

CAPITAL UNIVERSITY OF SCIENCE AND  
TECHNOLOGY, ISLAMABAD



**Factors affecting the Financial  
Structure Adjustments: Evidence  
from Pakistan**

by

**Arooj Khalid Butt**

A thesis submitted in partial fulfillment for the  
degree of Master of Science

in the

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*This work is dedicated to my beloved parents who have encourage me to achieve this milestone and to my respected supervisor Dr. Arshad Hassan, who has been a constant source of inspiration.*



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**CERTIFICATE OF APPROVAL**

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## *Abstract*

Financial Adjustment is referred to as the phenomena in which firms strive to seek their optimal capital structures. It is generally argued that this adjustment process is influenced by various factors, which either increase or decrease the speed of this process. The purpose of this study is to investigate the factors which influence the capital structure of the non-financial firms of Pakistan using the sample consisting 11 years from 2006 to 2016. Moreover estimate the adjustment speed using Partial Adjustment Model. This study allows to identify the factors which impact the speed of adjustment of capital structure. This study employs panel data analysis along with Generalized method of moments (GMM) for the purpose of robustness. The results indicate that industry variables play a vital role in identifying the capital structure and also impact the adjustment speed of the sample. The average adjustment speed to cover the difference in actual and optimal capital structure is different in case of long term debt to total assets ratio and in total assets to total debt ratio. The higher adjustment speed is observed in case of total debt to total debt ratio. Firms in Pakistan should keep in view the firm specific variables along with industry variables and governance when making decisions regards capital structure, which can impact their adjustment towards target structures.

**Keywords:** Leverage, Financial Structure Adjustment, Partial Adjustment Model, Adjustment Speed.

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# Chapter 1

## Introduction

The formulation of capital structure is very important for an organization, because it influences the firm's overall value. This decision regarding the capital structure of the firm is one of the most important finance decisions that a finance manager makes. This process does not only includes to evaluate each source of finance independently but also be able to weigh them up collectively. These different combinations of sources of finance offer different results. So firms use mix of the sources to finance their business. This combination is described as capital structure of the firm (Voutsina and Warner, 2011). Nguyen, Diaz-Rainey et al. (2012) describe capital structure as all types of financial resources used by the firm, which includes the short term and long term debt and equity. The discussion on capital structure was started by (Modigliani and Miller 1958) , who proposed the concept of Irrelevance theory. This theory argues that the capital structure does not matter to the firm's value in their first proposition because the decreased cost of capital by increasing level of debt, which is considered to have lower cost as compared to equity is overcome by the increased cost of equity as more debt level initiate higher risk levels for equity holders. Then in the second proposition of Miller and Modigliani study, it is argued that capital structure does matter to the value of the firm due to tax shield gain by using increased level of debt. Higher the debt level leads to lower tax liabilities, hence reducing the overall weighted average cost of capital. Then (Miller, 1977) come up with the concept of optimum debt level and that firms tend to reach their target capital structure, this is known

as Trade-Off theory. This theory explains that firm achieve that combination of debt and equity which offers the least weighted average cost of capital. The third theoretical explanation of Pecking Order Theory was provided by Myers and Majluf (1984) ,according to which firms follow a specific pattern in getting themselves financed by using internal sources of funds to external debt sources to equity financing. The fourth theory known as Market timing theory was given by Baker and Wurgler (2002), according to this theory the investor or business gets itself financed observing the timing of interest rates and the cost of equity, such as when the shares are traded in the market on higher prices and stock market is operating at peak, then the finance manager may would chose to sell shares and get itself financed through equity. In the same way when the interest rates are low, finance manager would sell bonds and rely more on debt. The recent discussion on capital structure is based on Behavioral finance.

The upcoming technology has brought evolutions in all types of fields, in the same way the field of finance and the way firms keep their cost low to have better business control has changed remarkably. Firms tend to chose such combination of debt and finance which bring the cost low. In this process to control financial cost, there are several factors which impact the choice of what level of debt or equity to employ. Many prior studies confer this important issue based on different business types and situations. Some of these researches include Shah and Khan (2007), Hijazi and Tariq (2006), Memon, Bhutto and Abbas (2012), these studies primarily focus on the identification of the factors which influence the capital structure choices made by firms in different circumstances. A study conducted by Akhtar, Husnain and Mukhtar (2012) on the textile sector of Pakistan, evaluate the microeconomic factors which may impact the capital structure decisions of these firms. This study is conducted using regression analysis and the microeconomic factors included are Size, growth, financial cost, profitability, and tangibility, out of which only financial cost is positively related to the debt-equity ratio, all other variables are negatively related. As well as studies have been conducted to evaluating the impact of capital structure decisions on the financial performance of the firm such as Saeed and Badar (2013). A study conducted by

Bokhari and Khan (2013), uses ordinary least square method to assess the impact of various capital structure ratios on the financial performance of the firms. But most of the discussion of capital structure is based on conventional finance. According to Barclay and Smith (2005), the existing studies concentrate on existing capital structures of the companies known to be stock or either the restructuring of this capital structure known to be flow. The study further insist that along with these workings there is need to focus the research on the target capital structure which companies follow, which may help to resolve the issue of complex capital structure decisions. The studies are conducted on this issue such as study by Drobetz, Pensa and Wohle (2006) suggest that firms seek their target debt to equity ratio, which not only minimize , their weighted average cost of capital but also offer flexibility in financial decisions. Due to some internal and external factors firms may temporarily deviate from their target structure but hence forth return back to its optimum structure. As the firms maintain their target capital structure, they adjust relatively to their structure. This relative adjustment to target capital structure is referred to as partial adjustment. Fischer et al.(1989) in their research identifies different firm related factors which contribute to the deviations of companies with their target structure based on the maximum and minimum debt ratios over time. This deviation is constrained in the presence of adjustment cost. Adjustment cost is any expense which is faced by firms for reaching their optimal structure. According to Leland (1994) stated that when the marginal cost of debt which is financial distress cost is equal to the marginal benefit which is the tax benefit of debt, this is the point at which firm is its optimal capital structure. When one of these either the marginal benefit or the marginal cost exceeds the other, the firm departs from its optimal structure, but this is temporary soon the firms seek to reach their optimal structures. According to a study by Arvin and Francis (2004), firms adjust to their capital structure along the industry mean, as well as it is found that adjustment speed for levered firms is more than the unlevered firms. Flannery and Hankin (2006) very well explain the concept that firms seek to adjust to their target structures with a specific speed. This adjustment speed is impacted by the balance between the marginal

cost of adjustment and the marginal cost of deviation from target/optimal structure. This study describes cost of adjustment as the value of equity if firm and the transaction cost of conducting the financial transactions and the cost of deviation towards leverage as the cost of financial distress. Ju et. al(2005) test the implication of dynamic tradeoff model, in which it was found that companies which have slight deviation from optimal structure should not frequently readjust which is due to high adjustment cost which outweighs the benefits of adjustment. Banerjee, Heshmati and whilborg (2004) conducts the first study which brings together the concept of adjustment factor and optimal capital structure. This study further adds into literature by estimating the adjustment speed, the determinants of the target capital structure and as well as the factors impacting the adjustment speed of the firms. Graham and Harvey(2001) describe that firms do follow an optimal structure. Approximately 80% of the Chief Financial Officers very strictly follow their target structure or have a range of capital structure which is acceptable to them for the firm. These CFO's readjust to their optimal structures keeping in view the cost and benefits of adjustment. Along with the tradeoff model other methods have been used to measure the adjustment to target structure such as Ozkan(2001) applies Generalized Method of Moment (GMM) to report that firms do follow target capital structures. The study argues that any deviations from the optimal structure would result in deviation costs for the company and firms seek to fill these gaps if this deviation cost is higher the cost to adjust. This gives rise to the adjustment speed by which the firms reach their target structure partially. Flannery and Rangan (2006) applied the partial adjustment model, which is another method to calculate the capital structure adjustment and its speed of firms. It was concluded that firms on average are able to only accomplish one-third of the optimal structure by making different adjustment in their existing leverage ratios. Capital structure adjustment is impacted by the cyclical movements in the industry patterns and the macro-economic conditions , this impact become relatively stronger if the firm's cash flows are dependent of the economical market changes (Hackbarth, Miao and Morellec, 2006). According to a research by Cook and Tang (2010), which investigate the impact of both microeconomic and

macroeconomic variables which impact the firm's adjustment towards its optimal structure. It is found that the favorable economic conditions enhance the adjustment speed where this speed is lowered in case of unfavorable market conditions. A lot of empirical research is found which implies Partial Adjustment Model such as used by De Miguel and Pindado (2001) and Hovakimian, Opler and Titman (2001). Partial adjustment model characterizes the financial behavior of the firm who adjust their target structures over time with a specific speed. Firms are not always on their target level as due to adjustment cost and some frictions present in the market. Measuring the adjustment based on the current leverage and the target leverage and this is impacted by different firm related and macro-economic variables. In Pakistan, firms approximately adjust 60% on annual basis to their optimal structure and fully adjust in period of 2 years on average (Memon, Rus and Ghazali, 2015). Deesomsak, Paudyal and Pescetto(2004) investigate the Asian Pacific firms and found that the firm-specific and macroeconomic factors impact their adjustment towards the optimal structure. A study by Amjed (2016) identifies different variables which may impact the leverage ratio and the adjustment speed of the firm. This study measures the adjustment speed and it was found that adjustment speed differs across the industries, such as adjustment is found to be highest in the textile industry and lowest in the sugar industry. Approximately firms on average adjust 33% per year towards their optimal structure and the full adjustment requires a tenure of 3 years. Along with this it is also found that firm-specific factors such as size, profitability, liquidity and macro-economic factors which include firm-specific interest rate and non-debt tax shield, all of these play a significant role in the determination of the target structure. A research by Chang, Chou and Huang (2014) uses the standard partial adjustment model to measure the adjustment speed and the impact firm specific factors and the quality of governance on adjustment speed. It is found that firms which are over levered along weak governance mechanisms adjust slowly to their target structure in comparison to the firm which have strong governance mechanisms.

## 1.1 Research Gap

As the discussion about capital structure began from 1958, with four conventional theories, came the concept to measure the determinants impacting the capital structure choices, some of the studies include Haqqani and Zehra (2015), Akhtar, Husnain, Mukhtar (2012), Khan, Sohail and Ali (2016), Nazir and Afza (2009), Ghani and Bukhari (2010). Then the researchers focus on determining the impact of capital structure on the financial performance of the firm, not a lot of precise studies are conducted in Pakistan, some of the studies which are available include Saeed and Babar (2013), Mumtaz et. al. (2013), Bokhari and Khan (2013), Khalid (2010), Sheikh and Qureshi (2014). Then the researchers came up with the concept of target capital structure such as a study by Fischer et al. (1989). It was not late when the researchers jumped onto determining the factors which impact this target structure and the speed by which firms adjust to this structure and then identifying the factors which contribute to this adjustment speed such as research by Banjeree, Heshmati and Whilborg (2004). Most of the studies have been conducted for developed countries. A recent study has been conducted by Amjed (2016) considering the situation and factors which operate in the market of Pakistan. This study covers this topic in a very meticulous manner but yet there is need to also identify that how this speed of adjustment is impacted by various other factors, such as along with firm specific and macro variables also including the impact of governance variables, and industry specific factors in Pakistan, which in detail considers this issue and identify variables which significantly influence the adjustment speed of non-financial firms. This research focuses on all those variables which have not been discussed in this context before.

## 1.2 Research Questions

This research tends to address the questions on how well Pakistani non-financial firms adjust to their target capital structure and the speed by which they adjust on an annual basis, as well what are the different factors which impact speed of

this adjustment to their target structures. More Specifically, following questions will be answered through this research:

- i. What factors are more significant in determination of the capital structure?
- ii. What is the adjustment speed of the non-financial firms of Pakistan?
- iii. Which of the factors impact the adjustment speed of non-financial firms of Pakistan?

### **1.3 Research Objectives**

This study aims to identify different factors which contribute to capital structure adjustment. In this study the dynamic nature of the capital structure of Pakistani firms is explored and how these firms converge towards their target capital structure at some adjustment speed using a partial adjustment model. More precise objectives of the study include:

- i. To identify the factors influencing the capital structure of the Pakistani non-financial firms.
- ii. To identify the adjustment speed of capital structure of non-financial firms of Pakistan.
- iii. To explore the factors influencing the adjustment speed of these non-financial firms.

### **1.4 Significance of the Study**

Companies in Pakistan operate in an uncertain and dynamic environment, for which company not only needs to adapt its management to these changes but also financially be able to cope up with these changes. This requires companies to be able to identify the target structure and then be able to identify the factors

which can impact firm's ability to reach these targets. The changing nature of financial environment influences the firms to make their capital structure dynamic, means have such structure which are able to adjust according to the changing requirements. Once this is done, firms must also be able to identify the time period (adjustment speed) which they require to reach those target. The impact of various variables which can somehow impact this adjustment speed of the firm. This study also allows the firms to be able to deal with all the issues mentioned above. As well as all the research already available on this adjustment process is based on developed countries, whereas the situation of financial development is entirely different in developing countries like Pakistan, because of the difference in the cost of adjustment and the financial opportunities of both type of economies. Another contribution of this study is that it bring together all type of variables, which have never been brought together in a research before in case of Pakistan such as Firm-specific variables, Governance variables, Macro-Variables and industry-specific factors. This allows the firms in Pakistan to have an overall view of all the factors which can impact their aim to attain target capital structure and adjustment speed.

## 1.5 Contribution of the Study

According to the objectives of this study, this research contributed to the literature of finance in three different ways. First, it allowed to identify the factors impacting the target leverage of the non-financial firms of Pakistan. This concept of target leverage is very less explored by researchers in Pakistan. Second is that it reported the estimation of adjustment speed through partial adjustment model, which again has not been widely used for the non-financial sector of Pakistan. The most important and significant contribution of this study is to identify the different factors which influence the adjustment speed of these non-financial firms. These factors included various settings in which firms operate such as the firm specific factors, the governance variables, the industrial factors and the macro-economic

variables. This aspect of adjustment speed has never been covered in a way as this study does.

# Chapter 2

## Literature Review

### 2.1 Capital Structure Adjustment

According to (Myers 1984), Firms strive to adjust their capital structure(debt) towards their target and this characterizes their financial behavior. This adjustment towards target debt is impacted by the level of adjustment cost faced by firms. The study attempts to examine impact of institutional factors on the target adjustment model and the determinants of capital structure for non financial Spanish firms. Low adjustment speed is observed for these firms (De Miguel and Pindado 2001). This research conducted on the Swiss firms analyzes determinants of leverage and their adjustment speed towards the optimal/target leverage (Gaud, Jani et al.).

According to Jalilvand and Harris (1984), financial behavior of firms is characterized by partially adjusting to their long-run leverage targets. It is further examined this speed of adjustment is affected by firm-specific characteristics and this varies across time and companies. The adjustment of capital structure is highly dependent on institutional setting. In a type of setup which is dynamic, better shareholder position, development of financial market has positive impacts on the adjustment speed of firms towards their target leverage (Wanzenried 2006). De Miguel and Pindado (2001) in their study, developed target adjustment model in which the current leverage is taken as the previous period's leverage ratio and the

target leverage as a function composed of various factors such as firm characteristics. This study uses this adjustment model to identify the factors affecting the target capital structure. Banerjee, Heshmati et al. (1999) is the first to collectively conduct study on adjustment factors and factors effecting target leverage ratio. The study not only identifies these factors which determine the target capital structure but also estimate the speed of adjustment and its determinants. Using U.K and U.S firms data, it is found the adjustment speed is not entirely dependent on the difference between current and target capital structure (leverage). Hovakimian, Opler et al. (2001), report that firms hold a tendency to take decisions which leads them towards their financial targets(target leverage ratio) and this tendency may vary over the time through impacts of firm's profitability and stock price changes. In the presence of adjustment cost to transform to target leverage, some firms may not completely adjust to their levels of target leverage. Firms do follow a adjustment process, but this must be hindered by the presence of adjustment cost (Leary and Roberts 2005). There are conflicting views on how companies adjust to their target capital structures by using a more generalized partial adjustment model. According to the results, each year firms approximately fill one-third of this gap between its actual and target leverage (Flannery and Rangan, 2006). Huang and Ritter (2009), constructed an econometric model to estimate the adjustment speed toward the capital structure and it is revealed that the speed of adjustment is about 3.7 years for the firms. Lööf (2004) conduct the study on various countries and come up with the results that equity-based/dominated countries are more likely to adjust to target capital structure with a faster adjustment speed rather than the debt-dominated countries. As well as the major determinants of adjustment of speed were indentified which include size, growth opportunities and distance between target and current capital structure. The study also concludes that more the distance between target and current structure, higher will be the speed to adjust to the target in the presence of adjustment cost. In this study, the adjustment cost has been explained through cash flow of the company. It is argued that the firms with larger positive cash flows tend to chose such financing option which allow them to meet their target structures, on the other hand

firms with more negative cash flows are likely to ensure lower adjustment costs to move towards their target structures. Overall looking at both the situations, it is concluded that firms with lower marginal cost of adjustment have higher adjustment speed towards their target capital structures. Moreover inverse relationship is observed between incremental cost and the speed of adjustment (Faulkender, Flannery et al. 2008). The capital structure adjustment mechanism of the firms which have to go through leverage changes. It is observed that large increases or decreases in the leverage, have asymmetric relations with the adjustment. As well as this adjustment process is impacted by the timing opportunities of the market, if there is persistent impact of equity market timing, then this adjustment process becomes slow (Xu, 2009). Mukherjee and Mahakud (2010) study the dynamic capital structure adjustment of Indian manufacturing firms, and conclude that most prominent factors impacting the target capital structure are growth, size, tangibility and Profitability. Factors which determine the adjustment speed of the Indian manufacturing firms include size, distance between target and current capital structure and growth opportunity. According to Clark et al. (2009), firms do not completely readjust to their target structures, whereas this adjustment is partial so dynamic model should be used to measure this speed of adjustment and the factors impacting this adjustment process.

## **2.2 Firm Specific Factors Affecting Capital Structure**

### **2.2.1 Growth and Leverage**

Myers (1977), suggested that growing firms have more flexibility to choose their future investments and at the same time growth is inversely related to level of leverage. Growing firms with risky debt are less likely to invest more in projects with positive net present value, they rely more on equity financing. It is because with uneven cash flows makes it difficult for them to bare any distress cost that may occur in future (Frank and Goyal 2009). Contrary to this argument, Bhaduri

(2002) argue that leverage and growth shares a positive relation, as in the growth stage firms require more finances to fulfill requirements of their capital expenditure. Drobetz and Wanzenried (2006) report a positive relationship between growth and leverage. Deesomsak, Paudyal et al. (2004) observe a negative relationship between leverage and growth, so it is assumed that growing firms will be more flexible in achieving the target capital structure with a faster pace. Another empirical study by also found a negative relation between leverage and growth (Titman and Wessels, 1988). Rajan and Zingales (1995) report a positive relation between leverage and growth of the firm.

**H1: There is a significant relation between growth and leverage.**

## 2.2.2 Size and Leverage

Rajan and Zingales (1995) integrates four variables to determine their relationships with capital structure, and finds a positive relationship between size and level of debt. Rajan and Zingales 1995, Huang (2006) also report a positive relationship between leverage and size for the firms in China. But at the same time Anwar and Sun (2013) report a negative relationship between leverage and size of firms. Harris and Raviv (1991) state that there is positive relation between leverage and firm size, because larger firm are highly diversified and they tend to finance them through external financing as well, which allows them to reach their target capital structures. Loof (2004) also argue that large-sized firms adjust more quickly to their capital structure. In contrary to this, Nivorozhkin (2004) argues that there is negative relation between size and leverage.

**H2: There is a significant relation between size and leverage.**

## 2.2.3 Profitability and Leverage

Ozkan (2001) and Rajan and Zingales (1995) report that there is negative relationship between profitability and leverage. As firms which have more internal funds available in form of profits they will rely less on external sources of funds.

On the other hand, according to trade-off theory perspective agency costs and taxes influence profitable firms to have higher level of leverage, firms which are more profitable can easily arrange for external sources of finance either its debt or equity. So there is positive relationship between leverage and profitability. According to Easterbrook (1984) and Jensen (1986), higher leverage allows firms to pay out more of excess cash so it helps to control agency problems such as paying large amounts of pre-interest earnings to creditors, also allows tax benefits. So it suggests positive relation between leverage and profitability.

**H3: There is a significant relation between profitability and leverage.**

## 2.2.4 Tangibility and Leverage

Tangibility is defined as the number of assets which can be made collateral to get loans. According to Myers and Majluf (1984), getting financed this way allows to have reduction in associated costs. This shows there is a positive relation between tangibility and leverage. There has been mixed views in this regard according to some researchers such as Titman and Wessels (1988) and (Wald 1999) there is a positive relationship between leverage and tangibility whereas according to some other researchers as Mazur (2007) and Booth, Aivazian et al. (2001) there is a negative relation between leverage and tangibility, it is because larger firms with more tangible assets have more access to both sources of finance debt/equity so they make different choices to reach their target capital structures. Mukherjee and Mahakud (2010) report a negative relation between leverage and tangibility, it is because firms with lower collateralizable assets tend to have higher levels of debt to avoid any kind of management privileges. Berger and Udell (1994) believe that firms with higher level of fixed assets have a view that they can provide large physical collateral to get loans, this allows them to have debts on lower interest rate. Therefore this study argues that there is positive relation between leverage and tangibility. After size and profitability, Tangibility is the most important determinant for the level of leverage chosen by firm in their capital structure (Nguyen, Diaz-Rainey et al. 2012). According to Morellec (2001), there is an exclusive relation between tangibility and the leverage of the firm, firms with

higher ratio of fixed assets tend to have higher level of debt in comparison to the firms which have low level of fixed assets.

**H4: There is a significant relation between tangibility and leverage.**

### **2.2.5 Earnings Volatility and Leverage**

It is considered an important determinant of capital structure because it determines the probability of financial distress. According to Banerjee et al. (1999), more volatile are the earnings of the firm, more difficult and uncertain it becomes to make the interest payments and meet debt obligations, so firms with higher earnings volatility should use lower debt. Almost all of the researchers who have conducted study on this aspect of the capital structure have found a negative relation between volatility and leverage such as Booth et al. (2001), Choi and Richardson (2016) and Huang and Song (2006). According to these studies, there can be two perspectives to understand the relation between earning volatility and leverage, either the debt financiers will require higher return due to volatile earnings, so debt financing will be more costly to the firm. The other perspective is that due to uncertain earnings, firm will not be able to manage regular repayments. In both cases leverage and volatility are inversely related. According to Antoniou, Guney et al. (2008), Agency Theory predicts a positive relation between volatility and leverage, it is because the problem of underinvestment gets resolved due to increased earnings volatility.

**H5: There is a significant relation between earnings volatility and leverage.**

## **2.3 Governance and Ownership Factors Affecting Capital Structure**

Corporate governance is defined as the system by which firms are controlled and directed (Cadbury 1992). Pass (2004) explains corporate governance as the duties and responsibilities of board of directors to lead the company in a successful

manner and the relationship shared by shareholders and all other stakeholders. Velnamby and Pratheepkanth (2012) mentions in their research, that good corporate governance practices allow to attract the investors by reducing the level of risk faced by them, have more easy access to capital markets and most importantly improve companies' performance.

### **2.3.1 Ownership Concentration and Leverage**

It is best define as the largest amount of block holders, it explains that it allows to effectively monitor the investor decisions on investment and be able to reduce the chances of agency problems to occur. These block holders are able to force the management to take certain decisions which are in the benefit of shareholders. According to Fosberg (2004)), number of shares held by the block holders in and organization is directly related to the total amount of debt in firm's capital structure whereas it is inversely related to total number of block holders in an organization. There is significantly strong relationship between ownership concentration and the capital structure, this specifies debt financing (Brailsford, Oliver et al. 2002). According to Mehran (1992) , there is statistically significant and positive relation between ownership of large amount of shares held by large investors and the debt financing of the company.

**H6: There is a significant relation between ownership concentration and leverage.**

### **2.3.2 Size of Board and Leverage**

According to Adams and Mehran (2003), bigger board allows to effectively control the management and improve the company's performance. Lipton and Lorsch (1992) argue that larger board more face the situation of conflicts and disagreement among the members as compared to smaller boards, so larger boards are less operative. In the view of Begeer et al.(1997) there is significant negative relation between financing decisions of firm and its board size. Bokpin and Arko (2009) report a significant positive relation between size of board and its capital structure

decisions. Wen, Rwegasira et al. (2002) report a positive relation between companies' boards size and their leverage levels. Whereas according to study conducted by Wiwattanakantang (1999), there is negative relation between capital structure and board size and this relation is statistically insignificant. Moreover Ofek and Yermack (1997) argue that firms with larger boards tend to finance themselves with lesser of debt, because they pressurize the management to have lower debts to avoid excess risk faced by investors. Bodaghi and Ahmadpur (2010) conduct a study on Iranian firms, concludes that there is negative relation between debt/equity ratio and the board size of firm. Saad (2010) conducting a research on four different industries of Malaysia report a positive relationship between board size and capital structure, using multiple regression analysis.

**H7: There is a significant relation between board size and leverage.**

### 2.3.3 Board Composition and Leverage

The overall board of the company, should be a mix of executive directors, non-executive directors and independent directors so that these independent can monitor the action to ensure that rights of other shareholders are not violated. Such as study of Weisbach (1988) states that if the board of organization is composed of both independent and outside directors, it allows to have more effective management and achievement of shareholder rights.

Kyereboah-Coleman and Biekpe (2006) argues that leverage is positively related to the percentage of directors in the board of the firm. Berger et al. (1997) offer a view that in the firms where there is low percentage of independent directors, the level of financing through debt in those firms will be relatively lower. A research by Wen et al. (2002) state that a negative relation between board composition and the capital structure of the firms, better explained in a way that firms which have independent directors rely less on debt financing. This negative relation is also supported by research conducted by Anderson, Mansi et al. (2004), which find a negative relation between independent directors and capital structure of the firm. Whereas Bokpin and Arko (2009) find a positive but insignificant relation between

board independence and its capital structure (leverage levels). Jensen (1986) also observe positive relation between the percentage of independent directors on board and the firms' leverage ratio. A research by Pfeffer (1973) reports that firms with large number of outside directors tend to raise finance more through external debts to avoid to face any type of uncertainties.

**H8: There is a significant relation between board composition and leverage.**

### 2.3.4 CEO Duality and Leverage

It means when CEO of company also serves as the chairman of the board of the company. According to Fama and Jensen (1983) the role of both CEO and Chairman should be separated as the chairman has the chief decision making authority and CEO manages the business conducted by the firm. Duality increases the overall judgment of the person as well as the power. Brickley, Coles et al. (1997) state that duality has both benefits and disadvantages, so identifying any single relation of positive or negative nature with capital structure may not be possible. Moreover it may be beneficial for some firms and for other it may be not of the same value. Saad (2010) conduct a research on four different industries of Malaysia, using multiple regression analysis, it is found that there is a negative relationship between CEO duality and capital structure of the firm. A research on Tehran Stock Exchange over the years from 2005-2010, suggest that there is a positive relationship between CEO duality and leverage of the firm (Vakilifard, Gerayli et al. 2011).

**H9: There is a significant relation between CEO duality and leverage.**

### 2.3.5 Ownership and Leverage

This variable explains how the business ownership such as either it's a private limited company or public limited or family owned business. And how does this impacts the level of leverage used by firms as a source of finance.

**H10: There is a significant relation between management ownership and leverage.**

## **2.4 Industry Specific Variables Affecting Capital structure**

### **2.4.1 Industry Dynamism and Leverage**

According to Dress and Beard(1984), Dynamism of industry measures how stable or unstable is the environment in which an industry operates. A company which operates in a dynamic environment, has to deal with more uncertainty in respect to sales and profitability. Boyd, Jung et al. (1995) calculate dynamism as standard error of the coefficient of munificence regression slope divided by the mean of industry sales, over the period of 5 years. Based on the calculations of these 5 years, the high dynamic industries are the above 50% of the industries and the low 50% of the industries are the low-dynamic industries, and otherwise it is 0. Simerly and Li (2000) describes environmental dynamism as instability of the environment change. The study reports that leverage is positively related to the performance of the firm in an environment which is stable where this relation is inverse in case of dynamic environment. Kayo and Kimura (2011) described that industrial dynamism is strongly related to the business risk of the firm. As the business risk increases, the cash flows of the company are more uncertain, same is the case which happens if the environment is unstable. As the firms which require similar labor, technology and input operate in a similar type of environment. So when the environment is unstable these firms in a similar environment, face business risk because their income stream becomes uncertain. Therefore it is concluded that as the firms' future income stream becomes more uncertain, firms are less likely to rely on leverage for financing. Moreover they argue that this relation between environment dynamism and long term debt financing is negatively co-related but insignificant in emerging markets/countries.

**H11: There is a significant relation between industry dynamism and leverage.**

## **2.4.2 Industry Munificence and Leverage**

Dess and Beard (1984) defines munificence as the environment's ability to be able to uphold the growth. According to research by Almazan and Molina Manzano (2002), capital structure is more varied in economies where growth opportunities are higher. Industries which operate in high munificence will be available with higher resources, that is why they are able to cope up with this growth. This availability of higher resources along low competition will allow to generate higher profits. According to the pecking order theory, there is positive relation between industry munificence and company's leverage levels, whereas according to trade off theory there is inverse relationship between them. Kayo and Kimura (2011) confirming the trade off theory, find negative relation between munificence and long term debt of the firms, but this relation is insignificant across countries. Boyd (1995) construct industry munificence by regressing time against the industry sales over the period of 5 years and then dividing this regressing slope by the mean value of sale over the same period of 5 years. The top 50% of the ranked industries are marked as High-munificent and the remaining 50% marked as Low-munificent over the period of 5 years, otherwise 0.

**H12: There is a significant relation between industry munificence and leverage.**

## **2.5 Macro-Variables Affecting Capital Structure**

### **2.5.1 Interest Rate and Leverage**

The prevailing lending rate in the country is taken as firm's interest rate. Graham and Harvey (2001) admit that there is negative relationship between interest rate and the leverage level of the firm, they argues that firm manager tend to issue

more debt when the interest rate is lower in the country. Haron et al. (2013) find a positive relation between leverage and interest rate of the country, it is because the high interest rate is actually the nominal interest rate due to inflation rather than real interest rate. According to Deesomsak, Paudyal et al. (2004), as the interest rate increases so borrowing becomes more expensive, as a result firms rely on borrowed finance due to more probability of financial distress. In times of high interest rates, firms could not afford to make the periodic repayments, so firms restrain themselves from extending further loans. Barry et al. (2008) argue that firms are more likely to use debt when the current interest rate is lower than the past interest rate. There is a negative correlation between leverage and interest rate across distressed and healthy firms. This relationship is in line with the trade-off theory which proves a negative relation between leverage of firm and prevailing interest rate (Ahmad, Ariff et al. 2008). But in case of market timing theory, this relationship between leverage and interest rate is positive, it is because the management of firms tends to take more debt finance even when the interest rate is high, in an expectation that this high interest rate is due to high inflation (Frank and Goyal 2004). A research by Bas et al. (2009) states that despite of high interest rates, firms tend to keep raising finance through short term debt, whereas they restrain to get financed by long term debt. This shows that short term debt is positively related to interest rate and it is negatively related to long term debt. Haron, Ibrahim et al. (2013) come up with mixed views through the research conducted, as there is positive relationship observed between leverage and interest rate in Malaysian firms, whereas this relation was observed to be negative in Singaporean and Thai firms.

**H13: There is a significant relation between interest rate and leverage.**

## 2.5.2 Stock Market Development and Leverage

In accordance to the Market Timing theory, a research by Baker and Wurgler (2002) argue that firms tend to take advantage of any financial market developments. Such as firms are more likely to get finance through equity markets when the stock market activities are increasing. Firms also actively take advantage of

the mispricing in the stock market. Many researches such as Mitton (2007), Frank and Goyal (2009) and Deesomsak, Paudyal et al. (2004) observe a negative relation between stock market development and the long term debt/short term debt used by firms as a source of finance. This somewhat makes a point that, equity market is a priority for listed firms to get them finance rather than using debt markets. Booth et. al (2001), Gurcharan (2010) and Mat Nor et. al (2011) report a negative relationship between stock market development and the level of leverage used by the firms, in case of Malaysian firms. De Jong, Kabir et al. (2008) states that the advancement of the equity markets over the years, has reduced the cost of obtaining finance from equity markets, this makes the competition tough for firms to choose between the both markets for getting them financed. Kayo and Kimura (2011) report a positive relationship between these two variables in the developed countries, it means stock market development influences higher level of leverage used by firms, whereas this relation is observed to be negative among developing countries. It is because the developed countries more freely rely on debt financing as there is properly developed market of debt financing. In the developing countries, similar to Pakistan, the large firms are more likely to used leverage as a source of finance when the stock market develops, in comparison to smaller firms which remain unaffected by the financial market development (Demirg-Kunt and Maksimovic 1996).

**H14: There is a significant relation between development of stock market and leverage.**

## **2.6 Factors Affecting Speed Of Adjustment**

### **2.6.1 Firm Specific Factors**

According to many researches this topic of adjustment of speed is the most important in today's world regarding the capital structure discussion of the companies. Such as a research by Drobetz, Pensa and Wanzenried (2007) , adjustment of speed depends upon three firm-specific factors growth, size and the distance

between target and current capital structure. Growing firms have less available internal resources to finance the new growth opportunities, so they rely on external finance. These firms tend to change their capital structure by either swapping debt for equity or equity for debt, depending on the market conditions and firm's nature. It is hypothesized in this study that there is positive relation between growth and adjustment speed. According to Mukherjee and Mahakud (2010), when it comes to a relation with firm size, larger firms are more able to bare fixed so they can adjust more to their target capital structure in comparison to smaller firms. As adjustment process includes cost, so larger firms are more likely to adjust to their target structure in comparison to smaller firms, so positive relation hypothesized between firm size and speed of adjustment. Larger firms are more able to adjust their capital structures at lower cost as comparison to smaller firms, it is because this adjustment process requires substantial fixed cost which is relatively higher for smaller firms, so positive relation is hypothesized between size and adjustment speed (Drobetz, Pensa and Wanzenried, 2007). Loof (2004) report that equity-dominated countries adjust faster to their capital structure as comparison to the debt-dominated countries. It is concluded that growth, size and distance between target and current structures are the most prominent firm specific factors which impact the adjustment speed. The study also adds that firms which are more distant from their target capital structures adjust more quickly as compare to firms which are less distant from their target structures. Myers and Majluf (1984) report that there is positive relation between profitability and speed of adjustment, more the availability of internal funds, this would allow to elevate the speed of adjustment for the firm. As a positive relation is observed between profitability by Easterbook (1984) and Jensen (1986), therefore it is assumed that the adjustment speed for more profitable firms will be faster. A positive relation observed by Morellec (2001) and Udel (1994) between tangibility and leverage, as when firms have more physical assets, these can be kept as collateral for having debts. Therefore it is assumed that there is positive relation between adjustment speed and tangibility. Researches such as Huang and Song (2006), Anwar and Sun(2013) observes a negative relation between earnings volatility and leverage.

As well as negative relation is assumed between adjustment speed and earnings volatility by Mirza, Rehman and XianZhi (2016), same is assumed for this study.

**H1A: There is positive relation between growth and adjustment speed of non-financial firms of Pakistan.**

**H2A: There is positive relation between size and adjustment speed of non-financial firms of Pakistan.**

**H3A: There is positive relation between profitability and adjustment speed of non-financial firms of Pakistan.**

**H4A: There is positive relation between tangibility and adjustment speed of non-financial firms of Pakistan.**

**H5A: There is negative relation between earnings volatility and adjustment speed of non-financial firms of Pakistan.**

## **2.6.2 Macro-Economic Factors**

According to Richard (1978) and Cox, Ingersoll and Ross (2005), interest rate impact the borrowing of firm in three different ways, it impacts the asset pricing, the interest rate risk and the borrowing cost for the firm. Among these cost of borrowing is the most important determinant for capital structure and speed of adjustment. During the period when interest rate is high, it increases the borrowing cost their adjustment cost increases therefore the adjustment speed decreases. A negative relationship is observed between adjustment speed and interest rate. Harvey (2001) described that firms tend to borrow more when they feel that short term interest rates are lower than the long term interest rates, it is hypothesized that there is negative relation between interest rate and adjustment speed. According to research by Hendersen et al. (2004), firms tend to issue more debt when the interest rates are low, the substitute effect of debt for equity carries secondary importance, it is an importance consideration to observe the impact on adjustment speed to target capital structure rather than the capital structure itself. Kayo and Kimura (2011) observe a negative relation between stock market development and leverage in developing countries, same as Pakistan.

It is assumed for this study that there is negative relation between adjustment speed and stock market development, higher the stock market development lower will be the adjustment speed.

**H6A: There is negative relation between interest rate and adjustment speed of non-financial firms of Pakistan.**

**H7A: There is negative relation between stock market development and adjustment speed of non-financial firms of Pakistan.**

### **2.6.3 Governance Variables**

No research work is found on this field where the impact of factors in the company board is examined over the adjustment speed of the firm. This study focuses on those aspects. The relation between the adjustment speed and its determinants are hypothesized on the basis of the relation of these governance variables with the leverage, because this leverage when studies along the target leverage develops the adjustment speed. According to Mehran (1992), there is positive relation between ownership by large investors and the level of debt financing, therefore it is assumed that there is positive relation between adjustment speed and ownership of large percentage of shares by large investors. Both type of relations negatives and positives have been observed by the literature, but based on the majority such as research by Bodaghi and Ahmadpur (2010) observe a negative relation between board size and leverage, therefore it is hypothesized that there is negative relation between adjustment speed of firm and its board size. A research by Kyereboah, Coleman and Beikpe (2006), describe that larger the number of independent directors, more will the firm be financed by debt sources. This shows a positive relation between board composition and leverage levels of the firm. Therefore for this study it is assumed that there is positive relation between adjustment speed and the board composition of the firm. According to a research by Vakilifard, Gerayli, Yanesari and Ma'atofi (2011), there is a positive relation is observed between CEO duality and leverage levels of firm, by them in their study . On basis of this, it is hypothesized that there is positive relation between adjustment speed of the

firm and CEO duality, as the power increases it allows more independent decisions to be made to adjust to target structure so the speed to adjust becomes faster. No major relation was developed in the literature between ownership of management and the leverage. This variable has not been tested before. But this study tends to study this relation of ownership of management and adjustment speed. So for this variable it is hypothesized that there is significant relation between ownership of management and adjustment speed.

**H8A: There is positive relation between block ownership and adjustment speed of non-financial firms of Pakistan.**

**H9A: There is negative relation between board size and adjustment speed of non-financial firms of Pakistan.**

**H10A: There is positive relation between board composition and adjustment speed of non-financial firms of Pakistan.**

**H11A: There is positive relation between stock CEO duality and adjustment speed of non-financial firms of Pakistan.**

**H12A: There is significant relation between ownership of management and adjustment speed of non-financial firms of Pakistan.**

## **2.7 Industry Variables**

Two of the major industry variables are discussed in this study and their relation with adjustment speed are examined through this research. The two variables are industry munificence and industry dynamism. The relation between adjustment speed and these two variables have not been studied before in any research. So the hypotheses of these are developed on the basis of their relation with leverage. Kayo and Kimura (2011) examines relation between industry dynamism and leverage levels of the firm, based on the business risk relation with leverage, as more uncertain cash flows leads to lower debt finance, this develops that there is negative relation between industry dynamism and leverage. Therefore for this study

negative relation between industry dynamism and adjustment speed is hypothesized. This research by Kayo and Kimura (2011) also examines relation between industry munificence and leverage. It is reported that this relation is found to be negative but insignificant across the countries. Therefore it is assumed that there is negative relation between adjustment speed and industry munificence.

**H13A: There is negative relation between industry dynamism and adjustment speed of non-financial firms of Pakistan.**

**H14A: There is negative relation between industry munificence and adjustment speed of non-financial firms of Pakistan.**

# Chapter 3

## Data Description

Various studies have been conducted on the factors that explain the capital structure and speed of adjustment of firms. The dependent variables studied in this research include the capital structure (leverage levels) and adjustment speed (difference in the target leverage and the current leverage). The combinations of firm specific variables, industry specific variable, governance variables and macro-economic variables is used. Such as the firms specific variables explain the impact of individualistic factors of each firm influencing its capital structure and the speed of adjustment. These variables include size, tangibility, Profitability, growth and earnings volatility. Governance variables used in this study analyze the impact of board size, board composition, CEO duality, ownership concentration and ownership of management over its capital structure and adjustment of speed. The macro variables interest rate and stock market development allows to study the market wide variables which impact the different firms in a different ways depending on their nature. Finally, the industry variables explain the industry dynamics which are less explained in the studies previously conducted, This study also reports how the industry factors of munificence and dynamism impact the firms' capital structure decisions (leverage levels) and its adjustment speed to the optimal capital structure.

### 3.1 Population and Sample Selection

The sample of the study includes the non-financial companies which are listed on Pakistan Stock Exchange from the year 2006 to 2016. The selection of companies to be a part of sample is done on sectoral basis, such as 20% of the companies are chosen from each sector based on the highest market capitalization of firms in the specific sector. If any company which is initially made a part of sample, but it did not remain listed from 2006 to 2016, then a company having the next highest market capitalization in the specific sector, which fulfilled the sample criteria was made a part of the sample. These sectors have been developed on the basis of commonality and judgment basis. The final sample has been formulated by rounding off the figures acquired by 20% of the companies listed in each industry. The data required for the analysis is extracted from the Balance Sheet Analysis of these companies published by State Bank of Pakistan. Following criteria is used to select the companies from the non-financial sector.

- i. Non-Financial firms which are listed on Pakistan Stock Exchange(PSX).
- ii. Firms which remain listed on the PSX for the period of 2006 to 2016.

The Financial sector is excluded from the same, because the capital structure and all other decisions of a financial sector are well regulated and significantly different from the companies in non-financial sectors (Michaelas, Chittenden and Poutziouris, 1999). At the same time this study can be used for the financial sector as well by making some fundamental changes.

### 3.2 Methodology

The methodology of the study has three sections. First section explains the model for estimation of leverage by using leverage as dependent variable. Second section explains the partial adjustment model used to capture the speed of adjustment. Finally third section produces the specification/model used to explain the speed of adjustment.

TABLE 3.1: Sample Selection.

Economic Groups	Number of listed companies (2016)	Sample based on 20%	Final Sample
Automobiles and parts	22	4.4	4
Cement	21	4.2	4
Chemical and Synthetic	40	8	8
Electric and Engineering	27	5.4	5
Fertilizers and Paper	17	3.4	3
Food and Vanaspati	26	4.2	4
Ceramics and Leather	34	6.8	7
Pharmaceutical	11	2.2	2
Power Generation and Technology	29	5.8	6
Sugar	34	6.8	7
Textile	155	31	31
Oil and Gas	13	2.6	3
Jute and Woolen	4	0.8	1
Total			85

### 3.2.1 Determinants of Capital Structure

$$\begin{aligned}
Lev_{it} = & \beta_0 + \beta_1 size_{it} + \beta_2 Prof_{it} + \beta_3 Tang_{it} + \beta_4 Growth_{it} + \beta_5 Volat_{it} + \beta_6 Int_{it} \\
& + \beta_7 SMD_{it} + \beta_8 Muni_{it} + \beta_9 Dynam_{it} + \beta_{10} BS_{it} + \beta_{11} Dual_{it} + \beta_{12} Compo_{it} \\
& + \beta_{13} Concen_{it} + \beta_{14} Own_{it} + \mu_{it}
\end{aligned}$$

In the model above, the dependent variable is Lev, which defines the leverage or capital structure of the firm, means how much equity and debt is used to finance the firm. The independent variables included are the size of the firm through level of its total assets value, profitability abbreviated as Prof, tangibility of the firm which explains the level of physical assets owned by the firm is abbreviated as Tang, Growth of the firm which explains the change in market value of the firm equity, Volat explains the volatility of the firm captured through deviation in the net profit of the firm over the years from 2006 to 2016.

Then the macroeconomic variables are included in this equation such as *Int* explains the impact of interest rate on the leverage of firm. The stock market development is abbreviated as *SMD*, which examines the impact of changes in the equity market over the leverage level of firms.

The industry specific variables in this model are industry munificence abbreviated as *Munif*, this explains how well is the industry able to uphold the growth in environment, then try to observe a relation between munificence and leverage through this equation. Another industry variable is industry dynamism, this is included in equation as *Dynam*, it explains how stable is the environment and how this impacts leverage levels of firms. *BS* explains the board size of the firm, the number of directors in the firm, then *Dual* explains the CEO duality, which tends to examine the relation between the duality (the same person is CEO and chairman of board) and the leverage of the firm. *Compo* is abbreviated by board composition of firms, the number of independent directors on the board and its relation with leverage levels is examined through this equation.

The ownership concentration is abbreviated as *Concen*, this explains the large percentage of shares owned by large investors, and impact on leverage. The last variable of governance which is included in this study is ownership management abbreviated as *Own*, this explains the ownership of shares by the family members and large investors.  $\epsilon$  represents the error term in the equation, which overcomes the impact of non-included variables or any missed variables, which may have significant impact on the leverage levels of the firm

It is worth mentioning that two of the proxies of leverage are used to test the robustness of results. The proxies include Long term debt to total assets ratio and Total debt to total assets ratio.

### **3.2.2 Estimation of Speed of Adjustment-Partial Adjustment Model**

This partial adjustment model has been used in many prior studies such as Jalilvand and Harris (1984), DeMiguel and Pindado (2001), Drobertz and Wanzenried

(2006).

$$Lev_{i,t} - Lev_{i,t-1} = \lambda_{i,t}(Lev^*_{i,t} - Lev_{i,t-1})$$

In the model above  $Lev_{i,t}$  is the current leverage level of firms, the combination of debt and equity that currently firm has.  $Lev_{i,t-1}$  is the lagged value, one period prior leverage level.  $Lev^*_{i,t}$  represents the optimal/target leverage which firm tends to reach in a specific period of time. This value of optimal leverage is calculated for this study by using the forecasted value through the actual leverage available for the sample by regressing leverage against all the independent variables under this study. The equation derived  $Lev_{i,t} - Lev_{i,t-1} = Lev^*_{i,t} - Lev_{i,t-1}$ , it means the change in lagged leverage to current leverage, is the change which is essentially required to reach the optimal/target leverage.  $\lambda_{i,t}$  shows the degree of adjustment in one period, therefore represents adjustment speed for the firm, the speed by which firms reach their target structures from  $Lev_{i,t}$  to  $Lev^*_{i,t}$ . There are three states of this adjustment speed, first if the adjustment speed  $\lambda_{i,t} = 1$ , then the firm will consistently be on its optimal leverage and  $Lev_{i,t} = Lev^*_{i,t}$ , is the  $\lambda_{i,t} > 1$ , then the firms over adjusts to their target in a specific period, means firms is above its optimal. If  $\lambda_{i,t} < 1$ , then firm under adjusts then the requirement to reach optimal leverage.

### 3.2.3 Determinants of Adjustment speed

Finally, adjustment speed estimated above is used as dependent variable and the factors influencing the speed of adjustment are explained by using the further econometric model,

$$\begin{aligned} \lambda_i = & \gamma_0 + \gamma_1 size_i + \gamma_2 Prof_i + \gamma_3 Tang_i + \gamma_4 Growth_i + \gamma_5 Volat_i \\ & + \gamma_6 Int_i + \gamma_7 SMD_i + \gamma_8 Muni f_i + \gamma_9 Dynam_i + \gamma_{10} BS_i + \gamma_{11} Dual_i \\ & + \gamma_{12} Compo_i + \gamma_{13} Concen_i + \gamma_{14} Own_i + \mu_i \end{aligned}$$

The model placed above tends to identify different factors which impact the adjustment speed,  $\lambda$ . The relation of these factors with the adjustment has been derived on basis of their with the leverage. The independent variables included are the size

of the firm through level of its total assets value, profitability abbreviated as Prof, tangibility of the firm which explains the level of physical assets owned by the firm is abbreviated as Tang, Growth of the firm which explains the change in market value of the firm equity, Volat explains the volatility of the firm it shows the deviation in the net profit of the firm over the years. Then the macroeconomic variables are included in this equation such as Int explains the impact of interest rate on the adjustment of firm. The stock market development is abbreviated as SMD, which examines the impact of changes in the equity market over the adjustment speed of firms. The industry specific variables in this equation are industry munificence abbreviated as Munif, this explains how well is the industry able to uphold the growth in environment, then try to observe a relation between munificence and adjustment speed through this equation. Another industry variable is industry dynamism, this is included in model as Dynam, it explains how stable is the environment and how this impacts adjustment speed of firms. BS explains the board size of the firm, the number of directors in the firm, then Dual explains the CEO duality, which tends to examine the relation between the duality (the same person is CEO and chairman of board) and the adjustment speed of the firm. Compo is abbreviated by board composition of firms, the number of independent directors on the board and its relation with adjustment speed is examined through this equation. The ownership concentration is abbreviated as Concen, this explains the large percentage of shares owned by large investors, and impact on speed of adjustment. The last variable of governance which is included in this study is ownership management abbreviated as Own, this explains the ownership of shares by the family members and large investors.  $\mu_{it}$  represents the error term in the equation, which overcomes the impact of non-included variables or any missed variables, which may have significant impact on the adjustment speed of the firm. The estimation of this equation is done using the cross sectional data, in which the average of each independent variables for each company is created from 2006 to 2010, then this average is regressed against the adjustment speed calculated for all companies in the sample.

### 3.3 Measurement of Variables

TABLE 3.2: Variables Description.

Variable	Proxies	Empirical Evidence
<b>Leverage</b>		
Long term Debt to Total Asset	Long Term Debt divided by Total Assets	Amjed (2016), Mirza, Rehman and Xianzhi (2016) and Titman and Wessels (1988)
Total Debt to Total Asset	Total Debt divided by Total Assets	Amjed (2016), Titman and Wessels (1988), Haroon, Ibrahim, Nor & Ibrahim (2016)
<b>Firm Specific</b>		
Size	Natural Logarithm of total assets	Haron et al. (2011), Loof (2004), Booth et al. (2001)
Tangibility	Fixed Assets/Total Assets	Kayo & Kimura (2011), Feidakis & Rovolis (2007), Shah & Khan (2007)
Profitability	EBIT/total assets	Titman & Wessels (1988), Flannery & Rangan (2006), Kayo & Kimura(2011), Booth et al. (2001)

Growth	Percentage increase in Sales	Titman & Wessels (1988), Rajan & Zingales (1995), Hovamikian et al. (2001)
Earnings Volatility	Deviation from mean of net profit/no. of years	Shah and Khan (2007)

**Governance****Specific**

Board Size	Logarithm of Number of directors	Masoon and Rauf (2013), Ali, Nasir and Satti (2014), Kajananthan (2012), Aboor (2007)
Ownership Concentration	Percentage of shares held by block holders (more than 10% with one investor)	Masoon and Rauf (2013), Ali, Nasir and Satti (2014), Abor (2007)
Ownership of Management	Percentage of shares held by family members, large investors/total shareholding	-
Board Composition	Ratio of outside/independent directors to total directors	Masoon and Rauf (2013), Ali, Nasir and Satti (2014), Kajananthan (2014), Abor (2007)

CEO duality	A dummy used, if CEO and chairman of board same person = 1; otherwise 0.	Masoon and Rauf (2013), Ali, Nasir and Satti (2014), Abor (2007)
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**Country****Specific**

Interest Rate	Lending Rate	Amjed (2016), Haron, Ibrahim, Nor & Ibrahim (2013)
Stock market development	Capitalization of stock market/GDP	Haron, Ibrahim, Nor & Ibrahim (2013)

**Industry****Specific**

Munificence	Regressing time against the sales of an industry for the past 5 years and then take the ratio of coefficient of regression slope to the mean of sales over 3 years.	Kayo and Kimura (2011), Boyd (1995)
Dynamism	Dividing Standard error of the coefficient of munificence regression slope by mean value of sales over the same 3 years.	Kayo and Kimura (2011), Boyd (1995)

### 3.4 Panel Data Analysis

Panel data analysis is used when the data has both cross sections and time series data, same applies to this study. There are three different models used in panel data analysis. Each having different assumption for the intercept. The first model of common coefficient, has constant intercept across all cross sections and time period. The second model is Fixed Effect Model which describes that intercept is different for all cross sections. The third one is Random Effect Model, in which the intercept is different for all the cross sections along with random over time. Two different tests are used to determine which of the three models should be used for application of panel data analysis. The Fixed Effect Redundancy test is used to identify which of the two models of common coefficient model and fixed effect model can be applied. If the result is significant in case of this test, then fixed effect model will be used but if the result is insignificant then common coefficient model will be used. The Hausmen Test is used to determine which of the two models of fixed effect model and Random effect model should be used for the study. If the result of this test is significant, then fixed effect model will be used and in case of insignificant results, the Random effect model will be used for the analysis of data.

### 3.5 Generalized Method of Moments (GMM)

GMM is applied in studies for its advantages over the ordinary least square. GMM is recommended to be used when the number of cross sections is higher than the time series observations. According to Caselli et al. (1996), GMM allows to resolve the problem of heterogeneity, endogeneity and any bias by omitted variable. Flanner and Hankin (2013), report that among the various dynamic panel methods, GMM tends to perform better. GMM has been used by various studies which are of the similar nature as this study. These studies include Memon, Rus and Ghazali (2015), Drobetz and Wanzenried (2007), Memon (2015) and Haron, Ibrahim, Nor and Ibrahim (2013).

### 3.6 Parameters Estimation

In this study, Generalized method of moments (GMM) is used to estimate the model. GMM is first introduced in 1984 by Karl Pearson. Then in 1982, it was more formalized by Lars Peter Hansen. GMM is widely used by researchers in the application of dynamic capital structure model such as by Memom, Rus and Ghazali (2015), Drobetz, Pensa and Wanzenried, 2007, Haron, Ibrahim, Nor and Ibrahim (2013), Ameer (2013) and Memon (2015). It allows to cover even the small variation and has various advantages over the Ordinary Least Square (OLS) such as unnecessary assumptions of OLS are avoided. For the application of GMM, it is mandatory to check that either endogeneity exists in this data or not. Endogeneity exists when explanatory variable are correlated with the error term. Endogeneity can be observed by looking at the value of J-stats after regressing the equation through GMM technique. If the value of J-stats is significant then endogeneity in data exists and if this value is insignificant, then Endogeneity does not exist and GMM cannot be applied. Table 4. below the value is significant J-stats, which shows endogeneity exists, so GMM can be applied in this study.

TABLE 3.3: Test to Apply GMM.

	LDTA	TDTA
R-squared	0.217	0.359
Adjusted R-squared	0.205	0.349
S.E. of regression	11.389	21.745
Durbin-Watson stat	0.622	0.824
Instrument rank	15.000	15.000
Mean dependent var	1.146	2.614
S.D. dependent var	12.773	26.953
Sum squared resid	119324.100	434999.100
J-statistic	0.000	0.000

TABLE 3.4: Redundant Fixed Effects Test.

Effects Test	Statistic	d.f.	Prob.
Cross-section F	7.2531	-84836.0000	0.0000
Cross-section Chi-square	511.8342	84.0000	0.0000

As it is Panel data analysis, so it becomes important which of the models of the panel analysis is be used in this study. There are two different model, Constant

Coefficient model, Fixed effect model. Each of these have different assumption in relation to the nature of the data with respect to time and cross section. For opting one of these models the Redundant Fixed effect test is used to identify either the constant coefficient model or the fixed model is to be used for the study. If the results are significant then Fixed effect model is used but if the results are insignificant then constant coefficient model is used. As the test results are significant so Fixed effect model is opted between these two. This study uses the GMM with Fixed effect model for estimating the results Leverage (long term debt to total asset and total debt to total asset) is kept as dependent variable and all other firm-specific, governance, macro-economic and industry specific variables are used as independent variables.

# Chapter 4

## Data Analysis and Discussion

This chapter presents the results of the study to achieve three basic objectives of the study, identifying the factors which significantly impact the firm's capital structure (leverage), estimating the adjustment speed of the sample group and identify the factors which impact the speed of adjustment of the firms.

### 4.1 Descriptive Statistics

The summary statistics table represents the size of the firms measured by natural log of total assets indicates that over the period of 2006-2016, the average size of non-financial firms of Pakistan was observed to be 15.563. The average long term debt to total asset ratio of the non-financial firms in the sample is observed to be 0.174, in case of total debt to total asset ratio average is 0.606. The average growth rate of firms is observed as 8.2%. In the same way, volatility of these non-financial firms measured by standard deviation of the earnings before interest and tax over three years is 11.7%. Proportion of external directors on the boards is averaged as 12.9%. The ownership is measured by the proportion of shares held by block holders, which on average has the value of 23.2% for sample sample. The munificence on average was 6.07 for the period of 2006-2016, which measures how well are the firms able to uphold the growth. The dynamism measures how stable

TABLE 4.1: Descriptive Statistics.

Variables	Mean	Median	Max	Min	Std. Dev.	Skewness	Kurtosis
LDTA	0.174	0.137	1.426	0.000	0.170	2.178	12.442
TDTA	0.606	0.610	4.140	0.000	0.339	3.333	29.114
BS	2.072	1.946	2.773	1.792	0.194	1.632	5.647
COMPOS	0.129	0.063	0.800	0.000	0.185	1.904	6.503
CONCEN	0.475	0.460	0.950	0.000	0.237	0.056	2.023
DYNAM	6.839	0.435	1109.045	0.000	56.944	14.835	247.880
GROWTH	0.083	0.093	10.092	-7.317	0.758	0.524	64.317
DUALITY	0.477	0.000	1.000	0.000	0.500	0.092	1.008
INT	9.368	9.000	13.400	5.750	2.577	0.204	1.747
OWN	0.232	0.130	0.930	0.000	0.256	0.963	2.801
MUNIF	6.058	0.041	1976.629	-323.219	78.140	19.073	450.061
PROF	0.114	0.056	5.626	-1.412	0.466	7.209	73.694
SIZE	15.563	15.374	20.431	8.826	1.663	0.205	3.603
SMD	32.314	30.159	55.195	16.370	11.184	0.583	2.356
TANG	0.611	0.579	11.673	0.001	0.733	12.282	172.261
VOLAT	0.116	0.043	12.743	0.000	0.490	19.638	481.547

is the environment in which the companies operate, it is on average 6.86 for these non-financial firms.

The highest deviation is observed in munificence as 78.14, the deviation is total debt to total asset is estimated to be 0.339. Whereas the lowest deviation in the data of the sample is observed in governance variable of composition which is 18.4% over this specific time period. The deviation in variable of Tangibility is 73.4% over the specific period of time. 49% deviation has been observed in volatility of these firms. The variation of profitability is estimated to be 46.7% for the sample data. The data for all the variables is positively skewed. The kurtosis is used to measure the peakness in the data, most of the variables in this study are observed to have a value of more than 3, it means these are leptokurtic, the volatility is highly peaked.

The correlation analysis has been preferred to explain the probability of multicollinearity. The results are reported in table 4.2. The correlation metrics allow to identify how strongly or weakly the independent variables are related to each other. The highest correlation is observed between board size and size which is 0.477. Followed by correlation between ownership and board size.

A very high value of correlation may be a source of multicollinearity and may result in biasness in the results. The correlation metrics indicate that the problem of

multicollinearity does not exist between independent variables and these can be used together in this study. As well as this problem of either these variables can be used together or not is explored through variance inflation factor and results are reported in tables 4.3. The value of variance inflation factor is below 5. It shows the problem of multicollinearity does not exist.

TABLE 4.2: Variance Inflation Factor.

<b>Variable</b>	<b>Centered VIF</b>
TANG	1.398949
VOLAT	1.077883
SIZE	1.561285
GROWTH	1.129009
PROF	1.135431
BS	1.391257
CONCEN	1.440774
COMPO	1.655607
DUALITY	1.409673
OWN	1.598248
SMD	1.012273
INT	1.128714
DYNAM	1.289235
MUNIF	1.179566

TABLE 4.3: Correlation Matrix.

Correlation	BS	COMPO	CONCEN	DUALITY	DYNAM	GROWTH	INT	MUNIF	OWN	PROF	SIZE	SMD	TANG	VOLAT
BS	1.000													
COMPO	0.268	1.000												
CONCEN	-0.016	-0.042	1.000											
DUALITY	-0.003	0.065	-0.035	1.000										
DYNAM	-0.038	0.046	-0.022	0.027	1.000									
GROWTH	0.036	0.004	-0.029	0.010	0.068	1.000								
INT	0.003	-0.017	-0.010	-0.011	-0.037	0.039	1.000							
MUNIF	-0.009	0.021	-0.042	0.010	0.478	0.104	-0.032	1.000						
OWN	-0.290	-0.038	0.140	-0.141	0.003	-0.052	-0.003	-0.003	1.000					
PROF	-0.014	0.059	0.150	-0.118	0.015	0.055	0.013	0.033	0.088	1.000				
SIZE	0.477	0.181	-0.032	0.134	-0.180	-0.030	-0.019	-0.087	-0.340	-0.082	1.000			
SMD	-0.011	-0.010	-0.008	0.001	-0.044	0.004	0.003	-0.037	-0.011	0.018	0.007	1.000		
TANG	-0.011	-0.082	0.005	0.056	-0.012	0.000	0.011	-0.035	0.103	-0.035	0.034	0.018	1.000	
VOLAT	-0.028	0.021	0.117	-0.014	0.070	0.034	0.000	0.010	0.061	0.246	-0.087	-0.042	-0.026	1.000

## 4.2 Determinants of Capital Structure Captured through Total Debt to Total Assets

This section of the study identifies the variables that impact the capital structure. The leverage measured as total debt to total assets. GMM with fixed effect model have been used for estimating these results.

TABLE 4.4: Determinants of Total Debt to Total Assets.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	101.4603	20.76151	4.886942	0.0000
CONCEN	-11.72046	25.78542	-0.454538	0.6496
DUALITY	-2.556002	4.810211	-0.53137	0.5953
DYNAM	0.163333	0.013988	11.67688	0.0000
GROWTH	-4.402198	0.847235	-5.195957	0.0000
MANAG	13.54335	32.98025	0.41065	0.6814
MUNIF	-0.099239	0.009064	-10.94855	0.0000
PROF	4.498424	1.604292	2.803994	0.0052
SIZE	-6.266945	1.114928	-5.620941	0.0000
TANG	2.31279	1.167858	1.980368	0.0480
VOLAT	2.214042	1.534127	1.443193	0.1493
R-squared	0.590095			
Adjusted R-squared	0.544225			

*Instruments List = Concen dual dynam growth manag munif prof size tang volat.*

*Note: With respect to concept of parsimony the highly non-contributing variables have been dropped from the equation.*

The value of determination coefficient ( $R^2 = 0.590095$ ) indicates that the model has strong explanatory power. The value of adjusted coefficient of determination (Adj.  $R^2$ ) = 0.544225 that the independent variables explain 54.4% variation in dependent variable. It is observed that the variable of Dynam, growth, munif, prof, size and tang are statistically significant. Dynamism, Profitability and tangibility have significant and positive relationship with the total debt to total assets ratio. Moreover intercept is significant (0.0000) that indicates the probability of omitted variables. It means there are various variables which are included in this study but there are also some variables which may impact total debt to total assets but are not included in this study. This first variable which significantly impacts the total debt to total asset ratio is dynamism, with p-value of 0.0000, The coefficient of

dynamism had value of 0.16333, this positive value along with p-value indicates a significant and positive relationship between dynamism and leverage. This results is according to the expectation. The growth also has significant relationship with the total debt to total asset ratio with a p-value of 0.0000, but the coefficient of growth has a value of -4.4021, which indicates a negative relation between growth and proxy of leverage. These results are consistent with the literature included in this study such as research by Deesomsak, Paudyal et al., (2004) and Titman and Wessels, (1988). These results of negative relation between growth and capital structure are consistent with pecking order theory, with higher growth there is lower preference for external financing. Munificence also significant impacts leverage, with a p-value of 0.0000, the coefficient of this variable is -.0992, which represents negative relation between industry munificence and leverage, this result is consistent with the results of study by Kayo and Kimura (2011) and confers to the pecking order theory, as negative relation between munificence and total debt to total asset ratio describes more available resources making the firm cope up with the growth without acquiring external sources of finance such as leverage. This shows there would be less preference for further external financing(leverage) when enough resources are already available. Profitability also has a significant relation with total debt to total debt ratio having p-value of .0052, the coefficient of this variable with value of 4.4984, which shows that there is positive relation between profitability and leverage. This positive relation is consistent with the trade-off theory having more debt to have optimal capital structure to have tax benefits. Size significantly impacts total debt to total asset ratio by having p-value of 0.0000, the coefficient value of size indicated negative relation between leverage and size as it has value of -6.2669. Tangibility also have a significant relation with total debt to total asset ratio having p-value of 0.0480, and the coefficient value of 2.3127 indicates positive relation between tangibility of non-financial firms and their total debt to total asset ratio. These results are consistent with study by, Berger and Udell (1994) which describes that firms with higher level of fixed assets have a view that they can provide large physical collateral to get loans, this allows them to have debts on lower interest rate, so tangibility has positive relation with

debt. According to the Trade-off theory, this relation between tangibility and leverage is observed to be positive, with higher level of physical assets the level of leverage increases, as easier loan terms are available which reduces the cost of debt therefore reducing overall cost of capital.

### 4.3 Determinants of Capital Structure Captured through Long Term Debt to Total Assets

The robustness of results have been tested by using long term debt to total assets ratio as dependent variable. This table 4.5 explains the impact of firm specific variables, industry specific variables, governance variables and macro-economic variables on Long term debt to total assets ratio by using GMM for estimation.

TABLE 4.5: Determinants of Long term Debt to Total Assets.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	49.82919	9.343935	5.332784	0.0000
DYNAM	0.02333	0.006973	3.345563	0.0009
GROWTH	-2.428444	0.422306	-5.750433	0.0000
DUALITY	-1.712235	2.337643	-0.732462	0.4641
INT	0.092714	0.115726	0.80115	0.4233
MANAG	9.893521	16.3228	0.606116	0.5446
MUNIF	-0.03085	0.004517	0	0.0000
PROF	2.354563	0.797155	2.953708	0.0032
SIZE	-3.331478	0.551664	-6.038959	0.0000
TANG	1.163326	0.582011	1.998804	0.0460
VOLAT	0.611587	0.678799	0.900983	0.3679
R-squared	0.546938			
Adjusted R-squared	0.496239			

*Instruments List = Dynam growth duality int manag munif prof size tang volat.*

*Note: With respect to concept of parsimony the highly non-contributing variables have been dropped from the equation.*

The value of coefficient of determination ( $R^2 = 0.546938$ ) indicates that the model has good explanatory power. The value of adjusted coefficient of determination (Adj.  $R^2 = 0.496239$ ) indicates that the independent variables explain 49.66% variation in dependent variable. Dynamism, growth, munificence, profitability, size and tangibility have significant impact on the long term debt to total asset

ratio. Rest of the variables have insignificant p-values indicating that these do not contribute to the variation in dependent variable. Dynamism significantly impacts the leverage and has positive relation with leverage with coefficient value of 0.0233. Growth has a significant impact on the leverage, the coefficient of growth is -2.428, which indicates there is negative relation between growth of non-financial firms and the leverage. This is consistent with the results of study by Titman and Wessels (1988) and Rajan and Zingales (1995), reporting that growing firms tend to less rely on long term debt because the uncertain cash flows increase the risk of financial distress. This result is consistent with the pecking order theory, as these are uncertain cash flows so avoidance of external sources of finance. Munificence has significant relation with leverage. The coefficient of munificence is -0.0208, represents negative relation between industry munificence and leverage (ltda ratio). These results are consistent with the study of Almazan and Molina Manzano (2002), reporting that firms which are able to cope up with the growing environment will be able to generate excess cashflows, leading to less reliance on long term debt for financing, so munificence and leverage have negative relation according to trade off theory. The Profitability significantly impacts the leverage, having a coefficient value of 2.3545, describing positive relation between profitability and leverage. This is consistent with trade-off theory, with an increased level of profitability, higher level of debt is opted by firms to have tax benefits. Size has significant relation with leverage. The coefficient value of -3.3315, represents that size negatively impacts the leverage. This result is consistent with the study by Nivorozhkin (2004), reporting a negative relation between size of the firms and its leverage levels. Tangibility describes that there is significant relation shared by tangibility and long term debt to total assets ratio. The coefficient of tangibility is 1.1633, that represents that tangibility positively impacts the leverage. This result is consistent with the literature, such as study by Myers and Majluf (1984) reports that firm with more collateralizable assets are able to get debt financing on lower rates, so a positive relation is shared between tangibility and leverage of the firm. The most of variables which significantly explain the long term debt to total assets ratio include the firm-specific variables, the least or no contribution at all

is by the macro-economic variables in explaining the leverage.

## 4.4 Descriptive Statistics of Adjustment Speed

The adjustment speed in this study has been estimated through regressing the difference in leverage and its lagged value against the difference in target leverage and lagged leverage value. As explained in the model 2 on methodology chapter. The target leverage has been calculated by taking the forecasted value after regressing all the independent variables against the dependent variable of leverage. The adjustment speed has been calculated for each company in the sample separately and for both of the proxies of leverage which include long term debt to total assets ratio and total debt to total assets ratio. The average adjustment in case of long term debt to total assets is observed to be .006, which describes that on average the non-financial firms of Pakistan cover .06% towards the optimal structure from its actual structure. In case of total debt to total asset ratio the average adjustment speed .0078, which explains that the sample adjusts .078% towards its optimal structure. The highest adjustment speed with respect to long term debt to total asset is 49.2% and in case of total debt to total asset the highest adjustment speed is observed as 64.7%. The lowest adjustment speed which has negative value of -10.3% in case of long term debt to total asset and the lowest adjustment speed with total debt to total asset is -11.62%, this shows no convergence to the target capital structure. The data is 5.7% deviated in case of long term debt to total asset and this value increases to 7.49% in case of total debt to total asset according to the statistics. The value of skewness shows that the adjustment speed data is positively skewed, mostly the values fall in zone of positive and the kurtosis show that data is highly peaked as the value is above 3, so it is leptokurtic.

## 4.5 Determinants of Speed of Adjustment

This part of the study identifies the factors that impact the adjustment speed. This estimation is done using GMM technique. The dependent variable in this

TABLE 4.6: Descriptive Statistics of Adjustment Speed.

	<b>LDTA</b>	<b>TDTA</b>
Mean	0.006624	0.007886
Median	0.001	0.001
Maximum	0.492	0.647
Minimum	-0.103	-0.116203
Std. Dev.	0.057904	0.074953
Skewness	6.931849	7.404569
Kurtosis	59.71051	63.88317

estimation is speed of adjustment of total debt to total asset ratio, a proxy of leverage used for this study.

TABLE 4.7: Determinants of Adjustment Speed of TDTA.

<b>Variable</b>	<b>Coefficient</b>	<b>Std. Error</b>	<b>t-Statistic</b>	<b>Prob.</b>
C	-0.0714	0.0405	-1.7644	0.0817
COMPOS	-0.0157	0.0245	-0.6378	0.5255
DUALITY	0.0132	0.0081	1.6283	0.1076
DYNAM	0.0025	0.0004	5.8071	0.0000
GROWTH	0.0629	0.0418	1.5036	0.1368
OWN	0.0317	0.0159	1.9975	0.0494
MUNIF	-0.0010	0.0004	-2.5160	0.0140
SIZE	0.0036	0.0027	1.3302	0.1874
VOLAT	-0.0395	0.0195	-2.0321	0.0456
R-squared	0.821389			
Adjusted R-squared	0.802587			

*Instruments List = dual dynam growth manag munif size volat compo.*

*Note: With respect to concept of parsimony the highly non-contributing variables have been dropped from the equation.*

The value of adjusted coefficient of determination (Adj.  $R^2 = 0.802587$ ) indicates that the independent variables explain 80.25% variation in adjustment speed. Dynamism, ownership, munificence and volatility significantly impact the adjustment speed, of total debt to total asset ratio.

The dynamism significantly impacts the variation in speed of adjustment of total debt to total asset ratio. and the coefficient of dynamism is 0.00249 that identifies that it shares a positive relation with speed of adjustment. This relationship is not consistent with the expectation developed in the hypothesis, that there is positive relation between industry dynamism and adjustment speed.

The ownership has significant impacts on the adjustment speed of the non-financial firms. The coefficient of ownership has a value of 0.03171, which describes that ownership positively impacts the adjustment speed. This result is consistent with the hypothesis developed that there is significant relation between ownership of management and adjustment.

Munificence has a p-value of 0.0140 which describes that it significantly impacts the adjustment speed over specific period of time. The coefficient of munificence have value of -0.0010, this describes that industry munificence negatively impacts the adjustment speed. These results are consistent with the study by Kayo and Kimura (2011), identifying negative relation between munificence and adjustment speed across different countries.

Volatility significantly impacts the adjustment speed. The coefficient of volatility -0.0395 describes that it has negative relation with adjustment speed. This relationship is estimated by the study confirms the hypothesis developed the relation between volatility and leverage. This is consistent with the study by Mirza, Rehman and XianZhi (2016) and Huang and Song(2006), reporting negative relations between volatility and adjustment speed. As uncertain cash flows decrease reliance on debt and lead to less adjustment towards their optimal structure. The industry variables munificence and dynamism have significant impact on in adjustment speed.

The robustness of the results have been tested by using the speed of adjustment of long term debt to total asset through the GMM technique for estimation. The dependent variable of adjustment speed is estimated using long term debt to total asset.

The adjusted coefficient of determination (Adj.  $R^2$ ) is 0.79198. It depicts that the factors explain 79.19% variation in the adjustment speed. Duality, dynamism, growth and munificence are factors have significant impact on the adjustment speed. Rest of the variables are non-contributing towards the adjustment speed.

Duality significantly impacts the adjustment speed. The coefficient of duality has value of 0.01399, it describes that there is positive relation between duality and

TABLE 4.8: Determinants of Adjustment Speed of LDTA.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.1522	0.1124	-1.3539	0.1798
DUALITY	0.0139	0.0065	2.1286	0.0366
DYNAM	0.0019	0.0003	6.5987	0.0000
GROWTH	0.0523	0.0264	1.9784	0.0516
OWN	0.0185	0.0139	1.3293	0.1878
MUNIF	-0.0008	0.0003	-2.4796	0.0154
PROF	-0.0081	0.0072	-1.1331	0.2608
SIZE	0.0024	0.0022	1.0793	0.2839
SMD	0.0032	0.0032	0.9731	0.3336
VOLAT	-0.0192	0.0128	-1.5062	0.1362
R-squared	0.814274			
Adjusted R-squared	0.791987			

*Instruments List = dual dynam growth manag munif prof size smd volat.*

*Note: With respect to concept of parsimony the highly non-contributing variables have been dropped from the equation.*

adjustment speed. The results are consistent with study by Vakilifard, Gerayli, Yanesari and Ma'atoofi (2011), reporting positive relation between CEO duality and adjustment speed. It is because as the power held by CEO increases by having dual position, it allows more independent decisions with respect to adjusting capital structure. Therefore adjustment becomes faster. Dynamism have a p-value of 0.0000 indicates that it significantly impacts the adjustment speed. Dynamism has a coefficient value of 0.001885, indicating positive relation between dynamism and adjustment speed.

Growth has a p-value of 0.0516, describing that there is significant relation between growth and adjustment speed. The coefficient value of growth is 0.052296, which explains that growth positively impacts the adjustment speed of non-financial firms. These results are consistent with the study by Drobetz, Pensa and Wanzenried (2007), reporting that growing firms have less available internal financing, so they rely on external sources. They often swap equity for debt and debt for equity depending on the changes taking inside firm and market condition. Therefore this makes the adjustment process faster.

Munificence has a p-value of 0.0516, which indicates that there is significant relation between munificence and adjustment speed. The coefficient value of munificence -0.000825 indicates that munificence negatively impacts the adjustment speed. This result is consistent with the study by Kayo and Kimura (2011), reporting that munificence negatively impacts the adjustment speed across different countries. In case of long term debt to total assets, munificence and dynamism, the two industry variables, significantly impacts adjustment speed, same as in case of total debt to total assets.

# Chapter 5

## Conclusion and Recommendations

### 5.1 Conclusion

The purpose of this study is to identify the factors which influence the capital structure decisions, determining the adjustment speed and explore the factors which influence the adjustment speed of firms in Pakistan. Usually impact of three types of variables is studied by researchers on the financial structure adjustments. This study investigates the impact of four type of variables which includes firm-specific variables, industry variables, macro-economic variables and governance & ownership variables. The sample consists of 85 non-financial firms listed on KSE 100, with a time frame of 11 years from 2006 to 2016.

Firstly, the analysis regarding the factors influencing the capital structures of firms. Out of 14 variables, only 6 factors significantly contribute the changes in capital structure over the period. In both cases, total debt to total asset ratio and long term debt to total debt ratio, these six variables impacted the capital structure. These factors include growth, dynam (dynamism), prof (profitability), munif (munificence), size and tang (tangibility). The hypothesis developed for the variables to have significant relation with leverage is accepted. Other variables they do not have significant relation with the leverage ratios. Looking at the

coefficient of these six factors, dynamism, profitability and tangibility share a positive relation with leverage, with an increase in these variables the leverage levels of firms is increased, either it long term debt or total debt. Whereas growth, munificence and size share a negative relation with leverage, both in case of long term debt to total debt ratio and total debt to total asset ratio. With an increase in these ratios, the leverage of firms tends to reduce.

Secondly, the adjustment speed is estimated using partial adjustment model. Different adjustment speed are estimated for long term debt to total asset ratio and total debt to total asset ratio. Both the ratios produce different results. The adjustment speed in case of long term debt is lower than the adjustment speed estimated in case of total debt to total asset ratio.

Lastly, this study explores the significance of factors influencing the adjustment speed of non-financial firms. Four type of different variables are used for this purpose. Out of the fourteen variables only four variables significantly influenced the adjustment speed, in case of total debt to total asset ratio and also in case of long term debt to total asset ratio. But in both ratios, different factors impact the adjustment speed. Such as when considering total debt to total asset ratio, dynamism, ownership, munificence and volatility significantly impact the adjustment speed. But in consideration of long term debt to total asset ratio, the four factors include ceo duality, dynamism, growth, profitability.

Looking at the coefficient of these factors, growth and dynamism positively impact the adjustment speed. The hypothesis developed in this study regarding the positive relation between growth and adjustment speed is accepted after estimations, whereas the negative relation hypothesized between dynamism and adjustment speed is rejected on the basis of results. According to the coefficient value, munificence has a negative relation with adjustment speed which allows to accept the hypothesis produced under this study. Ownership shares a positive relation with adjustment speed, these results are consistent with the literature and allows to accept the hypothesis developed under this study. It is concluded that the industry variables the most significant role in determining the adjustment speed of the non-financial firms of Pakistan.

## **5.2 Recommendation**

On the basis of the findings, it is recommended that firms should keep a check on the capital structure changes over time. In this process the consideration of various factors is very important. It allows to identify those factors which make the adjustment faster. Special consideration should be given to the industry factors which impact the capital structure and the adjustment speed of non-financial firms. The macro-economic factors which are usually given great importance regarding the capital structure decision, this study makes it clear that the factors of interest rate and stock market development do not influence any decision regarding the capital structure adjustment. Being vigilant about only those variables which influence the financial structure adjustment allows to save time and energy spent by firms in making these decisions and their implementation. In case of leverage dynamism, growth, munificence, profitability, size, tangibility proved to be the more significant factors. These factors should be kept in view by the non-financial firms when making capital structure decisions. The average adjustment speed in context of Pakistan non-financial firms was estimate to be very low, which describes that firms very slowly adjust to the optimal structure. In case of adjustment speed duality, dynamism, growth, volatility, ownership and munificence significantly impacted the speed. These variables should been given keen consideration by the firms when making capital structure changes.

## **5.3 Further Research**

The future research can should focus on the reason behind differing adjustment speed across firms. The behavioral factors which may impact the capital structure adjustments can be made a part of further research. The reason behind these financial choices, that either it is directed or a choice and its impact on the financial performance of the firm can further be explored.

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