Impact of macroeconomic factors and firm heterogeneity on the capital structure adjustment speed

Researcher:
Ms. Rameeza Andleeb
Reg. No. 225-FMS/MSFIN/F12

Supervisor:
Dr. Arshad Hassan
HOD, MAJU

Faculty of Management Sciences
INTERNATIONAL ISLAMIC UNIVERSITY, ISLAMABAD

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Ms. Rameeza Andleeb
Reg # 225-FMS/MSFIN/F12

A thesis submitted in partial fulfillment of the requirements for
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Islamabad

Supervisor
Dr. Arshad Hassan

In the name of Allah, the most merciful and beneficent

DEDICATION

I dedicate this thesis to my parents and my supervisor whose support has enabled me

to complete this research study successfully.

(Acceptance by the Viva Voice Committee)

Title of Thesis: "Impact of Macroeconomic Factors and Firm Heterogeneity on the Capital Structure Adjustment Speed."

Name of Student: Ms. Rameeza Andleeb

Registration No: 225-FMS/MSFIN/F12

Accepted by the Faculty of Management Sciences INTERNATIONAL ISLAMIC UNIVERSITY ISLAMABAD, in partial fulfillment of the requirements for the Master of Science/Philosophy Degree in Management Sciences with specialization in Finance.

Viva Voce Committee

Dr. Arshad Hassan
(Supervisor)

Prof. Dr. Muhammad Afzal
(External Examiner)

Ms. Sumayya Chughtai
(Internal Examiner)

(Chairman HS & R)

(Dean)

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ABSTRACT

This study examines the impact of macroeconomic factors and firm heterogeneity on the capital structure adjustment speed toward target leverage. The panel regression is used to study for a panel of 100 non financial Pakistani firms listed on KSE for the period of 2000-2012. The adjustment speed toward target leverage is a function of macroeconomic conditions and firm characteristics. This study results suggest that Pakistani firm adjust toward target level using both total and long term leverage. Macroeconomic factors and firm characteristics play a significant role on the capital structure adjustment speed toward target leverage. More over this study explores the comparison of capital structure adjustment speed between good and bad states; an interaction term included by the product of dummy variable of GDP and lagged leverage. The interaction term coefficient of lagged leverage and good state is significant and negative, which supports that adjustment speed is faster in good states. For the evaluation of capital structure adjustment speed for high levered and low levered firms, an interaction term included by the product of dummy variable of high levered and lagged leverage. The interaction term coefficient of lagged leverage and high levered is significant and negative, which supports that adjustment speed is faster for high levered companies. The coefficient of low levered is significant and positive which proves that adjustment speed is lower in bad states.

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DECLARATION

I hereby declare that this thesis, neither as a whole nor as a part thereof, has been copied out from any source. It is further declared that I have prepared this thesis entirely on the basis of my personal effort made under the sincere guidance of my supervisor and colleagues. No portion of work, presented in this thesis has been submitted in support of any application for any degree or qualification of this or any other university or institute of learning.

Ms. Rameeza Andleeb

MS (Finance)

Faculty of Management Sciences

APPRECIATION AND GRATITUDE

No words of gratitude will ever be sufficient for the Allah Almighty who made me capable of learning, blessed me with the knowledge & intellect and facilitated me with the finest of the mentors all through my academic years.

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Ms. Rameeza Andleeb

FORWARDING SHEET

The thesis entitled "Impact of macroeconomic factors and firm heterogeneity on the capital structure adjustment speed" submitted by Ms. Rameeza Andleeb as partial fulfillment of M.S degree in Management Sciences with specialization in Finance, has completed under my guidance and supervision. After receiving two reports from foreign evaluators, requried chagnes have been incorporated. The changes advised by the external and the internal examiners hava also been incorporated. I am satisfied with the quality of student's research work and allow her to submit this thesis for further process as per IIU rules & regulations.

Date: 10/5/2015

Signature:

Name : Dr. Arshad Hassan

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CHAPTER # 1

INTRODUCTION

1.1 Theoretical background

Capital structure choice is one of the most decisive concepts of financial managers and it is complex to implement in order to attain maximum value. Capital is generally required for firms to support or expand their business. Financial structure comprises of debt and equity mix that is maintained by firm. To finance their business, firms can exploit either debt or equity. Usually firms use mixture of both equity and debt. The combination of both equity and debt is called the capital structure. The main concern for financial managers is to select the optimal combination of debt and equity. This combination can vary from firm to firm due to firm specific characteristics. However, optimal financial structure refers to the set of combination of debt and equity that will maximize the value of firm therefore, decisions regarding such mix is quite challenging for financial mangers (Sheikh and Wang, 2010). When firms make decision about capital structures, following factors are considered: asset structure, taxes, market conditions, profitability, sales stability, growth rates and control issues.

In capital structure domain, Miller and Modigliani conducted the first scientific study in 1958. The capital structure concept received more attention after the publication of said work of Modigliani and Miller. This study concluded that the choice of equity and debt do not have any material effect on firm's value. This study is based on some specific assumptions such as zero taxes, no bankruptcy cost in the economy etc. Indeed this

proposition holds when capital markets are perfect. Frictionless markets are perfect markets and there are no bankruptcy and transaction costs. When imperfections are considered in the markets then value of the firm depends upon the capital structure.

In 1963, in the second article, corporate taxes are considered and it was concluded that firm's value increases as debt increases due to deductibility of tax. Trade off theory suggests that optimal level of financial structure can be determined by making a trade-off between cost of financial distress and the benefit of tax shield. As interest payments are tax deductible therefore, firms may employ more debt but it can increase the probability of firm's default and then cost of bankruptcy (Akinlo 2011). Due to the fact, profitable firms employ more debt to enjoy tax benefit because there is less chances of their bankruptcy (Ibrahim, 2011).A study conducted by Harvey and Graham (2001) shows that 81% of firms select their target level of leverage while country making decision about capital structure.

On the contrary, Myers and Majluf (1984) presented the pecking order theory and proposed that capital structure is determined through aspiration of firms. It refers that insiders of firm know more about the company's risk, prospects and value than outsiders therefore, mangers prefer to finance their new projects by utilizing their internally generated funds. After the utilization of retained earnings, then firm prefers debt financing and then equity financing because equity financing involved more cost of information than debt financing. According to this theory, there exist no pre-defined target debt ratio and debt ratio basically reflects the past profitability of the firm and the investment opportunities (Ibrahim 2011, Chen and Hammes 1997, Vivani 2008, Sheikh & Wang 2010).

Another theory of financial structure is agency cost theory which was pioneered by Berle and Means in 1932. Agency costs, basically take place when there exists a conflict between management and shareholders or between equity investors and debt holders. Conflict here refers to the conflict between the interests of both parties. Basically manager works as an agent of shareholders therefore they build an agent- principal relationship. Conflict will arise when managers keeping their interest prime, waste resources of firm or does not make any effort to increase the value of firm. In this regard, debt financing will force manager to reduce their efforts of wasting resources and to give payouts to shareholders as it reduces free cash flow (Jensen, 1986). In this way, debt financing will force the managers to increase their efficiency which will lead the mangers towards personal growth such as promotions or other incentives. In this way, powers of managers will also increase by increase in resources under their control. Thus, increase in debt will create such a mechanism that will align the managerial incentives with the shareholders benefits, i.e. distribution of free cash flow among shareholders (Akinlo 2011, Chen & Hammes, 1997, Boodhoo, 2009). In short, there exist many theories keeping different perspective into consideration, and every firm follows a theory that suits their perspective.

The Market timing or (windows of opportunity) theory of capital structure demonstrates that corporate executive issue securities when the cost of equity is low otherwise they prefer debt issuance (Huang & Ritter, 2009). Whether the investor is rational or irrational, issuance of securities depends on relative cost of equity and debt. It also has an important effect on capital structure choice because capital structure at time t depends on the past period issuance decision. Capital structure choices have significant importance

for the investor. It does not have any relation with the rational or irrational attitude of the investor. Market timing theory also argues that when the cost of equity is low firms' preference is to use equity financing otherwise it uses debt financing. The stock prices affect the capital structure decision of the investor.

The trade off, pecking order, market timing and the agency cost are three paramount theories of capital structure. The pecking order, market timing and agency cost theories of capital structure entails that managers do not make any effort to adjust leverage because they perceive there have no pre- defined target debt ratio therefore this study based on trade off theory. In contrast trade off theory maintains that market friction develop a relationship between firm value and leverage and have a target debt ratio therefore firms take immediate actions in order to approach their target level of leverage. The speed of adjustment to target their level of leverage depends on the cost of adjustment. The trade off theory implies that when adjustment costs are zero then firms automatically adjust their target level of leverage. However, if adjustment costs are so high then firms should not make any movement toward their target level of leverage (Wurlger and Baker, 2002). Therefore this study based on the trade off theory. According to this theory debt provides an advantage at a specific level. Above this level, debt cost increases so firms should select an optimal level for their leverage. So firms choose a specific level of leverage to operate as pointed out by Harvey and Graham (2001). Firms target a specific level of leverage and adjust their leverage to maintain secure immediacy to a specific target level of leverage (Frank and Goyal, 2009).

Pindado and De Miguel (2001) estimated a dynamic target adjustment model and documented a lower cost of adjustment. Dynamic capital structure model of choice in the

presence of adjustment cost propose by Fischer et al. (1989). The Theory of dynamic capital structure predicts that firms can diverge from their target level of leverage systematically, even though capital structure selection based on trade off theory. Adjustment costs will simply consist of transaction cost for issuance of securities, and implicit cost which is the opportunity cost of deviating from their target level of leverage. So it is expected that cost of adjustments have firm specific component and it is also expected that adjustment speeds are heterogeneous across firms. According to these, Myers argues that "Theories are conditional, not general," and Goyal and Frank (2009) conclude that theories of capital structure "work better in some conditions than in others". Many studies have reported a significant relationship between these two phenomena's. For instance, Harris and Jalilvand (1984) demonstrate that the speed of adjustment toward target capital structure directly attributed to macroeconomic conditions. Similarly Levy and Korajczky (2003) studied the effect of macroeconomic conditions on financially unconstrained and constrained firms. They demonstrate that leverage is pro-cyclical for unconstrained firms and counter-cyclical for constrained firms. Wanzenreid (2006) by using Swiss data showed a new method which estimated the impact of macroeconomic conditions and firm characteristics on the speed of adjustment. This study found that speed of adjustment is higher for those firms that are away from their target level of leverage and have higher growth. It further concludes that macroeconomic variables influence the adjustment process.

Most of the studies on capital structure adjustment speed assume that speed of adjustment toward their target level is same for all the firms (Ngugi, 2008). This study argued in their studies that firm's specific heterogeneity should have divergent effect on the speed of

adjustment toward their capital structure. Transaction cost for issuing securities are firm specific therefore the speed of adjustment should be firm specific (Florysiak and Elsas, 2011). So firm specific variables inclusion in the model will give new insight for how firms' heterogeneity affects the speed of adjustment to the target level of leverage.

This study estimates speed of adjustment on a large set of observable factors, firm characteristics such as profitability, size, growth and interest coverage and macroeconomic conditions such as inflation rate, term spread and GDP growth. The selections of these factors to analyze the heterogeneity consist on some general characteristics of firms like firm size, growth, interest coverage and profitability as in adjustment cost they are proxies for heterogeneity. Some of these selected characteristics are the reflection of fundamental capital structure determinants itself and it is expected that firm's determining factors of target leverage determine the economic pressure to settle their target level of leverage. Tian Tang and Douglas O. Cook (2009) attempted to analyze the macroeconomic factors such as default spread, term spread, GDP growth and dividend yield which can affect the capital structure adjustment speed. It astonishes that the substantial literature has been developed in the field of capital structure but the impact of firm specific characteristics and macroeconomic conditions on capital structure adjustment speed have received a very little attention in pragmatic research. Even Though adjustment costs largely depends upon the combination of firm specific characteristics and general economic conditions. For instance phase of economic cycle is a determinant of default risk as a result it raises the cost of capital. Addition to this, Banjeree (2004) argue that capital structure adjustment speed should have effected through economy wide factors such as interest rate, inflation rate and GDP growth. The

speed of adjustment is faster in good macroeconomic states and it relates to firm's favorable access to capital markets as defined by GDP growth, inflation rate and term structure.

1.2 Problem statement

As sufficient evidence does not exist in Pakistan regarding the process of capital structure therefore there is need to explore the role of macroeconomic factors and firm characteristics in the adjustment process.

Prior literatures of finance have addressed two relationships frequently, firstly, the relationship between firm characteristics and capital structure adjustment speed and secondly, macroeconomic conditions and capital structure adjustment speed. These two issues have been addressed separately but combined effect of both has been ignored. To enlighten this issue, this study will explore the relationship between these constructs in the context of Pakistan's listed non-financial firms. The focal point of this study is to test the alignment between macroeconomic factors, firm characteristics and capital structure adjustment speed in the context of Pakistani firms and will also analyze that whether these constructs affect each other in isolation and altogether as well.

The current study is an attempt to answer the following research questions.

1.3Research Questions

The current study is an attempt to answer the following research questions. The research questions for the study include:

- Whether the firm characteristics have any influence over the capital structure adjustment speed of the firms

- Whether the macroeconomic factors have any influence over the capital structure adjustment speed of the firms?
- Whether the alignment between firm characteristics and macroeconomic factors better explains the speed of adjustment toward target level?
- Whether high levered and low levered firms have divergent effect in adjusting their capital structure?
- Whether firms have divergent capital structure adjustment speed in good economic states and bad economic states?

1.4 Research Objectives

The objectives of the current study are to analyze the speed of adjustment on a large set of macroeconomic conditions such as inflation rate, term spread and GDP growth and firm characteristics such as profitability, size, growth and interest coverage. In order to test and validate, the specific objectives of the present study are:

- To promote insight relationship between firm characteristics and speed of adjustment toward target leverage.
- To provide insight about the relationship between macroeconomic factors and speed of adjustment toward target leverage.
- To explain the relationship between firm characteristics, macroeconomic factors and capital structure adjustment speed.
- To provide insight about the divergence behavior of high levered and low levered firms.
- To provide insight about the adjustment speed in good economic states and bad economic states.

Numerous factors have been discussed in past literature that affects the leverage of firm. However, in this study we have taken macroeconomic factors and firm characteristics take into considerations which have been introduced above in detail.

Alignment among macroeconomic variables, firm characteristics and capital structure adjustment speed has been highlighted by Mbululu and Chipeta (2013) and test the relationship between all constructs on non financial listed firms on JSE in South Africa. Internationally, it has been studied that macroeconomic factors and financial choices of firm's are significantly correlated. Morellec (2006) has well documented the relationship between capital structure adjustment speed and macroeconomic conditions. It was pointed out that firm's cash flows affected by the debt tax benefits, which are dependent on the prevailing economic conditions of markets. In the same way default probability is affected by economic conditions prevailing in the market. So, macroeconomic factors have an effect on the speed of adjustment toward their target leverage (chipeta and Mbululu, 2013).

1.5 Research Gap

The present study is neither testing any theory nor identifying the determinants of leverage. As ample evidences regarding the adjustment of leverage are not available therefore this study is focused to explore the level of adjustment of leverage toward target by Pakistani firms.

The number of studies assumes that the speed of adjustment toward target leverage is same for all the firms (Ngugi, 2008). From these observations, it is very important to evaluate these relationships within the context of Pakistan. In the context of Pakistani firms, the relationship between macroeconomic variables, firm characteristics and capital

structure adjustment speed of the firm is mainly unexplored to the best of my knowledge. This study is an effort to fill this gap by examining the co-alignment between macroeconomic variables, firm characteristics and capital structure adjustment speed in the context of non-financial listed firms of Pakistan.

1.6 Significance of the study

In different industries of Pakistan, this study will provide a better understanding and clarification about financing patterns; as a result it will help new investors to formulate their capital structure and adjust it. This will also help investors in portfolio diversification. In today's world, if a firm wants to enhance corporate growth, it is essential that firms should select an optimal combination of capital structure which enhances the value of the firm and can be a competitive edge for the firm.

Financial choices and capital structure adjustment speed are jointly emerging and a mixture of macroeconomic factors, firm characteristics and capital structure adjustment speed provides modern approaches and analytical practices in order to support financial decisions. It is documented in this study that firm level characteristics should have divergent effect on the speed of adjustment. As target capital structure is a function of firm specific characteristics and macroeconomic factors. Therefore the alignment of macroeconomic factors and firm specific characteristics will present new insights on how macroeconomic variables and firm characteristics affect the speed of adjustment toward their target level of leverage in Pakistan. As Pakistan is an emerging market and in emerging market local as well as foreign investors are interested. Due to globalization emerging markets are more focused as domestic as well as foreign investor are interested in more information about Pakistani firms so it is necessity to conduct this study in the

Pakistani context. This paper examines the dynamics of adjustment speed toward the target level of capital structure for non-financial listed firms in Pakistan.

1.7 Organization of the study`

The study is organized as follows: the second chapter precisely discusses the historical perspectives about macroeconomic factors, firm heterogeneity and the capital structure adjustment speed. Third chapter explains the sample, data set, measurements and explanation of variables and the methodology. Fourth chapter explains the results and discussion. Last chapter explains the practical implications, limitations and future direction.

CHAPTER # 2

LITERATURE REVIEW

2.1 Historical perspectives of the study

The present study is aimed to analyze the Impact of macroeconomic factors and firm heterogeneity on the capital structure adjustment speed in non-financial listed firms of Pakistan. In doing so, it is essential to delve into the literature and historical perspectives of these variables to analyze the nature of relationships that have been explored and supported by different studies. Major findings of these studies are reviewed below.

Characteristics of firm's are considered as determinants of capital structure adjustment speed. Chipeta & Mbululu (2013) conducted a study in South Africa to examine the affect of firm characteristics and macroeconomic conditions on capital structure adjustment speed. It included the four firm specific variables such as size, interest coverage, profitability and firm growth to study how heterogeneity of firms affects the speed of adjustment toward target leverage. It also included the four macroeconomic determinants such as inflation, growth in real GDP, term spread and industry market to book ratio to analyze how macroeconomic conditions affect the speed of adjustment toward the target level. DPF estimator is used on 191 non financial listed firms on the JSE for the period of 2000 to 2010. The results are found that variation in the speed of adjustment could be well explained by macroeconomic conditions and firm characteristics. It further suggested that managers should focus on long term target leverage and total leverage, not on the short term leverage. Firm characteristics proved

differing effects on speed of adjustment, and macroeconomic conditions played a significant role for deviating from target level of leverage.

Tang and Cook (2009) attempted to analyze the macroeconomic factors such as default spread, term spread, GDP growth and dividend yield which affect the capital structure adjustment speed. This study used the dynamic partial adjustment model to analyze the effect of macroeconomic conditions on the adjustment speed toward target level of leverage. It used a 30 year sample and the findings of the research pointed out that speed of adjustment is faster in good macroeconomic states and lower in bad macroeconomic states.

Capital structure choice affects by the change in macroeconomic conditions as argued by Levy and Korajczyk (2003). Tang and Cook (2010) promote this argument as they determined target leverage by trading off benefits of tax with bankruptcy costs, and both of these i.e. costs and tax benefits depends upon macroeconomic conditions. In the light of the trade-off theory, It can be said that macroeconomics conditions should affect the capital structure target decisions of a firm. Taxable earnings depend on economic conditions but tax benefits are dependent on taxable earnings. Correspondingly, probability of losses and default are also associated with the state of the economy and the chances of default and losses have an effect on bankruptcy costs. Therefore changes in target leverage must determine by changes in macroeconomic conditions. In bad conditions of the economy restructuring of the firm threshold is higher than in good conditions. And as a result in bad conditions of the economy speed of adjustment is weaker than in good conditions. It is significant to know a multiple macroeconomic

variables which affect the capital structure adjustment's speed. And those factors can be term spread, GDP growth rate etc.

Florysiak and Ralf Elsas (2011) conducted a study in Germany to examine the heterogeneity in the adjustment speed toward target leverage including the variable profitability, size, growth opportunities, asset tangibility and rating. This study used the partial adjustment model which assumed that all firms have same adjustment speed within a sample and dynamic capital structure model which assumes heterogeneity in the speed of adjustment due to firm's characteristics. DPF estimator used and the results pronounced heterogeneity in the adjustment speed, and higher bankruptcy costs have higher speed of adjustment. These results were consistent with trade off theory of Florysiak and Elsas (2011) who motivated the insertion of firm specific variables in the model as determinant of capital structure adjustment speed such as Size, Interest coverage, firm growth and profitability.

Sheikh and Wang (2010) attempted to analyze such factors which affect the choice of financial structure of Pakistani textile firms. This analysis was conducted by the application of panel estimation for 75 firms of textile sector listed at Karachi Stock Exchange for the period of 2002 to 2007. For the sake of this study, debt to total asset ratio had been taken as dependent variable where independent variables consisted of liquidity, size, profitability, growth opportunities and tangibility. Results advocated that leverage had a negative correlation with liquidity, profitability and tangibility, whereas it had a positive correlation with growth opportunities and firm size. The correlation was positive between growth opportunities and firm leverage and also a negative correlation of profitability and liquidity with leverage had supported the pecking order hypothesis. It

suggested that firms which were in need of external financing usually went for debt financing as it involved lower cost of information which company had to be provided to shareholders in case of equity financing. On the other hand, the relationship was positive between leverage and firm size which had supported the trade-off theory. This study concluded that finance theories such as trade-off and pecking theory hypothesis were applicable not in developed markets but also in under developed markets like Pakistan.

Similar nature of study was made by Ngugi for Kenyan firms (2008). This study exploited the instrumental variable techniques and least square dummy variables to set up the determinants of leverage. This study reported a high speed of adjustment toward the target level of leverage and low transaction cost. This study attributed to a small fraction of debt for Kenyan firms. Therefore speed of adjustment was high toward their target level of leverage.

Guney, Antoniou and paudyal (2008) exploited the GMM technique system to find out the dynamics of leverage for those firms working in five industrialized countries and those firms that are operating in these countries so this study found the presence of transaction cost.

In the context of South African, Botha and Ezeoha (2012) studied the firm's debt access issues with collateral value and varying ages. For non financial firms in a South Africa this study investigated the behavior toward the adjustment of target leverage. Furthermore, Gwatidzo and Ramjee (2012) finds that speed of adjustment toward target leverage relatively fast for South African firms.

For the understanding of capital structure determinants, a number of empirical studies have been conducted in the field of capital structure after the MM contribution. Roger Fix

and Wolfgang Drobetz (2003), Booth et al (2001), Wiwattanakantang (1999), Taylor (1998), Rajan Zingles (1995), Wessels and Titman (1988), are important mentioning.

2.2 Hypotheses of the study

2.2.1 Size and speed of adjustment

Size is an explanatory variable for the change in leverage of a firm. For larger firms the probability of taking debt is higher than smaller firms, because larger firms can acquire debts on favorable conditions as argued by Ventoura Neokosmidi, Vasiliou and Eriotis (2007). These favorable conditions facilitate them to acquire debts on lower interest rates. Moreover, financial institutions are prepared for giving more debts because larger firms are less risky. Therefore probability of default becomes lower. In addition to these larger firms have lower cost of asymmetric information and plenty of analysts as argued by Wanzenreid and Drobetz (2006).Therefore they have easy access to capital markets and cost for issuing new securities is smaller. So pace of adjustment toward target level should be higher by larger firms. Florysiak and Elsas (2011) pointed out that for larger firms opportunity cost could be lower for deviating from target level than smaller firms.

Hypothesis 1: There exist a significant positive relationship between size and speed of adjustment.

2.2.2 Growth opportunities and speed of adjustment

The theories of capital structure imply that growth opportunities and firm's financial decisions are correlated. High growth firms have low debt is a general concept amongst researchers. The reason behind this phenomenon is intangibility of growth prospects and complication in collateralization as argued by Smith and Barclay (2005). Thus growth effect depends on the manner in which growth is captured. Gupta (1968) by using

compounded annual growth rate finds out that higher growth firms have a propensity of higher leverage as compared to non growth firms because growth firms have an access of external debts in an unrestrictive environment. Wessels and Titman (1988) conclude the same results by using percentage change in total assets. A significant and positive relationship has been found between leverage and growth opportunities by using growth in sales as a proxy for growth prospects (Abor, Biekpe, 2005). This positive relationship shows that firms with higher growth prospects have a need of additional debts for investment opportunities. Growth opportunities maximize the value of the firm and therefore debt capacity of firm's increases so the adjustment speed to target leverage is higher for growth firms. Wanzenried (2006) argue that in the presence of asymmetric information, high growth firms can easily adjust the new issues. The value of the growing firms stay unaffected due to positive impact of potential growth opportunities, therefore speed of adjustment should be faster for firms having higher growth opportunities.

Hypothesis 2: Firms with higher growth opportunities have faster speed of adjustment

2.2.3 Interest coverage and speed of adjustment

Myers, Allen and Brealey (2011) argue that the ability of a firm to fulfill its predetermined obligation is measured by interest cover. When interest cover is higher it means firm is earning an adequate amount to fulfill its obligations. Financial distress is also determined by interest coverage. For instance, Klapper, Claessens and Djankov (2003) recognize that firms that have less than one coverage ratio are potentially financial distressed firms. Therefore firms can easily access funds that have higher interest coverage ratio.

Hypothesis 3: There exists a positive relationship between capital structure adjustment speed and interest coverage ratio.

2.2.4 Profitability and speed of adjustment

There are different point of views about leverage of firm and profitability. If firms finance their business through debt then they get the benefit of tax shield (Modigliani and Miller, 1963). So according to them a positive relationship exists between leverage and profitability. In contrast Myer and Majluf (1984) prefer the internal fund over external fund so a negative relationship exists between leverage and profitability. Zingales also founds a negative relationship between profitability and leverage.

Hypothesis 4: There exists a negative relationship between leverage and profitability.

2.2.5 Terms spread and speed of adjustment

High term spread is a determinant of future expected inflation as argued by Mishkin (1990). Furthermore Fama (1990) identify that term spread and expected and current borrowing costs are directly associated. So a converse relationship between lagged and current term spread and co efficient of adjustment may be expected. It's an indication of change in interest rate on the speed of adjustment. Conversely Tang and Cook (2010), Wanzenreid and Drobetz (2006) documents that economic conditions can be determined by term structure of interest rate. A high boom in the economy can be anticipated if the term spread is high, In contrast a slowdown is expected in a low term spread. Above arguments in the context of term spread are very important to evaluate the dynamics of the adjustment speed of capital structure.

Hypothesis 5: There exist a positive relationship between term spread and speed of adjustment toward target leverage.

2.2.6 GDP and speed of adjustment

Gross Domestic Product (GDP) is an indicator of economic activities of a country. In capital structure field , GDP has been used as a control variable in measuring state of an economy. For Instance, Ngugi (2008) discovers that leverage directly affect growth in real GDP. De Jong, Nguyen and Kabir (2008) conducted a study on 12000 firms from 42 countries and concluded that change in leverage causes by growth in GDP. The possible reason behind this study is that a growing economy needs more investment and this necessity increases the demand for funds. For that reason, it is expected from firms to adjust their capital structure in the period of economic expansion. Peters and De Haas (2006) conducted a study on dynamics of leverage in transition economies of Europe and concluded that speed of adjustment toward target leverage increases by the real GDP growth.

Hypothesis 6: There exist a positive relationship between capital structure adjustment speed and real GDP growth.

2.2.7 Inflationary pressure and speed of adjustment

Cost of capital affected by inflationary pressures, Hochman and Palmon (1985) and DeAngelo and Masulis (1980) demonstrate that real cost of capital reduces through inflationary pressure. It is an indication of increase in debt ratio. In contrast schall (1984) demonstrate that when inflation is high the share's return after tax becomes high than bonds return. In such cases investors simultaneously sell bonds and buy shares. So debt of corporations negatively influences. Katsimbrisb, Noulas and Hatzinikolaoua (2002) demonstrate that business risk increases due to increase in earnings volatility during the

period of high inflation. As a result probability of issuing of equity becomes high than debt.

Hypothesis 7: Capital structure changes due to inflationary pressure positively affect the speed of adjustment.

CHAPTER # 3

RESEARCH METHODOLOGY

3.1 RESEARCH DESIGN

Data source:

Initially, all firms that are listed at Karachi Stock Exchange for the period of 2000 – 2012 have been included. As the balance sheets of financial firms are different from those of non-financial firms (Chipeta, 2013) therefore, financial firms have excluded like banks, insurance companies and investment companies. Availability of data is also a key criterion that was considered while selecting the sample of firms. Keeping in view such criteria, the sample of 100 firms from non-financial sector for 2000 – 2012 has been selected. In this way, total number of observations for 100 firms and 12 years become 1200. The advantage of seeking secondary data sources is savings in time and costs of acquiring information (Uma Sekaran). So the source of data is Balance Sheet Analysis published by State Bank of Pakistan. As our data is cross sectional and time series so to analyze the relationships between all constructs, panel data analysis has been employed. Panel data analysis is considered as most appropriate estimation for heterogeneous data. It controls heterogeneity which usually arises due to number factors, whereas it has been usually neglected by cross sectional or time series analysis which then lead to biased estimation.

3.2 Description of variables

3.2.1 Leverage

We measure the LEVERAGE by dividing debt to equity which means for one rupee invested in equity, how much debt a firm will have (Chipeta & Mbululu, 2013), (Hongchao Zeng , 2009), (Cook & Tang, 2009).

$$\textbf{Leverage} = \frac{Debt}{Equity}$$

3.2.2 Growth opportunities

GROWTH OPPORTUNITIES will capture the difference between market value of equity and book value of equity of the firm in order to know the market value of shares and then divide on book value of shares (Hongchao Zeng , 2009).

$$\textbf{Growth opportunities} = \frac{MVofshares}{BVofshares}$$

3.2.3 Size

Logarithm of total assets is taken as a proxy for SIZE. (Chipeta & Mbululu, 2013), (Hongchao Zeng , 2009).

3.2.4 Interest coverage

INTEREST COVERAGE ratio is measured as EBIT (earnings before interest and tax) divided by IE (interest expense) (Chipeta & Mbululu, 2013), (Hongchao Zeng , 2009).

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$$\textbf{Interest coverage} = \frac{Earningbeforeinterestandtax}{Interestexpense}$$

3.2.5 Target debt ratio

Fitted value of actual debt is considered as target leverage (Chipeta & Mbululu, 2013), (Hongchao Zeng , 2009), (Cook & Tang, 2009).

3.2.6 Term spread

TERM SPREAD is measured by taking the yield of 10 years government bonds minus the yield of 3 month Treasury bill rate (Chipeta & Mbululu, 2013), (Cook & Tang, 2009).

Term spread= yield of 10 years government bonds- yield of 3 month Treasury bill

3.2.7 GDP

GDP is the real growth rate which is obtained from the state bank of Pakistan website (Chipeta & Mbululu, 2013), (Cook & Tang, 2009).

3.2.8 Inflation

INFLATION rate also obtained from state bank of Pakistan website (Chipeta & Mbululu, 2013), (Cook & Tang, 2009).

3.2.9 High levered and low levered

High levered firms takes the value of 1 when its leverage ratio above the median otherwise 0, and low levered firms takes the value of 1 when its leverage ratio below the median 0 otherwise.

3.2.10 Good and bad economic states

It takes the value of 1 if its GDP (real growth rate) is above from the median. It takes the value of 1 if it's GDP (real growth rate) is below from median 0 otherwise.

Model Specification

These equations are modeled to analyze the impact of macroeconomic factors and firm characteristics over adjustment speed of target leverage of the firm. For this sake, growth

potential (GP), profitability (PF), interest coverage (INTCOV), firm size (FS), term spread (TERMSP), inflation (INF) and GDP are taken as independent variables whereas leverage ratio (DR) is dependent variable. Financial constrained (FINCONS), high levered and low levered taken as dummies. financial constrained firms takes the value of 1 if its cash flow to debt ratio is less than 1 otherwise 0, high levered firms takes the value of 1 when its leverage ratio above the median otherwise 0, and low levered firms takes the value of 1 when its leverage ratio below the median 0 otherwise.

Following are the empirical models that have been derived from the hypotheses section. The capital structure dynamic model can be captured through following equation.

$$Lev_{i,t}^{*} = \beta_o + \beta_1 X_{i,t}' + \epsilon_{it} \quad \text{.....1}$$

$Lev_{i,t}^{*}$is the target level of leverage. $\beta_o$is unobservable effect of firm specific. $\beta_1 X_{i,t}'$is the vector of lagged macroeconomic factors and lagged firm characteristics. There is a need to establish a speed of adjustment toward desired level to effectively estimate the$Lev_{i,t}^{*}$. So a partial adjustment model is given;

$$Lev_{i,t} - Lev_{i,t-1} = \delta\left(Lev_{i,t}^{*} - Lev_{i,t-1}\right), 0 < \delta \leq 1 \quad \text{.....2}$$

$\delta$is the parameter of adjustment speed. The actual change in leverage is $Lev_{i,t} - Lev_{i,t-1}$ and the desired change in leverage is $Lev_{i,t}^{*} - Lev_{i,t-1}$. when transactions costs are zero then$\delta = 1$, it means firms will automatically adjust toward target level. When transaction costs are very high then $\delta = 0$, here$Lev_{i,t} = Lev_{i,t-1}$ the actual level of leverage can be computed from equation 2 as;

$$Lev_{i,t} = \delta Lev_{i,t}^{*} + (1 - \delta)\, Lev_{i,t-1} \text{.....3}$$

Now substitute equation 1 from equation 3;

$$Lev_{i,t} = (1-\delta)\, Lev_{i,t-1} + \delta\beta_o + \delta\beta_1 X'_{i,t} + e_{it} \quad \ldots\ldots\ldots\ldots\ldots 4$$

$1-\delta$ is the transaction cost measure. $X'_{i,t}$ is the vector of macroeconomic variables and firm characteristics as shown in equation 1. DPF estimator has been used for estimation because it censors the values between 0 and 1. It specifies the lower limit at 0 and upper limit at 1. DPF is also called the double censored Tobit model and it denotes the value as;

$$0, \text{ if } Lev^*_{i,t} \leq 0$$

$$Lev_{i,t} = \{Lev^*_{i,t}, if\ 0 < 0\ Lev^*_{i,t} < 1 \quad \ldots\ldots\ldots 5$$

$$1, \text{ if } Lev^*_{i,t} \geq 1$$

δ is the speed of adjustment and it is expected that it's a function of macroeconomic factors and firm specific characteristics. Firm characteristics and macroeconomic factors are denoted by $\beta\gamma_{i,t}$. Now the overall expression is as follow;

$$\delta = \beta_0 + \beta_1\gamma_{i,t} \quad \ldots\ldots\ldots\ldots\ldots 6$$

Now substitute the equation 4 from equation 6;

$$Lev_{i,t} = (1 - \beta_0 + \beta_1\gamma_{i,t})Lev_{i,t-1} + (\beta_0 + \beta_1\gamma_{i,t})\beta_1 X'_{i,t} + e_{it} \quad \ldots\ldots\ldots\ldots 7$$

Now expand the equation 7;

$$Lev_{i,t} = (1-\beta_0)Lev_{i,t-1} - \beta_1\gamma_{i,t}Lev_{i,t-1}\beta_0 X'_{i,t} + \beta_1\gamma_{i,t}\beta_0 X'_{i,t} + e_{it} \quad \ldots 8$$

Macroeconomic factors and firm characteristics interacted with the lagged dependent variable. β_1, of interaction term provides an indication of the effect of the macroeconomic factors and firm characteristics on the adjustment speed toward target leverage.

3.3 Model Specification

Following are the empirical models that have been derived from the hypotheses section. The capital structure dynamic model can be captured through following equation.

$$Lev_{i,t} = \beta_o + \beta_1 X'_{it-1} + \Theta_{it} \quad \text{.....1}$$

First equation modeled to estimate the Target leverage ratio. $\beta_o$is unobservable effect of firm specific. $\beta_1 X'_{i,t}$is the vector of lagged macroeconomic factors and lagged firm characteristics. There is a need to establish a speed of adjustment toward desired level to effectively estimate the $Lev^*_{i,t}$. So a partial adjustment model is given;

$$Lev_{i,t} - Lev_{i,t-1} = \delta(Lev^*_{i,t} - Lev_{i,t-1}), 0 < \delta \leq 1 \quad \text{.....2}$$

$\delta$is the parameter of adjustment speed. The actual change in leverage is $Lev_{i,t} - Lev_{i,t-1}$ and the desired change in leverage is $Lev^*_{i,t} - Lev_{i,t-1}$.

$$Lev_{i,t} = (1 - \beta_0)Lev_{i,t-1} + \beta_1 FZ_{i,t} + \beta_2 GP_{i,t} + \beta_3 INTCOV_{i,t} + \beta_4 PF_{i,t} + e_{i,t} \text{.....3}$$

This equation is modeled to analyze the impact of firm characteristics over leverage of the firm. For this sake, growth potential (GP), interest coverage (INTCOV), profitability (PF) and firm size (FS) are taken as independent variables whereas debt ratio (DR) is dependent variable. This equation is related to the first research question of this study.

$$Lev_{i,t} = (1 - \beta_0)Lev_{i,t-1} + \beta_1 TERMSP_{i,t} + \beta_2 INF_{i,t} + \beta_3 GDP_{i,t} + e_{i,t} \text{.....4}$$

Term spread, INF symbolizes inflation rate and GDP is the real growth rate.

$$Lev_{i,t} = (1 - \beta_0)Lev_{i,t-1} + \beta_1 FZ_{i,t} + \beta_2 GP_{i,t} + \beta_3 INTCOV_{i,t} + \beta_4 PF_{i,t} +$$

$$\beta_5 TERMSP_{i,t} + \beta_6 INF_{i,t} + \beta_7 GDP_{i,t} + e_{i,t} \text{.....5}$$

To find the co-alignment between firm characteristics, macroeconomic factors and capital structure adjustment speed.

$$Lev_{i,t} = (1 - \beta_0)Lev_{i,t-1} + \beta_1 GOODDUMMY + e_{i,t} \ldots\ldots\ldots\ldots\ldots\ldots 6$$

This equation is modeled to analyze the behavior of firms in good economic states. It takes the value of 1 if its GDP (real growth rate) is above from the median.

$$Lev_{i,t} = (1 - \beta_0)Lev_{i,t-1} + \beta_1 GOODDUMMY * Lev_{i,t-1} + e_{i,t} \ldots\ldots\ldots\ldots\ldots\ldots 7$$

These equations are modeled to analyze the behavior of firms in good and bad economic conditions in interacted terms.

$$Lev_{i,t} = (1 - \beta_0)Lev_{i,t-1} + \beta_1 HIGHDUMMY + e_{i,t} \ldots\ldots\ldots\ldots\ldots\ldots 8$$

This equation is modeled to analyze the behavior of high levered firms. It takes the value of 1 if its leverage ratio is above from the median.

$$Lev_{i,t} = (1 - \beta_0)Lev_{i,t-1} + \beta_1 HIGHDUMMY * Lev_{i,t-1} + e_{i,t} \ldots\ldots\ldots\ldots\ldots\ldots 9$$

These equations are modeled to analyze the behavior of high and low levered firms in interacted terms.

CHAPTER # 4

RESULTS AND DISCUSSION

Chapter three describes the research methodology i.e. Panel data estimation with common coefficient setting in order to test the co-alignment among firm characteristics, macroeconomic factors and firm heterogeneity of non-financial listed firms of Pakistan. This chapter describes Descriptive Analysis, Pearson Correlation Coefficient and Regression Analysis with partial adjustment model.

Estimating Target Debt Ratios

This section presents the empirical analysis for predicting observed target ratio by regressing actual debt ratio on a set of lagged macroeconomic factors and firm characteristics (Raja and Zingales, 1995). This methodology is employed regularly in current capital structure studies (Byon, 2008). In this stage all lagged macroeconomic factors and firm characteristics employ for predicting observed target ratio. The first section presents a two stage estimation procedure for predicting target leverage by using panel regression. To measure leverage ratio, both long term leverage and total leverage (short term + long term) is used.

DESCRIPTIVE ANALYSIS

Table 4.1 reports the mean with standard deviation, minimum and maximum values of variables used in the study for the period of 2000 to 2012.

Table 4.1

Table 4.1: Descriptive Statistics

Variables	N	Mean	Std. Dev	Minimum	Maximum
$Size_{it-1}$	1300	7.00	1.683358	0	12.12304
GDP_{it-1}	1300	4.1	1.959953	1.6	7.7
$GROTHOPP_{it-1}$	1300	-0.75	3.915852	-6.55	6.01
INF_{it-1}	1300	8.423	5.058268	2.9	20.3
$INTCOV_{it-1}$	1300	-26.98	0.5835484	-3.0	1.54
ROE_{it-1}	1300	9.06	0.2513447	-4.3	7.17
$TERMSP_{it-1}$	1300	4.16	38.1212910	-2.4	1.13

***Significant at 1%, ** Significant at 5%, * Significant at 10%,

Source of Table: Based on financial data extracted from Balance Sheet Analysis (BSA) published by State Bank of Pakistan (SBP). Here in the above table, SIZE symbolizes Firm size, GDP symbolizes Gross Domestic product, GRWTHOPP symbolizes Growth opportunities, INF symbolizes Inflation, INTCOV symbolizes Interest Coverage Ratio, ROE symbolizes Return on Equity and TERMSP symbolizes Term spread.

The sample of firms has been taken from different non-financial sectors and every sector has heterogeneous characteristics. Therefore, due to heterogeneity standard deviation for some variables are relatively high. Table 4.1 shows that non-financial firms have an average profitability of 9.06%, Average GDP growth rate is 4.1%, and Average inflation rate is 8.4%.

CORRELATION ANALYSIS

To explain the probability of multi co linearity it is essential to analyze their independent relationships and associations among all variables. Pearson Correlation Coefficient is used to fulfill the aim. Correlation matrix is computed by using data of 100 non-financial listed firms with 1300 observations for the period of 13 years.

Table 4.2

Computations of Pearson correlation are presented in the Table 4.2.

Table 4.2: Pearson Correlation Coefficient of Eight Variables for 100 (1300 Obs.) Non-Financial Firms.

		LEV	SIZ	GDP	GROP	INF	INTC	ROE	TRMSP
LEV	Pearson Correlation	1							
	Sig.								
	N	1300							
SIZE	Pearson Correlation	0.01	1						
	Sig.	0.09							
	N	1300	1300						
GDP	Pearson Correlation	0.02	-0.04	1					
	Sig.	0.39	0.12						
	N	1300	1300	1300					
GOPP	Pearson Correlation	0.06	-0.07	0.23	1				
	Sig.	0.02	0.0	0.0					
	N	1300	1300	1300	1300				
INF	Pearson Correlation	0.05	0.22	-0.34	-0.295	1			
	Sig.	0.03	0.00	0.00	0.00				
	N	1300	1300	1300	1300	1300			
ITCOV	Pearson Correlation	0.01	0.00	-0.01	-0.03	0.00	1		
	Sig.	0.66	0.92	0.63	0.21	0.88			
	N	1300	1300	1300	1300	1300	1300		
ROE	Pearson Correlation	-0.41	0.01	-0.00	-0.03	0.00	-0.00	1	
	Sig.	0.00	0.48	0.89	0.16	0.83	0.96		
	N	1300	1300	1300	1300	1300	1300	1300	
TRMSP	Pearson Correlation	0.04	-0.05	0.02	0.01	0.00	-0.00	-0.00	1
	Sig. (2-tailed)	0.06	0.05	0.29	0.54	0.90	0.92	0.88	
	N	1300	1300	1300	1300	1300	1300	1300	1300

Table 4.2 reports that interest coverage ratio, GDP, Term spread and ROE have no significant correlation with all variables. This shows that in context of Pakistani non-financial firms, these variables not independently associated with any variable. profitability have negative correlations (-0.41) (-0.00) (-0.03) with leverage, GDP and growth opportunities respectively which suggest that increase in these cause downward impact on leverage however, values show that there exist weak relationships. There exist weak correlations as all values of Pearson Correlation provide that there is no multi-linearity among all variables.

Table: 4. 3

Table 4.3 reports the result of target ratio estimation model.

Table: 4.3 Regression analysis predicting target debt ratio by using total leverage

Variables	Co-eff	SE	T-stats	p
$Size_{it-1}$	0.354234	0.304451	2.163517	0.02448
GDP_{it-1}	-0.37233	0.346598	-1.07423	0.2829
$GRWHOP_{it1}$	0.403999	0.199835	2.021668	0.0434
INF_{it-1}	0.148671	0.156407	2.311185	0.0755
$INTCOV_{it-1}$	-0.00016	0.000536	-0.28848	0.773
ROE_{it-1}	0.102671	0.002992	2.892455	0.03723
$TERMSP_{it-1}$	0.016035	0.019204	0.834976	0.4039
R^2	0.04141			

***Significant at 1%, ** Significant at 5%, * Significant at 10%,

Source of Table: Based on financial data extracted from Balance Sheet Analysis (BSA) published by State Bank of Pakistan (SBP). Here in the above table, SIZE symbolizes Firm size, GDP symbolizes Gross Domestic product, GRWTHOPP symbolizes Growth opportunities, INF symbolizes Inflation, INTCOV symbolizes Interest Coverage Ratio, ROE symbolizes Return on Equity and TERMSP symbolizes Term spread.

Table 4.3 reports the result of target ratio estimation model. Dit is actual leverage ratio as dependent variable, it-1 indicates lagged firm characteristics as independent variables including, interest coverage ratio, firms size, profitability and term spread.

Target leverage ratios anticipated by predicted values of lagged firm characteristics variables including, interest cover ratio, firms size, profitability, term spread and

macroeconomic factors including GDP, inflation and term spread. R^2 is not better explaining so study also used company average and industry average.

Table 4.4

Table 4.4 reports the model used for estimation of target capital structure for long term leverage.

Table: 4.4 Regression analysis predicting target debt ratio by using long term leverage

Variables	Co-eff	SE	T-stats	p
$Size_{it-1}$	0.148258	0.075443	1.96515	0.0496
GDP_{it-1}	-0.17515	0.085888	-2.03926	0.0416
$GRWTHOP_{it1}$	0.070375	0.049519	1.421151	0.1555
INF_{it-1}	-0.00847	0.038758	-0.21848	0.8271
$INTCOV_{it-1}$	-7.3505	0.000133	-0.55308	0.5803
ROE_{it-1}	0.00357	0.000742	2.482026	0.0629
$TERMSP_{it-1}$	0.000394	0.004759	0.08282	0.934
R^2	0.004865			

***Significant at 1%, ** Significant at 5%, * Significant at 10%,

Source of Table: Based on financial data extracted from Balance Sheet Analysis (BSA) published by State Bank of Pakistan (SBP). Here in the above table, SIZE symbolizes Firm size, GDP symbolizes Gross Domestic product, GRWTHOPP symbolizes Growth opportunities, INF symbolizes Inflation, INTCOV symbolizes Interest Coverage Ratio, ROE symbolizes Return on Equity and TERMSP symbolizes Term spread.

Table 4.4 reports the model used for estimation of target capital structure. Target leverage ratios anticipated by predicted values of lagged firm characteristics variables including,

interest coverage ratio, firms size, profitability, term spread and macroeconomic factors including GDP, inflation and term spread. The co-efficient proves that Pakistani firm target leverage ratio but R^2 is not better explaining so for better explanation so company average and industry average are also used.

Estimating speed of adjustment

This section presents the empirical analysis for predicting speed of adjustment by regressing $Lev_{it} - Lev_{it-1}$ on a $Lev_{it}^{*} - Lev_{it-1}$ (Hongchao Zeng, 200). In the first stage, actual change in leverage is regressed on desire change in leverage for predicting adjustment speed by using fitted values of actual total leverage, In the second stage actual change in leverage regressed on desire change in leverage for predicting adjustment speed by using average of target leverage Company, In the third stage actual change in leverage regressed on desire change in leverage for predicting adjustment speed by using average of target leverage industry. This section presents an observed speed of adjustment by using partial adjustment model. To construct adjustment speed, it uses company average target leverage and industry average target leverage.

Table 4.5

Table 4.5 reports the partial adjustment model for predicting adjustment speed of capital structure by using total leverage.

Table: 4.5 partial adjustment models for predicting adjustment speed of total leverage

Variables	Co-eff	SE	T-stats	R^2	Adjusted R^2	p
ADSP-DM	0.882091	0.027613	31.94433	0.439945	0.439945	0.0000
ADSP-CO	0.955422	0.005836	163.7098	0.953772	0.953772	0.0000
ADSP-IND	0.924572	0.007303	126.6038	0.925032	0.925032	0.0000

***Significant at 1%, ** Significant at 5%, * Significant at 10%,

Source of Table: Based on financial data extracted from Balance Sheet Analysis (BSA) published by State Bank of Pakistan (SBP). Here in the above table, ADSP-DM symbolizes adjustment speed by using dynamic model, ADSP-CO symbolizes Adjustment speed by using company target, ADSP-IND symbolizes adjustment speed by using industry target.

Table 4.5 reports the partial adjustment model for predicting adjustment speed of capital structure by using total leverage. The co-efficient of adjustment speed by using fitted values of actual leverage provides that Pakistani firms adjust 88% of their target when moves away from their target level. The co-efficient of adjustment speed by using company average provides that Pakistani firms adjust 95% of their target when moves away from their target level. The co-efficient of adjustment speed by using industry average provides that Pakistani firms adjust 92% of their target when moves away from their target level.

Table 4.6

Table 4.6 reports the partial adjustment model for predicting adjustment speed of capital structure by using long term leverage.

Table: 4.6 partial adjustments Model for predicting adjustment speed

Of long term leverage

Variables	coeff	SE	T-stats	R^2	Adjusted R^2	*p*
ADSP-DM	0.664225	0.025214	26.34369	0.348147	0.348147	0.0000
ADSP-CO	0.856434	0.009623	89.00100	0.859099	0.859099	0.0000
ADSP-IND	0.992095	0.002339	424.1808	0.992831	0.992831	0.0000

***Significant at 1%, ** Significant at 5%, * Significant at 10%,

Source of Table: Based on financial data extracted from Balance Sheet Analysis (BSA) published by State Bank of Pakistan (SBP). Here in the above table, ADSP-DM symbolizes adjustment speed by using dynamic model, ADSP-CO symbolizes Adjustment speed by using company target, ADSP-IND symbolizes adjustment speed by using industry target.

Table 4.6 reports the partial adjustment model for predicting adjustment speed of capital structure by using long term leverage. The co-efficient of adjustment speed by using fitted values of actual leverage provides that Pakistani firms adjust 66% of their target when moves away from their target level. The co-efficient of adjustment speed by using company average provides that Pakistani firms adjust 85% of their target when moves away from their target level. The co-efficient of adjustment speed by using industry average provides that Pakistani firms adjust 99% of their target when moves away from their target level.

Impact of firm heterogeneity on the capital structure adjustment speed toward target leverage

Dit is actual debt ratio, it-1 indicates lagged firm heterogeneity independent variables including, interest coverage ratio, firms size, profitability and term spread."Predicted values are used as proxies for target debt ratios"

Table 4.7

Table 4.7 reports the result of company specific characteristics in influencing capital structure of total leverage.

Table 4.7: Regression Results for Total Debt Ratio as Dependent Variable

Variables	coeff	SE	T-stats	P
LEV_{it-1}	0.243138	0.272072	2.893653	0.0371
$INTCOV*Lev_{it-1}$	0.000302	7.4805	4.044127	0.0001
$PROF*Lev_{it-1}$	-0.00146	0.000342	-4.28025	0.000
$TERMSP*Lev_{it-1}$	-0.05989	0.010049	-5.95936	0.000
$ASSETS*Lev_{it-1}$	0.000953	0.040913	2.023283	0.09814
R^2	0.133318			
Adjusted R^2	0.125237			

***Significant at 1%, ** Significant at 5%, * Significant at 10%

Source of Table: Based on financial data extracted from Balance Sheet Analysis (BSA) published by State Bank of Pakistan (SBP). Here in the above table, $SIZE_{it-1}$ symbolizes lagged Firm size, $INTCOV_{it-1}$ symbolizes lagged Interest Coverage Ratio, $PROF_{it-1}$ symbolizes profitability and $TERMSP_{it-1}$ symbolizes Term spread.

Table 4.7 reports the result of company specific characteristics in influencing capital structure of total leverage. The co-efficient in above table provide to have a significant

relationship with target leverage ratio. The adjustment speed toward target is (1-0.24) 0.76. This indicates that Pakistani firms adjust 76% of their target level when moves away from their target level. Disclosure of negative sign between profitability, term spread and adjustment speed support the hypothesis and is in confirmation with previous studies. It is found that Pakistani non-financial firms also target their leverage ratio on the basis of this key relationship of debt and equity and acquire debt, when they are in short of leverage ratio.

Table 4.8

Table 4.7 reports the result of company specific characteristics in influencing capital structure of long term leverage.

Table 4.8: Regression Results for long term Debt Ratio

as Dependent Variable

Variables	Coeff	SE	T-stats	p
LEV_{it-1}	0.271	0.289265	2.936856	0.0349
$INTCOV*Lev_{it-1}$	0.000132	7.6805	2.717801	0.0861
$PROF*Lev_{it-1}$	-0.00318	0.000258	-12.3049	0.000
$TERMSP*Lev_{it-1}$	-0.02637	0.013173	-2.00177	0.0455
$ASSETS*Lev_{it-1}$	0.047349	0.038789	2.22068	0.02224
R^2 0.249259 Adjusted R^2 0.242259				

***Significant at 1%, ** Significant at 5%, * Significant at 10%

Source of Table: Based on financial data extracted from Balance Sheet Analysis (BSA) published by State Bank of Pakistan (SBP). Here in the above table, $SIZE_{it-1}$ symbolizes lagged Firm size, $INTCOV_{it-1}$ symbolizes lagged Interest Coverage Ratio, $PROF_{it-1}$ symbolizes profitability and $TERMSP_{it-1}$ symbolizes Term spread.

On the other hand, leverage ratio with long term debt also provides a significant relationship with adjustment speed toward target leverage, which also supports the hypothesis. The adjustment speed toward target is (1-0.27) 0.77. This provides that Pakistani firms adjust 76% of their target level when moves away from their target level. It is found that Pakistani non-financial firms also target their leverage ratio on the basis of this key relationship of debt and equity.

Impact of macroeconomic factors on the capital structure adjustment speed toward target leverage

Table 4.9

Table 4.9 describes the role of macroeconomic variables in determining adjustment process for total leverage.

Table 4.9: Regression Results for Total Debt Ratio as Dependent Variable

Variables	Coeff	SE	T-stats	p
LEV_{it-1}	-0.38442	0.155286	-2.47559	0.0134
INF_{it-1}	0.051572	0.007533	6.846402	0.000
$GROWTHOPP_{it-1}$	0.000802	0.002182	0.367366	0.7134
GDP_{it-1}	-0.01234	0.017139	-0.71975	0.4718
R^2 0.104982				
Adjusted R^2 0.098738				

***Significant at 1%, ** Significant at 5%, * Significant at 10%,

Source of Table: Based on financial data extracted from Balance Sheet Analysis (BSA) published by State Bank of Pakistan (SBP). Here in the above table, GDP_{it-1} symbolizes lagged Gross Domestic product, $GRWTHOPP_{it-1}$ symbolizes lagged Growth opportunities and $INFit._{-1}$ symbolizes lagged Inflation

Table 4.9 describes the role of macroeconomic variables in determining adjustment process for total leverage. The interaction term coefficient between lagged leverage and growth potential is insignificant and positive for total leverage. This indicates that growth firm less likely to adjust toward their target leverage. These results are not unexpected as Mayer in 1997 proposes that firm with intangible growth prospects normally evade debt to lessen probable underinvestment problem allied with financial distress. More over growth creates variation in the value of the firm as argued by Eriotis *et al in* 2007. Therefore these variations are interpreted as higher risk and these variations create hurdles for growth firms to generate debt on the favorable terms.

Table 4.10

Table 4.10 describes the role of macroeconomic variables in determining adjustment process for long term leverage.

Table 4.10: Regression Results for Long term Debt Ratio as Dependent Variable

Variables	coeff	SE	T-stats	p
LEV_{it-1}	-0.04746	0.015299	-3.10224	0.002
$INF*Lev_{it-1}$	0.049101	0.004939	9.941274	0.00
$GROWTHOPP*Lev_{it-1}$	-0.13473	0.018068	-2.14113	0.0254
$GDP*Lev_{it-1}$	-0.04185	0.017943	-2.33247	0.0198
R^2 0.251056				
Adjusted R^2 0.245831				

***Significant at 1%, ** Significant at 5%, * Significant at 10%,

Source of Table:

Based on financial data extracted from Balance Sheet Analysis (BSA) published by State Bank of Pakistan (SBP). Here in the above table, GDP_{it-1} symbolizes lagged Gross Domestic product, $GRWTHOPP_{it-1}$ symbolizes lagged Growth opportunities and INF_{it-1} symbolizes lagged Inflation

Table 4.10 describes the role of macroeconomic variables in determining adjustment process for total leverage. Relationship between inflation and financial target leverage found to have a significant positive relationship. These firms employ more debt into their financial structure when there have more inflation in the country because cost of capital affected by inflationary pressures, Hochman and Palmon (1985) and DeAngelo and Masulis (1980) demonstrate that real cost of capital reduces through inflationary pressure so it is an indication of increase in debt ratio. These firms employ more debt into their financial structure when there have more growth opportunities (Hongyan, 2009). Relationship between growth opportunities and financial leverage found to have a significant relationship (Akinlo, 2011, Charitou et al., 2010). It shows that Pakistani firms finance their growth through debt financing.

Impact of macroeconomic factors and firm heterogeneity on capital structure adjustment speed

Table 4.11

Table 4.11 reports the result of macroeconomic factors and firm characteristics of target leverage of capital structure adjustment speed.

Table 4.11: Regression Results for Total Debt Ratio as Dependent Variable

Variables	coeff	SE	T-stats	p
LEV_{it-1}	-0.732547	0.364013	-2.012420	0.0444
ASSETS* LEV_{it-1}	-0.096340	0.040988	-2.350410	0.0189
GDP* LEV_{it-1}	0.084559	0.027953	3.025023	0.0025
GROWTHOPP* LEV_{it-1}	0.001113	0.002070	0.537585	0.5910
INF* LEV_{it-1}	0.097216	0.010140	9.587738	0.0000
INTCOV* LEV_{it-1}	0.000306	7.5005	4.083391	0.0000
ROE* LEV_{it-1}	-0.000433	0.000355	-1.218605	0.2232
TERMSP* LEV_{it-1}	-0.043518	0.012658	-3.437891	0.0006
R^2	0.217363			
Adjusted R^2	0.203880			

***Significant at 1%, ** Significant at 5%, * Significant at 10%

Source of Table: Based on financial data extracted from Balance Sheet Analysis (BSA) published by State Bank of Pakistan (SBP). Here in the above table, SIZE*Lag_{it-1} symbolizes lagged Firm size and interacted with lagged leverage, INTCOV*Lag_{it-1} symbolizes lagged Interest Coverage Ratio and interacted with lagged leverage, PROF*Lag_{it-1} symbolizes profitability and interacted with lagged leverage, TERMSP*Lag_{it-1} symbolizes Term spread and interacted with lagged leverage. GDP*Lag_{it-1} symbolizes lagged Gross Domestic product and interacted with lagged leverage, GRWTHOPP*Lag_{it-1} symbolizes lagged Growth opportunities and interacted with lagged leverage, INF*Lag_{it-1} symbolizes lagged Inflation and interacted with lagged leverage.

Table 4.11 reports the result of macroeconomic factors and firm characteristics of target leverage of capital structure adjustment speed. The main focus of this study is the interaction term of the coefficient of the lagged leverage and all variables. As hypothesized earlier that firm size plays a significant role in determining adjustment speed of capital structure. Larger firms less affected by information asymmetries therefore larger firms more readily adjust their capital structure than smaller firms. So it is well documented that size exerts a significant effect on capital structure (Boateng, 2010).

The interaction term co-efficient between lagged leverage and size is significant and negative at 5 percent level for the total leverage. The negative co-efficient shows that larger firms adjust more readily toward their target level of capital structure. The probable explanation for this relationship is that the adjustment cost for adjusting their target is lower.

The interaction term co-efficient between lagged leverage and growth potential is insignificant and positive for total leverage. This indicates that growth firm less likely to adjust toward their target leverage. These results are not unexpected as Mayer in 1997 proposes that firm with intangible growth prospects normally evade debt to lessen probable underinvestment problem allied with financial distress. More over growth creates variation in the value of the firm as argued by Eriotis *et al in* 2007. Therefore these variations are interpreted as higher risk and these variations create hurdles for growth firms to generate debt on the favorable terms.

The interaction term coefficient of the lagged leverage and term spread is significant and negative for the total leverage ratio. This relationship presents that firms with higher terms spread have a faster speed of adjustment. These findings also confirm the finding of cook and tang (2010) , Drobetz and Wanzenreid (2006).

The result in table 4.11 shows that macroeconomic factor plays an important role in determining capital structure adjustment speed. The speed of adjustment is expected faster in favorable macroeconomic conditions as following Hackbarth (2006). On the contrary the speed of adjustment is expected slower in unfavorable macroeconomic conditions. As hypothesized earlier speed of adjustment and GDP growth was positively associated. Therefore the interaction term coefficient of the lagged leverage and GDP growth rate is significant at 5 percent and negative for the long term leverage ratio. This is due to that real GDP growth reduces the allied costs with varying capital structure because economic expansion period associated with higher demand of goods. Firms operating in this period to funding this increasing demand adjust their capital structure. Accordingly the associated adjustment speed increases. This association corroborates the cook and tang (2010), Peeters and De Haas findings.

The interaction term coefficient of the lagged leverage and term spread is significant and negative for the long term and total leverage. The result shows that high term spread allied with faster speed of adjustment. These findings follow the cook and tang (2010) and Wanzenried (2006).

Table 4.12

Table 4.12 reports the result of macroeconomic factors and firm characteristics of target leverage of capital structure adjustment speed by using long term leverage.

Table 4.12: Regression Results for Long term Debt Ratio as Dependent Variable

Variables	coeff	SE	T-stats	p
LEV_{it-1}	0.830317	0.401511	2.067981	0.0388
ASSETS* LEV_{it-1}	-0.091722	0.044392	-2.066175	0.0390
GDP* LEV_{it-1}	-0.060452	0.030147	-2.005244	0.0451
GROWTHOPP* LEV_{it-1}	-0.011765	0.018568	-0.633598	0.5265
INF* LEV_{it-1}	0.039409	0.006616	5.956313	0.0000
INTCOV* LEV_{it-1}	0.000134	7.39E-05	1.814338	0.0699
ROE* LEV_{it-1}	-0.001980	0.000311	-6.372293	0.0000
TERMSP* LEV_{it-1}	-0.025148	0.017713	-1.419741	0.1559
R^2	0.315014			
Adjusted R^2	0.303213			

***Significant at 1%, ** Significant at 5%, * Significant at 10%

Source of Table: Based on financial data extracted from Balance Sheet Analysis (BSA) published by State Bank of Pakistan (SBP). Here in the above table, $SIZE*Lag_{it-1}$ symbolizes lagged Firm size and interacted with lagged leverage, $INTCOV*Lag_{it-1}$ symbolizes lagged Interest Coverage Ratio and interacted with lagged leverage, $PROF*Lag_{it-1}$ symbolizes profitability and interacted with lagged leverage,$TERMSP*Lag_{it-1}$ symbolizes Term spread and interacted with lagged leverage. $GDP*Lag_{it-1}$ symbolizes lagged Gross Domestic product and interacted with lagged leverage, $GRWTHOPP*Lag_{it-1}$ symbolizes lagged Growth opportunities and interacted with lagged leverage, $INF*Lag_{it-1}$ symbolizes lagged Inflation and interacted with lagged leverage. $SIZE_{it-1}$ symbolizes lagged Firm size, $INTCOV_{it-1}$ symbolizes lagged Interest Coverage Ratio, $PROF_{it-1}$ symbolizes profitability and $TERMSP_{it-1}$ symbolizes Term spread. GDP_{it-1} symbolizes lagged Gross Domestic product, $GRWTHOPP_{it-1}$ symbolizes lagged Growth opportunities and interacted with lagged leverage, INF_{it-1} symbolizes lagged Inflation.

Table 4.12 reports the result of macroeconomic factors and firm characteristics of target leverage of capital structure adjustment speed by using long term leverage. The adjustment speed for the long term leverage is (1-.8) 0.2. This suggests that the adjustment speed for the long term leverage is slower than for total leverage. The lagged leverage co-efficient (0.03) is significant for total leverage. The interaction term co efficient between lagged leverage and size is significant and negative at 5 percent level for the long term leverage

Table 4.13

Table 4.13 reports the behavior of good and bad economies for total leverage.

Table 4.13: Regression Results for Total Debt Ratio

as Dependent Variable

Variables	coeff	SE	T-stats	p
INTERCEPT	0.225629	1.053048	0.214262	0.830
LEV_{it-1}	0.359244	0.041860	8.582030	0.0000
GOODSTAT	2.472102	1.438172	1.718919	0.0859
GOOD* LEV_{it-1}	-0.440721	0.055444	-7.948907	0.0000
R^2 0.059092				
Adjusted R^2 0.056914				

***Significant at 1%, ** Significant at 5%, * Significant at 10%,

Source of Table: Based on financial data extracted from Balance Sheet Analysis (BSA) published by State Bank of Pakistan (SBP). Here in the above table, , lev_{it-1} symbolizes lagged leverage, Goodstat symbolizes good states and good*lev_{it-1} Symbolizes interaction term of good sates and lagged leverage

Table 4.13 reports the behavior of good and bad economies for total leverage. For the comparison of capital structure adjustment speed between good and bad states, an interaction term included by the product of dummy variable of GDP and lagged leverage. Which takes the value of 1 when its year observation above an average and 0 otherwise. The interaction term coefficient of lagged leverage and good state is significant and negative, which supports that adjustment speed is faster in good states.

Table 4.14

Table 4.13 reports the behavior of good and bad economies for long term leverage.

Table 4.13: Regression Results for long term Debt Ratio

as Dependent Variable

Variables	coeff	SE	T-stats	p
INTERCEPT	0.167743	0.251148	0.667903	0.504
LEV_{it-1}	0.356585	0.025798	13.82212	0.0000
GOODSTAT	-0.013190	0.343148	-3.038437	0.0969
GOOD* LEV_{it-1}	-0.032101	0.008856	-3.624749	0.0003
R^2 0.128938				
Adjusted R^2 0.126922				

***Significant at 1%, ** Significant at 5%, * Significant at 10%,

Source of Table: Based on financial data extracted from Balance Sheet Analysis (BSA) published by State Bank of Pakistan (SBP). Here in the above table, , lev_{it-1} symbolizes lagged leverage, Goodstat symbolizes good states and good*lev_{it-1} Symbolizes interaction term of good sates and lagged leverage.

The results in table 4.13 provides that the adjustment speed toward target level is faster in good states for both total and long term leverage ratios. The interaction term coefficient of lagged leverage and good state is significant and negative, which supports that adjustment speed is faster in good states.

Table 4.14

Table 4.14 reports the behavior of low and high levered firms for total leverage.

Table 4.14: Regression Results for Total Debt Ratio

as Dependent Variable

Variables	coeff	SE	T-stats	P
INTERCEPT	-17.79162	2.156768	-0.249202	0.1000
LEV_{it-1}	0.176214	0.034414	5.120407	0.0000
HIGH	21.45387	2.283741	9.394177	0.0000
HIGH* LEV_{it-1}	-0.169650	0.055855	-3.037338	0.0024
R^2 0.07964				
Adjusted R^2 0.077509				

***Significant at 1%, ** Significant at 5%, * Significant at 10%,

Source of Table: Based on financial data extracted from Balance Sheet Analysis (BSA) published by State Bank of Pakistan (SBP). Here in the above table, lev_{it-1} symbolizes lagged leverage, high symbolizes high levered companies and high*lev_{it-1} Symbolizes interaction term of high levered and lagged leverage.

The result in table 4.14 provides that the adjustment speed toward target level is faster for the high levered companies' for both total and long term leverage ratios. The interaction term coefficient of lagged leverage and high levered is significant and negative, which supports that adjustment speed is faster for high levered companies. The

coefficient of low levered is significant and positive which provides that adjustment speed is lower in bad states.

Table 4.15

Table 4.15 reports the behavior of low and high levered firms for long term leverage.

Table 4.15: Regression Results for long term Debt Ratio

as Dependent Variable

Variables	coeff	SE	T-stats	p
INTERCEPT	-1.288168	0.288755	-4.461115	0.0000
LEV_{it-1}	0.516156	0.031875	16.19313	0.0000
HIGH	2.179646	0.351671	6.197977	0.0000
HIGH* LEV_{it-1}	-0.435873	0.049367	-8.829285	0.0000
R^2 0.190249				
Adjusted R^2 0.188375				

***Significant at 1%, ** Significant at 5%, * Significant at 10%,

Source of Table: Based on financial data extracted from Balance Sheet Analysis (BSA) published by State Bank of Pakistan (SBP). Here in the above table, lev_{it-1} symbolizes lagged leverage, high symbolizes high levered companies and high*lev_{it-1} Symbolizes interaction term of high levered and lagged leverage.

Table 4.15 reports the behavior of low and high levered firms for long term leverage. For the comparison of capital structure adjustment speed for high levered and low levered, an interaction term included by the product of dummy variable of high levered and lagged leverage. Which takes the value of 1 when its year observation above an average and 0 otherwise. The interaction term co-efficient of lagged leverage and high levered is

significant and negative, which supports that adjustment speed is faster for high levered companies.

CHAPTER # 5

5.1 Conclusion

This study examined the dynamic of the adjustment speed toward target leverage of capital structure for Pakistani non-financial firms listed on KSE. Firm specific characteristics effect transaction costs therefore influence the adjustment speed toward target leverage. Particularly profitability, size, interest coverage ratio and term spread positively associated with adjustment speed. An increase in firm specific variables imply that firms can access debt on favorable terms, therefore, firms are endeavoring to achieve their target level of leverage, so firms are improving prospects of their capital structure for adjustment speed.

Mixed results are observed by interaction of macroeconomic factors and lagged leverage variables. According to the expectations, GDP growth rate is positively associated with the adjustment speed. This relationship presents that adjustment speed is faster in favorable macroeconomic conditions. Moreover, the term spread have greater role in influencing speed of adjustment.

For the comparison of capital structure adjustment speed between good and bad states, an interaction term included by the product of dummy variable of GDP and lagged leverage. Which takes the value of '1' when its year observation above an average and '0' otherwise. The interaction term co-efficient of lagged leverage and good state is significant and negative, which supports that adjustment speed is faster in good states.

For the evaluation of capital structure adjustment speed for high levered and low levered firms, an interaction term included by the product of dummy variable of high levered and lagged leverage. The interaction term co-efficient of lagged leverage and high levered is

significant and negative, which supports that adjustment speed is faster for high levered companies. The co-efficient of low levered is significant and positive which proves that adjustment speed is lower in bad states.

5.2 Practical implications and recommendations

This research study suggests following practical implications and recommendations:

- In different industries of Pakistan, this study provide a better understanding and clarification about financing patterns; as a result it help new investors to formulate their capital structure and adjust it because it effect the value of the firm.
- The research recommends to the academic researchers and business practitioners, that financial choices and capital structure adjustment speed are jointly determined by macroeconomic factors and firm characteristics; Moreover capital structure adjustment speed provides insight about the future financial decision.

5.3 Limitations of the study

The study is conducted with the below limitations;

- This research study conducted on the sample of 100 non-financial Pakistani companies only.
- The study only considered the time frame from 2000 to 2012.
- The research study considered only those companies whose financial reports are available and accessible because availability of the data is one of the main issues in the context of Pakistan.

5.4 Future Directions

The following areas can be explored for future research studies;

- Different proxies can be taken for the measurement of good states as default spread, dividend yield etc to investigate the above relationship.
- Different proxies can be taken for the measurement of growth opportunities, term spread to investigate the above relationship.
- Larger sample size can be taken to analyze the relationship for all variables.
- Future study can be taken to compare the various countries results analysis.

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