irwin.
- Scott, J. H. (1977). Bankruptcy, secured debt, and optimal capital structure. *The Journal of Finance* , 32 (1), 1-19.
- Serrasqueiro, Z. S., & Rogao, M. R. (2009). Capital structure of listed Portuguese companies: determinants of debt adjustment. *Review of Accounting and Finance* , 8 (1), 54-75.
- Shah, A., & Khan, S. (2007). Determinants of Capital Structure: Evidence from Pakistani panel data. *International Review of Business Research Papers* , 3 (4), 265-282.
- Sheikh, N. A., & Wang, Z. (2011). Determinants of capital structure: An empirical study of firms in manufacturing industry of Pakistan. *Managerial Finance* , 37 (2), 117-133.
- Stulz, R. M. (1990). Managerial discretion and optimal financing policies. *Journal of Financial Economics* , 26, 3-27.
- Tang, C.-H., & Jang, S. (2007). Revisit to the determinants of capital structure: A comparison between lodging firms and software firms. *Hospitality Management* , 26, 175-187.
- Titman, S., & Wessels, R. (1988). The determinants of capital structure choice. *The Journal of Finance* , 43 (1), 1-19.
- Viviani, J.-L. (2008). Capital structure determinants: an empirical study of French companies in the wine industry. *International Journal of Wine Business Research* , 20 (2), 171-194.