Firm, industry, and country level determinants of capital structure: evidence from Pakistan

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Abstract

Purpose – The purpose of this paper is to find out firm, industry, and country level determinants of capital structure of Pakistani listed non-financial firms.

Design/methodology/approach – The authors use a fixed effects panel data model over a 39 years (1972-2010) unbalanced panel data of Pakistani non-financial listed firms to determine the factors that influence capital structure of these firms.

Findings – The authors find that Pakistani firms prefer retained earnings to finance their business projects, and debt is easily available for experienced firms. Moreover, socio-economic collusive networks, poor corporate governance mechanism along with weak legal system provide these firms an opportunity to pass on their risk to the creditors (banks).

Research limitations/implications – The data set does not contain factors characterizing inter-industry heterogeneity, therefore, the authors use mean industry leverage and mean industry profitability to explore if any relationship exists between leverage of firms, and their respective industry leverage/profitability.

Practical implications – Pakistani non-financial firms are highly leveraged increasing their probability to face financial distress in erratic economic conditions. As such, the policy makers need to develop capital markets of Pakistan to enable a resilient corporate capital structure. Further, erratic economic conditions of Pakistan create uncertain business environment yielding short-term opportunities and to finance them Pakistani firms use short-term debt as a main financing source. The policy makers need to improve corporate governance mechanism and strengthen legal system that will go a long way to develop Pakistani capital market on sound and sustainable footing.

Originality/value – This is the first study that uses an extended number of variables and discovers financial behavior of firms in a bank-based economy having limited financing options, and facing erratic economic conditions.

Keywords Pakistan, Trade-off theory, Capital structure, Panel data analysis, Pecking order theory

Paper type Research paper

1. Introduction

This study aims to explain determinants of capital structure across a large panel data of non-financial firms listed in Pakistan by focusing on firms' attributes and their operating environment. The study tries to improve understanding about the capital structure behavior of the firms in developing countries by taking Pakistan as a sample case. Traditional research focused on firms' attributes only while analyzing

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determinants of corporate capital structure such as Miller (1977), Qureshi (2009), Sheikh and Wang (2011), and Titman and Wessels (1988). Lately, researchers have started incorporating industry as well as country level attributes into the traditional firm-specific attributes while explaining corporate capital structure (Jong *et al.*, 2008). They argue that along with the firm-level attributes, industry attributes influence the firm behavior as they differ in their size, technology, and product type and competition level. Moreover, the country conditions influence the quality of institutions, the judicial system and governance effectiveness that probably affect the costs and benefits associated with corporate capital structure.

Developed economic, legal and financial systems provide easy and cheaper access to external finances for firms. However, the continued political instability in Pakistan has rendered its economic, legal and financial systems underdeveloped and volatile. In such a volatile environment, protection of creditors' rights is very important to ensure easier access to long-term debt. However, the judicial system of Pakistan is not strong enough to protect creditor rights. Consequently, the creditors (i.e. banks) shy-away from provision of long-term debt (Sheikh and Qureshi, 2014) and the firms mostly rely on short-term debt financing. Previous empirical studies, carried out in Pakistan in the field of corporate capital structure focused on one industry (Sheikh and Wang, 2010; Qureshi *et al.*, 2012) or firm level determinants of corporate capital structure (Qureshi, 2009; Sheikh and Wang, 2011; Sheikh and Qureshi, 2014). We argue that the marked dearth of empirical work on capital structure dynamics in Pakistan that too yielding conflicting results (Qureshi, 2009; Qureshi *et al.*, 2012; Sheikh and Wang, 2011) and ignoring interaction of firms' characteristics with the peculiar nature of their volatile environment motivates us to carry out this research. Our objective is to understand the capital structure behavior of Pakistani firms over time using three tiers of variables: firm, industry, and country. For this purpose, we develop an extended unbalanced panel data set (1972-2010) of 13,375 firm-year observations and use a fixed effects panel data model. Considering abruptly changing atypical government forms over time and a bank-based debt market, it is important to study corporate leverage behavior of intertwined socio-economic networks in a unique and erratic macroeconomic context.

Confirming earlier studies in Pakistan (Qureshi, 2009; Sheikh and Qureshi, 2014), we find that these firms prefer retained earnings to finance their projects and debt is easily available for experienced firms. Further, these firms follow a mix of two basic capital structure theories, i.e. trade-off theory (TOT) and pecking order theory (POT). Moreover, this study also contributes to the literature in general and specifically in Pakistani context. Our first contribution is regarding the industry level variables. This is the first study in Pakistan that uses industry mean leverage as well as industry mean profitability and finds that Pakistani firms try to follow the leverage behavior of their respective industry and sector's profitability also motivates these firms to avail their probable share. Our second contribution comes from assessing the role of macroeconomic variables (inflation, exchange rate, economic growth, capital formation) for corporate capital structure decisions in Pakistan. We observe that good economic conditions improve corporate profitability by creating business opportunities. However, high and uncertain inflation rate in Pakistan severely hurts corporate profitability. Third, we contribute by explaining financial behavior of the firms belonging to different categories (domestic vs foreign-owned firms). For example, domestic firms use profitability to pay-off long-term debt whereas the foreign firms do the opposite. Fourth, we contribute to the literature by explaining financial behavior during different regimes (political, political-cum-military, military). We observe that

growth is a significant determinant of long-term debt under military regime and use of tax shield helps firms to adjust the term structure of their debt during political regime. In addition, we also contribute by explaining financing behavior of the firms operating in a bank-based economy and under volatile macroeconomic conditions. We find that these firms generally try to follow the leverage behavior of their respective industries irrespective of ownership type, and government form. Due to erratic economic environment, the firms in Pakistan try to avail short-term investment opportunities and remain skeptic about sustainability of positive trend in current economic indicators and consequently adjust the term structure of debt in their capital structure by raising short-term debt and paying off long-term debt. Furthermore, these firms tend to pass on their risk to the creditors facilitated by institutional features, environment of corporate arena, and deep-rooted family-based politics in Pakistan that help develop and sustain the collusive networks of debtor and creditor (banks).

Apart from the introduction presented in Section 1, we organize rest of the paper in the following manner; Section 2 describes theoretical framework; Section 3 presents the data and introduces the methodology; Section 4 presents the empirical results; Section 5 discusses main findings; and finally Section 6 is about the conclusions drawn and policy implications. We provide the references at the end.

2. Theoretical framework

The grounding concept of the TOT is benefit-cost trade-off between interest tax shield of debt and bankruptcy costs. The TOT states that the optimal capital structure is the one where the benefits from interest tax shield balance the costs associated with it such as bankruptcy. Accordingly, there should be a direct relationship between leverage and interest tax shield (Modigliani and Miller, 1958, 1963). However, researchers argue that firms borrow until interest tax shield benefits balance its associated costs. Therefore, a *U*-shaped relationship between interest tax shield and leverage is expected (Miller, 1977). Empirical studies have used tax payments/gross profit or tax payments/earnings before taxes to measure tax shield. We use tax payments/gross profit for this purpose. Empirical studies find this relationship either relatively weak (Rajan and Zingales, 1995) or insignificant (Chen and Strange, 2005). In Pakistan, one study finds this relationship insignificant in chemical sector (Qureshi *et al.*, 2012), while another study finds as significant positive/negative with short-term/long-term debt (Sheikh and Qureshi, 2014). Further, studies (Gomariz and Ballesta, 2014; Dhaliwal *et al.*, 2006) use Altman's (1968) *Z*-score[1] to represent bankruptcy probability, also used in this study. On the other hand, non-debt (ND) tax shield that includes depreciation and investment tax credit generally substitutes interest tax shield. Accordingly, firms enjoying higher level of ND should use less debt financing (DeAngelo and Mesulis, 1980). For empirical investigation, the researchers use annual depreciation expenses/total assets to measure ND that we also adopt for this study. The empirical results for ND are inconclusive as they indicate positive relationship in transitional economies (Delcoure, 2007; Bayrakdaroğlu *et al.*, 2013), insignificant relationship for American (Titman and Wessels, 1988), and Pakistani firms (Qureshi, 2009; Sheikh and Wang, 2011; Qureshi *et al.*, 2012). However, a recent study finds substitution of long-term debt by depreciation in Pakistan (Sheikh and Qureshi, 2014).

Agency conflicts between management and equity-holders and between equity-holders and debt-holders may lead to non-productive use of firm resources. Conflict between management and equity-holders arises due to the use of firm resources by the management for their own benefits. The conflict becomes severe in organizations generating substantial amount of free cash flows that the firms could use to payout

dividends to equity-holders or retain to finance the future projects. Use of debt is one of the helping hands because debt repayments reduce available free cash flows with the management to engage in value decreasing activities (Jensen and Meckling, 1976). Researchers calculate this agency conflict by expense ratio (operating expense/sales) or asset utilization ratio (sales/total assets) (Pantzalis and Park, 2014). We choose operating expenses/sales to measure agency cost. An empirical study for Pakistan indicates a direct relationship between leverage and management-equity holders agency conflict (Qureshi et al., 2012). On the other hand, managerial ownership may mitigate agency conflicts by aligning their interest with equity-holders. The firms with higher managerial ownership are expected to have less agency problems and consequently lesser debt borrowing (Bathala et al., 1994). Some empirical studies find an inverse relationship (Bathala et al., 1994), while others observe a positive relationship between managerial ownership and leverage (Leland and Pyle, 1977). Further, institutional owners usually have stronger monitoring mechanism and significant experience in interpreting and judging the financial performance of firms (Ramalingegowda and Yu, 2012). Accordingly, firms with higher institutional ownership are expected to have less agency problems, and consequently lesser debt borrowing (Bathala et al., 1994; Jensen and Meckling, 1976). Empirical studies have used natural logarithm of number of shares held by institutional investors (Al-Najjar and Taylor, 2008) and institutional ownership percentage (Al-Najjar and Taylor, 2008; Tong and Ning, 2004) as proxies for ownership structure to find mixed relationship between capital structure and institutional ownership. Considering lack of data on detailed ownership structure over such a long study period and empirical evidence about impact of foreign ownership on information asymmetry (Choi et al., 2013), we use it to classify the firms having either domestic ownership or foreign ownership.

Second agency conflict, between equity-holders and debt-holders, arises because debt-holders expect that equity-holders having limited liability may invest in highly risky projects. The equity-holders make money from the success of these projects and debt-holders face the cost of failures. Since growing firms have more opportunities to invest in highly risky projects at the cost of debt-holders therefore direct relationship is expected between leverage and growth (Jensen and Meckling, 1976; Myers, 1977). Empirical study for Turkey using percentage change in total assets as a proxy of growth, which we also adopt, explains positive significant relationship between leverage and growth (Bayrakdaroğlu et al., 2013). For transitional economies (Delcoure, 2007), China (Chen and Strange, 2005), USA (Titman and Wessels, 1988), and Pakistan (Sheikh and Wang, 2011), the results are not significant.

Moreover, some use earnings volatility to measure business risk (Delcoure, 2007; Al-Najjar and Taylor, 2008). We also use earnings volatility calculated as percentage change in net profit before tax/total assets. Researchers explain firm's optimal debt level as a decreasing function of its earnings volatility (Titman and Wessels, 1988). While explaining they argue that the creditors consider higher volatility as higher risk and demand relatively higher interest rates. Consequently, these firms should have lesser debt. On the other hand, theory of asset substitution explains that firms having limited liability may invest in projects with very high risk. Success of these projects makes money for equity-holders and failures are faced by debt-holders (Jensen and Meckling, 1976). Accordingly, a positive relationship is expected between business risk and leverage. Empirical results for Pakistan (Qureshi et al., 2012), and transitional economies (Delcoure, 2007) explain negative while for China (Chen and Strange, 2005) explain positive relationship between leverage and business risk.

The grounding concept of the POT suggests internal funds as first preference, debt as second choice and issuing new equity as the last resort of firms to finance its investments. Profitable and highly liquid firms may have more supply of internal financing that creates a negative relation of leverage with liquidity (Myers and Majluf, 1984) and current/past profitability (Fama and French, 2002). Alternatively, TOT argues that profitable and liquid firms considered less risky may issue cheaper debt. Consequently, TOT postulates a direct relationship of leverage with profitability and liquidity. Mostly, empirical studies estimate profitability as return on assets (Bokpin, 2009; Bayrakdaroğlu et al., 2013; Ganguli, 2013), and return on equity (Al-Najjar and Taylor, 2008; Bokpin, 2009). Some of the studies use profit or income/sales ratio to measure profitability (Mazur, 2007; Sheikh and Qureshi, 2014). We use return on assets calculated as net profit before taxes/total assets as a proxy for profitability and retained earnings/total assets for past profitability. A number of proxies are used to represent corporate liquidity, for example current assets/current liabilities, working capital/total assets, net cash flow/total assets, etc. We use current assets/current liabilities to measure liquidity. Mostly, empirical evidence for profitability as well as liquidity supports POT (Delcoure, 2007; Mazur, 2007; Qureshi et al., 2012).

Firms can use large amount of tangible assets as collateral to raise debt at cheaper interest rates. Therefore, there should be a direct relationship between tangibility/collateral value and leverage of a firm. Empirical studies have used net fixed assets/total assets to measure tangibility and gross fixed assets/total assets to measure collateral value. We adopt the proxy for tangibility and use gross fixed assets at cost/total assets to measure collateral value. Direct relationship is empirically observed in studies carried out in developed countries (Titman and Wessels, 1988; Rajan and Zingales, 1995). However, in developing countries tangible assets provide poor collateral value due to poor governance and inefficient legal system. Therefore, an inverse relationship is expected in this context. Empirical evidence for Poland (Mazur, 2007), and Pakistan (Sheikh and Wang, 2011; Qureshi et al., 2012) confirms it. However, other studies in Pakistani context show a mix of inverse and direct relationships for different sectors/proxies of leverage (Qureshi, 2009; Sheikh and Qureshi, 2014).

Further, creditors consider large firms lesser risky not only because of their large amount of tangible assets but also due to their ability to diversify. Consequently, positive relationship is expected between firm size and corporate leverage. Alternatively, it is argued that large firms are able to generate better cash flows reducing their dependence on external funds and consequently an inverse relationship is also expected between firm size and leverage (Rajan and Zingales, 1995). Empirical studies have used natural logarithm of total assets or total sales to measure firm size. We use natural logarithm of total assets to measure it. Empirical evidences suggest positive relationship of firm size with leverage in Turkey (Bayrakdaroğlu et al., 2013), nine transition economies (Jõeveer, 2013), and Pakistan (Sheikh and Wang, 2011; Qureshi et al., 2012). While other studies in Pakistani context find positive/negative relationships in different sectors/proxies of leverage (Qureshi, 2009; Sheikh and Qureshi, 2014).

The firms accumulate market knowledge and market power over time. The rival theories postulate how the firms might use these resources to affect their capital structure policy. The POT argues that using their market knowledge and market power the older firms are expected to have higher ability to internally meet their financial needs as compared to new or less experienced firms. Consequently, POT postulates a negative relationship of firm age and leverage. Alternatively, TOT states

that the older firms having market knowledge, market power, good reputation and corporate credibility can borrow debt easily at lower interest rates. Consequently, a direct relationship between firm age and leverage is expected. In line with most of the studies, we use natural logarithm of number of years a firm is listed to measure firm age (Rocca *et al.*, 2011; Chen and Strange, 2005). A study about Chinese firms finds a direct relationship between firm age and leverage (Chen and Strange, 2005) but a similar study about Pakistani firms finds this relationship to be inverse (Qureshi *et al.*, 2012).

The firms belonging to different industries/sectors demonstrate inter-industry heterogeneity because of industry level factors such as industry competition, employed technology differences, entry/exit barriers, type of product, level of risk, and peer characteristics. These industry fixed effects have their implications for corporate leverage decisions such as firms within the same industry have more similar financial behavior as compared to the firms of different industry (Bradley *et al.*, 1984) which is also observed in empirical studies (Jõeveer, 2013) including Pakistan (Qureshi, 2009). According to TOT, firms have a target/optimal leverage level, and this optimal leverage level may depend upon the characteristics of the industry to which it belongs. On the other hand, POT has no clear predictions about industry fixed effects. Our data set does not contain the various factors characterizing inter-industry heterogeneity, and so we assume that the classification of firms in 13 different industries/sectors may enable us to understand the corporate leverage behavior due to inter-industry fixed effects. We use mean industry leverage as target leverage level as used by Jõeveer (2013), and also use mean industry profitability to explore if any relationship exists between leverage of firms, and their respective industry leverage/profitability.

Many consider inflation a social ill that imposes welfare costs. However, unanticipated inflation is more dangerous as compared to anticipated inflation as it can distort income and wealth distribution (Fischer, 1981). Inflation uncertainty by increasing the volatility of a firm's cost/price structures also increases sales, earnings and cash flow volatility. All these volatilities increase business risk associated with the firms. Consequently, firms choose to issue equity instead of debt to avoid default on future debt repayments and increased probability of insolvency. Accordingly, a negative relationship is expected and found between inflation uncertainty and leverage (Hatzinikolaoua *et al.*, 2002). Moreover, a direct relationship between leverage and interest tax shield is also at the core of TOT (Modigliani and Miller, 1958). Given this, inflation rate is expected to be directly related with leverage because of higher tax deductions on debt. Empirical results explain mix results for the relationship between inflation and leverage (Bokpin, 2009; Jõeveer, 2013). We use inflation rate (consumer prices) obtained from World Development Indicators (WDI) database as a proxy of inflation.

Exchange rate can affect the business risk associated with firms having exchange rate exposure and ultimately can affect the borrowing cost of firms. Firms borrow debt mostly from the banks. The banks (with systems and resources) have access to more information not only about their client firms but also the environment in which they operate. Consequently, the banks being responsive to the extent and the direction of exchange rate exposure of the firms may reflect it in their loan pricing (Diamond, 1984; James, 1987). For example, domestic currency depreciation may affect importing firms negatively and decreases their probability of timely loan repayments and the same is possible for exporting firms under domestic currency appreciation. Majority of our sampled firms import their plant and machinery and export their produce.

Consequently, their investment, operational and financing cash flows are likely to be affected by exchange rate. To investigate this relationship, we use natural logarithm of the value of Pakistani Rupees in terms of US Dollars obtained from WDI to measure exchange rate.

Higher economic growth provides more corporate growth opportunities that may produce more profits for the firms. Growth firms are likely to need external financing and according to TOT profitable firms can borrow on lower interest rates. Given this argument, economic growth is expected to be positively related to leverage. Alternatively, POT postulates that firms' first preference as financing source is retained earnings. Accordingly, profitability is likely to have inverse relationship with leverage. Given this, an inverse relationship between economic growth and leverage is expected. Recent empirical results show positive (Jong *et al.*, 2008) as well as negative relationship (Bokpin, 2009) between leverage and economic growth. We use annual per capita GDP growth rate obtained from WDI to measure economic growth in Pakistan. Moreover, we argue that higher infrastructure and fixed capital development in the country is an indicator of a supportive business environment for which we use gross capital formation to GDP ratio obtained from WDI as a proxy.

The quality of governance has implications for information asymmetry and agency problems faced by the firms (Giannetti, 2003) and legal claims for/against the firms. Consequently, governance level across different countries may be an important determinant of corporate leverage. Empirical studies find significant influence of governance quality upon capital structure decisions (Giannetti, 2003; Jong *et al.*, 2008). The governance system in Pakistan is very weak according to Worldwide Governance Indicators. Politically connected firms borrow 45 percent more and have 50 percent higher default rates (Khwaja and Mian, 2005). Elected governments have also been unable to complete their tenures being dissolved by the presidents or army generals on corruption charges. Therefore, we observe erratic changes in government forms (political, military, and military-cum-political), and policies in Pakistan over the period under study. As such, in our case we use form of government to classify the sample time period 1972-2010 to understand the corporate leverage behavior during different forms of the government.

Financial structure of Pakistan

Pakistan had three stock exchanges that are now merged as Pakistan Stock Exchange (PSE), presently having a listed equity capital of around US$12 billion, whereas the listed debt capital is only US$150 million[2] that is a very small part of total listed capital. Whereas the total leverage ratio (0.7897) in Table II indicates that Pakistani non-financial listed firms are highly leveraged. These figures clearly suggest that banks are the main creditors for Pakistani non-financial listed firms and the capital market of Pakistan is bank based.

Variables' description and their expected relationship with leverage

We measure leverage (dependent variable) by using three proxies: short-term leverage (STL_{it}) measured as short-term liabilities/total assets; long-term leverage (LTL_{it}) measured as long-term liabilities/total assets; and total leverage (TL_{it}) measured as total liabilities/total assets, as measured by recent similar studies (Ahsan *et al.*, 2016a, b). We synthesize our review of literature in Table I to describe independent variables and their expected relationship with leverage.

Variable level	Variable name	Model name	Proxy	Effect on debt (+/−/?)
Firm level	Tax shield	TS_{it}	Tax payments/gross profit	+
	Probability of bankruptcy	Z_{it}	Altman's Z-score	−
	Business risk	BR_{it}	% change in (net profit before tax/total assets)	+/−
	Non-debt tax shield	ND_{it}	Depreciation expenses/total assets	−
	Agency cost	AC_{it}	Operating expenses/sales	+
	Growth	G_{it}	% Change in total assets	+/−
	Current profitability	CP_{it}	Net profit before tax/total assets	+/−
	Past profitability	PP_{it}	Retained earnings/total assets	+/−
	Liquidity	L_{it}	Current assets/current liabilities	+/−
	Tangibility	TAN_{it}	Net fixed assets/total assets	+
	Collateral value	CV_{it}	Gross fixed assets at cost/total assets	+
	Firm size	S_{it}	Ln (total assets)	+/−
	Age of business	A_{it}	Ln (number of years since listing)	+/−
	Ownership structure	O_{it}	Dummy; 0 for domestic firm, 1 for foreign-owned firm	?
Industry level	Industry leverage	IL_{jt}	Mean industry leverage	+
	Industry profit	IP_{jt}	Mean industry net profit before tax/total assets	?
Country level	Inflation rate	INF_t	Annual inflation (consumer prices) rate	+
	Exchange rate	EXR_t	Ln (yearly average exchange rate PKR/USD)	?
	Economic growth	EGR_t	Annual per capita GDP growth rate	+/−
	Capital formation	CF_t	Gross capital formation/GDP	?
	Form of the government	FOG_t	Political = 1; political-cum-military = 2; military = 3	?

Table I.
Independent
variables, their
description and
expected relationship
with leverage

3. Data and methodology

To examine capital structure choices of listed firms in Pakistan, we develop a unique data set[3] of all Pakistani non-financial firms listed on PSE taken from the State Bank of Pakistan (SBP) publications for the period 1972-2010 (SBP 1972-2010). We do not exclude any of the listed non-financial firms from the analysis to avoid survival bias. The time (years) and space (firms) dimensions make it an unbalanced panel data set comprising of 688 firms listed during this period giving 13,375 firm-year observations[4].

We consider panel data analysis as an appropriate method that is also used in similar studies (Bayrakdaroğlu *et al.*, 2013; Sheikh and Qureshi, 2014; Iqbal et al., 2016). Of the two competing models, fixed effects model (FEM) and random-effects model, we use FEM which has no problem to deal with an unbalanced panel data (Wooldridge, 2015) especially when time $t > 30$ (Judsona and Owenb, 1999), as in our case. Moreover, the results of the Hausman specification test also favor FEM for all models of leverage.

Finally, the objective of this study is to find out the variations in the leverage behavior of Pakistani non-financial listed firms and we are using data of all the listed Pakistani non-financial firms instead of drawing firms randomly from a large population that is why FEM is best suited for our study (Baltagi, 2008). In the following equation, we present our model:

$$L_{it} = \beta_{0i} + \beta_x X_{it} + \beta_y Y_{jt} + \beta_z Z_t + \varepsilon_{it}$$

where L_{it} is one of the three measures of leverage (STL_{it}, LTL_{it}, TL_{it}) for the ith firm at time t; X_{it} are the firm level independent variables of ith firm at time t; Y_{jt} are the jth sector level independent variables to which the ith firm belongs at time t; and Z_t are the country level independent variables at time t; β_x are the coefficients for the X_{it}, β_y are the coefficients for the Y_{jt}, β_z are the coefficients for the Z_t, β_{0i} is y-intercept of ith firm, ε_{it} is the error component for the ith firm at time t.

Descriptive statistics

Figure 1 presents the number of firms for each year under study. The graph shows that the number of listed non-financial firms in 1972 is lowest (199) and in 1997 is highest (532). The number of firms increased from 1972 to 1997 and then decreased from 1997 to 2010.

Table II presents descriptive statistics for dependent and independent variables. The mean STL_{it} of 0.5877 suggests that short-term debt is a dominant mode of financing in Pakistan confirming earlier studies in Pakistani context (Qureshi, 2009; Sheikh and Qureshi, 2014).

We find that tax payments are low and volatile with a mean of 0.0757 and SD of 0.1250 for TS_{it}. We also find highest variation of SD 2.7770 and 2.4672 in BR_{it} and Z_{it}, respectively, suggesting that Pakistani firms are facing quite an unpredictable business environment. Pakistani firms have witnessed a very good but volatile growth rate (mean = 0.1062 and SD = 0.2501) during the period under study. Low profitability and high variability seem hallmarks of corporate arena in Pakistan with a mean of 0.0245 and SD of 0.1283 for current profitability that is also reflected in past profitability with a mean of -0.0271 and SD of 0.6163. However, these firms are maintaining high liquidity (mean = 1.1026).

Industry average of 0.5877 for short-term leverage and 0.1952 for long-term leverage suggest that Pakistani firms heavily rely on short-term debt for their financing needs. The data suggest poor profitability and higher volatility (mean = 0.0227, SD = 0.0523) at industry level also.

Sudden and atypical changes in the government, its form and policies during the period under study resulted into an erratic business environment in Pakistan. We observe high volatility in inflation (mean = 0.0925, SD = 0.0489), exchange rate (mean = 3.3968, SD = 0.7018), and economic growth rate (mean = 0.0214, SD = 0.0198). However, capital formation in Pakistan remained good and stable (mean = 0.1833, SD = 0.0197).
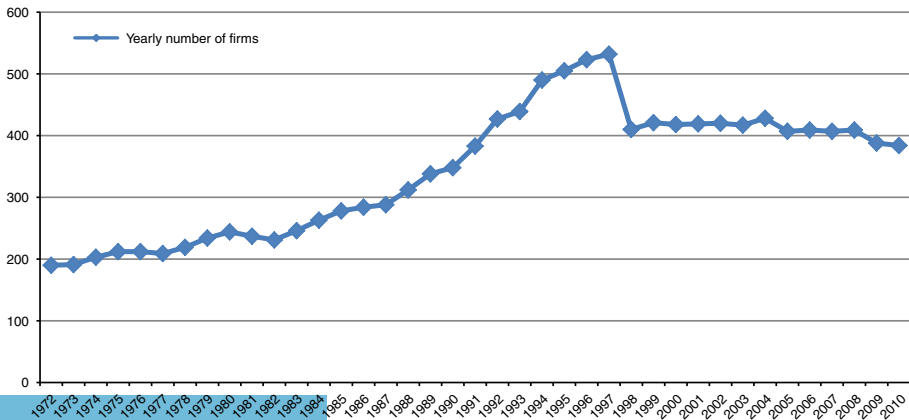
Figure 1.
Number of firms in each year under study (1972-2010)

Variable	Obs.	Mean	SD	Min.	Max.
STL_{it}^a	13,375	0.5877	0.4358	0.0868	2.9814
LTL_{it}	13,375	0.1952	0.2238	0.0000	1.1843
TL_{it}	13,375	0.7897	0.4996	0.1348	3.5393
TS_{it}	13,375	0.0757	0.1250	−0.2010	0.6460
Z_{it}	13,375	1.6000	2.4672	−8.0259	8.1999
BR_{it}	13,375	−0.1805	2.7770	−13.2480	12.7613
ND_{it}	13,375	0.0403	0.0230	0.0000	0.1016
AC_{it}	13,375	0.4153	0.6565	0.0000	4.5895
G_{it}	13,375	0.1062	0.2501	−0.3557	1.2686
CP_{it}	13,375	0.0245	0.1283	−0.3853	0.3859
PP_{it}	13,375	−0.0271	0.6163	−3.6428	0.7081
L_{it}	13,375	1.1026	0.8136	0.0511	5.3309
TAN_{it}	13,375	0.5091	0.2360	0.0466	0.9619
CV_{it}	13,375	0.8391	0.3901	0.0842	2.3023
S_{it}	13,375	5.6978	1.7683	1.6019	10.5088
A_{it}	13,375	2.4814	0.9187	0.0000	4.1271
$ISTL_{jt}$	507	0.5877	0.1393	0.2221	1.5522
$ILTL_{jt}$	507	0.1952	0.0758	0.0000	0.5603
ITL_{jt}	507	0.7897	0.1533	0.3510	1.7368
IP_{jt}	507	0.0245	0.0523	−0.1918	0.3275
INF_t	39	0.0925	0.0489	0.0291	0.2666
EXR_t	39	3.3968	0.7018	2.1612	4.4449
EGR_t	39	0.0214	0.0198	−0.0191	0.0660
CF_t	39	0.1833	0.0197	0.1293	0.2256

Notes: The table presents the descriptive statistics of dependent and explanatory variables used in this study. STL_{it} is the ratio of short-term debt over total assets; LTL_{it} is the ratio of long-term debt over total assets; TL_{it} is the ratio of total debt over total assets; TS_{it} is the ratio of tax payments over gross profit; Z_{it} is the Altman's Z-score; BR_{it} is the ratio of percentage change in net profit before tax over total assets; ND_{it} is the ratio of depreciation expenses over total assets; AC_{it} is the ratio of operating expenses over sales; G_{it} is the percentage change in total assets; CP_{it} is the ratio of net profit before tax over total assets; PP_{it} is the ratio of retained earnings over total assets; L_{it} is the ratio of current assets over current liabilities; TAN_{it} is the ratio of net fixed assets over total assets; CV_{it} is the ratio of fixed assets at cost over total assets; S_{it} is the natural logarithm of total assets; A_{it} is the natural logarithm of number of year since a firm is listed; $ISTL_{jt}$ is the mean industry short-term leverage; $ILTL_{jt}$ is the mean industry long-term leverage; ITL_{jt} is the mean industry total leverage; IP_{jt} is the mean industry net profit before tax over total assets; INF_t is the annual inflation (consumer prices) rate; EXR_t is the natural logarithm of yearly average exchange rate PKR/USD; EGR_t is the annual per capita GDP growth rate; CF_t is the ratio of gross capital formation over GDP. [a]accounts payable are negligible

Table II.
Descriptive statistics

Robustness

We are using 13 firm level, two industry level, and four country level variables along with one firm level and one country level categorical variables. For such a big database and a large number of variables, autocorrelation and multicollinearity might be an issue. Our results in Table III provide highest variation inflation factor of 6.03[5] for Z-score and as such multicollinearity is also not an issue (Nachane, 2006). Further, to ensure the validity and robustness of the results, we carry out some post-estimation tests such as modified Wald test for group-wise heteroskedasticity in fixed effect regression model and Wooldridge test for autocorrelation in the panel data. As a remedy for autocorrelation, we use robust standard errors adjusted for heteroskedasticity and clustered robust standard errors adjusted for clusters in panels (firms).

Table III.
Pair-wise correlation matrix and variation inflation factor

	STL_{it}	LTL_{it}	TL_{it}	TS_{it}	Z_{it}	BR_{it}	ND_{it}	AC_{it}	G_{it}	CP_{it}	PP_{it}	L_{it}	TAN_{it}	CV_{it}	S_{it}	A_{it}	$ISTL_{jt}$	$ILTL_{jt}$	ITL_{jt}	IP_{jt}	INF_t	EXR_t	EGR_t	CF_t	VIF
STL_{it}	1.00																								
LTL_{it}	−0.08	1.00																							
TL_{it}	0.87	0.40	1.00																						
TS_{it}	−0.15	−0.22	−0.24	1.00																					1.26
Z_{it}	−0.66	−0.42	−0.80	0.36	1.00																				6.03
BR_{it}	0.00	−0.01	−0.01	0.02	0.04	1.00																			1.01
ND_{it}	−0.04	0.21	0.06	−0.11	−0.13	0.01	1.00																		1.52
AC_{it}	0.22	0.11	0.25	−0.13	−0.33	0.01	0.02	1.00																	1.52
G_{it}	−0.13	−0.05	−0.15	0.09	0.68	−0.02	−0.02	−0.12	1.00																1.16
CP_{it}	−0.39	−0.30	−0.49	0.39	0.80	0.06	−0.20	−0.25	0.21	1.00															2.32
PP_{it}	−0.81	−0.35	−0.93	0.24	0.63	0.02	−0.11	−0.29	0.20	0.48	1.00														4.27
L_{it}	−0.45	−0.23	−0.50	0.26	0.02	0.02	−0.09	−0.13	0.08	0.43	0.43	1.00													1.91
TAN_{it}	−0.12	0.50	0.12	−0.28	−0.40	−0.02	−0.23	0.15	−0.10	−0.30	−0.16	−0.46	1.00												3.15
CV_{it}	0.21	0.36	0.37	−0.21	−0.44	−0.01	0.43	0.21	−0.24	−0.28	−0.43	−0.38	0.68	1.00											3.32
S_{it}	−0.32	0.02	−0.28	0.11	0.22	0.01	0.50	−0.04	0.18	−0.28	0.37	0.10	0.07	−0.14	1.00										2.35
A_{it}	0.15	−0.16	0.07	0.11	0.09	0.01	−0.15	0.08	0.04	0.18	0.01	0.07	−0.21	−0.05	0.20	1.00									1.38
$ISTL_{jt}$	0.32	−0.09	0.26	−0.07	−0.11	0.00	−0.10	0.02	−0.02	−0.13	−0.23	−0.12	−0.20	−0.05	−0.28	0.11	1.00								1.54
$ILTL_{jt}$	−0.08	0.34	0.09	−0.14	−0.17	0.01	0.20	−0.02	−0.05	−0.18	−0.06	−0.17	0.35	0.27	0.08	−0.08	−0.25	1.00							1.47
ITL_{jt}	0.27	0.10	0.31	−0.13	−0.19	0.00	0.00	0.01	−0.05	−0.22	−0.26	−0.19	−0.01	0.09	−0.22	0.07	0.84	0.28	1.00						1.81
IP_{jt}	−0.11	−0.15	−0.17	0.21	0.24	0.04	−0.11	−0.02	0.11	0.41	0.15	0.19	−0.16	−0.14	0.09	0.06	−0.33	−0.43	−0.55	1.00					1.86
INF_t	−0.03	0.02	−0.02	0.03	−0.02	−0.03	−0.04	−0.26	0.04	−0.02	0.02	−0.01	0.02	−0.07	−0.05	−0.09	−0.10	0.05	−0.07	−0.05	1.00				1.15
EXR_t	−0.05	0.04	−0.02	−0.03	−0.01	0.00	0.00	0.28	0.00	−0.01	0.01	0.04	0.14	0.14	0.61	0.30	−0.15	0.11	−0.06	−0.02	−0.13	1.00			1.12
EGR_t	0.04	−0.06	0.01	0.04	0.03	0.01	−0.05	−0.02	0.09	0.08	0.00	0.01	−0.05	−0.02	−0.01	0.07	0.12	−0.17	0.03	0.20	−0.10	−0.09	1.00		1.10
CF_t	0.05	−0.04	0.03	−0.02	0.00	−0.01	0.01	−0.21	0.06	0.00	−0.01	0.00	−0.02	0.01	0.17	0.10	0.16	−0.12	0.10	0.00	−0.02	0.15	0.14	1.00	1.18

Notes: VIF, variation inflation factor. The table presents the results from correlation analysis and variation inflation factor for all the dependent and explanatory variables used in this study

4. Empirical results

Table IV[6] presents the results of FEM for the three proxies of leverage using 13,375 firm-year observations. Our model explains 78.89, 38.95, 88.63 percent of the variations in short-term, long-term, and total leverage of the Pakistani listed firms, respectively.

In line with the core concept of TOT, we find a significant positive relation of TS_{it} with STL_{it}, the main financing source (mean = 58.77 percent) of Pakistani firms, whereas this relationship turns negative with LTL_{it} that is quite strange. Further, we find insignificant relationship of ND_{it} with STL_{it} and TL_{it} that turns significantly positive with LTL_{it}. Furthermore, we find negative association between Z_{it} and STL_{it} as well as TL_{it} and positive association between BR_{it} and STL_{it} only. Agency cost (AC_{it}) has no significant relationship with any of the leverage proxies but growth (G_{it}) has significant positive relationship with LTL_{it} as well as TL_{it}. Moreover, past profitability (PP_{it}) is negatively associated with all three proxies of leverage and current profitability (CP_{it}) is also negatively associated but with LTL_{it} only. We also find a negative association between liquidity (L_{it}) and STL_{it} and TL_{it} whereas this association becomes positive with LTL_{it}. Further, we find a positive relationship between tangibility (TAN_{it}) and LTL_{it} that becomes negative with STL_{it}. Furthermore, we find a negative association between collateral value (CV_{it}) and LTL_{it} that becomes positive with STL_{it}. Moreover, we find that firm size (S_{it}) is positively associated with LTL_{it} and TL_{it} in line with TOT. On the other hand, we find positive relationship of age (A_{it}) with STL_{it} and TL_{it} and negative relationship with LTL_{it}.

We find positive relationship of IL_{jt} and IP_{jt} with all three proxies of leverage. Contrary to the theory and the empirical evidence (Frank and Goyal, 2009), we find a negative association between INF_t and TL_{it}. We have quite interesting findings of positive association of EXR_t with STL_{it}, and negative association with LTL_{it} and TL_{it}. Moreover, we find positive association of EGR_t as well as CF_t with STL_{it} in line with TOT, which turn negative with LTL_{it} as advocated by POT.

Comparative results

Domestic versus foreign firms. Table V presents the results of the FEM for domestic and foreign-owned non-financial firms listed in Pakistan. We analyze the data of 537 domestic firms with 10,555 firm-year observations and 152 foreign-owned firms with 2,820 firm-year observations over the period under study. Our models explain 80.29 and 70.84 percent of the variations in STL_{it}; 37.48 and 42.16 percent of the variations in LTL_{it}; and 90.96 and 70.99 percent of the variations in TL_{it} of domestic and foreign-owned firms, respectively.

In line with overall results, domestic firms have significant positive relation of TS_{it} with STL_{it} and negative with LTL_{it} whereas foreign firms have significant negative relation of TS_{it} with LTL_{it} only. Further, Z_{it} is positively associated with LTL_{it} of domestic firms and negatively associated with LTL_{it} of foreign firms. Furthermore, BR_{it} is positively associated with STL_{it} of domestic firms and TL_{it} of foreign firms.

ND_{it} and AC_{it} do not have any significant role in capital structure determination of both firm types. Moreover, growing domestic as well as foreign-owned firms may have investment opportunities more than their internally generated funds as prophesied by POT and raise long-term/total debt signified by a positive relationship of G_{it} with LTL_{it} and TL_{it}. We find a universal negative association between PP_{it} and all three leverage ratios for both domestic and foreign-owned firms in line with POT. However, CP_{it} differentiates capital structure behavior of the two firm types. Domestic firms have significant negative relationship of LTL_{it} with CP_{it} while their foreign counterparts

Variables	STL_{it} Coef.	$p > |t|$	LTL_{it} Coef.	$p > |t|$	TL_{it} Coef.	$p > |t|$
TS_{it}	0.075	0.000	−0.047	0.004		
Z_{it}	−0.038	0.000			−0.028	0.000
BR_{it}	0.001	0.100				
ND_{it}			0.284	0.059		
AC_{it}						
G_{it}			0.017	0.009	0.022	0.000
CP_{it}			−0.064	0.070		
PP_{it}	−0.402	0.000	−0.172	0.000	−0.700	0.000
L_{it}	−0.122	0.000	0.076	0.000	−0.033	0.000
TAN_{it}	−0.640	0.000	0.433	0.000	−0.152	0.000
CV_{it}	0.045	0.048	−0.054	0.023		
S_{it}			0.050	0.000	0.063	0.000
A_{it}	0.041	0.000	−0.017	0.006	0.018	0.002
IL_{jt}	0.219	0.000	0.592	0.000	0.087	0.001
IP_{jt}	0.286	0.001	0.243	0.000	0.173	0.000
INF_t					−0.060	0.044
EXR_t	0.015	0.118	−0.071	0.000	−0.064	0.000
EGR_t	0.148	0.066	−0.217	0.005	−0.155	0.017
CF_t	0.451	0.000	−0.376	0.000		
Constant	0.680	0.000	−0.113	0.005	0.678	0.000
R^2	0.7889		0.3895		0.8863	
No. of obs.	13,375		13,375		13,375	
No. of firms	688		688		688	

Notes: The table presents the results of fixed effects model for three leverage models (STL_{it}, LTL_{it}, TL_{it}) used in this study. First, we run fixed effects analysis including all the variables for three models, separately. Second, we exclude insignificant variables and run fixed effects analysis again including only significant variables. STL_{it} is the ratio of short-term debt over total assets; LTL_{it} is the ratio of long-term debt over total assets; TL_{it} is the ratio of total debt over total assets; TS_{it} is the ratio of tax payments over gross profit; Z_{it} is the Altman's Z-score; BR_{it} is the ratio of percentage change in net profit before tax over total assets; ND_{it} is the ratio of depreciation expenses over total assets; AC_{it} is the ratio of operating expenses over sales; G_{it} is the percentage change in total assets; CP_{it} is the ratio of net profit before tax over total assets; PP_{it} is the ratio of retained earnings over total assets; L_{it} is the ratio of current assets over current liabilities; TAN_{it} is the ratio of net fixed assets over total assets; CV_{it} is the ratio of fixed assets at cost over total assets; S_{it} is the natural logarithm of total assets; A_{it} is the natural logarithm of number of year since a firm is listed; IL_{jt} is the mean industry leverage; IP_{jt} is the mean industry net profit before tax over total assets; INF_t is the annual inflation (consumer prices) rate; EXR_t is the natural logarithm of yearly average exchange rate PKR/USD; EGR_t is the annual per capita GDP growth rate; CF_t is the ratio of gross capital formation over GDP

Table IV.
Determinants of
capital structure
(Pakistan)

have the opposite. The results suggest that both the firms follow a mix of TOT and POT to guide their capital structure decisions. Both the firm types use liquidity (L_{it}) to reduce their short-term/total debt dependence (negative relationship) and to raise long-term debt (positive relationship). The results regarding TAN_{it}, CV_{it}, S_{it} and A_{it} for both the firm types are in line with those described in previous section.

The coefficients of IL_{jt} suggest that although domestic and foreign-owned firms follow the leverage behavior of their respective industries, yet the role of industry average long-term leverage is relatively stronger for domestic firms. Industry average profitability (IP_{jt}) generally considered as a benchmark for expected firm profitability, motivates only the domestic firms to raise more debt.

| Leverage | STL_{it} | | | | LTL_{it} | | | | TL_{it} | | | |
| Firm type | Domestic firms | | Foreign firms | | Domestic firms | | Foreign firms | | Domestic firms | | Foreign firms | |
Variables	Coef.	$p > |t|$	Coef.	$p > |t|$	Coef.	$p > |t|$	Coef.	$p > |t|$	Coef.	$p > |t|$	Coef.	$p > |t|$
TS_{it}	0.074	0.001			−0.042	0.026	−0.073	0.052				
Z_{it}	−0.041	0.000	−0.029	0.001	0.016	0.024	−0.017	0.068	−0.025	0.000	−0.043	0.000
BR_{it}	0.001	0.103									0.003	0.045
ND_{it}												
AC_{it}												
G_{it}					0.017	0.039	0.016	0.089	0.017	0.008	0.035	0.001
CP_{it}					−0.155	0.005	0.105	0.096				
PP_{it}	−0.400	0.000	−0.346	0.000	−0.210	0.000	−0.173	0.000	−0.713	0.000	−0.541	0.000
L_{it}	−0.133	0.000	−0.098	0.000	0.074	0.000	0.067	0.000	−0.034	0.000	−0.031	0.011
TAN_{it}	−0.651	0.000	−0.617	0.000	0.469	0.000	0.404	0.000	−0.124	0.000	−0.269	0.000
CV_{it}	0.049	0.052			−0.044	0.082	−0.081	0.023				
S_{it}	0.049	0.000	0.022	0.025	0.055	0.000	0.036	0.012	0.066	0.000	0.050	0.001
A_{it}	0.226	0.000	0.211	0.000	−0.023	0.002			0.017	0.015	0.024	0.020
IL_{it}	0.336	0.000			0.595	0.000	0.457	0.000	0.077	0.007	0.127	0.004
IP_{it}					0.255	0.000			0.172	0.000		
INF_t			0.093	0.100	−0.076	0.000	−0.093	0.035	−0.095	0.004		
EXR_t			0.046	0.002	−0.235	0.010	−0.071	0.029	−0.068	0.000	−0.054	0.057
EGR_t					−0.433	0.001			−0.151	0.036		
CF_t	0.430	0.001	0.625	0.001								
Constant	0.730	0.000	0.575	0.000	−0.142	0.003	−0.065	0.189	0.681	0.000	0.689	0.000
R^2	0.8029		0.7084		0.3748		0.4216		0.9096		0.7099	
No. of obs.	10,555		2,820		10,555		2,820		10,555		2,820	
No. of firms	537		152		537		152		537		152	

Notes: The table presents the results of fixed effects model for three leverage models (STL_{it}, LTL_{it}, TL_{it}) for domestic and foreign-owned firms. First, we run fixed effects analysis including all the variables for three models, separately. Second, we exclude insignificant variables and run fixed effects analysis again including only significant variables

Table V.
Capital structure
determinants of
domestic and
foreign-owned firms
in Pakistan

The foreign-owned firms have significant positive relationship of EXR_t and INF_t with STL_{it} that turns significant negative with LTL_{it} whereas domestic firms have significant negative relationship of INF_t with TL_{it} only and significant negative relationship of EXR_t with TL_{it} as well as LTL_{it}. EGR_t has negative association with LTL_{it} and TL_{it} of domestic firms only while CF_t has positive association with STL_{it} of both types of firms and negative association with LTL_{it} of domestic firms only.

Leverage behavior during different forms of government tenures
Table VI presents the results of FEM for three proxies of leverage of all the firms during three different government tenures in Pakistan. We compare the results of 7,005 firm-year observations during political tenures, 3,230 firm-year observations during political-cum-military (mix) tenures, and 3,140 firm-year observations during military tenures. Our models for STL_{it}, LTL_{it}, and TL_{it} explain 77-81, 30-42 and 86-89 percent of the leverage variations during three different government tenures.

We find positive/negative association of TS_{it} with STL_{it}/LTL_{it} during political tenures only and positive association of TS_{it} with STL_{it} during political-cum-military tenures. Irrespective of government type, we find negative association of Z_{it} with STL_{it} as well as TL_{it}. Further, we find a positive association of AC_{it} with STL_{it} during political tenures that turns negative during political-cum-military tenures. We also find that G_{it} has a significant positive association with LTL_{it} as well as TL_{it} during military tenures and with TL_{it} during political tenures. For CP_{it}, firms follow TOT during political-cum-military tenure only but for PP_{it}, we find significant negative relationship with all three leverage proxies, irrespective of government type. Furthermore, we find that L_{it} is negatively associated with STL_{it} as well as TL_{it} and positively associated with LTL_{it}, irrespective of government type. The results regarding TAN_{it} and CV_{it} are not affected by the changes in the form of the government.

Positive relationship of IL_{jt} with firms' leverage proxies suggests that the firms try to follow the leverage behavior of their respective industries irrespective of government form. Only during political tenures, the corporate entities in Pakistan consider industry average profitability (IP_{jt}) as a relevant variable in their capital structure decision making.

Moreover, we find negative relationship of INF_t with TL_{it} during military tenures and with LTL_{it} during political-cum-military tenures. CF_t has no significant association during political-cum-military tenures but significant positive/negative association with STL_{it}/LTL_{it} during political tenures and significant positive association with TL_{it} during military tenures. On the other hand, EGR_t has significant positive association with LTL_{it} during political-cum-military tenures and with TL_{it} during military tenures only.

5. Discussion about main findings of the results
We find opposite direction of association of short-term leverage and long-term leverage with many of the independent variables. This is because the firms in Pakistan role over short-term debt to use it as a substitute to long-term debt depicted in inverse correlation between short-term leverage and long-term leverage (Table III). On the other hand, short-term leverage and total leverage have same direction of relationship with many of the independent variable as short-term leverage is the main source of financing (mean = 58.77 percent). Further, significant negative relationship of tax shield and significant positive relationship of ND tax shield with long-term leverage conforms an earlier study (Sheikh and Qureshi, 2014) and explains that depreciation being a

Leverage FOG Variables	STL$_{it}$ Political Coef.	$p>|t|$	STL$_{it}$ Mix Coef.	$p>|t|$	STL$_{it}$ Military Coef.	$p>|t|$	LTL$_{it}$ Political Coef.	$p>|t|$	LTL$_{it}$ Mix Coef.	$p>|t|$	LTL$_{it}$ Military Coef.	$p>|t|$	TL$_{it}$ Political Coef.	$p>|t|$	TL$_{it}$ Mix Coef.	$p>|t|$	TL$_{it}$ Military Coef.	$p>|t|$
TS_{it}	0.087	0.000	0.068	0.036	-0.028	0.001	-0.056	0.001					-0.028	0.000	-0.035	0.000	-0.016	0.004
Z_{it}	-0.035	0.000	-0.042	0.000														
BR_{it}																		
ND_{it}																		
AC_{it}	0.019	0.068	-0.033	0.004														
G_{it}											0.033	0.006					0.040	0.000
CP_{it}															0.147	0.023		
PP_{it}	-0.407	0.000	-0.426	0.000	-0.449	0.000	-0.164	0.000	-0.169	0.000	-0.200	0.000	-0.687	0.000	-0.681	0.000	-0.758	0.000
L_{it}	-0.114	0.000	-0.093	0.000	-0.145	0.000	0.064	0.000	0.066	0.000	0.102	0.000	-0.030	0.000	-0.028	0.003	-0.041	0.000
TAN_{it}	-0.600	0.000	-0.538	0.000	-0.623	0.000	0.415	0.000	0.449	0.000	0.486	0.000	-0.157	0.000	-0.105	0.016		
CV_{it}									-0.065	0.029	-0.087	0.015					-0.082	0.005
S_{it}							0.046	0.000	0.057	0.000	0.040	0.000	0.050	0.000	0.066	0.000	0.056	0.000
A_{it}	0.049	0.000	0.068	0.000	0.049	0.000	-0.026	0.000					0.018	0.010	0.026	0.058		
IL_{jt}	0.187	0.001	0.157	0.004	0.148	0.020	0.561	0.000	0.530	0.000	0.606	0.000	0.111	0.000				
IP_{jt}	0.265	0.005					0.239	0.001					0.242	0.000				
INF_t							-0.058	0.000	-0.914	0.000	-0.072	0.000	-0.041	0.002	-0.099	0.000	-0.209	0.001
EXR_t									-0.116	0.000							-0.030	0.081
EGR_t									1.658	0.000							0.111	0.096
CF_t	0.550	0.000					-0.368	0.004									0.873	0.001
Constant	0.707	0.000	0.777	0.000	0.897	0.000	-0.139	0.001	-0.103	0.140	-0.197	0.000	0.644	0.000	0.803	0.000	0.568	0.000
R^2	0.7880		0.8022		0.7741		0.4139		0.3070		0.3955		0.8946		08883		0.8687	
No. of obs.	7,005		3,230		3,140		7,005		3,230		3,140		7,005		3,230		3,140	
No. of firms	683		568		549		683		568		549		683		568		549	

Notes: The table presents the results of fixed effects model for three leverage models (STL_{it}, LTL_{it}, TL_{it}) during different government tenures in Pakistan. First, we run fixed effects analysis including all the variables for three models, separately. Second, we exclude insignificant variables and run fixed effects analysis again including only significant variables

Table VI.
Capital structure determinants during different government tenures in Pakistan

non-cash charge to the cash revenue of the firms in Pakistan provides them a stable source of cash flow over time to help them raise additional long-term funds reducing the utility of interest tax shield associated with long-term debt.

The high Z-score firms are generally healthy. As such, these firms have sufficient resources not only to finance their normal business activities internally but also to reduce their debt dependence. It is astonishing to note that even though Pakistani firms have relatively higher and volatile business risk (BR_{it}) but it does not have significant role in their long-term financing decisions. Nevertheless, they try to pass on their risk to the short-term creditors by increasing their short-term debt as indicated by a positive association between business risk and short-term leverage, may be by using their political connections (Khwaja and Mian, 2005). The plausible explanation may be that the banks being the main supplier of long-term debt shy-away from providing long-term debt (Sheikh and Qureshi, 2014) especially to the firms having high business risk to avoid long-term risk but succumb to political pressure and provide short-term debt. Our results suggest that agency cost have no significant role in corporate capital structure decision making in Pakistan. A probable explanation lies in corporate governance mechanism in Pakistan where the members of the board of directors (owners) also act as the managers of these firms resolving the owner-manager agency problem and consequent free cash flow problem[7]. Further, a positive relationship of growth with long-term and total leverage provides empirical evidence to the theory (Jensen and Meckling, 1976) that growing firms may invest in risky projects at the cost of debt-holders. However, this finding contradicts an earlier study in Pakistan (Sheikh and Wang, 2011). A universal negative relationship of past profitability with all three proxies of leverage and that of current profitability with long-term leverage confirms not only the theoretical underpinnings of POT but also the earlier studies in Pakistani context (Sheikh and Wang, 2011; Qureshi et al., 2012; Qureshi, 2009). Further, liquid firms in Pakistan use their liquidity to amend the term-structure of their debt. They pay-off their short-term debt and use their liquidity as a positive signal to secure long-term debt financing. Furthermore, these firms use their tangibility to raise long-term debt and pay-off their short-term debt because higher tangibility lowers the agency cost of long-term debt (Frank and Goyal, 2009) which is very important to the banks in Pakistan. This indicates that banking industry in Pakistan may have realized the pitfalls of the collusive networks and crony capitalism. They believe that tangibility may mitigate their risk even though the legal system in Pakistan is quite weak and political interferences make the regulatory bodies dysfunctional. Further, higher collateral value makes equity less costly for Pakistani firms as they have lesser information asymmetry (Harris and Raviv, 1991) resulting into a negative relationship between collateral value and long-term leverage. The creditors in Pakistan consider bigger firms as more diversified and lesser risky and consequently may provide them relatively easy and cheaper long-term financing. Moreover, better market reputation and longer banking relationship of the older firms help them secure cheaper short-term debt reducing their dependence on long-term debt.

Pakistani non-financial firms try to follow the leverage behavior of their respective industry and their sector's profitability also motivates these firms to avail their probable share. Contrary to the theory and empirical evidence (Frank and Goyal, 2009), we find a negative association between inflation and total leverage. Conforming to the theory, Table III depicts that inflation has a positive correlation with tax shield but a negative correlation with profitability and liquidity. These correlations suggest that inflation hurts profitability/liquidity so badly that the firms may not be able to avail

fully the tax shield benefits of debt. We have quite interesting findings of positive association of exchange rate with short-term leverage, and negative association with long-term and total leverage. These findings suggest that weak local currency boosts the export revenues of Pakistani non-financial firms and consequently they raise additional short-term debt to support their increased working capital finance needs. Alternatively, weak local currency increases the cost of long-term debt of the firms that mainly import their machinery and consequently they reduce their (long-term and total) debt dependence. Moreover, better economic environment improves corporate profitability (Table III) by creating increased business opportunities. However, in urgency to avail these opportunities emerging in an erratic economic environment (high SD of EGR_t in Table II) these firms are able to make available short-term debt quickly and not the long-term debt that requires lengthy formalities. Moreover, due to the observed volatility of the economic environment the non-financial firms in Pakistan remain skeptic about sustainability of positive trend in the current economic indicators and consequently adjust the term-structure of debt in their capital structure by raising short-term debt and paying off long-term debt. These results show that experiencing interaction of leverage and its three level determinants in their unique and volatile business environment, Pakistani non-financial firms display a mix of pecking order and trade-off leverage behavior.

Regarding the ownership structure, the coefficients for tax shield suggest that it has relatively stronger role in short-term leverage determination of domestic firms and long-term leverage determination of foreign firms. Stronger domestic firms (with higher Z-score and lower bankruptcy risk) increase their long-term debt as depicted by positive association between long-term leverage and Z-score whereas their foreign counterparts try to finance long-term projects internally as depicted by negative association between long-term leverage and Z-score. Further, domestic firms try to pass on some of their business risk to their short-term creditors (positive association between BR_{it} and short-term leverage), while their foreign counterparts do this to their non-banking creditors (positive association between business risk (BR_{it}) and total leverage). Moreover, domestic firms use their current profitability to pay-off long-term debt (in conformity of POT) whereas their foreign counterparts do the opposite and use their current profitability to raise long-term debt (in conformity of TOT). The results suggest that both the firms follow a mix of TOT and POT to guide their capital structure decisions. The foreign-owned firms adjust the term-structure of their debt in the wake of increase in inflation whereas their domestic counterparts reduce their total debt. Facing weakening local currency, both the firm types reduce their long-term/total debt (negative association of exchange rate with long-term and total leverage) whereas foreign-owned firms increase their short-term debt in this scenario. The two firm types, domestic and foreign firms, also view the benefits of high economic growth quite differently resulting into different responses. The domestic firms do not seem to believe in the long-run stability in the economic growth and utilize the dividends of the economic growth to pay-off long-term debt and reduce their financial risk, whereas their foreign counterparts seemingly consider high economic growth as an opportunity and raise additional short-term debt to finance their increased investment needs.

The political instability and atypical form of the government in Pakistan have some implications for corporate capital structure behavior. The positive/negative association of tax shield with short-term/long-term leverage suggests that these firms take advantage of interest tax shield of leverage and try to adjust term-structure of their debt by increasing short-term debt and reducing long-term debt during political

tenures only. The results of Z-score indicate that irrespective of government type, financially strong firms having low bankruptcy risk (higher Z-score) reduce their short-term as well as total leverage. It is interesting to note that Pakistani firms use debt as disciplinary tool to mitigate agency costs only during political tenures. The plausible explanation may be that firms raise short-term debt to forestall/reduce a probable increase in agency costs due to political interference in corporate domain. A significant positive relationship of growth with long-term debt under military regime suggests that the owners/managers have relatively strong faith in the long-term stability of the policies of military governments and consequently they are willing to increase their long-term financial risk to finance their growth. The firms increase their ND (total) liabilities in response to their higher current profitability during political-cum-military tenures only suggesting that irrespective of the government form current profitability has a nominal role in defining corporate capital structure. Alternatively, universality of negative association between leverage proxies and past profitability suggests that irrespective of government type, Pakistani non-financial listed firms prefer retained earnings to finance their investment needs. Moreover, Pakistani firms use their liquidity to pay-off short-term debt and to raise long-term debt irrespective of the form of the government.

Contrary to the theoretical underpinnings, negative relationship of inflation with total leverage during military tenures and negative relationship with long-term leverage during political-cum-military tenures suggests that inflation hurts profitability of the firms so badly that they may not be able to fully avail the tax shield benefits of debt. Consequently, they reduce their total debt in the face of rising inflation. Conspicuously, capital formation has no role in capital structure determination during political-cum-military tenures, whereas economic growth rate has a strong role to increase long-term corporate leverage under the same regime. The latter reflects the confidence of the corporate decision makers that the dividends of economic growth initiated by this government form will continue in the long run. Apropos capital formation, the firms raise short-term debt and pay-off long-term debt during political tenures. A plausible explanation may be lesser confidence in the long-term viability of the type of capital formation carried out by the political regimes.

6. Conclusions and policy implications

We find plenty of capital structure studies carried out in developed economies and in firm-specific context. Research studies covering firm, industry, and country specific variables collectively are quite few especially for developing countries. In Pakistan, this is the first study using micro- and macro-level variables with an extended unbalanced panel data set having 13,375 firm-year observations over 39 years (1972-2010). Our study finds that although firm-specific variables do have significant impact on leverage behavior of non-financial firms listed in Pakistan; however, industry and country specific variables also have their role to play in determining leverage behavior of these firms. These firms prefer retained earnings to finance their projects and when they need debt, it is easily available to old and experienced firms. These firms follow a mix of two basic capital structure theories (TOT and POT). Further, these firms generally try to follow the leverage behavior of their respective industries irrespective of their ownership type, and government form.

However, leverage behavior of these firms varies with the ownership type, and form of the government. For example, domestic firms reduce their total debt in the wake of increase in inflation, whereas their foreign counterparts adjust the term-structure of

their debt in the same situation. Industry profitability is considered as a benchmark by domestic firms only. Further, Pakistani firms use debt to mitigate agency problems during political tenures only. Furthermore, the banks use tangibility of assets to mitigate the risks associated with the weak legal institutions, deep-rooted socio-economic collusive networks, poor mechanisms of corporate governance, and the regulatory bodies mired by political interferences. Accordingly, the policy makers (nationally and internationally) need to facilitate conducive business environment for these firms and improve corporate governance mechanism not only for these firms but also for the banks and the regulators in Pakistan as well as strengthen Pakistani legal system. These policy reforms will go a long way to develop Pakistani capital market on sound and sustainable footing. Our findings on inflation are contrary to the theoretical suggestions and observed empirical evidences. We identify excessive inflation and poor average corporate profitability as the reasons for this unique relationship. Controlling inflation in Pakistan will not only help to serve the myopic political agenda of any government but will also help to develop capital market in Pakistan.

Notes

1. Z-score $= 1.2\times$(working capital/total assets)$+1.4\times$(retained earnings/total assets)$+3.3\times$(earnings before interest and taxes/total assets)$+0.6\times$(book value of equity/book value of total liabilities)$+0.999\times$(sales/total assets).

2. www.psx.com.pk

3. To the best of our knowledge, this is the second study that uses the data set of all non-financial listed firms of Pakistan since 1972.

4. We include in our sample all non-financial firms listed at PSE and do not put any other checks to exclude firms from the analysis. Descriptive statistics in Table II shows that our sample does have considerable variations with respect to firm level variables such as firm size and firm age, etc. Accordingly, the selected sample does not face any issue of survival bias.

5. We run variation inflation factor (VIF) separately for three models ($STL_{it}, LTL_{it}, TL_{it}$) used in the study and find highest VIF of 6.03 for Z-score for TL_{it} model. Accordingly, we present VIF obtained from TL_{it} model in Table III.

6. First, we run fixed effects analysis including all the variables for three models ($STL_{it}, LTL_{ib}, TL_{it}$) separately. Second, we exclude insignificant variables and run fixed effects analysis again including only significant variables. We carry out same procedure from Tables IV to VI.

7. Reference to the family-based listed firms where domination of board by close family members is a general practice, especially in Pakistan.

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384

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