

**CAPITAL MARKET IMPERFECTIONS, INVESTMENT AND
COMPLEMENTARITIES BETWEEN DEBT AND EQUITY**

**EVIDENCE FROM PAKISTAN: DATA ANALYSIS OF NON- FINANCIAL FIRMS
OF KARACHI STOCK EXCHANGE**



THESIS

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LIST OF ABBREVIATIONS

Q model	Tobins q model
LDCs	least developed countries
MM-1	Modigliani and Miller theorem 1
Kt	actual capital stock
Kt*	desired capital stock
US	United States
UK	United Kingdom
IPO	initial public offering
KSE	Karachi Stock Exchange
ICFS	investment- cash flow sensitivity
GCC Countries	Gulf Cooperation Council countries
CMI	Capital Market Imperfections
W	Retained Earnings
W ²	Square of Retained Earnings
D	Debt
K	Capital
DW	interaction term of Debt and Retained earnings
KW	interaction term of capital and retained earnings
OLS	ordinary least squares
GMM	generalized method of movements
LP regime	low premium regime
HP regime	High Premium regime
KZ	Kaplan and Zingles
MBA	Market to book asset ratio
OECDs	Organization for economic cooperation and development
IndD	industry dummies

YrD	year dummies
NPV	Net Present value
MPS	market price per share
DPS	dividend per share
EBIT	Earnings before interest and tax
FA	Fixed asset
CF	cash flow
P-value	probability value

Dedicated to my parents.....

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ABSTRACT

The rationale behind this study is to analyse investment and financing decisions of corporate sector in Pakistan. This study is to explore the impact of internal and external financial limitations on investment choice of firms. The data have been taken from 20 non-financial industries of Pakistan; 100 listed firms in the Karachi Stock Exchange for the time period 1999 to 2011 on the annual basis. Two models have been employed by the study of which one includes q-model of investment and second comprises of the simultaneous equation model. The technique of Generalized Method of Moments and Two-stage least square (2SLS) methods have been used in the study respectively. The Q-model of investment has successfully picked up the market imperfections as the impact of these imperfections is significant. No doubt, these imperfections influence investment activities of firm. However, this affect is not evenly distributed in the market. Thus the capital market flaws do have differential effects on investment behaviour of non-financial firms listed in KSE. The study also employs balance sheet variables that are different of all industries. Our approach highlights the connection between imperfections generating financing constraints and investment wavering with time across the industries. In a nutshell, all the non-financial firms listed in Karachi stock Exchange use debt and equity as complementarities and not as substitutes. This study has provided evidence that the capital structure of the corporate sector is actually its complementarities attitude and that all industries have different investment structures defining their own imperfections and financing constraints.

Keywords: corporate investment behaviour, capital market imperfections, debt and equity as complements.

Chapter I

INTRODUCTION

Corporate investment plays a significant role in the sustainable economic growth of any country. Firm's investment behaviour can be only through using debt measure or equity. So this behavior at times depicts the true picture of the firm's financial operations. Reilly and Brown (2003) define that investment is the stream of assured funds for a time period to obtain future payments. The central point to be discussed here is that fund generation is only possible through two ways that include equity financing and debt financing.

The Capital markets, along with corporate investment and other factors are vital in determining the economic growth of emerging capital markets because these act as a medium to channel and mobilize funds to business enterprise and offer an efficient source of investment in the financial systems so its development is witnessed as a necessary condition to nourish the economy with a fact that well-functioning markets act like a catalyst in making over the economy into a more proficient and competitive framework along with maintaining a nation made towards an exceptional growth. So when the economy prospers, there is a rise in the share prices because the mature and comprehensive capital market reforms a sustainable growth of the economy.

The financial systems of Asian economies are prone to imperfect information between borrowers and lenders and it rely heavily on the banking system. So this alone bank dominated system has much intensified systemic risk along with imperfect pricing by the financial regulations and thus high probability of facing loses as there are inadequate opportunities available for investors and borrowers (Plummer and Click, 2003). The

development of capital market is determined by demand and supply patterns of the securities and legislative and fiscal framework of the country, Shamsi and Jaffery (2000).

Pakistan's money and bond market has been initiated in 1990, after the liberalization. The decades gap has not still been sufficient for the bond market of Pakistan to flourish and prosper rather it is still accounted as least developed when compared to the other countries (Hameed, 2006). Similar to other emerging market of south Asia, debt financing in Pakistan is mainly through bank borrowing and issuance of equity stocks so this market is a main confront for issuers, intermediaries and regulators.

Pakistani equity market is dominated by excessive price volatility followed by small market upshots and international imperfections. Individual Investors lack sufficient information about firms than those in industrial markets. The less developed countries have risk-averse savers due to capital market imperfections that insist for rigid yield claims with high liquidity as mentioned by Wai and Patrick (1973) so the insufficient information is one of the main features along with taxation policies, inflation and devaluation that impinge on the investor's decision and thus the demand of equity.

Thus equity financing is the most preferred mode of financing over the debt financing observed in the LDCs. This mode is also critical for good corporate governance by the help of speedy structural changes in the real economy. So it is central to modernize the financial system.

The emerging economies should make efforts for the development of the bond markets because the market interest rates are created by the local debt markets. This may help in expertise investment and financing decisions. Moreover efficient risk management and diversification will also be able due to tradable instruments in the bond market (Turner, 2002).

The capital market of Pakistan is inefficient especially the debt market is lagging much behind because of certain drawbacks like non-existence of benchmark yield curve, non-market driven low rate of return and increased prices with less supply. As a result auctions bids are rejected, investors and banks are pressurized to invest in these securities even at low interest rate.

Furthermore, the corporate debt issued by the firms is less striking to traders because of lack of precision and risk-averseness of investors. There are also managerial and dealing costs that a company faces at the time of issuance and trade which mainly causes fewer issuances of bonds. Thus elevated transaction cost, slim market, improper settlement system, inexperience cast, minute competition level, concentration of issues in few hands, limited size, absence of intermediaries and regulatory structure all together assist in a significant decline of the bonds secondary market.

The stock market of Pakistan is weak form efficient as recently the study of Haque, Liu and Nisa (2011) reveals that stock market of Pakistan for period 2001 to 2010 is weak form efficient and not characterized by random walk. Similarly, Abdullah and Shah (2007), Riaz, Hassan and Nadim (2011) also report that Karachi stock market is also not weak-form efficient. The performance of Karachi stock exchange remained efficient for the period of December 1991 to December 2003, Mustafa and Nishat (2007). So if the market is not efficient in its weak form, this means that stock prices are not accurately priced and there is no efficiency in the allocation of capital to numerous development and private projects as stated by Mishra (2012). Bahudri (2002) is of the view that underdeveloped stock markets of developing nation engender several constraints on the choices concerning sources of funds.

Most of the corporate sectors have started determining their capital structure optimally. This is probably a result of shift towards free market along with intensified various financial

markets Salawu and Agboola (2008). Alfred (2007) and Pandey (1999) suggested that a firm's capital structure entails the proportionate bond between long-term debt and equity. So a firm's capital structure is the combination of debt and equity financing. But one of the main and complex issues in corporate finance is on the subject of the optimality of the capital structure that exists in relation to a firm's value.

Thus the trouble-free access to global financial markets for individuals, corporations, and countries will result in well-organized allocation of capital and thereby will boost the economic growth of a country. Pakistan's stock markets are weak form market efficient which influences gross savings and investment status negatively of any country along with distressing the resource mobilization process. Nevertheless, if there is an informational inadequacy of capital markets, then it can surely stimulate the market to move towards efficiency in the long run by providing innovations and opportunities of making surplus profit in an inefficient market Mishra (2012).

1.1: Theoretical framework:

There are important interactions between instruments of external and internal financing. The relationship between debt and equity is quite complex as some firms use the two instruments as substitutes while some take them as complementarities. The study of Friedman (1985) provides evidence on the substitution of debt and equity securities. The study also concludes that the short-term debt and equity are complements and that long-term debt and equity are substitutes. However equity financing is the most preferred mode of financing over the debt financing observed in the LDCs. This mode is critical for good corporate governance by the help of speedy structural changes in the real economy. So it is central to modernize the financial system.

1.1.1 Capital structure Theories:

Until 1958, there were no skilfully composed models about investment activities and capital structure. In 1958, Modigliani and Miller (MM) constructed the propositions in such a technical and systematic mode that they started out a chain of research till today. MM Stated in their most important capital structure irrelevance theorem that under certain assumptions (no taxes, no bankruptcy cost and transaction costs, efficient market with homogenous expectations, and asymmetric information) a firm's financing decisions are completely irrelevant to its investment decisions. This implies that a firm's value is independent of its capital structure decisions. Researchers like Hamada (1969), Stiglitz (1972) and Hatfield, et al (1994) etc. also supported the theorem. As Pakistan is a developing country so the security markets are under-developed due to lack of depth, breadth etc. Thus MM -I proposition does not hold in context of Pakistan because of existence of imperfect capital market.

Myers and Majluf (1984) preferred internal capital over external capital in pecking order theory of capital structure. According to them a firm should initially finance itself with the internal funds available. When retained earnings are not accessible then go for debt financing. In the end when there is no option left then it shall float the new equity in the market. Chittenden et al., (1996) and Shyam-Sunders & Myers (1999) are also the supporter of this theory. However, Brennan and Kraus (1987), Noe (1988), Constantinides and Grundy (1989) hold a different opinion.

Signalling theory generated pecking order in a way. This theory has been experimented by Cadsby, Frank and Maksimovic (1990). The outcome of their research work also endowed same results about firm's financing decisions. Moreover, Asquith and Mullins (1986) and Eckbo (1986) also came up with adverse selection generating because of equity issues. However, pecking order theory assumes the semi-strong form of market efficiency and Jibran

et al (2012) tests the pecking order theory in Pakistani firms. As Pakistan's capital markets are under-developed so firms face complexity in introducing new capital. Moreover, there is usually low profitability and low levels of retained earnings which forces firm to get into the easiest possible source of financing by leaving the pecking order theory. The results are in line with that of Sunder and Myers (1999) and Frank and Goyal (2002). Medeiros and Daher (2004) organize parallel research on Brazilian firms which also bring report the presence of Pecking Order phenomena in Brazil.

Jensen and Meckling (1976) offered Agency Cost Theory which presented ideal capital structure of a firm. According to agency theory, the owners of a firm bear the cost of ownership and administration. The level of leverage is the main element of the agency conflicts between shareholders and managers. This element affects the firm performance as the manager's supports or restrains shareholders to take (operating) decisions of their interest. To increase the output and for effective work, the shareholders must provide motivations to the managers. Agency cost is the cost that is paid by owners to managers or agents. The managers have to act as the agent of owners as well as to the debt providers in a case when firm takes loans. For that reason, agency cost theory of capital structure states that the optimal capital structure is that point where there is least agency cost of all the concerned participants.

Likewise, trade off theory explains that the capital structure decisions of a firm should always be based on the cost and benefit analysis that are linked with each source of finances. As the use of debt provides a tax shelter to a firm but if debt is increased it also results in the higher interest rates, bankruptcy cost and more default risk. So tax shelters are the benefits but they shall be equating with the later costs in approaching the optimality.

Then a refined version of this theory came up as capital signalling theory describing that every investor does not have the same level of information as compare to the owners and

managers of a firm. Because of the asymmetries in information, the investor's rationality takes them towards the signals. This could be thought as an obvious indicator that when a firm operates under best conditions with profitable projects, it would definitely enjoy the whole profit alone. In such condition it will finance itself through debt even on higher interest rates and default risk. On the other hand, if a firm's expected future cash flows seems awful then the firm won't bear the pain itself rather it will offer new equity in the market so that the new shareholders also bear some pain. These are the signals that can help the investors.

In addition, market timing theory explains that when the current market prices of the company stocks are high compared to its book value the firm issues equity to acquire funds and repurchase those stocks when market values are down for the company (Baker and Wurgler, 2002).

Most of the studies on the capital structure have been done in the framework of developed and industrialized nations as Kester (1986), Harris & Raviv (1991), Kostyuk (2011), Sinha (2011). However, few of these studies have also done international comparison of capital structure determinants (Wald, 1999; Rajan & Zingales, 1995) as well as those in the context of developing countries (Singh & Hamid, 1992; Demirguc-Kunt, 1992; Booth et al., 2001).

Another worth sharing theory is the corporate finance theory which implies that firm ability to finance its investment projects may get restricted by the presence of immature financial system thereby influencing corporate investment decisions. So the development of financial system is needed to lessen the capital market imperfections by lessening the transaction and information costs and thus stimulating the saving rates and investment decisions.

1.1.2: Q-Theory of Investment:

Jorgensen's neo-classical theory (1963, 1967 and 1971) and accelerator theory deals with two main predicaments implying that both desired and actual capital stock are adjusted instantaneously and completely in each period i.e., $K_t^* = K_t$. The solution to this optimization problem can be tackled by adding an adjustment cost function. The solution to the second problem of unreal expectations role in life is the origin of q theory of investment stated by Brainard and Tobin (1968) and Tobin (1969) that investment should be made at the level when it comes equal to the replacement cost of assets. Tobin (1969) defines q theory as the rate of investment should be related, if to anything, to q which is the value of capital relative to its replacement cost. The most commonly used q theory of investment which can be easily derived from the profit-maximizing and microeconomic optimization behavior predicts that when the marginal return from installing an extra unit of capital stock exceeds its cost then the investment will be positive. It also supports the idea that the amount of investment will rely on the marginal cost of adjustments to the extent of capital stock. The thrust of Tobin's q model is that given the adjustment costs, q is a sufficient determinant of investment. As investment determines real interest rate negatively while a positive function of future profits expectations. As q is the expected value of profit course initiated by an increase in capital stock divided by the cost of additional capital goods.

It is in a way very similar to the neo-classical theory with same marginal conditions and rather all of its assumptions but the Q theory of investment puts a constraint by adding up an adjustment cost function in the model on the momentum of adjustment of capital stock.

For reproducible assets, the normal value of q is 1 and less than one for others. The value more than 1 shows a positive sign for the investment while the lesser value discourages

investment. When q value is one then it means that the project is not at all profitable and $K_t^* = K_t$.

1.1.3: Criticism and appreciation:

However the theory is criticized by the models of Muth (1961) and Lucas (1976) with the assumption of one equilibrium at a time, if there holds more than one equilibrium then the theory is not implementable. Similarly Sonnenschein-Mantel-Debreu theorem also argues with the aggregate behavior of the theory rather than the individual behavior. Hence this theory does not deal with the microeconomic foundation. At the same time, theory has also been appreciated by New Keynesians such as Stanley Fischer.

1.2: Research Questions:

- What is the impact of financial market imperfections on investment of firms?
- Do the capital market imperfections have differential effects on the investment behavior of firms?
- Are debt and equity complements or substitutes to each other?
- What is the relationship among investment, capital structure and complementarities between debt and equity?

1.3: Research Objective:

The objectives of this research can be stated as:

- To identify the determinants of investment behaviour of firms
- To explore whether the capital market imperfections have differential effects on the investment behavior of firms

- To provide insight about debt and equity as complements or substitutes to each other.
- To study the impact of complementarities between debt and equity on investment.
- To explore relationship between investment, capital structure and complementarities between debt and equity on investment.

1.4: Significance of study:

From all over the world, quiet enough literature has been found regarding investment and financing decisions. The post 19th century exhibits a fine collection of the literature regarding investment and financing decisions exploring the models, variables and techniques and even the problems that may be encountered in such research procedures. However, the enhanced literature of the developed countries like US, UK, France, Spain, Germany, Belgium etc. is in direct contrast to the literature found in Pakistan.

To the top of our familiarity, a very less empirical work has been done that links the investment and financing behavior of firms in the presence of capital market imperfections both theoretically as well as empirically. No study could be found with reference to Pakistan to identify the role of capital market imperfections in determining investment, capital structure decisions and complementarities among debt and equity of the firms. There has been no attempt to prove that financing and investment decisions are important and inter-related in the imperfect capital market, nor there is any study exploring the firm's behavior regarding the substitutability or complementarities of internal and external finances.

So under the imperfect capital market, when debt and equities are not perfect substitute to each other, it is important to see how imperfections or inefficiencies are affecting the investment behavior of firms. This research will not only add a significant addition in the literature of investment and capital structure decisions but it shall also define the attitude of Pakistani listed firms in dealing between debt and equity. No prior inquiries

have been done in Pakistan on the simultaneous decisions of investment behavior and capital structure, complementarities between debt and equity in the presence of imperfect capital market. Thus, because of such weak financial market, there is a need to make reforms that can be used to make capital and bond markets efficient with in Pakistan.

1.5: Plan of the study:

Chapter II covers the literature in the area of interest and critical analysis of the literature. Chapter III provides detail about data description and methodology used to capture the relationships. Chapter IV is about data analysis and discussion whereas chapter V concludes the study and presents suggestions and policy implications.

Chapter II:

LITERATURE REVIEW

There exists a huge literature related to investment structure of firms located both nationally as well as internationally. The study incorporates the detailed literature found for internal and external financial constraints of firms along with their investment behaviour. However, many researchers enlighten the importance of capital structure along with the necessary variables affecting it. The contribution cited in this study also reveals the proxies to be taken for financial variables like Tobin's Q, internal cash flows, investment structures and size of firms.

Nabi (1989) examines the determinants of credit worthiness among the two main traditional markets i.e formal and informal markets running in lower developing countries as Pakistan. The findings confirm that significant determinants of credit worthiness are the firm's profit, firms based in small towns, firm's product specialization and initial or value of past capital stock. The study also reviews the distinction in access to capital markets manipulate the corporate investment decisions. The study applies accelerator model with the help of two-stage endogenous switching regressions model on the two regimes portrayed as favoured and excluded firms. The firms lying in favoured regime show the accelerator effect in their respective investment behaviour while the investment plans of the later are restricted because of the size of self-generated funds. The study reveals that the favoured firms easily regulate their desired capital stocks and the firms will concentrate on more capital-intensive production technologies when there is a cheap credit access. Tybout [1983] presents similar results for Colombia and claim that firms may find ease in implementing their investment plans if they participate in the formal capital market.

The analysis of Hoshi et al (1991) is based on the abstract that demonstrates the problems of capital markets such as information asymmetries that may have significant effects on both financial structure and investment. The research focuses on two types of Japanese manufacturing firms. One set of firms is closely linked to the bank or financial intermediary that moderates the dilemma of information irregularity by monitoring the decisions of firms. While the second set of firms have weaker relations with the banks resulting in more difficulties in bringing up capital. The analysis also compares the investment behaviour of both types of firms. Liquidity as the determinant of corporate investment is the basis of comparison. This means the study is investigating that for which type of firms the liquidity is a more important determinant of investment. The empirical tests are based on the conclusions of Jensen and Meckling (1976) and that of Myers and Majluf (1984) that managers are more willing to do investment with the internal funds. The results show that the independent firms have more volatile investments, liquidity and production and these are slightly more than the industrial group. Likewise Tobin's q, sales growths are also higher for independent firms. The close relationship with the financial intermediary reduces the cost of debt so the banks affiliated firms have higher debt-equity ratio. So for non-industrial group, liquidity is more important. This could be because the non-industrial group operates under the environment of high growth industries where higher level of liquidity can be proxy by the higher investment opportunities and vice versa for grouped firms. The independent and quasi-independent firms have stronger investment-cash flow sensitivity while cash flow serves to be a minor determinant for the investments of affiliated firms. So the firms affiliated with banks are less liquidity constrained although the economy as a whole may be liquidity constrained.

Bond and Meghir (1994) applies hierarchy of financial approach to explore the responsiveness of investment to the access of internal funds. The study describes the practical inference of this approach for dynamic investment models and tests these implications

through UK manufacturing firm's level data. The conclusion under investment model verifies the excess sensitivity of investment to cash flow measure but with a negative sign for Euler equation interpretation of the model. This is mainly due to the imperfections in the capital market and inseparability between investment and borrowing decisions.

The prediction of pure hierarchy of finance model has been falsified that firms should not simultaneously pay dividends and issue new shares. Moreover, the firms that pay low dividends have greater sensitivity of investment expenditure to financial variables. So the econometric findings imply that neither the standard neoclassical model nor the pure hierarchy of finance alternative provide sufficient clarification of the investment activities of the UK manufacturing firms.

Study of Bond et al (1997) seeks help of accelerator model, error correction technique and finally of Euler equation to study the role played by the financial factors across UK, Germany, Belgium and France. So the same investment model is applied across four countries through three different equations to check if robust results are acquired. All of the three equations use investment rates, real sales, cash flow rates and output capital ratios as the financial factors of the companies. The research explains that the relationship of investment to financial variables is not that sensitive in some firms which are mostly related to banks in Japan and Germany and those firms in UK and US which benefit from more dividend payout ratios. The investment rates and gross operating profit rates are on average similar in the sample of four countries. The sensitivity of investment spending to cash flow rates turned up high for the companies in UK and lesser in the sample of Germany than in Belgium and France. The coefficients of the gross operating profit are directly related to investment but significantly different from zero in case of all countries which means that there are financial constraints for investment and this effect is more in UK case. The coefficients of profits terms remain highly significant, larger and positive. The profit terms in all of the three models play

an important role in case of UK. The firms in UK are much larger than in other countries. A robust result of the study indicates that sensitivity of investment to financial variables is significant mainly in the UK. This result is not particular to differences in the size of firms in UK and to nature of the accounts data of UK firms. As UK has a market-based financial system, so there is an internal financial constraint for investment i.e. such financial system acts sluggishly in trenching investment funds to those firm who have more beneficial investment opportunities than the bank-based financial systems. Thus there could be a possibility that different financial orders have different effects on the investment behaviour of companies. Moreover the study analyze that the investment is only constrained when its desired level exceeds from the supply of internal finance.

Hu and Schiantarelli (1998) pick up a switching regression model along with the q theory of investment to investigate the importance of financial constraints in determining the investment decisions of firms in presence of capital market imperfections. The study shows that it is the corporate investment structure that depends on availability of internal finance in addition to its investment opportunities whenever a firm faces a high interest on external finance. The firm's cash flow has been used as proxy for the internal funds and average Q as a sufficient statistic for its investment opportunities. Both the variables together are significantly proved to capture the capital market imperfections. The variables that considerably capture a firm's possibility of being in a high premium regime (financing constraints) are interest payment to income ratio, firm size, debt-to-asset ratio and liquid assets to capital stock ratio. To conclude the respective hypothesis, the analysis split the samples of US manufacturing sector in two types of regimes i.e., a low premium and a high premium regime with less and high information and agency problems respectively. Such splitting has several drawbacks, so an alternative and yet less severe technique of estimating the separate and single equations can also be done to capture the severity of agency costs.

According to the findings, the higher is the coefficient of cash flow, the greater is the probability of a firm to fall in the high premium regime. This depicts that investment-cash flow sensitivity is higher in high premium regimes. Q Coefficient is positive implying that firms falling in low premium regime have more investment opportunities and so as their future growth prospects. Similarly, debt- to- asset ratio, interest coverage ratio and size are all positive but liquid asset to capital ratio is significantly negative. The study also includes bond ratings as a dummy and lagged sales to capital ratio as a further proxy for expected profitability to condense the cash flow as a predictor of future profits for a more general specification of switching and investment functions. Rated firms are less likely to be in high premium regime when the interaction terms are absent in the specification. So firms without a bond rating have more probability of facing a high premium regime. However being rated lessens the probability of being in the high premium regime.

Adam and Goyal (2000) explore the performance of proxy variables of firm's investment opportunity set and finds that market to book asset ratio or Tobin's Q is a high-quality and informative proxy used for growth opportunities. The MBA portray the unity of assets in place as well as in growth opportunities because book values define the assets in place while the market value shows the assets in place and growth opportunities both. So the market to book asset ratio and Tobin's Q are closely related to each other and when tested at the firm level data, the twin proxies appear to have the highest informative content about the firm's investment opportunities of all proxies' i.e market to book equity ratio and earning-price ratio.

The main argument of Fazzari et al (2000) is that the firms that come across an immense difference between the cost of internal and external funds will always face stronger investments-internal cash flow sensitivities. However, at one side the positive relation of financial constraints and investment-cash flow sensitivity is supported immensely in the

literature as by Hoshi, Kashyap, and Scharfstein (1991), Schaller (1993), Shin and Park (1998) and Love (2001) portray evidence from Japanese, Canadian, and Korean data, respectively. On the other hand, the general notion that investment cash-flow sensitivity is a positive function of financial constraints is in conflict with the estimates of Kaplan and Zingales (1997) and Cleary (1999) which indicates that investment cash-flow sensitivity is a negative function of financial constraints. The research of Allayannis and Mozumdar (2001) defines the negative cash flow observations which may be responsible for the difference in the results in literature of Kaplan and Zingales (1997) and Cleary (1999) results. In the end, it has been concluded that firms of less developed countries are likely to face high under-investment costs and challenges in approaching external capital markets which results in sluggish economic growth of the country.

Ang and Beck (2000) explores that marginal Tobin's Q is different from average Tobin's Q. Most studies use marginal q as a proxy for the average q which can lead to incorrect decisions regarding investment since both are not same. According to the analysis report, 52% of the time, the correct decision is reached when average Qs are substituted for marginal Qs. While 32% and 16% of the time, the firm will over and under invest respectively.

Eriotis et al (2002) explores the relationship between debt-to equity ratio and firm's profitability, including the amount of investment and extent of market power or concentration ratio. The work suggested that when a firm borrows capital, there is an increase in the amount of investment and the only expense of such borrowing is payment of interest. But any increase in the borrowed capital will increase the risk for both the firm and owners because whenever one borrows, there is always a fixed expense which the borrower has to return within specific time period. So at least that much profit must be generated to cover the interest expenses. The analysis employs pooled model along with fixed effects model and random effects model.

The findings specify a negative connection between concentration ratio and profit margin. This means that the less the concentration ratio will be the more the gross margin profit will be which implies that firms never cooperate with each other rather they always compete. All the same, concentration ratio verifies to be an important instrument for the profitability of firms. Debt-to-equity ratio and profit margin are conversely related to each other which indicates that cost is greater than the benefit of debt or firms that finances themselves from retained earnings are more money-making than those financed by loan. This negative sign is in line with the results of Baker (1973), Hurdle (1974) and Oustapassidis (1998). Investment and profit margin is positively related to each other. This result shows that there is an efficient utilization of capital.

Study of Stenbacka and Tombak (2002) determines the simultaneous investment and financing decisions of the financially constrained firms in the presence of imperfect capital market. The study emphasizes optimal combination of debt and equity by taking into account the interactions between internal and external capital. Such interactions characterize the investment behavior of firms. The analyses prefer simultaneous development of both equity and debt market rather directing towards only one market and construct three hypotheses under three situations. In the first situation of debt as the only instrument for external finance, the paper reveals that investment is an increasing and concave function of net worth of a firm. So there is a positive relationship between the two. The second case analyze taking into consideration new equity as the only source of financing. In such situation, it has been proved that new equity is increasing and concave function of firm's internal funds which implies that new-equity and internal funds of a firm are directly related to each other. The third case in which Stenbacka and Tombak combines the first two hypotheses and take complementarities between debt and new-equity as the external financing instrument gave the results that these complementarities are function of firm's present equity. Thus the work recognizes these

complementarities and suggests that exploitation of these can accelerate the growth of firms. It further claims that both investment and capital structure are endogenous and that they depend on components like nature of the capital markets, the internal finances and qualities of investment opportunities available to firm. The results came up consistent with the theory that before offering new issues, the firms should have a particular level of retained earnings and that if there is no complementarities with debt then the new equity will not be required by the average sized firm. Results of Bond and Meghir (1994) are consistent with their conclusions.

Net worth is directly proportional to both debt and new equity. The functions of debt and equity financed investment are concave. Thus the theory identifies the situations of complementarities. The optimal combination of debt and equity depends on the bankruptcy risk and dilution cost.

Carpenter and Petersen (2002) define the ways in which high-tech industries, especially small ones are likely to face financial constraints caused by imperfections in capital market. The level of investment in high-tech sector is more likely to be distressed by capital market imperfections because of existence of information asymmetries, extreme volatile returns and limited collateral value. The survey also examines the impact of financing constraints and funding gaps (rising from imperfections in capital markets) on some sectors. Another dimension of the research comprises of observing the role of new equity finance. A remarkable change in size is often expected when a firm issues new-equity. The IPO, in general, is very large relative to the firm's size. There could be a difficulty in achieving this increase in size if the firm uses debt as the only source of external finance. The results indicate that before and after going public, most of the small and medium-sized high-tech firms are least debt financed and when they go public they don't continue with external finance anymore. Rather they indulge themselves in the internal finance or retained earnings.

The study suggests that publicly traded high-tech firms, especially small firms find an easy way out of financial constraints on investment by issuing new-equity. So in this way they relax themselves from such financial constraints and finance themselves through new-equity and when they get somewhat settled then they continue with internal equity. Debt financing is probably inappropriate for high-tech firms because of rising expected marginal cost of debt due to nature of debt contracts, moral hazard, adverse selection and a little collateral value of assets. This also leads to large funding gaps between internal and external financing.

Islam and Mozumdar (2002) unfold the influence of financial development on firm's internal cash flow and investment sensitivity for 31 countries. The research reveals the case of firms in less financially developed countries where investment is extra sensitive to cash flow when controlled for firm size and future profitability (or investment opportunities as measured by Tobin's q). The study internationally supports the estimates of Fazzari, Hubbard, and Petersen (2000) in providing the evidence that investment-cash flow sensitivity is inversely related to financial development, holding constant the future investment and firm size. This implies higher information asymmetric cost and limited external capital accessibility. The estimates also show a well-built association of size (measured by log of total assets) and investment cash-flow sensitivity. However these results get muddle in case of OECD countries. But overall, the smaller the size of firm, the greater the information cost and the more will be the dependency on internal generated capital for making investment expenses. The availability of internal cash plays an important role in determining the financial constraints along with the sensitivity of investments to future profitability (Wurgler, 2000).

Bruinshoofd (2003) argues that investment-cash flow sensitivity is important in both academics and policy implications. Cash holdings can perfectly measure financing constraints as during the crucial time the firms hold precautionary cash balances. However the endogeneity problem may arise by the inclusion of cash flow holdings. The study is based

on two assumptions according to which there are different levels of constraints faced by the firms and the more the cash flow –investment sensitivity the greater is the impact of financial constraints. The research talks about certain pros and cons of different investment models that are applied to analyze the effects of financial constraints on corporate investment. Split sample analysis has been used to figure out those firms to which financial constraints are relevant to their investment decisions. Two strategies of q model and Euler equation have been discussed to detect the financial constraints in corporate investment. Q-models and reduced form investment equations recognize the role of financing constraints in corporate investment on the basis of excess sensitivity tests of the constrained firm's investment to financial variables. The proxies used for investment opportunities are Q, sales-assets (sales-capital stock measures), user cost of capital and sales growth. When a firm faces financial constraints, its available internal finance gets depleted because of the increased costs of external finance so it reviews its investment decisions again. Moreover, spare debt capacity and cash holdings at one hand can be used as substitutes while on the second hand they can be used jointly to remain safe from getting the estimates affected by the impact of future financing constraints. Nevertheless, some conflicting results have been shaped by the Investment-cash flow sensitivity as a measure of financing constraints. Firms that have low levels of internal funds are consistent with the lower ICFS. This fact shows that ICFS is not good measure of financial constraints.

Guariglia (2003) takes advantage of error-correction specification to study the investment-cash flow sensitivity of the firms facing different stages of internal and external financial constraints. The study includes interaction terms based on the cash flow to capital ratio and the coverage ratio. The findings show that When data are split on the internal funds level, the association between investment and cash flow are U-shaped i.e., when cash flow falls, the firms in sample raise their investment level to be able to pay back their lenders and treat

efficiently with their financing gaps. The same are the conclusions of KZ (1997) agreeing for the highest sensitivity of investment to cash flow for the least financially constrained firms. Generalized Method of Moments (GMM) specification is used to tackle the unobserved firm heterogeneity by estimating the equation in first-differences and endogeneity problems by using the lagged two or more periods model variables as instruments. The study uses a dynamic adjustment mechanism with error correction model to avoid the problems of misspecification. It upholds the long-run properties of value-maximizing investment models but never figure out the limitations on short-run dynamics linked with special adjustment cost specifications. The coefficient associated with the term capital and sales is negative showing that when capital is lower than its desired level, future investment should be elevated. Thus internal and external financial limitations have diverse effects on the investment-cash flow bond.

Adelegan and Ariyo (2008) study the influence of capital market imperfections on Nigerian manufacturing firm's investment behavior. According to research, the consequence of a market imperfection is that the external and internal capitals do not remain a perfect substitute to each other. This is mainly due to the asymmetries in information that investors demand high premium from less reliable customers and make external capital somewhat more expensive than the internal. The framework uses switching regression model and seek help from q theory of investment. Q and cash flow model of investment has been used in the study to figure out the link between capital market imperfections and firm's investment structure.

The results reveal that q is positively related to the investment expenditures of low premium firms which show that their investments are sensitive to market evaluation of the potential growth. Contrarily, decreases in q will upshot an increase in investment of the high premium firms. This means that firms lying in HP regime will increase their investment level when the

market evaluation of their upcoming growth prospects is low. The coefficient of cash flow is statistically significant and positive in case of LP regime firms and insignificant in HP regime firms. The Leverage variable i.e. debt- to-market-value ratio is statistically insignificant and negative. However the flow of debt variable which is interest expense-to-operating-income ratio is statistically significant with a negative sign. The stock measure of liquidity variable taken as liquid-financial-assets-to-capital-ratio and size are statistically significant and positive.

Azam and Shah (2011) investigate the impact of internal and external financial constraints on investment decisions by applying multiple regression analysis. The framework takes dividend payout ratio as the internal constraint of an enterprise. Through OLS technique the result shows that there is a positive connection between firm size and investment.

Doku et al (2011) inspect the affiliation existing between financial market development and optimal choice of debt-to-equity ratio. The central interest of the research paper is to check that either debt or equity is complements or substitutes to each other. They developed the model which has been used earlier by Demirguc-Kunt & Maksimovic (1999), Agarwal & Mohtadi (2004) and Biekpe (2006). The results depict that more than 90% of the twenty-one listed firms at Ghana Stock Exchange (GSE) are being financed by the short term debt under the period of 1995-2005. The results are reported as random effect results. Similarly they account a positive relationship of market capitalization ratio and turnover ratio with long and short term debt. The banking indicator which is liquid liability ratio is positively related to long term debt, this means that as the banking sector is fostered, the firms attire themselves into debt, emphasizing on the significance of debt financing. Nevertheless, the positive connection of indicators showing bank development and long-term debt in addition to stock market growth and long-term debt, approves the complementarities between banking sector and stock markets in sponsoring firms escalation. The findings of firm variables appears to be

somewhat blended among short and long term debt. The larger the firm the lesser will be the adoption of short term debt which could be due to the agency problems faced by the larger firms and access to debt. This conclusion is in accordance with Ozkan (2001). On the whole, the study concludes that debt and equity are chief financing complements that allow the firm to finance so in this way debt-equity ratio will increase when the financial market improves. On the other hand, substitution effect gets into the preference of internal source of finance i.e. equity finance. As the financial environment advances further the firms listed in Ghana stock exchange will wish to enter long term equity financing options.

Tsoukalas et al (2011) design an active and an inactive investment regime with fixed adjustment costs, cash accumulation and costly external finance which is then simulated to investigate the reliability of investment-cash flow sensitivities in reduced form investment equations augmented with cash flow for the presence of capital market imperfections (CMI). The technique employed to all the equations is GMM which come up with the results that these sensitivities are not consistent indicators of CMI because the study uses the investment model with a non-linear function of fundamentals as its decision rule and using cash flow as a proxy has misspecified the equation. The second test is formed with the help of saving-cash flow regression which relates a firms accumulation of cash (saving) to total assets ratio to its cash flow to assets ratio, size and Tobin's Q (proxy for sales growth). The savings-cash flow regression is used to spot the existence of high-priced external finance in the simulated panels which is proving a solid evidence about the capital market imperfections. A high sensitivity implies a high standard CMI which means that when firms face high premium on external finance, they will mount up the cash in periods of idleness while in and periods of investment activity they will utilize the accumulated savings.

Bahlous and Yusof (2012) studies the impact of financing constraints generated by asymmetric information, capital markets frictions, and credit control policies on investment

and growth of firms in East Asian countries and GCC countries. Accelerator model is applied with the variables serviced are cash flow, change in sales, debt maturity defined as change in long term debt and change in short term debt. To better comprehend the research, the study splits its sample into the small and large firm's criteria according to size. The result in case of Malaysian companies show that generally the small firms invest when internal funds and short term debt are easily adoptable. So the small firms are financing long term deals with short term debt and internal funds which is actually against the tenant of finance. The larger firms have a good access to long term financing are thus more sensitive and relying on to the long term debt. So unlike the large firms, small firms are though financially constrained. The investment in Taiwan companies is more sensitive to the access of new long term debt than to internal cash flow. Larger companies finance their investments with both type of debts and internally generated funds while the smaller companies only depend on the access to long term debt. The results conclude that small firms are poor in asset liability management and are thus a victim of financing constraints. Corporate sector in the GCC is facing no financing constraints on the both small and large firms because their investment patterns never get into a weak position if they fall short of the internal funds. Thus, investment is determined both by long and short term loans.

Ahmad et al (2013) investigate the negative connection between financial leverage and firm's investment in the presence of certain control variables such as Tobin's Q, liquidity, cash flow, return on equity and sales to clearly spot the impact of leverage on firm investment as literature has confirmed their impact on investment. The findings are in line with the various agency theories of corporate leverage and Stulz (1990) according to which the high levered firms generally invest less. The leverage hampers managers from indulging in non profitable capital expenditures. The debt insist manger to pay additional funds as interest and principal, that may else been allocated to poor investment projects. (Myers, 1977) is of the view that

often the managers pay no heed in investing in positive NPV projects, this is because some or all of the profits from the investment may mount up to debt-holders; this debt overhang problem leads to underinvestment. So the leverage provides a penalizing role in overcoming the over-investment and agency problems. Moreover, there is a strong negative association of investment with cash flow which means that Pakistani non financial firms have very strong investment and cash flow sensitivity. ROE (proxy for profitability) and sales are positively related to non-financial sectors investment. The results find no evidence of any relationship of liquidity and Tobin's q with investment.

Fazzari et al (1988) elaborates in the research that investment depends on financial factors, like availability of internal funds, new debt or equity finance etc. The study employs the use of balance sheet variables determining the firm level investment. The variables include cash and working capital and results show that changes in balance sheet positions and liquidity have a significant effect on investment for the low-payout firms. The conclusive remarks show that financial factors does have an effect on investment and the bond between financing constraints and investment differ by nature of firm.

Thus, the immense literature listed above reveals that there exists a strong connectivity between investments and Tobin's Q along with cash flow sensitivities. Both the variables are likely to pick up the financial market imperfections when they are induced in the model. The variables that noticeably capture a firm's possibility of being financially constrained are interest payment to income ratio, firm size, debt-to-asset ratio and liquid assets to capital stock ratio. Moreover the best proxy taken for Tobins Q is marginal Q while for internally generated funds is cash flows. However, most of the literature is about the determinants of capital structure and there exists a major gap confronting the substitutable and complementary attitude of the firms. This specific part is relatively missing from the immense literature. In a nutshell, researchers have expended considerable effort in trying to

understand the nature of financial constraints like Information asymmetry, moral hazard and agency costs of firms but this literature is missing in the case of Pakistan specifically.

Chapter III

DATA AND METHODOLOGY

3.1: Methodology

To better comprehend the theoretical part of our research, the research now uses the empirical model in the study same as derived by Hubbard (1998) through the basic neo-classical approach. The study employs the traditional Q model of investment in the estimation with the essential idea to highlight market valuation of firm's assets as determinant of corporate sector investment so this illustration of q model has been utilized by an adequate amount of literature aiming to investigate the effects of imperfect substitutability of external and internal finance on the corporate investment behaviour; for example Fazzari, Hubbard and Peterson (1988), Hu and Schiantarelli (1998), Adelegan and Ariyo (2008), Bruinshoofd (2003).

3.2: Model I:

The empirical form of the derived q model of investment is:

$$\left(\frac{I}{K}\right)_{it} = \alpha + bQ_{it} + c\left(\frac{CF}{K}\right)_{it} + \mu_{it} \quad (3.1.1)$$

Where the term:

$(I/K)_{it}$ = capital expenditure divided by capital stock during year t for ith firm.

I_{it} = gross investment expenditures while K_{it} is the capital stock.

Q_{it} = Tobin's q used to measure the available investment opportunities to a firm.

$\left(\frac{CF}{K}\right)_{it}$ = cash flow of the ith firm during period t scaled by capital stock. CF is used as the proxy for the internal funds.

μ_{it} = an error term.

According to the objectives of the study, the above investment function may be extended as:

$$\left(\frac{I}{K}\right)_{it} = \alpha + \beta_1 \left(\frac{I}{K}\right)_{i,t-1} + \beta_2 Q_{it} + \beta_3 \left(\frac{CF}{K}\right)_{it} + \beta_4 \left(\frac{CF}{K}\right)_{i,t-1} + \beta_5 \left(\frac{D}{TA}\right)_{i,t-1} + \beta_6 \left(\frac{Liq}{K}\right)_{i,t-1} + \beta_7 \left(\frac{Int}{Y}\right)_{i,t-1} + \beta_8 (LMK_{i,t-1}) + \beta_9 \left(\frac{FA}{TA}\right)_{i,t-1} + \sum_{i=n}^n \beta_i INDD + \sum_{i=n}^n \gamma_i YRD + \mu_{it} \text{ ----- (3.1.2)}$$

Where the additional variables include:

$(D/TA)_{i,t-1}$ = lagged values of the debt-to-total asset ratio.

$(Liq/K)_{i,t-1}$ = lagged values of stock of liquid-financial-assets-to-capital ratio.

$(Int/Y)_{i,t-1}$ = lagged values of interest-to- operating-income ratio.

$LMK_{i,t-1}$ = lagged values of logarithm of market capitalization taken as proxy for Size of the firm.

$(FA/TA)_{i,t-1}$ = lagged values of tangibility ratio.

These indicators are a set of balance sheet variables that are considered to be important in showing that a firm is dealing with the financial constraints. Such firm-specific variables capture the credit worthiness, asymmetric information and agency problems of each and every firm taken into account. These include debt to total asset ratio $((D/TA)_{i,t-1})$, the stock of liquid-financial-assets-to-capital ratio $((Liq/K)_{i,t-1})$, the interest-to-operating-income ratio $((Int/Y)_{i,t-1})$, tangibility ratio $((Fa/Ta)_{i,t-1})$, and SIZE which is described as the logarithm of market capitalization $(LMK_{i,t-1})$.

Finally, INDD are the industry dummies to see the differences along the industries. The significant dummy will allow revealing the magnitude of difference of the specific industry from the bench mark industry. Similarly, YDd are the year dummies to see the macroeconomic impact on the investment decisions of firms over the years. The dynamics effects of a firm's specific attributes are captured by the balance sheet variables and industry dummies together. However, the macro conditions influencing the firms' investment behaviour and financing decisions are taken into account through the year dummies.

3.3: Model II:

Simultaneous equation system used by Stenbacka and Tombak (2002) also been implied in this study to examine the complemented or substituted behaviour of non-financial sector towards debt and equity. To get a clearer view of the firms inclined nature towards a specific source of finance, both the equations will help the study to portray the source of finance (debt and equity as substitutes or complementarities) employed by the firms of non-financial sector and the impact of such behaviour on the investment decisions.

$$K = a_0 + a_1W + a_2W^2 + (a_3+a_4W + a_5 W^2)D + a_6\mu + e_1 \dots \dots \dots (3.3.1)$$

$$D = \beta_0 + \beta_1W + \beta_2W^2 + (\beta_3 + \beta_4 W + \beta_5W^2) K + \beta_6INT + e_2 \dots \dots \dots (3.3.2)$$

Here:

K= share holder's equity

D=the long-term debt;

W=the retained earnings;

μ =dividend yield

INT= interest rate.

3.4: Description of variables:

The Tobin's q, is the market valuation of capital relative to its replacement cost. It is taken as a surrogate for the firm's investment opportunities. Tobin's q has been employed by a comprehensive literature as a proxy used to capture the capital market imperfections and investment opportunities.

The instrument of Cash flow $(CF/K)_{it}$ is used as a substitute to indicate the firm's internal funds. Cash flow is also serviced in the model to capture the imperfections of the capital market.

Total debt to total asset ratio is the leverage ratio. This leverage ratio explains the amount of total assets that are levered by debt. The higher the ratio, the higher will be the degree of leverage, and so as the financial risk.

Stock of liquid-financial-assets-to-capital ratio define how much of the liquid assets are supposed to be held by financial institutions. This implies that how much a firm has the liquid assets in ratio to its capital stock.

Interest Expense to Operating Income Ratio means that how much a company pays the interest to its obligations out of its operating income which is the difference between the revenue and expenses. A low figure of this ratio shows that a company is going in flow and is financially fit i.e. it has less interest paying obligations. It is making quite enough money and is not in need to borrow a lot to stay in business. This ratio is also an indication of plenty of credit availability, valuable assets, and enough cash in hand.

Size of the firm is proxy by the log of market capitalization. The size defines the condition of the firm and is evident of many financial statements.

Continuing the things and approaching the second model which has been assigned in the study for the accomplishment of the objectives deciding either the substitutes or complementarities between debt and equity. The insignificance of the interaction term $(a_3 + a_4W + a_5W^2)$ D in equation (3.3.1) depicts that the firm has just used the internal generated funds and no debt measure has been used. Likewise, similar arguments hold in the case of term $(\beta_3 + \beta_4 W + \beta_5W^2)$ K in equation (3.3.2). The insignificant figure provides evidence that all of the company's operations have been financed by using debt and no equity has been used.

Nevertheless, the significance of the respective interactive term and the positive sign shows that a firm is using a complementary of debt and equity. This means that a firm is said to be implying both debt and equity together in its operations if the debt measure and equity are in positive relation. However, contrary signs are taken in the view that a firm is employing debt and equity as substitutes.

3.5: Formulas and construction of the variables:

3.5.1: Gross investment expenditure (I_{it}):

I_{it} is gross investment expenditures taken as fixed assets after accumulated depreciation divided by capital stock i.e:

$$FA \text{ after depreciation of } y \text{ period} - FA \text{ after depreciation of } x \text{ period} / \text{capital stock}$$

3.5.2: Tobins Q (Q_{it}):

Q_{it} is the Tobin's q used to measure the available investment opportunities to a firm. It is the ratio of market value of equity in addition to book value of debt to total assets i.e.

$$Q_{it} = \text{market value of equity} + \text{book value of debt} / \text{total assets}$$

3.5.3: Capital stock:

Capital stock is taken as inventories plus fixed asset at cost i.e.

$$\text{Capital stock} = \text{inventories} + \text{fixed asset at cost}$$

3.5.4: Cash flow (CF):

Cashflow (CF) is used as the proxy for the internal funds which is the earnings before interest and taxes plus depreciation i.e.

$$CF = EBIT + Depreciation$$

3.5.5: Liquidity (liq/K)_{it}:

For liquidity, cash and short term investments have been taken in account i.e.

$$(liq/K)_{it} = cash + short\ term\ investments / inventories + FA\ at\ cost$$

3.5.6: Retained earnings:

- Retained earnings are taken as net profit before tax less tax less total amount of dividends i.e.

$$Retained\ earnings = profit\ before\ tax - tax\ provision - total\ amount\ of\ dividends$$

3.5.7: Dividend yield:

Dividend yield is defined as dividend per share divided by market price per share and is calculated as under:

$$Dividend\ yield = DPS / MPS$$

3.5.8: Market capitalization:

Market capitalization is the product of MPS and number of shares and is calculated as under:

$$\text{Market capitalization} = \text{MPS} \times \text{Number of shares}$$

3.6: Data Estimation:

The population of the study comprises of listed firms in non-financial sector of Pakistan so the unit of analysis of the present study is non-financial sector of Karachi Stock Exchange. This research is going to consider only the non-financial sector of Pakistan because the financial sector has different capital structure and accounting period. Secondary data has been taken which is panel data comprising both time series and cross-sectional units. The panel data is beneficial in the sense that due to more observations, it provides more information to the analysts, it accounts for the dynamic behaviour and better estimates of the parameters. The data has been taken of 100 manufacturing companies listed in non-financial sector covering twenty industries listed on KSE. The sample period is of 13 years starting from 1999 to 2011. The data has been obtained from different volumes of “Balance Sheet Analysis of Joint Stock Companies listed on the Karachi Stock Exchange” published by the State Bank of Pakistan.

The data set has been taken from the twenty non-financial industries of Pakistan and among them; the sample of top five companies has been taken so that the study operates under a consistent data set. Companies have been determined as top five on the basis of their stocks market capitalization.

3.7: Techniques for Model I and Model II:

3.7.1: Technique for Model I:

A considerable literature has used q model of investment, Euler equation and accelerator model to capture the imperfections and their impact on investment decisions.

The techniques provided in literature to measure the impact of imperfections on investment are switching regression approach, impulse response function, two stage least square methods, least square dummy variable technique, error correction method, fixed and random effects model, financial constraint method and generalized method of moments (GMM). However the most common among these are endogenous switching regression function and generalized method of moments (GMM) to study the link between capital market imperfections and firm's investment structure.

The study has employed the use of two techniques to deal with two models. The first model uses generalized method of moments (GMM) and least square dummy variable analysis. The model is actually based on q and cash flow model of investment to study the link between capital market imperfections and firm's investment structure. This is because when we include the cash flows as internal source of fund of a firm in the q model of investment, then it is mostly expected to pick up the imperfections generating in the capital market. The q and cash flow technique has numerous theoretical advantages over the others as unlike Jorgenson's neoclassical model and the accelerator model it is progressive, it also avoids the Lucas critique which is the most important thing.

The study has used generalized method of moments (GMM) approach on the selected panel data because this method is proficient in considering the complex connection between investment opportunities and the financial situation of the firms. It controls for the endogeneity of explanatory variables, allows firm-specific and time-specific effects, and the use of lagged dependent variables. So the study is likely to exploit several additional moment conditions by adopting the GMM technique by significantly improving the consistency and efficiency of the estimators. To analyse the specific cross sectional and time effects, the study has used least square dummy variable analysis. Thus our findings are not prone to the strong

assumptions that are vital in models that employ the Euler equations or switching regression functions like Nwachukwu (2013).

3.7.2: Model II:

The second model has used two stage least square method for the second model as the model is comprised of simultaneous equations and they are over identified as checked before. So following the theory, the research employs 2SLS method.

CHAPTER IV:

EMPIRICAL RESULTS AND INTERPRETATION

4.1. Descriptive Statistics Analysis:

The study first of all demonstrates the descriptive analysis of the 100 firm- year observations from 2000 to 2011. Descriptive statics have been shown to reveal the quantitative description of the sample. The description includes mean, median and standard deviation.

Table 4.1: Descriptive Statistics of annual observations from 2000-2011

Variables	Mean	Median	Maximum	Minimum	Std. Dev
$(I/K)_{it}$	0.003526	1.13E-06	3.515801	-0.00501	0.107974
$(I/K)_{it-1}$	0.003499	1.14E-06	3.515801	-0.00501	0.107969
Q_{it}	2.710614	0.340618	324.0711	0.00074	21.48066
$(CF/K)_{it}$	2399.718	305.669	1429694	-10369.4	43929.81
$(CF/K)_{it-1}$	2256.835	238.1	1429694	-10369.4	43919.25
$(D/TA)_{it-1}$	0.616951	0.625407	4.692372	0.00078	0.386377
$(Liq/ K)_{it-1}$	0.248626	0.052575	9.248581	8.49E-05	0.730769
$(Int/Y)_{it-1}$	0.277785	0.126638	154.25	-75.3018	7.040623
$(LMKT)_{it-1}$	6.712118	6.643386	15.75387	0.818016	2.097069
$(FA/TA)_{it-1}$	0.770564	0.796082	1.83044	0.005384	0.345214

Table 4.1 presents the statistical behaviour of the effects of variables that capture imperfections in capital market along with the parameters that measure each firm's investment behaviour and financing decisions. From the Table 4.1, the average investment-to-capital ratio (I/K) is 0.003526; most of the firms have an investment-to-capital ratio that is high up to 3.515801. The mean and maximum values of previous year's investment-to-capital ratio (I/K) are as same as current year's investment to capital ratio. The mean value of

Tobin's Q defines that the averages of about 2.710614 of the firms have investment opportunities. However, the figure shows that the value is more than 1. This can also be taken as of the view that the companies listed in Karachi Stock Exchange are overvaluing the stocks. As this demonstrates that the cost to replace a firms assets are a bit greater than the value of their stocks. The average firms that have internal funds i.e. their cash flow-to-capital ratio (CF/K) is 2399.7 while the stock of debt calculated as debt-to market value of the firm ratio ((D/V)_{t-1}) is 0.616951 which is about 62 per cent on the average. Likewise, the flow measure of debt which is the interest expenses ratio ((INT/Y)_{t-1}) is about 27%. The size of the market which is measured as taking log of market capitalization is 6.71. Finally the average tangibility ratio of the firms is 0.77 which means that 77 percent of the firms on average have their fixed assets from total assets.

Table 4.2 : Correlation Matrix

	(I/K) _{it-1}	Q _{it}	(CF) _{it}	(CF) _{it-1}	(D/TA) _{it-1}	(Liq/K) _{it-1}	(Int/Y) _{it-1}	(LMKT) _{it-1}	(FA/TA) _{it-1}
(I/K) _{it-1}	1.00000								
Q _{it}	-0.02056	1.00000							
(CF/K) _{it}	-0.02271	0.09779	1.00000						
(CF/K) _{it-1}	-0.02375	0.06738	0.84708	1.00000					
(D/TA) _{it-1}	-0.01499	-0.20884	-0.10477	-0.16603	1.00000				
(Liq/K) _{it-1}	-0.03828	0.22881	0.33873	0.34517	-0.25587	1.00000			
(Int/Y) _{it-1}	0.02085	-0.45309	-0.20646	-0.22895	0.38889	-0.44948	1.00000		
(LMKT) _{it-1}	-0.02485	0.65953	0.68540	0.73064	-0.23364	0.35326	-0.35706	1.00000	
(FA/TA) _{it-1}	0.01044	-0.05917	-0.12497	-0.09793	0.03290	-0.50728	0.40705	-0.08724	1.00000

Table 4.2 shows that generally there are no significant problem of multi-collinearity that exists among the concerned variables. However, the parameter of cash flows indicates a high correlation with its lag value and market capitalization.

4.2: Panel Dummy Variable analysis:

To deal with the model I, the study has been developed into four ways further with the help of panel dummy variable analysis. At first, the panel data is only estimated without the industry and year dummies. Then the study conducted the results including with separate analysis of industries and year dummies. Finally, the results have been carried out seeing the separate analysis of both industries and year dummies.

4.3: MODEL I:

As the respective model includes the lag of the dependent variable (I/K) so there arises the problem of endogeneity. Due to violation of OLS assumption, OLS is inapplicable and in this case it gives biased estimates. GMM handles endogeneity along with many economical dilemmas. Thus, equation 3.1.2 has been run by GMM. The results are shown below:

Table 4.3.1: GMM Results:-

Variables	coefficients	St. error	t- statistics	P- value
Intercept	70.81062	5.934822	11.93138	0.0000
Investment(I/K) _{it-1}	-0.065823	0.027617	-2.383431	0.0174
Tobin's Q _{it}	10.32924	1.094578	9.436734	0.0000
Cash flows (CF/K) _{it}	3.116550	0.612948	5.084528	0.0000
Lag of cash flows (CF/K) _{it-1}	-3.541636	0.849216	-4.170477	0.0000
Leverage ratio(D/TA) _{it-1}	14.41457	1.002010	14.38565	0.0000
Liquidity ratio (Liq/ K) _{it-1}	-0.557001	0.407291	-1.367575	0.1719
Interest-operating-income ratio (Int/Y) _{it-1}	-0.541919	0.429107	-1.262899	0.2071
Market capitalization ratio (LMKT) _{it-1}	-7.778834	1.026299	-7.579504	0.0000
Tangibility ratio (FA/TA) _{it-1}	-7.637823	1.441939	-5.296913	0.0000
R-square : 0.571630	Adjusted R square : 0.499675			

*, **, *** significant at 10%, 5% and 1% level

4.3.2: Interpretation of the results:

As the results show that the lag of the dependent variable i.e. ratio of capital expenditures to capital stock is statistically significant but is negatively associated with the dependent variable. This depicts that the past values of the investment itself affect the investment behaviour of firms negatively.

The Tobin's Q is statistically significant and positive in relation to investment expenditures (I/K). This means that as the performance of non-financial sector of Pakistan improves, the firms tends to increase their investment behaviour as well. The main reason behind this is because when firms have sales growth so it depends on its sales. Due to these

sales there is generation of internal generated funds and the firm is deprived of the use of external finance.

The t-statistics of cash flows is 5.0845 which is statistically significant and positive. This means that when the firms of non-financial sector of Pakistan have more internal generated funds then they expand their investment. The impact of the imperfections in capital market is such that the firm is only utilizing its internally generated funds for investment and it is not taking much use of external finance.

However, the t-statistics of lag of cash flows is significant but negative. This shows that the previous internal funds affect investment behaviour of firms conversely. This can be of the view that the firms with liquidity have positive effect on investment and the pattern is reversed with the passage of time.

The t-statistics of the leverage ratio is 14.38 which show that the stock of debt is statistically significant to investment manners of a firm. The positive association between the two shows that firms with high debt have more investment. However, this may amplify the financial risk as the fruits of investment in such conditions may squash. But the results show that the KSE non-financial listed firms are risk takers as they use debt for capital expenditures.

The t-statistics of the liquidity ratio is insignificant but negative. This means that the liquid assets of a firm affect its investment behaviour insignificantly.

Similarly, interest-to-operating income ratio affects investment conduct of non-financial firms insignificantly. This insignificant and negative correlation among the two variables may be due to the nature and peculiarities of the non-financial firms listed in KSE. As Pakistani firms are highly geared, so the profit generating from the debt usually goes as

big amounts of interest along with the original sum. Thus there is an insignificant impact of this ratio on investment.

The t-statistics of market capitalization ratio is -7.57 which depicts that large firms have low investment opportunities so the growth rate is low and as the size of firms increases then it reaches maturity level so investment opportunities decrease and firms prefer the profit coming from the existing business. This negative impact also signifies that when the size of a firm is large, then obviously it has been employed itself in several investment projects and the current projects may sound invaluable to the large sized firms.

The tangibility ratio influences the investment conduct of Pakistani firms significantly but negatively. The negative connection between the two illustrates that the more the tangible assets a company has, the more it would be reluctant to indulge in further investment activities.

Table 4.3.3: Least Square Dummy Variable Analysis- Industry**Effect:**

Variables	coefficients	Standard error	t- statistics	P- value
Intercept	28.47199	3.756071	7.580257	0.0000
(I/K) _{it-1}	-0.007197	0.026261	-0.274051	0.7841
Q _{it}	5.209388	0.861568	6.046404	0.0000
(CF/K) _{it}	4.490821	0.523738	8.574564	0.0000
(CF/K) _{it-1}	-3.621339	0.746193	-4.853089	0.0000
(D/TA) _{it-1}	11.79990	0.767107	15.38234	0.0000
(Liq/ K) _{it-1}	0.850489	0.287363	2.959637	0.0032
(Int/Y) _{it-1}	-0.592555	0.333837	-1.774983	0.0763
(LMKT) _{it-1}	-3.214183	0.823212	-3.904440	0.0001
(FA/TA) _{it-1}	-0.240046	0.901413	-0.266300	0.7901
Pharmaceuticals	1.274728	2.748460	0.463797	0.6429
power generation and distribution	9.368542	2.668533	3.510746	0.0005
Refinery	0.937558	3.301216	0.284004	0.7765
Cable and electric goods	2.293692	2.798772	0.819535	0.4128
Miscellaneous goods	8.697765	2.617157	3.323364	0.0009
Textile composite	6.419026	2.822278	2.274413	0.0232
Textile spinning	2.906448	2.405186	1.208408	0.2273
Textile weaving	-3.220058	2.634164	-1.222421	0.2220
Sugar and allied industries	3.214697	2.610810	1.231303	0.2186
Food and Personal Care-Products	-2.135920	2.751625	-0.776240	0.4379
Chemicals	1.148876	2.581489	0.445044	0.6564
Leather and Tanneries	-1.033867	2.895913	-0.357009	0.7212
synthetic and rayon	7.197939	2.633374	2.733352	0.0064
Cement	11.53484	2.676772	4.309238	0.0000
Automobile assembler	-5.225966	2.785455	-1.876163	0.0410
Paper and board	5.480244	2.622767	2.089490	0.0370
Woolen and jute	4.807589	2.901974	1.756662	0.0580
oil and gas	3.608104	2.791208	1.292667	0.1965
Venaspati and allied products	-2.935158	3.068437	-0.956565	0.3391
engineering	-0.268654	2.532897	-0.106066	0.9156

Table 4.3.3 represents the results of least square dummy variable analysis to view only the specific effect of different industries on their investment behaviour. The results describe that twelve industries out of the twenty are insignificantly different from the bench mark industry. These eleven industries are Pharmaceuticals, Refinery, Cable and electric goods, Textile

spinning, Textile weaving, Sugar and allied industries, Food and Personal Care-Products, Chemicals, Leather and Tanneries, oil and gas, Venaspati and allied products and engineering. The effect on investment activities of these twelve industries is not significantly different from that of glass and ceramics industry. On the other hand, the industries that are significantly change from the bench mark industry and that have investment behaviour significantly different from that of bench mark industry are power generation and distribution, Miscellaneous goods, Textile composite, synthetic and rayon , Cement, Automobile assembler, Paper and board and Woollen and jute respectively.

Table 4.3.4: Least Square Dummy Variable Analysis- Time Effect:

Variables	coefficients	Standard error	t- statistics	P- value
Intercept	39.38003	4.868488	8.088759	0.0000
(I/K) _{it-1}	0.007154	0.022756	0.314376	0.7533
Q _{it}	3.584340	0.681185	5.261916	0.0000
(CF/K) _{it}	5.146317	0.476675	10.79627	0.0000
(CF/K) _{it-1}	-5.349283	0.678436	-7.884725	0.0000
(D/TA) _{it-1}	10.55370	0.595878	17.71117	0.0000
(Liq/ K) _{it-1}	0.753340	0.243124	3.098580	0.0020
(Int/Y) _{it-1}	-0.861988	0.276637	-3.115952	0.0019
(LMKT) _{it-1}	-1.440663	0.665685	-2.164182	0.0308
(FA/TA) _{it-1}	2.843986	0.641796	4.431295	0.0000
Year 2001	-9.453347	5.706509	-1.656590	0.0980
Year 2002	-15.62653	4.439261	-3.520074	0.0005
Year 2003	-16.03923	4.436312	-3.615443	0.0003
Year 2004	-18.38565	4.472548	-4.110777	0.0000
Year 2005	-21.34241	4.478093	-4.765959	0.0000
Year 2006	-17.40106	4.506449	-3.861368	0.0001
Year 2007	-15.05544	4.451873	-3.381822	0.0008
Year 2008	-15.49647	4.490416	-3.451010	0.0006
Year 2009	-12.46754	4.469082	-2.789731	0.0054
Year 2010	-12.59364	4.473667	-2.815059	0.0050
Year 2011	-27.96708	8.127277	-3.441137	0.0006
R2 = 0.351000				

Table 4.3.4 represents the time effect and changes in investment behaviour over time has been estimated by excluding the industries dummy effect and only estimating the macro-economic shocks. The results are evident that investment structures of non-financial firms do

change with the passage of time. The significance of all time dummies reflect that time shocks significantly impact the investment behaviour of firms. Thus the maladies of drought, terrorist attacks, earthquake in 2005 and aftershocks that continued after few years, energy crises, presidential and general elections in 2008, balance of payment crisis, global recession up till 2010 and war on terror have made corporate investment stagnant in Pakistan.

Table 4.3.5: Least Square Dummy Variable Analysis- Both Industry and Time Effect:

Variables	Coefficient	Std. Error	t-Statistic	P-value
Intercept	44.80246	5.379973	8.327637	0.0000
(I/K) _{it-1}	-0.009673	0.023006	-0.420439	0.6743
Q _{it}	5.779938	0.800233	7.222820	0.0000
(CF/K) _{it}	4.922184	0.482526	10.20086	0.0000
(CF/K) _{it-1}	-4.525964	0.707326	-6.398699	0.0000
(D/TA) _{it-1}	11.97780	0.673315	17.78929	0.0000
(Liq/ K) _{it-1}	1.046941	0.261259	4.007294	0.0001
(Int/Y) _{it-1}	-0.895778	0.300534	-2.980619	0.0030
(LMKT) _{it-1}	-3.278918	0.785292	-4.175413	0.0000
(FA/TA) _{it-1}	1.177638	0.810057	1.453771	0.1465
Pharmaceuticals	1.921244	2.430272	0.790547	0.4295
power generation and distribution	11.40937	2.382480	4.788861	0.0000
Refinery	3.751135	2.979885	1.258819	0.2085
Cable and electric goods	5.291079	2.471670	2.140689	0.0326
Miscellaneous goods	8.634329	2.303563	3.748250	0.0002
Textile composite	8.572227	2.500608	3.428057	0.0006
Textile spinning	4.674654	2.113662	2.211638	0.0273
Textile weaving	-2.900122	2.303881	-1.258799	0.2085
Sugar and allied industries	5.071367	2.292074	2.212567	0.0272
Food and Personal Care-Products	-1.083367	2.418510	-0.447948	0.6543
Chemicals	0.609567	2.274892	0.267954	0.7888
Leather and Tanneries	0.694405	2.539722	0.273418	0.7846
synthetic and rayon	8.848102	2.348466	3.767609	0.0002
Cement	11.83945	2.416907	4.898596	0.0000
Automobile assembler	-3.718567	2.497898	-1.488679	0.1370
Paper and board	6.186058	2.305433	2.683252	0.0075
Woolen and jute	6.127514	2.538920	2.413433	0.0161
oil and gas	5.579557	2.532648	2.203052	0.0279
Venaspati and allied products	-2.066255	2.676869	-0.771892	0.4404
Enginnering	0.532512	2.225377	0.239291	0.8109
Year 2001	-5.379756	5.745751	-0.936302	0.3494
Year 2002	-12.96960	4.555796	-2.846835	0.0045
Year 2003	-13.35349	4.555888	-2.931041	0.0035
Year 2004	-15.78121	4.600268	-3.430498	0.0006
Year 2005	-18.49909	4.616559	-4.007116	0.0001
Year 2006	-14.45214	4.640170	-3.114571	0.0019
Year 2007	-11.93674	4.582860	-2.604648	0.0094
Year 2008	-12.08575	4.635157	-2.607410	0.0093
Year 2009	-8.558830	4.607531	-1.857574	0.0636

Year 2010	-8.568033	4.613074	-1.857337	0.0637
Year 2011	-23.45854	8.311523	-2.822412	0.0049

As the study is supposed to analyse the effects of twenty-one industries and twelve years, i.e. to see the specific industry and year whose effect is significant. So the study estimates the sample data by generating industry and year dummies. Table 4.3.5 gives the least square dummy analysis of both industry and year dummies along with the independent parameters of the study.

The study includes twenty-one industry and twelve year dummies. From each category one dummy has been taken as a bench mark and is thus dropped to avoid the problem of dummy variable trap.

This table portrays that all other industry dummy's effect is significant when compared to the bench mark industry dummy i.e Glass and Ceramics except nine industries that include Pharmaceuticals, Refinery, Textile weaving, Food and Personal Care-Products, Chemicals, Leather and tanneries, Automobile assembler, Venaspati and Allied products and Engineering.

The t-statistics of power generation and distribution industry is 4.788. This means that this industry is significantly different from the bench mark industry and the difference estimated is about 5%. This may also be interpreted as this industry is significantly investing. However the t-statistics of pharmaceuticals is 0.79 which shows that this effect is not significant and it is insignificantly different from the bench mark industry. Similarly industries of Cable and electric goods, Miscellaneous goods, Textile composite, Textile spinning, Sugar and allied industries, synthetic and rayon, Cement, Paper and board, Woollen and jute, oil and gas are 4.788861, 2.140689, 3.748250, 3.428057, 2.211638, 2.212567, 3.767609, 4.898596, 2.683252, 2.413433 and 2.203052 respectively change from the bench mark industry. In

addition, these industries are significantly involved in investment activities at 5% level of significance. On the other side, pharmaceuticals, refinery, textile weaving, sugar and allied industries, Food and Personal Care-Products, chemicals, leather and tanneries, automobile assembler, Venaspati and allied products and engineering are insignificantly different from the bench mark industry. This depicts that these industries do not indulge in investment endeavours significantly.

Table 4.3.5 also illustrates the effect of year dummies from 2001 to 2011. The result gives the study a picture that all of the years taken in account effect investment significantly except the dummy of year 2001. Thus, else then 2001, all the years significantly affect investment performance of firms. In addition all the years except 2001 are significantly different from 2000 i.e. the bench mark year dummy. This insignificant difference can be taken as the 2001 is much close to 2000 and all the effects of 2000 are passing in 2001 and that is the reason that the difference is not that much significant. The negative sign shows that there is negative impact of the years on the investment behaviour of firms.

The coefficients of year dummies are negative which implies that general macroeconomic conditions do influence the performance of firms through their investment structures. As a matter of fact, a worst drought in the history of Pakistan's 50 years struck in late 90s and remained up till 2002. The aftershocks of the drought decelerated the investment especially foreign investments in the country. The terrorist attacks have also lingered the corporate investment level as many risk adverse investors failed to cope with the ongoing circumstances. In addition, energy crisis of the country in 1st decade of 21st century also adversely affected the non-financing sector especially the manufacturing sector of Pakistan.

The worst earthquake in 2005 also left big blotches on the economy of Pakistan. One of the reasons behind the staggered growth was slowing down of many investment projects.

the coefficient on 2005 year dummy represent that investment has been stained a lot due to such macro shocks. Going on with the negative coefficients on year dummies, the balance of payment crisis in 2008 and the global recession destruct the investment activities of the industries that continued up till 2010. This recession pulled down the demand at international level, lowering down the exports of Pakistan even up to 2010 thus dragging down the growth of manufacturing sector.

Resultantly, energy crisis, massive flooding, terrorist attacks; a disturbed law and order situation in the country, a balance of payments crisis, and the follow-on Rupee depreciation more than 20%, have all pooled to shrink the profits. These were the major reasons that the investors lost the confidence in Pakistani capital markets. And thus the investment activities were lessened down.

4.4: MODEL 2

4.4.1: Simultaneous Equations Model:

The model two is the simultaneous equation model as the dependent variable of first i.e. 3.3.1 equation i.e. shareholder's equity (K) is the independent of the second equation i.e. 3.3.2. Likewise the dependent variable of second equation i.e. debt (D) is the independent of the first. Thus the endogenous variable of one equation is the exogenous of the other. This compels the model to run from the two-stage least squares method as this model is over-identified.

Table 4.4.2: Two Stage Least Squares Method: Simultaneous Equation

Model:

Variables	Coefficient	Std. Error	T-statistic	P-value
Intercept	3715.190	342.0714	10.86086	0.0000
W	-0.693671	0.262173	-2.645855	0.0082
W ²	1.21E-06	4.75E-07	2.553395	0.0107
D	0.065372	0.027012	2.420080	0.0156
DW	-1.62E-05	3.88E-06	-4.179886	0.0000
DW ²	4.26E-11	2.92E-11	1.461834	0.1439
Dividend yield	0.089448	0.018448	4.848567	0.0000

Results in Table 4.4.2 help study to take another initiative in accomplishing its objectives. The t-statistics of retained earnings (W) is statistically significant. This means that earnings influence the equity of shareholders significantly. Nevertheless, the relationship between the two is negative. This depicts that when the company or a shareholder has internally generated funds, then these will not go for using equity. Rather they will first and foremost prefer the use of retained earnings or internally generated funds.

On the same note, when the study employs the use of square of retained earnings, it proves to show that there is non-linearity in the model. This means that retained earnings influence the equity of shareholders (K) both linearly and non-linearly.

The t-statistics of debt (D) is statistically significant. In addition, the connection between debt and equity is positive implying that both the instruments are used as complementarities with each other. However, the ratio between the two may vary according to the preferences and choices of the corporate sector. But both the parameters are being used side by side by the non-financial sector.

The t-statistics of the interaction term i.e. debt times retained earnings (DW) is statistically significant and negative. This represents that when a firm uses its internally generated funds along with debt, the use of shareholder's equity will decrease as this term tends to increase. So there is an adverse relation of the interaction term with the equity. The more it increases, the less is the equity employed by the firms.

The t-statistics of DW^2 is less than 2 showing the insignificance of this term. This means that this interaction term does not affect the firms non-linearly.

Dividend yield is significantly related to share holder's equity. The positive sign exhibits that when dividend yield on shares and stocks increase, share holder's equity will also increase.

Table 4.4.3: Simultaneous equation model:

variables	coefficients	Std. Error	t- statistics	P- value
Intercept	3715.190	342.0714	10.86086	0.0000
W	-0.693671	0.262173	-2.645855	0.0082
W^2	1.21E-06	4.75E-07	2.553395	0.0107
K	0.065372	0.027012	2.420080	0.0156
KW	-1.62E-05	3.88E-06	-4.179886	0.0000
KW^2	4.26E-11	2.92E-11	1.461834	0.1439
Financial expense	0.089448	0.018448	4.848567	0.0000

Table 4.4.3 gives the estimates run by the equation in which dependent variable is debt instead of shareholders equity. Retained earnings are negatively and yet significantly related to debt. This means that when there are internally generated funds, the corporate sector will not use debt and instead it will first prefer to use the internally generated funds.

The significance of square of retained earnings (W^2) reveals that there is linearity as well as non-linearity in the model.

The significance and positivity of the endogenous variable of the model i.e. share holder's equity (K) entails that both debt and equity are being used by the non-financial firms as complementarities. Thus they are being used together with different ratios.

The significant t- ratio of the interaction term (KW) from equation (3.3.1) depicts that a firm decrease its use of debt significantly when it employs both equity and internally generated funds(W) together. As the significant sign signifies that a firm can use both equity and retained earnings at a time. However, in such case they employ the least or no units of debt measure.

The t-statistics of square of interaction term (KW^2) is insignificant which indicates that non-linearity in retained earnings is not at all affecting equity and capital structure of firms.

Finally the financial expense is significantly and positively linked with debt which presents that when a company gives the financial expenses, it never lowers its debt level. Rather the debt level is increased by the corporate sector.

Chapter V:

CONCLUSION AND POLICY IMPLICATIONS

5.1: Conclusion:

As the study has measured capital market imperfections i.e. credit worthiness, agency problems etc. through Tobin's Q and Cash flows. The Q-model of investment has successfully picked up the market imperfections as the impact of these imperfections is significant. This means that Pakistan's capital markets non-financial sector consists of significant capital market imperfections. With no doubt, these imperfections influence investment activities of firm. The speciality of Q-model (Hubbard 1998) is thus evident that when it adds cash flows in the model along with Tobin's Q; it captures imperfections of the capital market. However, this affect is not uniformly distributed in the market. The study also employs balance sheet variables that are different of all industries.

Twelve of the twenty industries are insignificantly indulge in investment activities. This means that the twelve industries are financially constrained in relation to investment activities. Moreover the negative sign with the year dummies represent that macroeconomic shocks have hit Pakistan's corporate sector badly in terms of investment.

The results of this study conclude that capital market imperfections have differential effects on investment behaviour of firms. As all the industries in table 4.4 give different estimates as the bench mark industry. This shows that all industries comprising of different firms have different investment behaviours when compared to each other. Our approach highlights that the connection between imperfections, financing constraints and investment varying across the firms and across years.

In a nutshell, all the non-financial firms listed in Karachi stock Exchange use debt and equity as complementarities and not as substitutes. Nevertheless, the ratio of this capital structure may change. Some industries may employ more units of debt with some share of equity while other firms may employ the debt and equity instruments in contrary manner. Combining both the estimates of model 1 and model 2, the study concludes that the firms are somewhat reluctant in investing due to macro-economic shocks hitting the country since 2000. The inclusion of industry dummies illustrates that all the firms from different industries invest differently according to their preferences, choices and financial conditions.

Conversely, the results of this study go against that of the study of Friedman (1985). The estimates of Friedman (1985) represent the substitution of debt and equity securities.

Thus there exists a relation between investment, capital structure and complementarities between debt and equity. The corporate sector is treating debt and equity as complementarities thus investing in the capital stocks to get the internal generated funds. This study has provided evidence that the capital structure of the corporate sector is actually its complementarities attitude and that all industries have different investment structures defining their own imperfections and financing constraints.

5.2: Policy implications:

The policy implications that come up from conclusions of this study can be explained in points:

1. The policymakers should put an effort towards the development of both credit as well and equity market. Besides concentrating on the development of only one market, it should take reforms to polish the debt market as well. With the progress of debt

market, automatically investment activities would be improved which may company the growth of the country. Thus local bond market should be widened.

2. New firms should pledge more than required amount and property to get access to the debt instrument. Moreover they should start IPOs by the help of financial intermediaries. They should try to make an attractive outlook to attract the institutions helping in financing instruments. So by strengthening the company data and useful information propagation, the liquidity of the bond market could be improved. At length, transaction cost by means of administrative costs and stamp duty should be condensed to render bonds issuance more cost effective. (Nazir et al 2010)
3. Some firms have a quality that has high credit worthiness and the managers concerned may over-invest. To avoid this concentration of debt in few hands, the lender should investigate maximally and set a bench mark. Moreover, there should be a scheme to take the funds away from such firms; these funds should be redistributed to ether shareholders or tax payers in order to avoid over-investment.

5.3: Limitations and Future Research:

The study has several limitations so this study can be further extended in various ways. First of all, the empirical models of this study; especially the first model can be extended by either enlarging panel data set or by adding more predictors. This will direct the research with more information and improved results.

The model implied in this analysis is q-model of investment. The same work can also be done through the aid of Euler equation. The upcoming work can also be accomplished by adopting the Euler equation to see the difference in the results.

To see the actual performance of the companies that how many are financially constrained; the sample may be split. The firms that find no obstacle in credit rationing and

that get debt on a very less amount of interest; such firms fall in low premium regime while the firms that get high paid on the employment of debt fall in high premium regime. This would give the study a good direction to individually see that how many firms fall in high premium regime and how many in low premium regime. This would give the specific view of the Pakistan's capital market.

This study is only stick to the companies listed in KSE and not in LSE and ISE. Future research can be done by comparing the companies listed in all three of the exchange markets. Non-listed firms may also be included in the research to deepen the conclusions.

The analysis can also be conducted at international levels i.e. competing non-financial sectors of countries in South Asia and Europe. Moreover, there can be sector wised evaluation in non-financial sector of Pakistan and companies classification of high growth and low growth firms. In addition, the future research related to model 1 can also be carried out in financial sector of Pakistan.

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