Impact of Financial leverage on Firm Investment: Evidence from Non Financial Pakistani Firms

Khursheed Ahmad

31-FMS/MSFIN/S08

Supervisor

Dr. Syed Zulfiqar Ali Shah

Assistant Professor

Faculty of Management Sciences

International Islamic University Islamabad Pakistan

2011

1. Finance ; Management

2.

DEDICATION

They fed me when I was hungry, gave me strength when I was weak, protected me when in danger, taught me to walk on my feet. Nursed me when hurt, encouraged when dejected and helped me to live honorably in this world; I dedicate this humble effort to my loving parents.

(Acceptance by the Viva Voice Committee)

Title of Thesis: Impact of Financial Leverage on Firm Investment Evidence from Non Financial Pakistani Firms.

Name of Student: Khursheed Ahmad
Registration No: 31-FMS/MSFIN/S08

Accepted by the Faculty of Management Sciences International Islamic University Islamabad, in partial fulfillment of the requirements for the MS/ Master of Philosophy Degree in Management with specialization in Finance.

Viva Voce Committee

Supervisor Dr. Syed Zulfiqar Ali Shah

External Examiner Dr. Aliya Javed

Intrenal Examinar Ch. Mazhar Ihssain

11/8/11

Chairman/Director/Head

11/8/11

Dean

Member

Date: 28 - 3 - 2011 2010

This research work is submitted to the

Faculty of Management Sciences,

International Islamic University, Islamabad

As a partial fulfillment of the requirement for the award of the Degree of Master of Science in Finance.

Declaration

I hereby declare that I wrote this thesis "***Impact of financial leverage on firm investment; Evidence from non financial Pakistani Firm's***" by myself and listed all used sources. It is further declared that I have done this research with the accompanied report entirely on the basis of my personal efforts, and full guidance of my supervisor ***Dr. Syed Zulfiqar Ali Shah***. If any part of this work is proved to be copied from any source or found to be reproduction of any other research from any other training or educational institutions, I shall stand by the consequences.

Khursheed Ahmad

31-FMS/MSFIN/S08

ACKNOWLEDGMENTS

I would first of all pay my thanks to Almighty Allah for His providential guidance, analytical wisdom and vigor to put my best possible effort towards the accomplishment of this thesis.

I express my gratitude to my venerable supervisor for his vital support and constant encouragement toward the completion of this thesis.

I also express my gratitude to all of my teachers for their kind contribution in my knowledge and expertise.

I am also thankful to all members of MS/ PhD Committee for their kind guidance to ensure the quality of work in my dissertation.

I am also indebted to my friends Mr Idrees Ali Shah, Mr Tayyab Ur Rehman, Mr Rehman Ud Din, Mr Jawad Muhammod And Imran Saeed for their unconditional support.

Table of Contents

Abstract

The study has been carried out with the purpose to analyze the relationship between financial leverage and firm's investment in the presence of certain control variables; such as, Tobin's Q, cash flow, liquidity, return on equity and sale etc. The relationship was analyzed by implying different methodologies such as pooled regression, fixed effect model and random effect model. Housman test was performed for selection between fixed and random effect model. Data was taken from balance sheet analysis of joint stock companies, annual reports of the companies, Business Recorder and Karachi Stock Exchange. Data was collected for nine years from 2000 to 20008, but analyses were performed for eight years because 2000 was taken as a lag. This study found that financial leverage has significant negative impact on firms' investment.. The results of the common effect model support that capital structure plays a vital role in the decisions of firms that is how to invest. But whenever we extended the model to incorporate the time and individual effect, then no relationship was seen. The relationship between liquidity and investment is positive but insignificant. Tobin's Q has also shown positive but slightly insignificant relationship with investment for the target samples. The relationship between cash flow and investment is negative and is highly significant. Finally the results or ROE indicates that profitability and investment moves in the same direction.

CHAPTER #1

INTRODUCTION

Introduction

Corporate sector is considered to be the backbone of an economy. Corporations play a vital role in contributing to the economic growth. In today's dynamic environment, firms generally face intense competition and should therefore need to act in response. They make huge investment in modern technology, infrastructure, land, building, machinery, quality management, innovation and product development etc. Such factors will help organization to promote efficiency and effectiveness and gain competitive advantage. A firm needs cash or money to invest in land, building, machinery and to take care of day to day operations. The money which firms or businesses invest in purchasing these assets is called capital investment. In other words we may say that investment is made on capital goods by firms which ultimately amplified production of consumer goods.

According to Brown (2006), the investment is current commitment of funds for a period of time in order to derive future payments that will compensate the investor for the time the funds are committed, the expected rate of inflation and the uncertainty of future payments.

But a very important question rises here that how such funds will be generated. Literatureture points out mainly two sources of fund generation, these sources include equity financing and debt financing.

Equity financing means raising funds for company activities or operations by issuing stocks to individual and institutional investors. These stocks can be common or preferred in nature. These individual and institutional investors become creditors and receive ownership interest in

exchange for their funds. On the other hand when a company raises funds through the issuance of bonds or borrowings from banks or other financial institution, it is called debt financing. In return these individuals and institutions receive promise that they will receive interest periodically and the principal amount at maturity. When a company uses mix of these two sources it is called capital structure. The purpose of this study is to investigate that whether the financing which a company or firm generates through debt, effect its investment or not.

There is abundant literature regarding the inclusion of leverage in capital structure of a firm. According to Odit and Chittoo (2008), in 1930s and 1940s the inclusion of debt in capital structure was considered as evil as also as taboo and the basic source of bankruptcy and financial distress. But the concepts were changed by Modigliani and Miller (1958). They claimed that the value of a firm is independent of its capital structure in a frictionless world or complete world, where there is no transaction cost, no default risk, asymmetric information and no taxes. But whenever any assumption is relaxed the irrelevance value of firm and its capital structure does not hold any more. If the irrelevance theory is correct then the market value of firm can increases, as it takes more and more debt. It suggests that high levered firm will provide tax shield advantage, which in turn increases the value of firm. Anyhow it is not common practice to observe firms that use only debt for financial considerations. A question arises here that what are the reasons that prevent firms from debt financing only. Literature suggests bankruptcy cost and agency cost to be the primary sources that leads to optimal capital structure. Therefore agency cost is considered as important issue in corporate sectors. The separation of ownership and control in corporate sector is a source of agency problem. It may be in the form of inefficient efforts from manager, investing on their own preferences, or failing in maximizing shareholder wealth or value of the firm.

Bankruptcy costs also discourage borrowing or limit leverage in capital structure. Bankruptcy cost represents the cost associated with liquidation and reorganization. Robicheck and Myers (1966) argue that the cost of financial distress is incurred when the firm comes under the threat of bankruptcy, even if it can be avoided.

Theory suggests that the choice of capital structure may help to reduce these agency cost. Harris and Raviv (1991) argued that greater leverage may affect managers and it may reduce agency cost through the threat of liquidation, which causes personal losses to managers in the form of low salaries reputation etc. On the other hand Berger et al. (2006) comments that when leverage increases expected cost of financial distress or bankruptcy, the agency cost of outside debt may magnify the agency cost of outside equity, so further increase in leverage results in higher total agency cost. Therefore they argued that high leverage may cause agency problem between bondholder and equity holder. The study of Cantor (1990) highlights the relationship between leverage and investment. According to him a firm with a huge amount of average cash flow can accumulate a large amount as a reserve which can be drawn upon to make an investment when a firm faces shortage of cash flow in a particular year. On the other hand a highly levered firm with a small amount of average cash flow does not maintain reserve and may need to cut investment back in the year when firm faces shortage of funds. It means that investment is more sensitive to cash earning in highly levered firm. Therefore, the leveraged firm shows greater variability in its investment over time.

In the past, many empirical studies have been conducted to investigate the relationship between leverage and capital investment theories. Lang et al. (1996) concluded with negative relationship between leverage and investment, but the intensity was stronger for firms with low Tobin's Q or

low growth opportunities. These findings were consistent with the overinvestment theory of (Stulz, 1990). These studies were undertaken in mature markets and developed economies such as U.S. and Canada. In these countries long term finance is provided by profit making organizations such as banks and other public bonds markets. Here, the debt-holders keep an eye on and control the firms they lend to. However, the results from these studies do not necessarily generalize to transitional economies where the relations between lenders and borrowers are more complex and subtle. Transitional economies are characterized as having nascent stock markets, an absence of public debt markets (or, at most, embryonic public debt markets), and a reliance on bank borrowing. Furthermore, most banks are state owned and their decision making often reflects the policies dictated by government. Sapienza (2004), Khwaja and Mian (2005), and La Porta et al. (2002) argue that state-owned banks are controlled by politicians who use the banks to maximize their own political and personal objectives such as providing jobs for political supporters and bailing out poorly performing firms. In these cases, the banks' incentives to exert disciplinary pressures on firms are compromised. This could be particularly true for the poorly performing and loss-making firms because the state-owned banks often have the obligation to support them (Cull and Xu, 2003; Dobson and Kashyap, 2006). An investigation into the link between leverage and investment in an environment where banks are state owned can therefore provide a useful addition to the literature. Privately owned banks in developed countries generally use commercial criteria in making lending decisions although on some occasions political considerations may impinge on the decision process. In transitional or emerging economies where banks are owned by the state, political considerations are likely to weigh very heavily on lending policies.

Recent research finds negative impact of leverage on investment expenditure. According to Aivazian et al. (2005) there is a negative relationship between leverage and investment for the firms with low growth opportunities in Canada. Mehmet Umutlu (2009) also found negative relationship for low growth firms. However when he extended the model for incorporating the time – effects no significant relationship existed. Adrian and Shin (2008) investigate the relationship between the roles of financial variables in firm growth. He found that leverage is positively related to firm growth.

This study aims to provide evidence on the relationship between leverage and firm investment decisions for the period of 8 years from (2001 to 2008). Only those firms have been considered which were listed on Karachi stock exchange. According to the limited knowledge of author this study is the first one in Pakistan on this subject. Previous studies regarding financial policy and investment have mostly restricted to America and Canada. However, research on the relationship between financial policy and firm investment in developing country, like Pakistan is an extending line of research due to institutional, cultural and technological differences in developed and developing economies. This study contributes to the existing literature by providing empirical evidence on the relationship of financial leverage and firm investment of Pakistani firms. We used panel data from 342 firms for 8 years, by implying different methodologies, such as (common effect model, random effect model and fixed effect model). The major finding of the study is that there is a negative relationship between financial leverage and firm investment, but these results are not consistent by implying different methodologies. The results of the fixed effect model revealed that there was no significant relationship between financial leverage and firm investment.

Significance of the study

A significant, but controversial issue in corporate finance is the impact that leverage has on a firm's investment decisions. Modigliani and Miller (1958) demonstrate that leverage is unrelated to a firm's investment choices and to firm value. However, in a world where there are incomplete markets and significant agency costs, leverage may have a wide-ranging and complex impact on investment. For example, managers of highly levered firms may, in some circumstances, be induced to pass by positive net present value (NPV) projects (Myers, 1977) because some or all of the benefits from the investment may accrue to debt-holders; this is known as the debt overhang problem and leads to underinvestment. Alternatively, Jensen (1986) argues that high leverage or (high portion of debt in capital structure) in low growth firms are used to discourage management from investing in non-profitable businesses or projects. Here, debt pre-commits firms to pay cash as interest and principal and such commitments in low growth firms can reduce managerial discretion over free cash flows that may have otherwise been allocated to negative NPV projects. In other words, the banks and other debt-holders perform a beneficial monitoring and disciplinary role in low growth firms where a high level of debt can limit the overinvestment bias caused by managerial agency problems. In recent years empirical studies have been undertaken to examine the relevance of the leverage and capital investment theories. Lang et al. (1996), Aivazian et al. (2005a), and Ahn et al. (2006) all report a negative relation between investment and leverage although the correlation is much stronger for firms with low growth. This evidence is consistent with the overinvestment story (Stulz, 1990) where leverage inhibits managers of low growth firms from investing in non-profitable capital expenditures. These studies use data from the U.S. and Canada where long-term debt finance is provided by profit

maximizing banks and public bond markets. Here, the debt-holders keep an eye on and discipline the firms they lend to. Nonetheless, the results from these studies do not necessarily generalize to transitional economies where the relations between lenders and borrowers are more complex and subtle. Transitional economies are characterized as having nascent stock markets, an absence of public debt markets (or, at most, embryonic public debt markets), and a reliance on bank borrowing. Furthermore, most banks are state owned and their decision making often reflects the policies dictated by government. Khwaja and Mian (2005), and La Porta et al. (2002) argue that state-owned banks are controlled by politicians who use the banks to maximize their own political and personal objectives such as providing jobs for political supporters and bailing out poorly performing firms. In these cases, the banks' incentives to put forth disciplinary pressures on firms are compromised. This could be particularly true for the poorly performing and loss-making firms because the state-owned banks often have the obligation to support Dobson and Kashyap (2006). An investigation into the link between leverage and investment in an environment where banks are state owned can therefore provide a useful addition to the literature. Privately owned banks in developed countries generally use commercial criteria in making lending decisions although on some occasions political considerations may impose on the decision process. In transitional or emerging economies where banks are owned by the state, political considerations are likely to weigh very heavily on lending policies.

So the purpose of this study is to scrutinize empirically the relationship between financial leverage and firm investment of non financial Pakistani firm's. Literature revealed that many studies relating to capital structure and investment have been conducted in developed countries like America, Japan, United Kingdom and Canada. But the body of literature on leverage and

investment is still very small on Asian firms. This study aims to apply those models in Pakistani setup and to add to the applicability of those models in developing countries.

Objective of the study

The objective of the study is to find the relationship between financial policy (measured as financial leverage) and firm investment for Pakistani non financial sector.

Contribution of the study

According to the limited knowledge of the author this is the first comprehensive investigation of the relationship between financial leverage and investment in Pakistan, so it will make some contribution to the literature from the developing economy.

Organization of the study

The study has been organized as follows;

Section 1 provides details of literature review regarding leverage and investment. Section 2 contains methodology of the study along with the econometric tests used to find the relationship. Section 3 highlights the results and discussions, while section 4 concludes the study with findings and applications.

CHAPTER #2

LITERATURE REVIEW

Literature Review

The relationship between capital structure decisions, firm value and performance has been studied widely in the last few decades. The finance literature on capital structure started after the paper of Modigliani and Miller in 1958. Since then, many capital structure theories have been developed to determine the factors that influence capital budgeting decisions such as; trade -off theory, pecking order theory, and agency cost model and many more. Modigliani and Miller were the pioneers and they studied the relationship between the cost of capital, corporation finance and theory of investment. Modigliani and Miller (1958) found in their paper that in a perfect world (no transaction cost, bankruptcy cost and no taxes) value of the firm remained same whether it is financed with debt or equity. The researchers considered that in a perfect world the difference between equity financing and debt financing reduced to one terminology, and they considered equity and debt as perfect substitutes. They argued that investment policy of a firm should be based only on those factors that would increase the profitability, cash flow or net worth of a firm. Abundance of empirical literatures has challenged the leverage irrelevance theorem of Modigliani and Miller. For example Stiglitz (1969) pointed out five limitations of the Modigliani and Miller theorem which were:

1) Modigliani and Miller theorem depended on the existence of risk classes; they proved their theory by forming risk classes.
2) The existence of risk classes implies subjective rather than objective probability distribution over the expected outcomes.
3) Modigliani and Miller theorem was based on partial equilibrium rather than general equilibrium.

4) Modigliani and Miller theorem was not clear whether it held only for competitive markets.

5) Except under special conditions, it was not clear how the possibility of firm bankruptcy affected the validity of the theorem.

Stiglitz (1969) proved that value of the firm is irrelevant from its capital structure without assuming risk classes.

Modigliani and Miller (1963) revised their formal stance by incorporating tax benefits. The incorporation of debt in capital structure provided tax shield; because interest expense are tax deductible. There existed a larger advantage of tax savings for debt finance, but it doesn't necessarily means that companies should always try to use the maximum amount of debts in their capital structure. Sometimes other forms of financing such as retained earnings may in some situation be cheaper still when the tax status of investor under the personal income tax is taken in to consideration.

Pecking order theory

Pecking order theory is one of the most important theories of capital structure. After the paper of Modigliani and Miller in 1958, Donaldson (1961) started working on capital structure decisions. According to Donaldson (1961) management prefers to use internal financing to pay dividends and support investment opportunities. In addition, Myers (1984) analyzed the capital structure of non financial firms for the period of ten years from 1973-1982. Researcher found that these firms rely heavily on internal financing and debts. Author provided further evidence that the portion of internally generated funds (such as retained earnings) covered, on average, 62 percent of capital expenditures, including investment in fixed assets and current assets. It was

found that bulk of required external financing came from borrowing. Net new stock issues were never more than 6 percent of external financing. Myers further pointed out that why management prefers debt to equity; due to cost which is associated with external financing, which includes administrative cost, underwriting cost and in some situation under pricing of the new securities. Moreover (Myers and Majluf, (1984) argued that investor generally considers an equity issue as a sign of overvaluation. Furthermore, Frank et al (2002) demonstrated in their study, that high growth firm's generally with more financing needs end up with high debt ratio due to manager's reluctance to issue equity.

Barclay (2001) on the other hand concluded that firm with more growth opportunities issue less debts in their capital structure. According to Abor et al (2009) external finance is more expensive for riskier securities due to information asymmetry between mangers and security holders. Therefore firm prefer to finance its assets and projects with internal fund first, then debts and equity as a last resort. The study of Bolton and Scharfstein (1996) compared the external sources of financing for funds generations. Further Researchers argued that firms must finance its projects with debt rather then equity. They observe US firms for the period of 41 years from (1946 to 1987) and found that 85% of external financing were raised through debts as compared to 7% through equity.

The validity of pecking order theory was tested by Frank and Goyal (2002) for publically traded American firms. Researchers used date for 27 years from 1971-1998. The result of the study was contrary to those what is often suggested. This study explored that internal finance (retained earnings) is not ample to cover investment spending on average. External financing is mostly used. Moreover debt financing generally dominate equity financing in size. They

concluded that small firms normally do not follow the pecking order theory. Similarly Fama and French (2002) examined several predictions of the trade off and pecking order theories regarding capital structure and dividend. The findings of this study and those of Frank and Goyal (2002) are similar that small high growth companies issue most of the equity, which is contrary to pecking order theory.

Trade off theory

Another important theory in corporate finance is known as trade- off theory. According to the theory a firm finances its assets through borrowings to the level where the tax shield advantage on debt just offsets the increase in the cost of financial distress Myers (2001). There are two components involved in the definition. One is the tax shield advantage and the other is the cost of financial distress. When a company raises funds through utilizing debt in capital structure, the advantage that a company makes is the interest payments on debt which is considered as tax deductible expense, also known as tax shield. However, there always exist two sides of a picture, the other side of debt is the cost of financial distress or bankruptcy risk. When a company finances its assets through debts, it exposes to such risk. Such risk arises in a situation when a company is not able to generate enough cash flows from its operating, financing and investing activities to meet its financial obligations.

Tax incentive

Researchers who worked on capital structure have given different explanations of the impact of taxation on the capital structure decisions. Eriotis (2007) found that benefit which is associated with debt financing is the fact that interest payments are subtracted in calculating taxable

income, permitted a ''tax shield'' for the firms. The tax shield which arises from borrowing permits firms to pay lower taxes than they should, when using mix of capital, instead of using only their equity financing. Frydenberg (2004) found that as tax rate increases the value of firm tax shield will also increase. Firms generally reduce income by paying interest expenses on debt and ultimately reduce their tax liabilities. The tax advantage were compared between large and small firms by (Pettit and Singer 1985) they found that small firms are generally less profitable and made less use of tax shied than large firms and generally have greater chances of bankruptcy. Therefore small firms should use less debt in their capital structure as compared to their large counterparts. According to (DeAngelo and Masulis1984) the firms that pays tax, generally substitutes debt for equity as a minimum to the level where the probability of financial distress and bankruptcy starts to be important.

Bankruptcy incentive

Bankruptcy costs are the costs incurred when the perceived probability that the firm will default on financing is greater than zero. Bankruptcy costs may be direct on indirect. Direct bankruptcy costs include legal expenses, trustee fee and other administrative costs in the bankruptcy process (Abor et al 2009). Robicheck and Myers (1966) argue that the cost of financial distress is incurred when the firm comes under the threat of bankruptcy, even if it can be avoided. Myers (1977), for example, demonstrates that, with sufficiently high leverage, the firms share holders do not want to issue new stock due to debt overhang. Owing to this, most projects with positive net present value (NPV) can go unfunded and if a firm raises more new debt then the chances of bankruptcy increase.

Agency cost model

Agency conflicts represent important issue in corporate world, both in financial and non financial industries. Such conflicts start to arise as owner of firm delegates authority to agents. When owner delegates authority to mangers it results in a conflicts which induces cost, which is generally called agency cost. The purpose over here is to provide a brief literature on agency cost from the viewpoint of leverage and investment.

Literature suggests that the choice of capital structure may help to lessen these costs. Agency cost arises because of the differences in the interest of the ownership and management; it may take the form of preferences for the job perks, shirking and self interested decisions that reduces shareholder wealth (Ang et al 2000). According to Jenson (1986) debt in capital structure is in efficient means of reducing agency cost which is associated with equity. Furthermore researcher state that liabilities in capital structure help in avoiding over investment problem, because the payment of interest on debt reduces the cash flows left up to corporate managers and it ultimately mitigate agency problem. But liabilities have also potentially negative impact of causing under investment problems for companies with growth opportunities. Williams (1987) finding also support the theory of Jenson that incorporating more debt in capital structure reduces agency cost.

Hart and More (1995) emphasized the role of liabilities in reducing agency problems between shareholder and managers. Researcher argued that debt increases efficiency of firm because it averts managers from undertaking projects with negative net present value. On the other hand debt may also block or miss the profitable business investment opportunities.

Leverage and size

Size is the important characteristic of any firm and is videly studied in the literature. Many researchers predict a positive relationship between leverage and firm size. Rajan and Zingales (1995) studied such a relationship and concluded with a positive sign. They demonstrate that leverage of any firm increases as its size expends. Ang et al (1982) investigated that large firm are generally more diversified and less prone to bankruptcy. These arguments support the idea that large firms are generally more levered as compared to small firms. Titman and Wessels (1998) found negative relationship between size and short term debts, possibly due to reasonably high transaction costs small firms face when issuing long-term financial instruments.

Leverage and risk

The variability in return of a firm is generally considered as a proxy for firm risk. And risk is assumed to be negatively related to leverage. No significant relationships were found between risk and leverage in the study of (Mohammed Amidu 2007).

Leverage and profitability

Literature identified firm performance and profitability as major determinants of capital structure. According to tax trade-off models large and profitable firms employ more debts due to high tax burden and low bankruptcy risk (Ooi 1999). On the other hand (Myers 1984) and pecking order hypothesis reports negative relationship between leverage and profitability, further researcher argued that profitable companies often don't rely on external fund. Instead, they generally used internal funds, which are available to them in the form of retained earnings. The

study of (Mohammed Amidu 2007) for bank in Ghana revealed a negative relationship between level of short term debts and firm characteristics such as, growth, profitability and assets tangibility. In addition (Serrasqueiroa and Rogao 2009) also researched the impact of listed Portuguese companies' specific determinants on adjustment of actual debt towards target debt ratio and they concluded negative results between profitability and leverage.

Leverage and growth

The study of Lang et al (1995) showed that there is negative relationship between leverage and growth opportunities for firms with low Tobin's Q; on the other hand it is positive for those firms who's Tobin's Q is greater than 1. The pecking order theory supposes positive relation between leverage and growth, while trade-off theory assumes negative relations. The findings of (Karadeniz et al 2009) indicate that asset tangibility ant return on assets is negatively related to debt ration while growth opportunities, size of the firm have no relation to the debt ratio.

Investment

Investment plays a key role in explaining constant growth. Investment plays a key role in explaining constant growth. Investment is studied widely in the last few decades. The empirical relationship between investment and q and has been investigated for more than twenty years with varying degrees of success. The most basic empirical study of (Furstenburg 1977) built directly on Tobin's (1969) argument that investment is an increasing function of q, and these studies simply regressed aggregate investment on q. Around that time, Mussa (1977) also found that a version of the q theory can be derived rigorously from a model of investment by a firm facing convex costs of adjustment.

Different models for investment measurement are given below. These models were developed to provide explanation of firm investment. In the literature different models have been used for investment determination, which is briefly explained below.

Investment models

From the literature we can identify four models for investment measurements; namely,

1) Neoclassical model
2) Sales accelerator model
3) Tobin's Q model
4) Euler model

Neoclassical model

Jorgenson (1963) proposed a model for investment measurement; the model explained that cost of capital is the major and lonely determinant of corporate investment. The model is defined as

$$\frac{I}{K_{it}} = \alpha + \alpha_1 \left[\frac{C_K}{K}\right]_{it} + \alpha_2 \left[\frac{C_K}{K}\right]_{i,t-1} + \alpha_3 \left[\frac{C_k}{K}\right]_{i,t-1} + \epsilon_{i,t}$$

In the given model I is the investment of a firm, K is the capital stock whereas CF is the cash flow of firm. The coefficients α1 and α2 and α3 give cash flow sensitivities for firm *i* and $\epsilon_{i,t}$ is the error term. The model was criticized on the basis that it does not include any forward looking variables Goergen and Renneboog (2000).

Sales accelerator model

Sales accelerator model was proposed by (Abel and Blanchard 1986). The model emphasized that investment of a firm is determined through only and only sales of the firm's. The model was criticized on the basis that it does not include growth potentials and assumes that investment grows along with sales of the company.

$$\frac{I}{K_{it}} = \alpha + \alpha_1 \left[\frac{S}{K}\right]_{it} + \alpha_2 \left[\frac{S}{K}\right]_{it-1} + \alpha_3 \left[\frac{CF}{K}\right]_{i,t} + \epsilon_{i,t}$$

In the above equation, S stand for total sales.

Tobin's Q model

In the first two models there existed a problem of ignoring future growth and future expectations. So a model was needed to incorporate future growth opportunities, Tobin's Q model was proposed to overcome these problems. Tobin's Q may be defined as the ratio of the market value of equity and debts to the replacement value of the firm capital stock.

$$\left[\frac{I}{K}\right] it = \text{ri} + \text{r1}it \square + \square 2 \left[\frac{CF}{K}\right] + \square_{it}$$

In the above model Q stands for Tobin's q and is a proxy for growth opportunities whereas (ri) is the investment for firm (i) needed to generate future profitability. The model is good up to some extent as it covers the limitation of future growth and expectation, but it is not without problems.

The first problem associated with the model is the estimation and measurements of Tobin's Q. Usually companies do not report the replacement value of their capital stock in their final accounts. Some researchers use the book value of assets instead of the replacement value of the assets, but it also bears the problem of estimation of intangible assets.

Second, Tobin's q will only include future expectations if the firm is a price taker in perfectly competitive industries, if there are constant returns to scale and if the stock market value correctly measures the fundamental present value of the firm's future net cash flows (Hayashi 1982). In practice, these conditions may not be fulfilled, e.g. if the stock market displays excessive volatility relative to the fundamental value of the companies. Thus, if cash flow (or profitability) variables are included in an investment model along with Tobin's q, these cash flow variables may still be made up of expectations not captured by Tobin's q. It may then be difficult to disentangle the effect of expectations from the one of liquidity constraints in the parameter estimate of the cash flow variable. Chirinko and Schaller (1995) show that average Tobin's q is flawed as it reflects the average return on a company's total capital whereas it is the marginal return on capital that is relevant. Gugler, Mueller and Yurtoglu (1999) develop a method to measure marginal Tobin's q and test the degree of cash flow sensitivity to investment in different Tobin's q scenarios to differentiate between cases with asymmetric information and agency conflicts.

Euler –equation model

The Euler-equation model proposed by Bond and Meghir (1994) is based on the first-order conditions of a maximization process. The model deals with the shortcomings and limitations of the neoclassical and average Tobin's q-models. The level of investment relative to the capital

stock is a function of discounted expected future investment adjusted for the impact of the expected changes in the input prices and net marginal output. The Euler specification has the advantage that it controls for the influence of expected future profitability on investment spending whilst no explicit measure of expected demand or expected costs is required as future unobservable values are approximated by instrumental values. The theoretical model translates into the following empirical specification and tests the wedge between retained earnings and outside financing.

$$\left[\frac{I}{K}\right] = \alpha \left[\frac{I}{K}\right] + \left[\frac{I}{K}\right] + \alpha 2 \left[\frac{I}{K}\right] + \alpha 3 \left[\frac{I}{K}\right] + \alpha 4 \left[\frac{I}{K}\right] + \alpha 5 \left[\frac{I}{K}\right] + \Psi i + \Phi i + \square$$

Where D stands for the debt of the firm, Ψi and Φi stand for time specific effects and fixed effects respectively, and all the other symbols are as previously defined.

Leverage and investment

The relation between leverage and investment opportunities has been a topic of interest among finance scholars for many years. According to Odit and Chittoo (2008) in 1930s and 1940s the inclusion of debt in capital structure was considered as evil. And it was considered as the basic source of bankruptcy and financial distress. Modigliani and Miller (1958) proposed a theory regarding capital structure. They claimed that the value of a firm is independent of its capital structure in a world with no taxes, no default risk, no transaction cost and perfect & frictionless market. Myers (1977), for example, it demonstrates that, with sufficiently high leverage, the firms share holder doesn't want to issue new stock due to debt overhang. Owning to this most projects with positive net present value (NPV) can go unfunded.

Stulz (1986) predics a negative relation between leverage and investment. He demonstrates that investment is negatively related to firm investment and profitability. Therefore high profit firms should have a lower leverage. In the last two decades empirical studies have been undertaken to study the relationship between leverage and investment decisions. Lang et al. (1995) report negative relationship of leverage and firm investment, but its effect is stronger for small firms with low growth. Similarly Aviazion et al., (2005) find that a higher percentage of long term debt in total debt significantly reduces the firm investment especially in firms with high growth opportunities. In contrast he found no significant relation in debt maturity and firm investment for firm with low growth opportunities. Likewise Michael et al (2008) investigated the relationship between leverage and investment in china. Their result depicts a negative relationship between leverage and investment. The researchers further investigated that negative relation is weaker in firm with low growth and poor operating companies while it is stronger for firms with high growth opportunities and good operating performance. On the other hand McConnel and Servaes (1995 find that for firms with low P/E ratio or low growth opportunities the value is positively related to the degree of leverage while for high P/E ratio or high growth opportunities leverage is negatively associated with firm value. Such finding is also supported by Aggarwal and Kyaw (2006). They reveal that leverage is positively and significantly related to firm's growth for low firm's Q ratios. The researchers further suggest that leverage is value creating for firms with low growth opportunities while it is value- reducing for firms with high growth opportunities.

Norvaisienė et el (2008) investigated the relationship between loan capital, investment and growth. They demonstrate that firm's debts and agency problem (between managers, shareholder and creditors) causes underinvestment or overinvestment which in turn has a negative impact on

corporate investment, growth and firm value. Similarly the finding of Mehmet Umutlu (2009) also shown negative relationship between leverage and investment but only for low growth firms, and it was the finding of one–way error components model. However, no relationship was found when he extended the model to include time effect in a two way component model. Similarly Firth et al (2008) examined the relationship between leverage and investment under a state–owned bank lending environment in china. They concluded their study with three major findings; first that there is negative relationship between debts and growth, second that this negative relationship is weaker for firms with low growth opportunities and bad operating performance, while stronger for firms with good operating performance and high investment opportunities. Thirdly, this relationship is weaker for firms with greater and high level of state shareholding, than the firms with low level of state shareholding. They further explain that state owned banks in china impose fewer restrictions on investment expenditure of firms with low growth opportunities, which create overinvestment problems in these firms. A strong negative relationship of financial leverage and R&D expenditure were also reported by (Singh and Faircloth 2005). The negative relationship is strong due to changes in model specifications and sample periods. More significantly, the results show that it is higher leverage that leads to lower R&D expenditure.

On the other hand Jo et al (1994) investigated the relationship between financing decisions and investment opportunities and reported a positive relationship between debt ratio and measure of investment opportunities. The study was conducted in Japan and data was taken from Pacific – Basin Capital Markets database for the period of five year from 1986-1990. The sample size was 1044 Japanese firms. He further argued that such relationships were negative in USA due to agency conflicts which were mitigated in Japanese firm's because of their institutional

arrangements. The study of Anderson and Makhija (1999) found that bond debt is inversely related to growth opportunities while bank debt is positively related to growth opportunities.

Similarly, Ahn et al (2005) found positive relationship between leverage and firm value but it is weaker for firms with low growth opportunities and stronger for firm with more growth opportunities. Childs et al (2005) examined the interactions between the financing and investment decisions in model of agency conflicts (between shareholder and bond holder). They found in their study that short term debt is significantly helpful in reducing agency costs on underinvestment and overinvestment. However, such decline in agency costs couldn't cause any increase in leverage level, as the firm early debt level choice depends on the type of growth options in its investment opportunity set.

CHAPTER #3

METHODOLOGY

Research Methodology

This chapter contains the measurement of variables and the methods and sources of data collection. It also highlights different methodologies that have been used to determine the relationship between financial leverage and investment.

Sample and Data collection

This section highlights the methods and sources of data collection and sample size used in the study. This study; the relationship between financial leverage and firm investment, is based on secondary data. The data for the study are extracted from the annual reports, Karachi Stock Exchange, Business Recorder and Balance Sheet Analysis of joint stock companies for the period of nine years from 2000 to 2009. Data for the study was collected for nine years but analysis was conducted for eight years, the year 2000 was taken as lag year. Initially the samples included all non financial companies (435) which are listed on Karachi Stock Exchange, but after screening the data, the firms with incomplete data were dropped from the sample. After screening only 343 firms remained for Panel data estimation. Financial firms, such as banks, insurance companies, leasing companies, mudarrabas etc were excluded from sample due to regulation complications and different capital structures. The sample includes 343 firms from 27 different sectors. The sector wised classification are as follows.

SECTORS	NUMBER OF FIRMS
TEXTILE SPINNING	74
TEXTILE WEAVING	10
TEXTILE COMPOSITE	37
WOOLEN	6
SYNTHETIC and RAYON	9
SUGAR and ALLIED INDUSTRIES	25
CEMENT	12
TOBACCO	4
REFINERY	6
POWER GENERATION and DISTRIBUTION	6
OIL and GAS MARKETING COMPANIES	5
OIL and GAS EXPLORATION COMPANIES	4
ENGINEERING	10
AUTOMOBILE ASSEMBLER	8
AUTOMOBILE PARTS and ACCESSORIES	6
CABLE and ELECTRICAL GOODS	7
TRANSPORT	5
TECHNOLOGY and COMMUNICATION	4
FERTILIZER	8
PHARMACEUTICALS	7
CHEMICALS	19
PAPER and BOARD	7
VANASPATI and ALLIED INDUSTRIES	4
LEATHER and TANNERIES	4
FOOD and PERSONAL CARE-PRUDUCTS	14
GLASS and CERAMICS	6
MISCELLANEOUS	36
TOTAL NUMBER OF FIRMS	**343**

Measurement of Variables

For this study we have taken the model from literature for measuring investment. The model has been used by Lang et al, (1996) and Aviazian et al. (2005) which is as follows

$$\frac{I_{it}}{K_{it-1}} = ait + \beta 1\left(\frac{CF_{it}}{K_{it-1}}\right) + \beta 2(Lev_{it-1}) + \beta 3\left(Tobin'sQ_{it-1}\right) + \beta 4\left(\frac{Sales_{it-1}}{K_{it-1}}\right) + \beta 5(ROE) + \beta 6(Liquidity_{it}) + \varepsilon i_{it-1}$$

In the proposed model the I_{i-t} is the net investment of the firm i at time t; while $K_{i,t-1}$ is the lagged net fixed assets; $CF_{i,t}$ is the cash flow of firm I at time t.; $Leverage_{i,t\_1}$ is the lagged Tobin's Q; $Lev_{i,t-1}$ is lagged leverage; $Sale_{i,t-1}$ is lagged net sales of firm i; α is a constant effect; ε_{t-1} is the error term.

Description of variables

In the proposed model investment $_{i,t}$ is the ratio of net capital expenditure (capital expenditure – depreciation) of firm I at time t to total to the lagged net fixed asset; $Lev_{i,t-1}$ is the lagged one time period ratio of total liability to total asset. In the literature other dimension have also been used for its calculation such as ratio of long term liability to total asset and ratio of short term liability to total asset. We will follow prior literature to control for firm cash flows, Cash $flow_{i,t}$ is the ratio of operating cash flow of the firm to the lagged net fixed assets. Other control variable such as Tobin's Q and Sale is also included in the model. It is a proxy for growth; its value greater than 1 represent high growth opportunities and less than one represent low growth opportunities.

Tobin's Q is lagged one time period. It is the ratio of market value of total assets of the firm to book value of the firm. The market value of the firm can be calculated as the value of the common stock and the estimated value of the preferred stock. $Sale_{i,t}$ is the ratio of net sale to lagged one time period fixed assets.

Sales will be measured as sale deflated by net fixed assets.

Investment

An important debate in corporate finance is that whether gearing ratio or leverage ratio effect investment policies or not. The purpose of this study is also to check such relationship. We have measured investment as the ratio of net investment to lagged fixed assets. Net investment was calculated as (capital expenditure – depreciation). The same ratio has been used by (Lang et al. 1995, Aivazian et al. 2003 and Odit and Chittoo. 2008.)

$$Investment = \frac{net\ investment}{lagged\ net\ fixed\ assets} = \frac{capital\ expenditure - depriciation}{lagged\ net\ fixed\ assets}$$

Leverage

In this study financial policy of a firm is measured with leverage. There are different measures of leverage, such as Long term debt to total assets, short term debt to total assets and total liability to total assets. We have used total debt to total assets as a measure of leverage. The same measure has been used by (Pamela et al. 1983, Mehmat Umutlu 2009, Ahn et al 2005 and Sean Cleary. 1999).

$$Leverage = \frac{Total\ liability}{Total\ assets}$$

Control Variables

In this study the relationship between financial leverage and Investment is investigated in the presence of certain control variables, these are Tobin's Q (it is a proxy of growth opportunities of firms). Its value greater than 1 represents high growth opportunities and low than 1 represents low growth opportunities. It is measured as market value of the total assets of the firms divided by the book value of the assets of the firms. Market value of the assets was calculated as book value of total debts + Market Capitalization. Other control variables include cash flow, sale, liquidity and ROE. Cash flow was calculated as (earnings before interest and taxes + depreciation / total fixed assets). Sales were measured as the ratio of gross sales to fixed assets. Liquidity was measured as the ratio of current assets to current liability. The profitability was measured with ROE and is the Ratio of net income to total equity. We have used these control variables to clearly identify the impact of leverage on firm investment, because literature revealed that these variables have a significant impact on firms' investments.

Cash Flow

According to Whited (1992) investment of a firm is more sensitive to cash flow, but its effect is greater for high levered firms as compared to low levered firms. Fazzari et al (1988) found that investment is positively related to inter funds, and this impact is stronger for financially constrained firms. Cash flow is the ratio of cash flow before extraordinary income to lagged fixed assets.

$$Cash\ flow = \frac{Operating\ cash\ flow}{Lagged\ net\ fixed\ asset}$$

This ratio has also been used by (Odit and Chittoo 2008).

Tobin's Q

Tobin's Q measures the performance of a firm and it is the ratio of (market capitalization of the firm + book value of the debt) to book value of the assets. From the literature it is clear that Tobin's Q has a significant impact on investment. Gomes (200I) describes that investment of a firm in very much sensitive to Tobin's q and Cash flow. Researcher further argued that the availability of external financing makes no difference. The idea was also supported by Cooper and Ejarque (2003) they solved a model with quadratic adjustment costs and a concave revenue function, and also found that investment is strongly related to Tobin's q and cash flow.

In order to find out the exact relationship between financial leverage and firm investment we controlled for both Tobin's Q and Cash glow.

$$Tobin'sQ = \frac{Market\ value\ of\ total\ asset\ of\ the\ firm}{Book\ value\ of\ the\ firm}$$

TH - 8599

Sale

Sale of a company is also taken in to consideration, it is calculated as follows.

$$Sale = \frac{Net\ sale}{lagged\ net\ fixed\ assets.}$$

ROE

To control for the impact of profitability on firm investment, we have taken Roe as a proxy for firm profitability. It is the ratio of net income to shareholder equity.

$$ROE = \frac{Net\ Income}{Shareholder\ Equity}$$

The Ratio was also used by Odit and Chittoo (2008).

LIQUIDITY

The liquidity ratio is measured by the current assets divided by the current liabilities.

$$Liquidity = \frac{Current\ Assets}{Current\ Liability}$$

Panel Data Estimation

This study checked the relationship between financial leverage and firm investment. The relationship was checked by applying panel data. From panel data we get two dimensions of data, such as time series and cross sectional. Panel data has certain advantages, such as it offers a wide range of observations which better estimate the parameters. According to Dimitrious Asteriou (2006) panel data outsources more information to the analyst and accounts for the dynamic behavior of parameters. Panel data was estimated by three different methodologies Pooled Regression or common constant model, fixed effect model and random effect model.

Common Effect Model

Common effect model or pooled regression analyzes the relationship with the assumption that all the intercept will remain constant all over the years and across sectors. Practically the common constant method implies that there are no differences between the estimated cross section and it is useful under the hypothesis that the data set is a priority homogeneous. This assumption is too much restrictive and beyond the reality. To take into consideration the time effect and individual effect we had applied the fixed effect and random effect model.

Fixed Effect Model

Fixed effect model is similar to polled regression but it allows for the constant to vary across individuals. It is also called Least Square Dummy Variable (LSDV) estimator, because it uses dummy variables for taking different constants in to account (Gujrati 2006). Different intercept concepts are logical because our samples consist of heterogeneous set of non financial firms relating to diverse sectors.

$$y_{i,t} = \alpha + \beta_1 X_{i,t} + e_{i,t}$$

$y_{i,t}$ = dependent variable of firm i at time t.

α = intercept

β_1 = slope of the independent variable.

$X_{i,t}$ = independent variable of firm i at time t.

$e_{i,t}$ = error term of firm i at time t.

Dummy variable is the one that allows us to take different group specific estimates for each of the constants for every different section. Despite of its strength the model also faces certain problems such as;

Firstly it ignores all explanatory variables that don't vary over time.

Secondly it is inefficient because it estimate a very large number of parameters. Therefore it is not good to use fixed effect model without considering another model such as random effect model.

Random Effect Model

The random effect model does not take intercept as constant or fixed but as random parameters. Random effect model assumes that there is not a constant or fixed intercept for each company but a random drawing from much larger population with a common mean value for the intercept. As this model does't discriminate between the intercept of companies, it allows the error terms to take into considerations all the differences in the individual intercept.

$$y_{i,t} = \beta_1 + \beta_2 Xi,t + \varepsilon_i + u_{i,t}$$

$y_{i,t}$ = Dependent variable of firm i at time t.

β_1 = Mean value of all intercept.

β_2 = Slope of the independent variables.

$X_{i,t}$ = Independent variable of firm i, at rime t.

ε_i = Deviation of individual intercept from mean.

$u_{i,t}$ = Error term of all the firm i, at time t.

One major disadvantage of random effect model is that it needs to make specific assumptions about the distribution of the random components. Also if the unobserved group specific effects are correlated with the explanatory variables then the estimates will be biased and inconsistent. Having this disadvantage this model has certain advantages as well.

First, it has fewer parameters to estimates as compared to fixed effect model. Secondly it allows us for additional explanatory variables that have equal values for all observations within a group.

In general the difference between the two possible ways of testing panel data model are that the fixed model assumes that each variable differs in its intercept terms, while random model assumes that each variable differs in its error term. According to Dimitios Asteriou when the panel is balanced the fixed effect model will work excellent. On the other hand when the sample contains limited observations of the existing cross sectional unit the random effects model might be more appropriate. But statistically Housman test will show that which model is appropriate to use.

Housman specification test

A Housman test is formulated in the selection of fixed effect and random effect. Housman state the hypothesis that

H0 = fixed effect model and random effect model estimators are not different.

H1 = fixed effect model and random effect model estimators are different.

CHAPTER #4

RESULTS &DISCUSSIONS

Results and Discussion

The purpose of this section is to provide detail empirical evidence of the study. These empirical evidences are structured to provide in depth results which include descriptive statistics, correlations, three panel data models such as common effect model, random effect model and fixed effect model. For comparison between fixed effect and random effect models the Housman tests were performed.

Descriptive Statistics Table 1

	Investment	Leverage	Liquidity	Sale	Cash Flow	ROE	Tobin's Q
Mean	-0.0420846	0.712605	1.726046	9.303822	0.3858371	0.296877	1.155924
Standard Deviation	0.9877884	0.487996	5.839397	54.54453	1.544653	3.217851	1.355087
Minimum	-46.08571	0.018124	0.009915	-47.1111	-44.38889	-41.579	0.078104
Maximum	5.495758	9.117647	265.0227	1236.261	38.05714	137.6667	42.93401

This table provides summary of descriptive statistics of the dependent and explanatory variables used in the study. The sample of the study consists of 342 non financial firms which were listed on Karachi Stock Exchange during 2000 – 2008, with a balance panel of 2736 observations. The mean of the investment to fixed assets is (-.0420846) while its standard deviation is (.9877884).

The results show that the firm investment is negative on average. And its standard deviation is quite high. This implies that the investment of Pakistanis firms move on either directions. On the other hand there is a greater variation in investment with a minimum value of (-46.08571) and a maximum value of (5.495758). The mean value of leverage is (.7126046) with a standard deviation of (.4879956). The minimum level of debt that Pakistani firms use is (.0181237) while the maximum limit for the studied firms is (9.117647). The mean ratio for liquidity is (1.746024) with a standard deviation of (5.839397). The minimum ratio of liquidity is (.0099148) which implies that some firms are facing severe liquidity problems, whereas the maximum limit is (265.0227). The mean value of Tobin's Q which is (1.155924), represents that there exist growth and investment opportunities for firms. At the same time there exists some variation in these opportunities between Pakistanis firms. The results indicate that investment opportunities can move upward or downward with a magnitude of (1.355087) from the mean. As we have taken the data from heterogeneous sectors therefore it shows so much variability. The minimum value of Tobin's Q is (.078104) while the maximum is (42.93401). The mean value of sales is (9.288776) while its standard deviation is approximately 6 times more than the mean. From these statistics we can interpret that sales of Pakistanis firms suffer from greater deviation. Sale can move upward for the selected firms up to (1236.261) on the other hand it falls to (-47.1111). The mean of ROE is (.2968767) which implies that shareholders on an average receive (30%) return on their investments. The minimum value for ROE is (-41.75895) and the maximum is (137.6667).

Correlation

	Investment	Leverage	Liquidity	Sale	Cash Flow	ROE	Tobin's Q
Investment	1						
Leverage	-0.0106	1					
Liquidity	-0.0041	0.0288	1				
Sale	-0.0576	-0.0409	-0.0009	1			
Cash Flow	-0.05464	-0.0737	0.008	0.1718	1		
ROE	-0.0048	-0.0137	-0.0002	-0.0017	0.1486	1	
Tobin's Q	0.0309	0.2486	0.0068	0.0403	-0.0275	-0.0344	1

In this study we conducted correlation analysis to check out whether there exists multi-co-linearity in the model or not. As Cuthbertson (1996) pointed out in his book that multicollinearity exists in the model when the explanatory variables are strongly related to each other. In this study multicollinearity were checked by checking the

correlation between Leverage, Liquidity, Tobin's Q, Sale, Cash Flow and Return on Equity. All the coefficients are less then (.148), which suggests that multicollinearity is not a serious problem in our model. The relationship between leverage and investment is negative which an indicator of inverse relationship between these two variables. Investment has a positive

relationship with Tobin's Q and negative relationship with all other explanatory variables. Leverage has a positive relationship with liquidity and Tobin's Q while it has a negative relationship with Sale, Cash Flow and Roe. Liquidity represents a positive relationship with cash flow and Tobin's Q and negative relationship with all other variables. Tobin's Q has a negative relationship with ROE and Cash flow while positive relationship with all other variables. Cash flow has a also a positive relationship with sale and liquidity.

Common Effect Model

Table 3

Variable Description	Coefficient	z statistics	P value
Intercept	0.1410078	4.41	0
Leverage	-0.1076574	-3.08	0.002
Liquidity	0.0009181	0.34	0.736
Sale	0.0007379	2.39	0.017
Cash Flow	-0.3737831	-35.18	0
ROE	0.0251835	5.1	0
Tobin's Q	0.1410078	1.54	0.124
Wald Chi ^{2}	1256.04		
R Square	0.3433		

The value of overall R square is .3093; it means that there is 30.93% variation in the dependent variable owing to independents variables. The value of overall R square is not highly satisfactory, but it is acceptable for panel data. There may be certain other variables which also influence the investment decisions of the firms that is way the value of R square is .3093. The

results revealed that the level of debt does have a significant negative impact on firm investment. The coefficient value of leverage is (-.1076574). It indicate that when leverage of a firm is increased by 1 unit its investment decreased by (.1076574) units. These findings support the theory that leverage has an important role in over coming over investment. It supports the inverse relationship between financial leverage and firm investment. These results are consistent with those of the Firth et al (2008), they also concluded inverse relationship between these two variables. McConnell and Servaes (1995) also concluded that the value of U.S. firms is negatively correlated with leverage for high growth firms (indicated by high Tobin's Q), and positively correlated with leverage for low growth firms (or low Tobin's Q). These results are also consistent with that of Lang et al (1996) they found that leverage is negatively associated with investment but only for firms with low growth opportunities. Aivazian et al (2005) also found negative association between leverage and investment, and its effect stronger for firm with low growth opportunities as compared to high growth opportunities. Similarly Ahn et al. (2006) document that the negative relation between leverage and investment in diversified firms is significantly stronger for high Q segments than for low Q business segments, and is significantly stronger for non-core segments than for core segments. Among low growth firms, the positive relation between leverage and firm value is significantly weaker in diversified firms than in focused firms The results of Polled regression indicate that capital structure's plays a very important role in firm investment decisions. The relationship between liquidity and investment is positive but insignificant. Tobin's Q has also shown positive but slightly insignificant relationship with investment for the target samples.

The regression coefficient of Sale is (.0007) and is significant with P value less then (.05) and z value greater than 2. Its result indicate that I unit increase in sale leads to (.0007) units increase

in investment. It means that both are in the same directions, when sale of a firm increases its investment is also increased.

The relationship between cash flow and investment is negative and is highly significant. 1 unit increased in cash flow causes (.3737) unit decrease in investment.

Finally the results or ROE indicates that profitability and investment moves in the same direction. When profitability increases by 1 unit, investment of Pakistanis firms increases by (.025) units. It is significant at (000) level and its t value is greater than 5.

Fixed Effect Model

Table (4)

Variable Description	Coefficient	t statistics	P value
Intercept	0.120401	2.94	0.003
Leverage	-0.0328595	-0.67	0.500
Liquidity	0.0033532	1.09	0.275
Sale	0.0012827	2.87	0.004
Cash Flow	-0.4248858	-35.23	0.000
ROE	0.0285548	5.48	0.000
Tobin's Q	-0.0012129	-0.08	0.936
F statistics	209.63		
R Square	0.345		

The fixed effect model shows that that there is no significant relationship between leverage and investment. It means that a firm financial policy is irrelevant to its investment decisions. The results suggest that whenever we extend the model to incorporate the time effect the relationship between financial leverage and investment disappears. But the results of Sale, Cash flow and Roe is somehow similar to that of common effect model. Results support the recent research findings

of various researchers who found negative impact of leverage on investment expenditure. According to Aivazian et al. (2005) there is a negative relationship between leverage and investment for the firms with low growth opportunities in Canada. Mehmet Umutlu (2009) also found negative relationship for low growth firms. However when he extended the model for incorporating the time – effects no significant relationship existed. Similarly Norvaisienė et el (2008) investigated the relationship between loan capital, investment and growth. They demonstrate that firm's debts and agency problem (between managers, shareholder and creditors) causes underinvestment or overinvestment which in turn has a negative impact on corporate investment, growth and firm value. The results of the fixed effect are similar to those of the Firth et al (2009) who estimated fixed effect model with two way error component, but their results were also insignificant for leverage and investment .

Random Effect Model

Table (5)

Variable Description	Coefficient	t statistics	P value
Intercept	0.1410078	-4.41	0.000
Leverage	-0.1076574	-3.08	0.002
Liquidity	0.0009781	0.34	0.736
Sale	0.0007379	2.39	0.017
Cash Flow	-0.3737831	-35.18	0.000
ROE	0.0251835	5.1	0.000
Tobin's Q	0.0189451	1.54	0.124
Wald Chi ^{2}	1256.04		
R Square	0.3433		

The results of the random effect model are mostly similar to that of common effect model. Leverage inversely influences firm's investment. Investment has significant and positive relationship with sales and ROE, however, it has a positive but insignificant relationship with liquidity and Tobin's Q and it has a significant negative relationship with Cash flow.

Housman Test

Table (6)

	Coefficients		
	(b)	(B)	(b-B)
	Fe	Re	Difference
Leverage	-0.0328595	-0.1076574	0.0747979
Liquidity	0.0033532	0.0009181	0.0024351
Sale	0.0012827	0.0007379	0.0005448
Cash Flow	-0.4248858	-0.3737831	-0.0511027
ROE	0.0285548	0.0251835	0.0033713
Tobin's Q	-0.002129	0.0189451	-0.0210741

Chi 2 (6)	91.59
Prob > Chi 2	0.000

In order to find out which methodology is appropriate, whether fixed effect or random effect, we applied Housman specification test. The random effect model assumes that there is no correlation between the group specific random effects and the regressors. However, the fixed effects model does not make such assumptions and the possibility remains that the assumption of zero correlation in random effects model is not feasible. The Hausman test checks whether the correlation assumption is statistically evident or not. The null hypotheses for the Hausman test is that the group specific random effects and the regressors are not correlated and thus if the Hausman test shows a parameter value of more than 0.05 then it would mean that fixed effects model is inefficient and random effects model is better (Girma,2006).

The result of Housman suggests that fixed effect model is appropriate to use. Housman rejects the null hypothesis that there is no significance difference in fixed effect and random effect. So we accept the alternative that both the models are not the same. On the basis of Chi square and P value <.05 we select that fixed effect model is appropriate to use.

On the basis of p values it is decided that which model is appropriate whether fixed effect model or random effect model.

Discussion

The calculated F value is greater than table value. That's why the chosen variables are significantly related with investment during the period. Further it shows that the leverage has negative impact on investment. This implies that as leverages increases, investment in Pakistani firms decreases. This means that Pakistani firms have adequate resources financing the projects. So Pakistani firms are not dependent on debts as a source of finance to finance the projects.

As we have seen positive relationship between investment and ROE, it indicates the operating efficiency of the employed funs over investment is positive. Positive relationship also attracting funds from investors for expansion and growth.

Liquidity is positively related to investment and is not statistically significant. It means that the failure of a firm to meet its obligation due to lack of sufficient liquidity will result in poor credit worthiness loss of creditors' confidence. So Pakistani firms should make certain that that they do not suffer from lack of liquidity, as this may lead to financial distress and ultimately bankruptcy.

The result depicts that when profitability increased by 1 unit, investment of Pakistanis firms was increased by (.025) units. It was significant at (000) level and its t value was greater than 2. Sales had a positive and significant impact on investment, which shows that as sales of Pakistani firms' increases its investments also move in the same direction.

The value of overall R square is .3093; it means that there is 30.93% variation in the dependent variable owing to independents variables. The value of overall R square is not highly satisfactory, but it is acceptable for panel data. There may be certain other variables which also influence the investment decisions of the firms that is way the value of R square is .3093. The

results revealed that the level of debt does have a significant negative impact on firm investment. The coefficient value of leverage is (-.1076574). It indicate that when leverage of a firm is increased by 1 unit its investment decreased by (.1076574) units. These findings support the theory that leverage has an important role in over coming over investment. It supports the inverse relationship between financial leverage and firm investment for Pakistani firms. These results are consistent with those of the Firth et al (2008), they also concluded inverse relationship between these two variables. McConnell and Servaes (1995) also concluded that the value of U.S. firms is negatively correlated with leverage for high growth firms (indicated by high Tobin's Q), and positively correlated with leverage for low growth firms (or low Tobin's Q). These results are also consistent with that of Lang et al (1996) they found that leverage is negatively associated with investment but only for firms with low growth opportunities. Aivazian et al (2005) also found negative association between leverage and investment, and its effect stronger for firm with low growth opportunities as compared to high growth opportunities. Similarly Ahn et al. (2006) document that the negative relation between leverage and investment in diversified firms is significantly stronger for high Q segments than for low Q business segments, and is significantly stronger for non-core segments than for core segments. Among low growth firms, the positive relation between leverage and firm value is significantly weaker in diversified firms than in focused firms The results of Polled regression indicate that capital structure's plays a very important role in firm investment decisions. The relationship between liquidity and investment is positive but insignificant. Tobin's Q has also shown positive but slightly insignificant relationship with investment for the target samples.

CHAPTER #5

CONCLUSION

Conclusion

This study examined the relationship between financial leverage and firm investment, for Pakistani non financial sector. The investigation is motivated by the theoretical work of Myers (1977), Jensen (1986), Stulz (1990), and by empirical work of McConnell and Servaes (1990).

The relationship was analyzed by controlling certain variables that had an influence on investment. These variables are Cash Flow, Tobin's Q, Sale; Return on Equity and Liquidity. This study amalgamates information on a large balance panel from 342 non financial firms for 8 years from (2001 to 2008). Panel data techniques (common effect model, random effect model and fixed effect model) were used for such analyses.

The study examined whether financial policy (leverage were taken as a proxy for financial policy) influences investment decisions of firms causing underinvestment or overinvestment incentives. This study found that financial leverage was significantly negatively related to firms' investments. It shows that as leverage increases firm's investment decreases, we may say that highly levered firms invest less. This evidence is consistent with the over investment story of (Stulz 1990) where leverage inhibits managers from investment in non profitable capital expenditures. Here the debts enforce the mangers to pay extra funds as interest and principal, that may otherwise be allocated to poor investment projects. Thus leverage helped in overcoming the overinvestment problems and alleviating agency problems. The results of the study provide support to the agency theories of corporate leverage and especially to the theory that leverage has a disciplining role in overcoming the overinvestment problems. Thus the result of the study is consistent with the hypothesis that leverage attenuates to invest in poor projects. The results of the common effect model support that capital structure plays a vital role in the decisions of firms

that how to invest. But whenever we extended the model to incorporate the time and individual effect, then no relationship were seen. The relationship between leverage and investment were checked in the presence of certain control variables. The result shows negative relationship between investment and cash flow. Strong relationship was seen between investment and cash flow. The results indicate that investment and cash flow sensitivity is very strong for Pakistani non financial firms. Whenever we checked the relationship between investment and ROE (proxy for profitability) positive relationship were found by applying common effect model. The result depicts that when profitability increased by 1 unit, investment of Pakistanis firms was increased by (.025) units. It was significant at (000) level and its t value was greater than 2. Sales had a positive and significant impact on investment, which shows that as sales of Pakistani firms increases its investments also move in the same direction.. No relationship was seen between liquidity and investment for the selected sample. Tobin's Q had also showed insignicant relationship with investment. We may therefore concluded that despite different debt markets and banking structures between developed countries and developing countries the relationship remained same for financial policy (measured as financial leverage) and investment.

Limitations of the study

There are various methods for calculating financial leverage but this study employed only one method; that is total long term liability under total assets, so future research may be conducted by employing different methodologies, such as total liability by total assets and long term liability by total assets. This study is only limited to the non financial sector of Pakistan. Thirdly this study uses book value of debts for financial leverage.

Recommendations for future research

The empirical model of this study can be extended which could generate further information. The model can be extended by various ways; by enlarging panel data set or by increasing the number of predictors' variables. Increasing the data set will further enhance the applicability of the research. Secondly, company classification, whether it is a high growth company or low growth company has been entirely excluded from the study so future research may be conducted in a way that classifies between companies. Thirdly, future research may also be made on sector wise comparison in non financial sectors. Fourthly, the relationship between financial leverage and firm's investment can also be conducted in financial sector of Pakistan. In this study we have used book to measure debt and it would have been better if market values were available for debt which may have improved the model fit. Future research may measure this variable with market value of debts as well.

References:

Abel, A., Blanchard, 0. J.,(1986). "The present value of profits and cyclical movements in investment". Econometrica, Vol. 54, pp. 249-273.

Abor, J. (2007), "Corporate governance and financing decisions of Ghanaian listed firms", Corporate Governance, Vol. 7, pp. 83-92.

Abor, J. and Biekpe, N. (2005), "What determines the capital structure of listed firms in Ghana", African Finance Journal, Vol. 7 No. 1, pp. 37-48.

Ahn, S., Denis, D.J., Denis, D.K., (2006). "Leverage and investment in diversified firms". Journal of Financial Economics, Vol. 7. 9, pp 317–337.

Aivazian, V., Ge, Y., Qiu, J., (2005a). "The impact of leverage on firm investment: Canadian evidence". Journal of Corporate Finance, Vol. 11, pp. 277–291.

Baltagi, B. (2003), "Econometric Analysis of Panel Data". Wiley, Chichester, UK

Baltagi, B.H. (2005), "Econometric Analysis of Panel Data". John Wiley and Sons, Chichester.

Childs, P., Mauer, D., Ott, S., (2005). "Interactions of corporate investment and financing decisions: the effects of agency conflicts". Journal of Financial Economics, Vol. 76, pp. 667–690.

Cleary, S., (1999). "The relationship between firm investment and financial status". Journal of Finance Vol. 54, pp. 673-692.

DeAngelo, H. and Masulis, R.W. (1980), "Optimal capital structure under corporate and personal

taxation", Journal of Financial Economics, Vol. 8 No. 1, pp. 3-29.

Fama, E.F., French, K.R., (2002). "Testing Tradeoff and Pecking Order Predictions about Dividends and Debt". Review of Financial Studies Vol. 15, pp. 1-33.

Fazzari, S.M., Hubbard, R.G., Petersen, B.C., (1988). "Financing constraints and corporate investment", Brookings Paper on Economic Activity, Vol. 1, pp. 141—195.

Firth, M., Fung, M.Y., Rui, O.,(2006). "Corporate performance and CEO compensation in China". Journal of Corporate Finance, Vol 12, pp. 693–714.

Firth, M., LIN, C., Wong, S., (2008). "Leverage and investment under a state-owned bank lending environment: Evidence from China" Journal of Corporate Finance. 14, 642-653.

Hart, O., Moore, J., (1995). "Debt and seniority: an analysis of the role of hard claims in constraining management". American Economic Review. Vol 85, pp. 567–585.

Hart, O., Moore, J., (1998). "Default and renegotiation: a dynamic model of debt". Quarterly Journal of Economics, Vol 113, pp. 1–41.

Hovakimian, A., Opler, T. and Titman, S. (2001), "The debt-equity choice", Journal of Financial and Quantitative Analysis, Vol. 36, pp. 1-24.

Harris, M., Raviv, A., (1991). The theory of capital structure. Journal of Finance, Vol` 46, pp. 297–355.

Hayashi, F.,(1982). "Tobin's average q and marginal q: a neoclassical interpretation". Econometrica, Vol. 50, pp. 213-224.

Jensen, M.C., (1986). "Agency costs of free cash flow, corporate finance, and takeovers". American Economic Review 76, 323–329.

Jo, H., Pinkerton, J.M. and Sarin, A. (1994), ''Financing decisions and the investment opportunity set: some evidence from Japan'', Pacific-Basin Finance Journal, Vol. 2, pp. 227-42.

Lang, L., Ofek, E., Stulz, R.M., (1996). Leverage, investment and firm growth. Journal of Financial Economics , Vol 40, pp. 3–29.

McConnell, J.J., Servaes, H., (1995). "Equity ownership and the two faces of debt". Journal of Financial Economics, Vol 39, pp. 131–157.

Modigliani, F., Miller, M.H., (1958). "The cost of capital, corporation finance, and the theory of investment". American Economic Review, Vol. 53, pp. 433–443.

Modigliani, F., Miller. M.H., (1963). Corporate income taxes and the cost of capital: a correction. American Economic Review, Vol. 53, pp. 433-43.

Myers, S., (1984) "The capital structure puzzle". The Journal of Finance, Vol 39, pp. 575-92.

Myers, S., Majluf, N., (1984). "Corporate financing and investments decisions when firms have information that investors do not have". Journal of Finance Economics. Vol. 13, pp. 187-222.

Myers, S., (1977). "Determinants of corporate borrowing". Journal of Financial Economics, Vol 5, pp. 147–175.

Myers, S.C., (2001). "Capital structure". Journal of Economic Perspectives Vol. 15 (2), pp. 81–102.

Nishat, M. and Ullah, W. (2008), "Capital structure choice in an emerging market: evidence from listed firms in Pakistan", paper presented at the 21st Australasian Finance and Banking Conference.

Odit, M. P., and Chittoo, H. B., (2008). Does Financial Leverage Influence Investment Decisions? The Case of Mauritian Firms. Journal of Business Case Studies. Volume 4.

Stulz, R.M., (1990). "Managerial discretion and optimal financing policies". Journal of Financial Economics, Vol. 26, pp. 3–27.

Ooi, J. (1999), "The determinants of capital structure: evidence on UK property companies", Journal of Property Investment and Finance, Vol. 17 No. 5, pp. 464-78.

Pettit, R. and Singer, R. (1985), "Small business finance: a research agenda", Financial Management, Vol. 14 No. 3, pp. 47-60.

Rajan, R., Zingales, L., (1995). "What do we know about capital structure? Some evidence from international data". Journal of Finance, Vol. 50, pp. 1421–1460.

Titman, S. (1984), "The effect of capital structure on a firm's liquidation decisions", Journal of Financial Economics, Vol. 13 No. 1, pp. 137-51.

Titman, S., Wessels, R., (1988). "The determinants of capital structure choice". Journal of Finance, Vol. 43, pp. 1–19.

Van Horne, J.C. (2002), Financial Management and Policy, 12th ed., Prentice-Hall, Englewood Cliffs, NJ.

White, H., (1980). "A heteroskedasticity-consistent covariance matrix estimator and a direct test for heteroskedasticity". Econometrica, Vol. 48, pp. 817–838.

Zwiebel, J. (1996), "Dynamic capital structure under managerial entrenchment", The American Economic Review, Vol. 86, pp. 1197-215