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## **CAPITAL STRUCTURE DYNAMICS AND SENSITIVITY ANALYSIS: A CASE OF DEVELOPING COUNTRY”**

### **Abstract:**

Key questions that policymakers facing today are how to mitigate the risk of global financial instability and how the firms' financial behavior to comply with different economic conditions. In this purview, this study contributes to the corporate finance literature by investigating the effects of different economic periods on financial behavior of listed companies across developing countries. By employing panel estimations over the period 2003-2011, our analysis incorporates the Global Financial Crisis (GFC) shock which appears to have affected the leverage mechanism of Pakistani listed firms. The study with specific focus on stable and crises period finds that the leverage mechanism distorted to a certain degree. Consequently, the notion of prevailing capital structure theories also become distorted whereby changes to capital structure come about because of the primary goal to survive, rather than managerial speculation. Based on sensitivity analysis, the association between firm characteristics and capital structure during both economic periods is mainly influenced by firm size, profitability, non-debt tax shield and tangibility. The sign and magnitude of coefficients clearly confirms the impact of different economic inferences on financial behavior of Pakistani listed firms across sugar and cement sectors. Taking altogether, the study evident that sectors' are unequivocally responsive to the effects of different economic periods in Pakistan. The study gained important measures that how Pakistani companies achieve financial flexibility during financial crises, and provides valuable intuitions for banking and corporate sector to develop lending and borrowing mechanism based on different economic conditions.

### **Keywords:**

Global financial crises, leverage mechanism, financial behavior

**JEL Classification:** C58, G01

## 1. Introduction

In the purview of corporate finance to maximize the value of the firms, financial managers transaction with two core responsibilities; rational investment decision making and choice of capital structure (Watson and Head, 2010). Capital structure is fertile area of corporate finance. It gives firms financial suppleness in taking up investment opportunities because; debt can be raised more quickly than either accumulation of earnings or equity financing. It is also the case that by exploiting the debt tax shields, firms may able to increase their after tax earnings (Harrison and Widjaja, 2013). In accordance with Voulgaris, Asteriou and Agriomigiankis (2004), capital structure decisions are of immense importance as they create the value of the firms. Since the theory of irrelevancy of capital structure (Modigliani and Miller, 1958), the body of literature on capital structure mainly attempted to advance the understanding of factors influencing the capital structure choice of firms (Rajan and Zingales, 1995; Baker and Wurgler, 2002). In this regard, the empirical models and methodologies employed contributed a great deal to understand how the chosen capital structure affects the firm's value. Consistent with this theoretical and empirical spat of past literature, researchers formulated the determinants of capital structure in the framework of pecking order theory, static and dynamic theory, agency cost and market timing theory.

Based on previous studies, literature to date has recognized the importance of internal and external factors which influence the firms' choice of capital structure. In the context of capital structure, a large strand of work initially remained focused on US firms. Further research glanced through international purview and highlighted similarities and certain institutional differences across other developed, emerging and developing countries. For instance, Rajan and Zingales (1995) conducted study on G-7 countries; Booth, Aivazian, Kunt and Maksimovic (2001) examined the capital structure in ten developing economies; Huang and Song (2002) conducted research on Chinese economy; Deesomsak, Paudyal and Pescetto (2004) focused on Asia Pacific region. However, the significance of different economic periods in explaining the firms' financial behavior remained untapped, particularly in developing economies. The economies of the World experienced a major crunch of financial and banking crises during first decade of 21<sup>st</sup> Century. Consistent with Kantor and Holdsworth (2010), practitioners and researchers argued that these economies are now on move to recovery; though the rate of recovery is rather slow. According to Iqbal and Kume (2013), these financing and banking crises, following the collapse of US sub-prime mortgage market, left lasting scars at both micro and macro-levels on almost all the economies of the world. For instance, a large spat of industrial and financial corporations have experiencing their market values dropping during these crises and a certain spat of them faced the financial distress and bankruptcy.

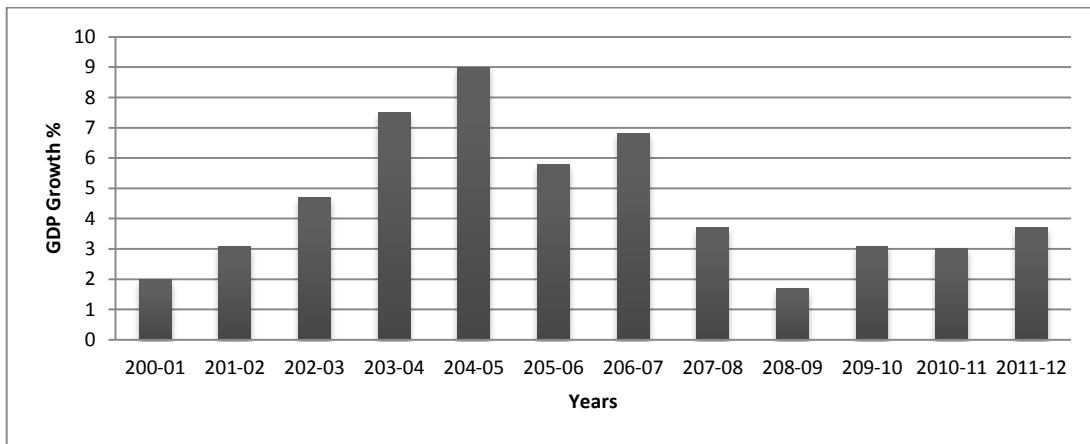
Keeping in view this Global financial and banking crises (2008), recent development in capital structure accentuated the need to investigate the impact of different economic conditions on firms' financial behavior. In this regard, a few studies looked into the impact of global or regional shocks on capital structure decisions in the context of developed market. For example, it is documented by Diamond and Rajan (2009) that markets favor capital structure that relies on long-term debt during crises period but favor capital structure that relies on short-term debt during stable economic period. Likewise, Voustsinas and Werner (2011) examined the impact of banking crises (1998) on Japanese firms. They

reported that extreme supply fluctuations have significant impact on capital structure of Japanese firms. Furthermore, they revealed that bank dependent firms learned a greater lesson during 1998 credit crunch, and as a result they experienced significant reduction in leverage levels. Claessens, Djankov and Xu (2000) found that during and after financial crises periods, many firms had weak financial structure.

Despite the importance of different economic periods in explaining the firm's financial behavior; most of extant literature on capital structure mainly remained focused on developed countries. However, a far too little attention has been paid in emerging and developing economies, particularly, there is no unequivocal evidence in developing countries in this regard. In line with these arguments, the study warrants the need to contribute to the existing body of literature by examining the sensitivity analysis of developing market. Given that the firm's value is affected by its financing and investment decisions, this study aimed at examining how different economic conditions affect the financial behavior of Pakistani listed firms across sectors. The subsequent section provides rationale behind choosing Pakistan.

In accordance with Economy Watch (2012), Pakistan is 47<sup>th</sup> largest economy of the world in nominal terms and 27<sup>th</sup> largest economy in terms of purchasing power parity. As shown by Figure 1, Pakistan economy has witnessed a remarkable growth during the mid-2000s. On average, 7% yearly GDP growth observed between periods of 2003-2007. Pakistan economy showed a remarkable double digit growth during 2000 to 2008. International Monetary Fund (2010) reported that Pakistan enjoyed relatively strong economic growth before occurrence of global financial crises. However, after the onset of global financial crises in 2008, Pakistan economy experienced major commotion in normal economic operations as result of inflated interest rate and limited access to capital. Ali and Afzal (2012) reported that these economic crises enhanced the volatility in Pakistan stock exchange and mild negative impact on stock returns. It is clearly traceable from Figure 1.1 that economy of Pakistan has enjoyed relatively strong economic growth until 2008, however, as result of these crises, the GDP growth rate reduced from 7% to 1.7% in 2008-2009 to 3.1% in 2009-2010, followed by 3% in 2010-2011 (Business Recorder, 2012).

Pakistan is bank oriented economy where companies are highly dependent on commercial banks loan (Shah and Hijazi, 2004). Since global financial crises directly affected the banking sector of the world, hence, as a result of high dependency on banking sector, the industries of Pakistan has learned a great lesson. In the light of above strand, Pakistan is best choice to investigate the impact of different economic conditions on firm's financial behavior in developing economies. Thus, the study compares capital structure of Pakistani listed firms during stable economic period (2003-2008) with that of financial crises period (2009-2011).



**Figure 1.1** GDP Growth

Source: Federal Bureau of Statistics: Govt. of Pakistan (2012)

The organization of rest of study is as follows: Section 2 deals with literature review. Section 3 outlines data and research methodology. Section 4 presents empirical discussion and findings. Section 5 concludes the study and brings into focus potential areas for future research.

## 2. Literature Review

In the perspectives of financial crises, previous studies documented that the conditions of credit supply are important factor in financing decisions of firms. Voutsinas and Werner (2011) revealed that decrease in credit supply negatively affect the leverage ratios of Japanese firms. Moreover, they observed significant reduction in leverage ratios of firms during crises period, especially the firms which heavily dependent on bank loans. In a study from Korea, Lim (2003) found that large Korean firms shifted to capital markets and left the financial intermediaries after the Korean crises. However, this was not the case for small size firms with sound profitability. Similarly, Deesomsak, Paudyal and Pescetto (2004) examined the impact of financial crises on capital structure mechanism for Asian firms. They revealed that earning volatility and tangibility appeared to be unaffected by financial crises, whereas liquidity, non-debt tax shield and firm size are significant factors which corroborated the effect of financial crises. Ahmad, Khan and Tariq (2012) argued that global economic crises have shown devastating effect on the financial and industrial sectors of Pakistan. In the purview of Turkish economy, Balsari and Kirkular (2009) examined the impact of financial crises on firms' capital structure. Their findings suggested a negative impact of financial crises on firm's leverage levels. They further noted that Turkish firms chose short-term debt to solve their liquidity issues and tend to avoid long-term debt during crises period. In addition, the results of their study traced a decrease in level of equity.

According to Ariff, Taufiq, and Shamsheer (2008), the adjustment process towards target debt is significantly slower for financially distressed firms. Keeping in view the possibility of rare economic crises, firms tend to be more conservative in their financial policy (Bhamra, Kuehn and Strebulaey, 2011). In the context of dynamic framework, Campello, Graham and Harvey (2010) conducted a survey to investigate the real effect of financial crises. Their findings revealed that firms in financial crunch tend to use internally generated funds and

attempts to obtain bank credit in anticipation on restricted access to capital in the future. According to Harrison and Widjaja (2013), recent financial crises provided researchers with opportunity to investigate the impact of financial shocks on capital structure. However, the empirical evidence on the impact of financial crises on capital structure is very limited, especially in developing countries.

Recently, Pattani and Vera (2011) argued that as the economic outlook deteriorated, UK firms reduced both their demand for loans and investments. As compared to developing economies, the level of debt market development is higher in developed countries. This is why; UK public firms increased the use of public debt market during 2008-2009 (Pattani and Vera, 2011). Similarly, Fosberg (2012) reported that global equity issuance decreased during 2007-2008. By employing data from Wall Street Journal, the findings of his study ascertained that issuance of debt and equity ratio increased in 2008 and a gradual decrease was traceable after onset of financial crises.

There has been pronounced confirmation that the amount of credit channeled to non-financial intermediaries in the wake of Global financial crises 2008 has declined in those economies heavily affected by these crises. However, there has not been considerable spat of evidence that financial crises triggered substantial changes in capital structure choice of firms. Kayo and Kimura (2011) argued that firm-level factors and efforts to time the market still remained the strong factors as growing outcome of optimal capital structure. From the perspectives of another strand, Campello, Graham and Harvey (2010) augmented the consequences of financial crises. They argued that severe financial crises results in firms' financial constraint and consequently, these firms experience quantity constraints (credit rationing) in the capital market and also the challenges of high borrowing costs and problems in renewing or opening new credit extension. Moreover, due to difficulties in raising internal capital and limited access to raise external financing, these financial crunched firms would even forego investment opportunities with positive net present values. Likewise, the market conditions react differently to financial structure of the firms. In general, market conditions before outbreak of financial crises tend to be more advantageous than during and after financial crises (Doukas, Guo and Zhou, 2011). Based on past literature, favorable capital market conditions strengthen the employment of debt financing. Doukas et al. (2011) reported the contradictory mechanism of trade-off theory with financial behavior of financially constrained firms. They argued that trade-off theory cannot explain the financial behavior of firms during different economic conditions.

In the light of above strand of literature, the evidence from developed and emerging economies revealed that impact of global financial crises varied widely across countries, and even across firms within a country (Mittoo and Bancel, 2011; Zarbeski and Dimovski, 2012). The evidence also suggests that these cross-sectional differences provide unique sample to examine that how different economic periods affect the firm's financial structure. As the impact of global financial crises is directly connected with each country's institutional financial settings, therefore, this study looks into the sensitivity analysis to investigate how different economic conditions affect the financial behavior of firms across developing economies, particularly Pakistan. Consistent with past studies, the consequent section deals with significant firms level factors which have the power to influence the firm's choice of capital structure.

In line with previous studies, the theoretical and empirical literature has addressed the issues of capital structure from various perspectives and has advanced the understanding of firms' financial behavior. Consistent with past literature, the mechanism of capital structure mainly controlled by firm-level characteristics. For instance, most commonly cited factors include, firm size, profitability, liquidity, tangibility, non-debt tax shield, growth opportunities and business risk. The consequent section provides spat of significance of firm level factors in explaining the firm's financial behavior in the light of empirical evidences from past literature.

According to Claessens, Djankov and Xu (2000), different economic conditions affect the financial behavior of firms differently. The firms experience different economic stages; as a result the mechanism of capital structure may change during different economic conditions. In the context of firm size, Suto (2003) explained a positive relationship between leverage and size of the firm. He explained that there exists close relationship between lenders and borrowers through firm size. As a major player of capital market, commercial banks underwrite most of corporate bonds that are issued by large Malaysian firms during financial crises (Suto, 2003). Likewise, similar significant results were obtained by Deesomask et al. (2004) after financial crises period. They traced that in order to reduce default risk, lenders become more reluctant to issue funds to large size firms during financial crises periods. In conjunction with tangibility, the rational that triggers this factor is, it is easy to collateralize tangible assets and they reduce debt related agency costs (Rajan and Zingales, 1995). Consistent with trade-off theory, firms with greater level of tangibility tend to have larger capacity for debt. Consistent with findings from past literature, a substantial amount of literature have found a positive relationship between tangibility and leverage of the firm (Rajan and Zingales, 1995; Frazer, Zhang and Derashid, 2006).

It is generally accepted that firms with high growth, usually with greater financing needs, will end up with high leverage. In the context of financial crises, the utilization of leverage is more during stable economic periods as compared to instable economic periods (Pandey, 2001). Zarbeski and Dimovski (2012) found that during economic crises, growth opportunities have positive relationship with gearing levels. Consistent with past literature, non-debt tax shield also plays important role in determination of firm's leverage. When cost of financial distress increases during economic crises periods, firms tend to find alternative ways to minimize their tax burden (Deesomsak et al., 2004). DeAngelo and Masulis (1980) argued that non-debt tax shield and leverage is negatively related during crises period. However, Suto (2003) argued as the economy stabilizes, non-debt tax shield becomes irrelevant to determine financing choice of firms.

Generally, the probability of default increases with the increase in firm's earning volatility. In this regard, Suto (2003) concentrated on the relationship between earning volatility and leverage. His study revealed that risk tends to be significant variable during both economic periods (stable and crises period). Consequently, Deesomsak et al. (2004) argued that if the consequences of liquidation are low, firms might ignore earnings volatility. In line with large strand of past literature, most of studies have witnessed inverse relationship between leverage and business risk. In relation to liquidity, Mazur (2007) argued that liquidity is most important factor in explaining the variations in capital structure. Creditors consider liquidity as important measure of firm's ability to meet its short-term obligations. Bris and Koskinen (2002) argued that liquidity risk among firms was more

apparent during economic downturn. Likewise, Deesomsak et al. (2004) found that liquidity is more significant and negatively related to leverage during crises period. It reveals that during economic crises period, firms tend to more concentrate on liquid assets for investment purpose. Consistent with findings from past work, most of the studies reported negative association between leverage and liquidity.

In relation to firm's profitability, the pecking order theory (Myers and Majluf, 1984) implies negative relationship between profitability and capital structure. It reveals that profitable firms tend to employ internally accumulated funds than external financing. On the other hand, static trade-off theory (Myers, 1977) reveals that firms with greater profitability level are likely to have higher tax burden and low bankruptcy cost, which provide them obstinate reason to employ more leverage. It is also the case because profitable firms have greater capability to debt tolerance, since they are in position to timely service their debt as compared to firms with lower profitability level. Evidence from Gordon (1961) cited by Myers (1977) suggests; when raising capital, firms first prefer retained earnings, then debt and issue new equity in the last resort. He further added that such behavior of firms may be due to the costs associated with issuing new equity. These costs can be transactions costs associated with new equity issuance or can be arise because of asymmetric information. According to Titman and Wessels (1998), whichever is the case, current retained profit or past profitability of the firm plays important role in leverage determinations.

Few studies also reported operating leverage as important driver of company's capital structure. According to Garrison and Noreen (2003), operating leverage is the degree of response of earnings to changes in sales revenue. Damodaran (2001) argued that firms' with greater level of operating leverage will tend to have greater variability in operating income. Baral (2004) found that higher level of operating leverage increases the potential danger from forecasting risk. In context of operating leverage, both agency cost and bankruptcy theory contends negative relationship between operating leverage and debt level of firm's capital structure.

### **3. Data and Research Methodology**

**3.1 Data.** This study is based on Pakistani sugar and cement sector consisting of 315 and 171 firm years respectively. The data for variables obtained from Karachi Stock Exchange (KSE) and State Bank of Pakistan (SPB). Keeping in view the sensitivity analysis, the data is partitioned into pre-financial crises period (2003-2008) and during financial crises period (2009-2011). In order to ensure the accuracy and quality of variables measurement, the data is in the form of audited financial statements and financial reports of sugar and cement sector companies for the period of 9 years (2003-2011). Consistent with Ariff et al. (2008), for independent auditing, the financials of every company comply with the requirement of each country's security commission. The study is based on balanced panel dataset. Firms with 9 consecutive observations towards the end of span of study included in the dataset (Deesomsak et al. 2009). The study excluded the firms for which complete data is not available. Furthermore, firms which are delisted by KSE and those which are in the process of merger and acquisitions are also excluded.

**3.2 Formulation of Variables.** The choice of leverage measurement is crucial because several definitions of leverage are used in previous studies. It is also the case that different

measures of leverage produce different results. Based on past literature, different types of debt with a variety of its definitions have been described by researchers, which mainly focused either on book value or market value measurement. The previous studies indicated that different capital structure theories have different implications on different types of debt across developed, emerging and developing countries (Titman and Wessels, 1988; Booth et al., 2001; Pandey, 2001; Abor, 2008). Consistent with previous studies, in order to have greater insights into the financial behavior of firms across sectors during different economic conditions; the present study based on book value of debt, employed three dependent variables, such as, short term, long term, and total debt. Likewise, the choice of independent variables is based on extensive literature review. Eight firm-level factors are characterized as independent variables which have the tendency to influence the financial behavior of firms. The choice of predictors employed extracted from previous studies. Table 1 shows the summary of independent and dependent variables along with their measurement.

**Table 1:** Formulation of Independent and Dependent Variables

<b>Independent Variables</b>	<b>Formulation</b>	<b>Empirical Evidence</b>
Profitability	Earnings before interest and taxes/total assets	Titman and Wessels (1989), Rajan and Zingales (1995), Abor (2008), Forsberg (2010), Kayo and Kimura (2011).
Size	Natural logarithm of Total Assets	Titman and Wessels (1988), Rajan and Zingales (1995), Booth et al. (2001)
Tangibility	Fixed assets/total assets	Rajan and Zingales (1995), Booth et al. (2001), Pandey (2001), Kayo and Kimura (2011).
Growth Opportunities	Annual % Change in Total Assets	Song (2005), Titman and Wessel (1989), Baral (2004), Sayilgan, Karabacak, and Kucukkocaoglu (2006).
Liquidity	Current Assets divided by Current Liabilities	Deesomask (2004), Mazur (2007)
Non-Debt Tax Shield	Annual Depreciation to Total Assets	Titman and Wessels (1989), Song (2005), Forsberg (2010)
Business Risk	Co-efficient of Variation in Profit before Interest and Tax	Baral (2004), Kim et al. (2007), Abor (2008), Psillaki and Daskalakis (2008)
Operating Leverage	% change in earnings before interest and tax as proportion of percentage change in sales	Garrison and Noreen (2003), Baral (2004), Lima (2009), Mohapatra (2012), Ahmed (2012)
<b>Dependent Variables</b>	<b>Formulation</b>	<b>Empirical Evidence</b>
Short-Term Debt	Short- term debt divided by total assets	Titman and Wessels (1988), Booth et al. (2001), Feidakis and Rovolis (2007)



Long-Term Debt	Long-term debt divided by Total Assets	Titman and Wessels (1988), Rajan and Zingales (1995), Booth et al. (2001)
Total Debt	Total debt divided by total Assets	Rajan and Zingales (1995), Booth et al. (2001), Hijazi and Shah (2004)

**3.3 Specification of Model.** In line with principal idea to investigate the effect of different economic periods on firm's financial behavior across sectors, the study estimated panel data estimator, which has the feature of cross-sectional and time series analysis. For sensitivity analysis, the study mainly employed two estimators- Ordinary Least Squares (OLS) regression and Fixed Effect Model. Consistent with Baltagi (2005), the panel data analysis distinguishes this model from cross-sectional or times series analysis by double cover on its variables. Firstly, it represents cross-sectional units that is, firm level factors and secondly, it signifies the time. The rationale behind the using of OLS regression is, it ignores the individual and time effect and minimizes the error between estimated and actual observed points on the line (Hill et al., 2008). Fixed effect model is employed in order to include the unobserved firm specific and individual invariant time effects in the analysis (Mundlak, 1961; Nguyen, Rainey and Gregoriou, 2012). Fixed effect method allows control for unobserved heterogeneity (Mundlak, 1961).

The equation (3.1) and (3.2) assesses the sensitivity mechanism between firm's financial behavior and firm-level factors.

$$LG_{it} = \beta_0 + \beta_1(SIZE)_{it} + \beta_2(PROFIT)_{it} + \beta_3(LIQ)_{it} + \beta_4(TANG)_{it} + \beta_5(GROWTH)_{it} + \beta_6(NDTS)_{it} + \beta_7(RISK)_{it} + \beta_8(OL)_{it} + \varepsilon_{it} \quad (3.1)$$

$$LG_{it} = \beta_0 + \beta_1(SIZE)_{it} + \beta_2(PROFIT)_{it} + \beta_3(LIQ)_{it} + \beta_4(TANG)_{it} + \beta_5(GROWTH)_{it} + \beta_6(NDTS)_{it} + \beta_7(RISK)_{it} + \beta_8(OL)_{it} + \mu_i + \varepsilon_{it} \quad (3.2)$$

where  $LG_{it}$  is debt ratio of firm  $i$  in time  $t$ . The firm characteristics are firm size, profitability, liquidity, tangibility, growth, non-debt tax shield, business risk and operating leverage. The firm fixed effect is denoted as  $\mu_i$  and disturbance term is signified as  $\varepsilon_{it}$ .

#### 4. Empirical Analysis

Based on Table 2, for sugar sector firms, the positive impact of tangibility shows that the collateral aspect of tangible assets is central for determination of leverage. The sugar sector firms tend to increase their short term leverage during crises period and long-term leverage as their level of tangibility increases. However, in case of long-term debt, the statistical relationship is more significant during stable economic period. This is consistent with findings from past literature (Frank and Goyal, 2009; Kayo and Kimura, 2011). Notably, the mechanism of tangibility and leverage is same across long-term and total debt; however, it differs during sub economic periods in case of short-term debt. Liquidity has negative impact on leverage which is consistent with Nguyen et al. (2012). Subliminally,

lending institutions regard liquidity as strong indicator of firm's capability to payback their short-term obligations. Sugar sector firms seem to have good liquidity position as they tend to use accumulated cash and liquid assets rather to employ external source of short-term financing.

The profitability has highly significantly positive impact on both short-term and total-term debt during financial crises period. It shows that during financial crises period, sugar sector firms tend to employ more debt in order to avoid any possible financial constraint. Based on past literature, the prediction about the relationship between leverage and profitability is not consistent. In accordance with trade-off theory, profitable firms should employ more debt as they need to shield their income from tax. On the other hand, pecking order theory predicts inverse relationship between profitability and leverage. However, despite this theoretical dispute, the findings in hand support the pertinence of trade off theory to sugar sector during economic crises period.

Surprisingly, non-debt tax shield is highly sensitive and positively associated to short-term and total debt during both economic periods. It supports the findings of Bradley, Jarrell and Kim (1984) when the non-debt tax shield increases, firms tend to increase leverage. This study employed annual depreciation as a measure to this variable which assesses the securability of the fixed assets of firms that intends the firms to employ higher level of leverage. The effect of financial crises is evidently observable on the relationship between leverage and growth opportunity. Although the effect is minimal, the sugar sector firms tend to be negatively reacted to leverage during financial crises period across all types of debt. The analysis further reveals that the behavior of total debt of sugar sector is tightly controlled by the behavior of short-term debt.

**Table 2: Sugar Sector Sensitivity Analysis**

DEP. VAR	IND.VAR	Stable Economic Period	Economic Crises Period	Stable Economic Period	Economic Crises Period
		2003-2008 (Sugar Sector)	2009-2011 (Sugar Sector)	2003-2008 (Sugar Sector)	2009-2011 (Sugar Sector)
		OLS	OLS	Fixed Effect	Fixed Effect
STD	Size	-0.302 (-7.78)***	-0.217 (-7.94)***	-0.326 (-8.09)***	-0.243 (-7.37)***
	Profit	-0.009 (-2.65)***	0.005 (3.51)***	-0.006 (-1.70)*	0.007 (3.74)***
	LIQ	-0.097 (-5.26)***	-0.045 (-7.63)***	-0.089 (-4.58)***	-0.053 (-7.45)***
	TANG	-0.256 (-1.37)	0.299 (2.16)**	-0.379 (-1.92)*	0.133 (0.79)
	GROWTH	-0.017 (-0.38)	-0.025 (-0.93)	0.010 (0.21)	-0.017 (-0.49)
	NDS	0.141 (5.42)***	0.005 (3.62)***	0.151 (5.54)***	0.007 (3.76)***
	BR	0.011 (0.31)	0.015 (0.50)	0.009 (0.24)	0.007 (1.14)
	OL	0.008 (0.32)	-0.018 (-0.79)	0.023 (0.79)	-0.042 (-0.77)
	R-sq	0.41	0.62	0.52	0.75
	F-Stat	17.63	20.1	4.46	4.62
	Obs.	210	105	210	105
LTD	Size	-0.866 (-23.29)***	-0.918 (-21.02)***	-0.858 (-21.47)***	-0.901 (-17.21)***
	Profit	0.004 (1.28)	0.003 (1.31)	0.004 (1.14)	0.004 (1.46)
	LIQ	-0.102 (-5.83)***	-0.126 (-13.28)***	-0.103 (-5.36)***	-0.119 (-10.47)***
	TANG	0.438 (2.45)**	0.288 (1.30)	0.439 (2.25)**	0.331 (1.24)
	GROWTH	0.028 (0.63)	-0.022 (-0.51)	0.028 (0.57)	-0.001 (-0.02)
	NDS	-0.008 (-0.34)	4.865 (0.18)	-0.004 (-0.18)	0.001 (0.45)
	BR	-0.034 (-1.01)	-0.068 (-1.43)	-0.034 (-0.92)	-0.104 (-1.79)*
	OL	0.009 (0.35)	0.054 (1.44)	-0.004 (-0.13)	0.069 (1.42)
	R-sq	0.81	0.87	0.84	0.92
	F-Stat	110.7	86.16	21.09	17.4
	Obs.	210	105	210	105
TD	Size	-1.169 (-22.67)***	-1.135 (-20.40)***	-0.184 (-21.48)***	-1.145 (-16.33)***
	Profit	-0.004 (-1.06)	0.008 (2.75)***	-0.002 (-0.42)	0.011 (2.86)***
	LIQ	-0.201 (-8.18)***	-0.171 (-14.17)***	-0.192 (-7.24)***	-0.172 (-11.33)***
	TANG	0.182 (0.73)	0.587 (2.08)**	0.061 (0.22)	0.464 (1.30)
	GROWTH	0.010 (0.16)	-0.048 (-0.86)	0.039 (0.57)	-0.018 (-0.25)
	NDS	0.132 (3.84)***	0.006 (1.92)*	0.145 (3.92)***	0.009 (2.11)**
	BR	-0.023 (-0.49)	-0.053 (-0.87)	-0.025 (-0.48)	-0.062 (-0.79)
	OL	0.017 (0.49)	0.035 (0.74)	0.019 (0.48)	0.045 (0.69)
	R-sq	0.79	0.87	0.82	0.91
	F-Stat	99.8	86.25	19.2	15.6
	Obs.	210	105	210	105

Table 3 presents the cement sector sensitivity analysis based on non-financial crises period and financial crises period. The mechanism between firm size and leverage changed during the financial crises period, as the cement sector firms started to increase their consumption of leverage. Since, in determination of leverage, the relationship between firm size and leverage reflects the effects of both financial distress and asymmetrical information cost; therefore, from this perspective, it is observable that large size cement firms are less informationally opaque and less risky. Hence, to meet their financial needs, they increased their debt financing during unfavorable economic conditions. The pertinence of liquidity across cement firms is only significant to long-term debt during stable economic period. This result supports the findings of Nguyen et al. (2012). However, there is no statistically significant relationship between liquidity and short-term debt. It may be attributed to the reason that lending institutions usually give more importance to tangibility than liquidity during the course of debt financing, especially in economic crises period. In case of short-term debt, strong impact of tangibility is traceable during both sub-periods. However, this impact is restricted to non-financial crises period only in case of long-term debt because during economic crises conditions, tangibility is insignificantly associated to long-term debt. A similar situation is perceptible between tangibility and total debt. Looking into the effect of sub economic periods, these findings

are consistent with the studies from developed, emerging and developing countries during pre-financing crises period (Rajan and Zingales, 1995; Frank and Goyal, 2003; Kayo and Kimura, 2011). It reveals that when negotiating borrowing, tangibility becomes very important driver of leverage for cement firms.

**Table 3: Cement Sector Sensitivity Analysis**

DEP. VAR	IND.VAR	Stable Economic Period	Economic Crises Period	Stable Economic Period	Economic Crises Period	
		2003-2008	2009-2011	2003-2008	2009-2011	
		(Cement Sector)	(Cement Sector)	(Cement Sector)	(Cement Sector)	
		OLS	OLS	Fixed Effect	Fixed Effect	
STD	Size	-0.104 (-6.89)***	0.001 (0.08)*	-0.107 (-6.23)***	0.010 (0.57)*	
	ROA	-0.008 (-3.97)***	-0.009 (-4.21)***	-0.009 (-3.99)***	-0.008 (-2.82)***	
	LIQ	-0.026 (-0.65)	-0.058 (-1.28)	-0.016 (-0.37)	-0.057 (-1.11)	
	TANG	0.416 (7.26)***	0.345 (2.09)**	0.425 (6.40)***	0.382 (1.84)*	
	GROWTH	0.057 (1.79)*	0.010 (0.55)	0.067 (1.84)*	0.020 (0.84)	
	NDS	0.055 (4.27)***	0.060 (3.93)***	0.051 (3.53)***	0.052 (2.74)**	
	BR	-0.031 (-1.29)	-0.020 (-1.23)	-0.026 (-0.96)	-0.021 (-1.08)	
	OL	0.015 (0.73)	0.008 (0.62)	0.004 (0.20)	0.020 (1.04)	
	R-sq	0.63	0.67	0.67	0.76	
	F-Stat	22.62	12.26	6.97	3.82	
	Obs.	114	57	114	57	
	LTD	Size	0.010 (0.88)	0.011(0.76)**	0.037 (0.63)	0.003 (0.18)*
		ROA	-0.003 (-1.85)*	-0.002 (-1.04)	-0.008 (-1.85)*	-0.001 (-0.41)
		LIQ	0.076 (2.32)**	-0.014 (-0.27)	0.003 (2.22)**	-0.036 (-0.66)
TANG		0.124 (2.74)***	-0.056 (-0.28)	0.077 (2.51)**	-0.278 (-1.27)	
GROWTH		-0.009 (-0.36)	0.025 (1.12)	0.133 (0.17)	0.042 (1.66)	
NDS		-0.023 (-2.28)**	-0.061 (-3.33)***	-0.005 (-1.92)*	-0.059 (-2.97)***	
BR		0.005 (0.26)	0.006 (0.33)	-0.022 (-0.03)	0.005 (0.28)	
OL		-0.016 (-0.97)	-0.009 (-0.60)	-0.012 (-0.62)	-0.002 (-0.14)	
R-sq		114	0.35	0.31	0.64	
F-Stat		0.25	3.36	1.57	2.13	
Obs.		114	57	114	57	
TD		Size	-0.094 (-5.38)***	0.010 (0.61)*	-0.098 (-4.91)***	0.013 (0.68)**
		ROA	-0.011 (-4.71)***	-0.012 (-4.06)***	-0.012 (-4.72)***	-0.009 (-2.89)***
		LIQ	0.049 (1.02)	-0.073 (-1.19)	0.061 (1.20)	-0.093 (-2.89)
	TANG	0.540 (8.18)***	0.288 (1.29)	0.559 (7.23)***	0.104 (0.44)	
	GROWTH	0.048 (1.30)	0.035 (1.41)	0.072 (1.70)	0.062 (2.30)	
	NDS	0.032 (2.14)**	-0.009 (-0.04)	0.029 (1.71)*	-0.007 (-0.35)	
	BR	-0.026 (-0.93)	-0.013 (-0.61)	-0.027 (-0.85)	-0.015 (-0.69)	
	OL	-0.006 (-0.02)	-0.001 (-0.07)	-0.007 (-0.25)	0.017 (0.79)	
	R-sq	0.61	0.58	0.65	0.79	
	F-Stat	20.8	8.35	6.27	4.43	
	Obs.	114	57	114	57	

On the other hand during crises period, tangibility reacted negatively and insignificantly to long-term debt which is consistent with Sayligan et al. (2006). Based on past literature, this inverse relationship between tangibility and leverage observed is not in line with the findings of many previous studies. For cement sector during crises period, these results also contradicts the expectations of trade-off theory that tangible assets serves as collateral for borrowing. The possible reason may be high lending interest rate during financial crises period and it may also be the reason that lenders become reluctant to supply loan during unfavorable economic conditions. The influence of profitability on leverage (i.e., short-term and long-term debt) is strongly negative during both economic periods, which strongly confirms the pertinence of pecking order theory. This could be attributed the fact that during stable economic period, cement firms gained greater level of profit which enabled them to rely on internally generated funds during crises period. This argument further supports the pecking order theory. The inverse relation of tangibility with

leverage further supports these findings. The relationship between non-debt tax shield and total debt diverges across pre financial and financial crises period. During crises period, cement sector decreases their total debt. However, in line with short-term and long-term debt, this variable maintained significantly same relationship with leverage across both periods. Consistent with sugar sector sensitivity analysis, earning volatility (business risk) and operating leverage maintained similar (insignificant) relationship with all types of leverage during stable and unsteady economic conditions. Based on above analyses, the effect of different economic conditions is clearly observable across sectors from the inconsistency of relationships between leverage and firm-level factors during two different economic periods. Furthermore, the sectoral behavioral effect is also traceable which may not be discernible in overall sample analysis. The findings as a whole report that sectors markedly responsive to different economic conditions. From overall purview, the sensitivity analysis corroborates the orientation of different economic period's effect on financial behavior of firms across sectors in Pakistan. The findings reveals that the leverage mechanism is highly dependent on economic conditions of the country as most of the Pakistani listed firms across both sectors are reacted differently to both economic sub-periods. It is clearly observable that firms operating under different sectors environments have different magnitude towards financial mechanism.

## 5. Conclusion

Basing on the results of sensitivity analysis of the model, the study gained important insights that how the financial behavior of Pakistani listed firm changed while coping with stable and crises periods. The results indicate that most of Pakistani listed firms are highly responsive to different economic conditions. It is clearly noticeable that degree of influence and mechanism between leverage and firm-level factors changes as the firms operate in different economic periods. In the view of above strand of discussion, the association between firm characteristics and capital structure during both economic periods is mainly influenced by firm size, profitability, liquidity, non-debt tax shield and tangibility. The magnitude and different sign of coefficients clearly confirms the impact of different economic inferences on financial behavior of Pakistani firms across sectors. These findings validate the enquiry which refers the effects of different economic periods vary across and within sectors. Moreover, the study finds mixed support for prevailing capital structure theories. Taking altogether, the study evident that sectors' are unequivocally responsive to the effects of different economic periods in Pakistan.

In the light of global financial crises, the outcome of the study adds to existing body of literature by investigating the financial behavior of companies during different economic stages. Notably, the influence of leverage determinants becomes markedly substantial during crises period. The present study provides valuable insights for banking and corporate sector, mainly in Pakistan. The companies could take into consideration the significance of external environment in explaining the orientation of their financial behavior. Likewise, the borrowing and lending procedures could be advanced by complying with different economic conditions. Furthermore, the findings of this research provide obstinate grounds for future research. As more data become available, we would extend this study to investigate the sectoral analysis to find how different economic conditions bring distinctive impact on the financial structure of each sector. In addition, sector-level and macro-economic factors could be incorporated to ascertain more insightful analysis.

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