IMPACT OF RISK ON FIRMS FINANCIAL POLICY
(A Study from Pakistani Listed Firms)

Researcher:
Muhammad Jamil
REG NO.36-FMS/MSFIN/S08

Supervisor:
Dr. Syed Zulfiqar Ali Shah

Department of Business Administration

Faculty of Management Sciences

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Name of Student: Muhammad Jamil

Registration No: 36-FMS/MSFIN/S08

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Dean

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Chairman/Director/Head

External Examiner

17/x/2011

Supervisor

Member

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STATEMENT OF UNDERSTANDING

DECLARATION

I hereby declare that the research work is my own work and no part of this thesis is copied out from any source. It is further declared that this research is entirely my personal effort made under the sincere guidance of my supervisor Mr. Syed Zulfiqar Ali Shah. No segment of this work presented in this research thesis has been submitted in support of any other degree /qualification of this or any other university or institute of learning.

Muhammad Jamil

REG NO. 36-FMS/MSFIN/S08

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Abstract

Numerous theories have emerged to explain factors associated with the firm's choices between debt and equity. Certainly in the past few decades financing choice of the firm is most researched area. Most of the researches in business field have analyzed the outcome of risk on firm's financial policy. But only few studies have checked the influence of risk on firms' financial policy. The study has a unique importance in a perspective that it will provide knowledge to financial analysts, researchers, academicians and financial practitioners about the risk mechanism effects on the financial policy and returns related decisions. The main purpose of this research is to investigate how financial policy is affected by risk factor. On the basis of previous studies and so far developed theories of capital structure a static model of financial policy is specified for the study. Financial data for six sectors is used for the calculation of Z-score and Beta for the period of 2002 to 2007. Sample includes more than 229 companies of Textile sector, Cement sector, Technology and communication, Paper and Board, Fuel and Energy, Tobacco Sector. Theses sector are included because they represent the major portion of firms listed on stock exchange. Fixed effect model random effect model and correlation is used for analysis. This study has observed that firms among non financial sector which have high probability of survival will adopt more financial obligation (in the form of debt) in their fusion of capital due to low cost of borrowing. Results indicate that the hypothesis of the study is accepted in the light of fixed effect model and random effect model regarding to the firm financial distress risk but fails to explain the influence by the proxy of market risk. This study is clearly in line with past studies and specifies that the forecasting of the capital structure trade off models for firms that have high risk would have lower capability of borrowing. More over this study concludes that Size of the firm is identified as an important determinant of capital structure decisions of Pakistani firms operating in non financial sector. The empirical outcome of this investigation commonly have implications for appropriate risk administration as well as describes how these effect the financing decision of firms belonging to less developed countries.

Key Words: Risk, Financial Policy, Debt, Equity, Size, Non-Financial Sector

CHAPTER 1

INTRODUCTON

1.1 INTRODUCTON

Particularly research in business economics and finance has always analyzed the economic value creation process as their core field of studies. Researchers and practitioners have always tried to find out the factors and variables that influence the economic value creation process and attempt to enhance these factors by controlling their effects.

Numerous theories have emerged to explain factors associated with the firm's choices between debt and equity. Certainly in the past few decades financing choice of the firm is most researched area. The seminal article of miller and Modigliani raised the issue of relationship between firm value and its choice regarding debt and equity. Even though there is no unanimously acknowledged theory for the firm's choices among debt-equity. Several theories have been anticipated in this regard to clarify the choices of firms' between debt and equity in the past few decades. Most of the studies carried out in this regard attempted to verify the presence of an optimal amalgamation of equity and debt that could augment a company's ability to create value. According to DeAngelo and Masulis, 1980 in some theories of capital structure developed so far the presences of bankruptcy costs and taxes makes debt relevant. The most commonly recognized theories include pecking order theory and trade-off theory. The first one theory emphasis's the importance of information differences between managers and security holders and emphasis that because of this possible information asymmetry the external financing is more expensive. Hence firms would like to finance their operations initially with internally generated resources then with debts and finally rely on equity.

The second renowned theory which is trade off theory, weighted the incentives of augmented level of debt (for example, incentive associated with taxes or diminutions in agency costs) in

opposition to the possible outlay of dead weight costs of bankruptcy in order to finding out the most favorable quantity of leverage in capital structure (Korajczyk and Levy, 2003). Consequently the trade off theory proposed a relative association in between economic performance and leverage in the perspective of bankruptcy cost, the probability for bankruptcy increases with the rise in leverage level of a firm and ultimately raises the risk level of firms in terms that the company might not be able to produce enough revenue to service the debt. Simply if there is likelihood of bankruptcy, and probable related bankruptcy cost are important the firm with high level of debt in their capital structure may not be much attractive, as compared to firms that have lower percentage of debt in their capital structure. The above argument support that risk is the important factor in financial decisions. Studies done so far do not provide a clear cut conclusion whether rise up in a company's risk in doing business can lead towards lower debt level (Kale et al., 1991). Most of the studies proposed negative relationship between highest level of debt and risk. A lot of studies done on the capital structure and financial policy have taken data from developed western countries. But a few used the data from less developed countries. This investigation contributes the existing literature of capital structure by giving empirical justification for the influence of risk of the firms from developing countries. The study clearly gives support for the proposition that high use of debt is associated with lower business risk.

The remainder of the study is planned as follow Chapter two discusses previous literature support for the propositions and empirical support on the influence of risk on financial policy. Chapter three discusses definition of variables and the methodology adopted to examine the influence of risk on firms financial policy. Chapter four discusses the estimation of the results of the investigation. Chapter five concludes the study with major finding of the study.

1.2 Problem statement

Numerous researches have been performed on financial policy and capital structure by using data of the companies from Europe and America. But still there is a gap in the studies of Asian countries like Pakistan. However, research regarding to the factors of capital structure of newly establishing market firms has evolved as an emerging trend in research because of discrepancies in evolving and developed markets. Therefore these studies add values to the current knowledge through empirical evidence about the influence of risk on the financial policy of firms from emerging market. This study analyzes risk effect on finance decision in developing markets of Pakistan. The major focus of this study is towards the problem that the higher the changes of survival a firm has, the likely it will involve in debt usage. Therefore, a clear linkage is likely between firm's survival and debt usage. This research clearly gives data based support for the proposition that the risk of the firm positively influence the debt level of the firm in Pakistan.

1.3 Objective of the study

- To determine the level of Systematic, Operating, And Financial risk of non financial firms in Pakistan.
- How this particular risk effects the capital structure decisions of non financial firms in Pakistan.
- To provide opportunities guidance to financial analysts, researchers, academicians and financial practitioners about the risk mechanism effects on capital structure related decisions.

In this empirical study, the influence of risk on firm's capital structure with respect to Pakistanis non financial sector is examined by developing testable hypotheses on the basis of

previous literature. The risk of the firm is measured by using Altman (1968) probability of survival and through **β** (beta) which measure systematic risk of a firm.

The rest of this study is ordered as follows:

- Chapter Two discussed literature based reviews on the effect of risk on capital structure.
- Chapter Three explained the methodology employed for the analysis.
- Chapter Four discussed the results of the study.
- Chapter Five concluded the major findings of the study.

1.4 Significance of the Study

This study has a unique importance as it provides knowledge to financial analysts, researchers, academicians and financial practitioners about the risk mechanism effects on the financial policy and risk- return trade off decisions. Moreover it adds value to the present literature of capital structure by giving risk effect on financial policy's empirical results of evolving market firms. This investigation is important because the financial analyst, investors, and regulatory authorities in financial risk management of the non-financial firms in Pakistan. If there exist chances of bankruptcy then, their probable related bankruptcy cost are important due to higher debt level firms are less suitable as compare to lower debt level firms in capital structure. The said statement support that risk is the significant factor in financial decision.

It is quite significant that the study clearly provides support for the issue that high use of debt is associated with lower business risk. It is very important element that this study provides an inside that Pecking order theory emphasize that initially firms finance project trough internally

raised funds because of internal and external information differences. Afterwards, firm move for debt and finally again decides to finance through internal sources.

The implications of this study are as follow

(1) To provide a systematic approach to the firms that how they will decide between internal and external financing by knowing the prospective behavior of firms financial decision. Further it is assumed that Information asymmetries are relevant only for outside financing.

(2) Companies prefer debt over equity through issuance of safe securities when they require mix capital structure. More considerations are given to reduce debt instead repurchasing securities when companies have excessive funds. However, in the eve of high external financing demands companies move from secure to riskier debts.

(3) The research will provides assistance to the financial intermediaries, long run investors and regulatory bodies to support the firms dynamically regarding to the design of appropriate optimal capital structure so that the goal of the firm may be achieved successfully through proper financial decision and risk management.

CHAPTER 2

LITERATURE REVIEW

2.1 LITERATURE REVIEW

Over the past few decades in the field of finance firms financial policy has attracted intense debate and scholarly attention. A firm financial policy includes the decision regarding the selection between debt and equity. It is defined as total debt to total assets at book value, in other words capital structure of the firm is the combination of debt and equity which it deems as suitable to augment its operation. Glen and Pinto (1994) argued that for the smooth running of an organization choice between debt and equity is an important decision. Bos and Fetherston (1993) investigated that financial policy of the firm significantly affects the profitability and risk level of a firm. Over the past decade, different capital structure theories have been proposed in order to exploring the aspects that affect capital structure decisions. The initial work on capital structure of the firm was commenced by the Modigliani and Miller's (1958) early paper on the theory of irrelevancy of capital structure. In this study he argued that under some restrictive conditions like absence of taxes, transactions costs, and bankruptcy costs, the market value of a firm is independent of its capital structure. The conclusion of this argument was that capital structure and financing decisions affects neither cost of capital nor market value of a firm. After the seminal contribution of Modigliani and Miller (1958) in the field of capital structure much investigation has been aims to finding the logical justification for what characteristic influences the choice of capital structure. What are the factors which have significant influence in determining capital structure? Conventional models in the field of finance which are supported by empirical literature proposed that firms choose optimal capital structures by trading off different tax and other spur benefits of financing with debt against financial distress cost. Other studies indicate that firm's characteristics such as size, future growth options, earnings volatility, profitability, risk and control affected the capital structure of the firm (Titman and Wessel's,

1988). In there study Karadeniz et al. (2009) examine the variables that affect the capital structure on Turkish companies and concluded that growth-opportunities, non debt tax shields, net commercial credit position, free cash flow, and firm size do not appear to be linked with the debt ratios of lodging companies. On the other hand effective tax rates, tangibility of assets, and return on assets negatively relate to the debt ratio for lodging companies. According to him all these findings partially support the pecking order theory of capital structure he further explained that, neither the trade-off theory nor the pecking order theory full explains the capital structures of Turkish lodging companies. These arguments show that factors effecting firms capital structure may vary region to region.

Later on in 1963 Modigliani and Miller's revised their earlier position and expressed that under capital market imperfections firm value will increases with higher level of leverage. As interest expenses are tax deductable the higher the debt a firm will employee in capital structure the higher the value firm will realize. By following this practice net profitability increases as the result of tax shelter. Under this scenario optimal capital structure is determined by a swap between bankruptcy risk associated with the use of higher debt and tax advantage from the use of higher debt. Miller (1977) investigated that the value of a firm in equilibrium will be independent of its capital structure either interest payments are fully deductible in computing corporate income taxes.

In their study "Impact of Ownership Structure and Corporate Governance on Capital Structure of Pakistani Listed Companies" Hassan and ali butt (2009) concluded that board size and managerial Shareholding is significantly negatively correlated with debt to equity ratio. Further more they argued that variables like size and ownership structure and managerial shareholding play important role in determination of financial mix of the firms. Shah and Hijazi 2004

concluded by examining non financial firms listed on KSE in Pakistan that Size of the firm is positively correlated with leverage this suggests that large firms will employ more debt. The implication is that large firms consider themselves to have less chances of falling into financial distress and have more capacity to absorb shocks. By examining the association among failure rates and leverage ratios for 36 lines of business, Richard Castanias (1983) found inconsistent results with irrelevance hypothesis. Empirical results in this investigation reports that firm in line of business which have high failure rate not likely to employee more debt in their capital structure because of risk associated with the use of higher debt. These findings supports that firms with high probability of bankruptcy choose smaller amount of debt this represent the negative relationship between probability of bankruptcy and debt level.

Furthermore Pettit & Singer (1985) argued that firms having greater probability of bankruptcy as a result of increased cost of debt by employing more debt in their capital structure, in future these companies will issue less debt in their new capital structure in order to prevent from bankruptcy. This shows a negative relationship between bankruptcy cost and use of debt. In their study The Insignificance of Bankruptcy Costs to the Theory of Optimal Capital Structure Robert Haugen and Senbet (1978) Emphasizes that capital market prices are competitively determined by rational investor the bankruptcy cost which can be considered as the major determent of capital structure would be trivial or nonexistent. Rajan and Zingales (1995) proposed that large firms may prefer to rely on equity financing as compared to debt financing because these firms enjoys reputational advantage because of their big size. This increases the trust of investors and reduces risk. For that reason, they may prefer to utilize this opportunity instead of approaching the more expensive bank lending or other covenant-prone capital market debt instruments.

A small number of studies on the emerging market have carried out to find out determinant of capital structure. These includes Amidu (2007) which examined the firm level characteristics such as profitability, growth, tax, asset structure, risk and size and found a inverse relationship between profitability and debt level of a firm which are also consistent with previous studies Titman and Wessel's (1988) because profitable firms have enough funds to meet their financing requirement though they have potential for external finance. This is consistent to pecking order theory which proposed that firms prefer internal financing as compared to external finance. Argument put forth by Titman and Wessel's (1988) in their investigation by employing 469 large firms and argued that firm size, uniqueness are negatively related to debt ratio results of this study provided a support for an effect on debt ratios arising from non-debt tax shields, volatility, collateral value, or future growth. Work by Michaelas et al. (1999) on UK small and medium-sized enterprises (SMEs) suggested that tax considerations do not influence the total debt level. Which is contrary to Modigliani and Miller's theory because small firms face low profitability resulting from higher level of expenses during their institution, means they have less use of tax advantage as compared to large firms. Scott and Martin (1976) found that firm size play a crucial role in determining capital structure. As the degree of financial leverage increases in a firm capital structure, the risk of ruin becomes very important. because the interest rate which is considered as fixed cost for a business in case of holding debt will rise only very slowly when dependence on debt is low, but. The interest rate may begin to rise very sharply, as the capital structure becomes more risky .Further he argued that the capacity of a firm to bear the risk level will depend on the volatility of operating income. Therefore possibility of risk of ruin is less for the firms containing stable net operating cash flows. As a result financer may require

less return (in the form of interest which they receive) in the exchange of wealth which they provide to the business (Baxter, 1967).

According to Jensen and Meckling (1976) financial distress cost, bankruptcy cost and agency cost leads the formation of trade of theory. The trade-off theory underlines taxes, and states that firms gradually move toward their target debt to value ratio. According to this theory firms may choose capital structure by creating equilibrium between advantages (tax advantages) and disadvantages (financial distress and bankruptcy costs) of debt. DeAngelo & Masulis (1980) empirically viewed that there is a positive relationship between debt level of firm and taxes. In order to reach at the equilibrium where the costs of possible financial distress offset the tax advantages of additional debt firms should seek that capital structure.

Bankruptcy cost is a direct cost incurred at the time when it is highly perceived that firm my probably go default. Liquidation cost is the one of bankruptcy cost which represents that the loss of value resulting from liquidating the net assets of the firm in bankruptcy situation. Due to this cause debt provider will adjust their interest on debt to the firms in order to accommodate potential loss of value. Cassar and Holmes (2003) by utilizing data obtained from the Business Longitudinal Survey (BLS) developed by the Australian Bureau of Statistics (ABS) and find out that due to the potential liquidation cost firms will incur higher finance cost because financer will adjust effect of liquidation cost in to the interest payments that he expect in case of leverage contract.

Distress cost is also associated with bankruptcy cost. A firm will face this cost when stake holders other than financial lenders believe that the firm will not able to carry on its operations in future. If a business is perceived to near to bankruptcy the stake holder of the firm will change their behavior like customer may be less willing to purchase the goods and services

of the firm from the fear that firm will not provide after sales services guarantee, warrantee etc. employees might be less willing to work and supplier will hesitate to extended credit. These behaviors of stake holders negatively affect the value of the firm. Resultantly firms which have high distress cost would tries to relying less on debt financing in order to lower these costs. All these cost are associated with probability of risk and hence influence the capital structure choice of the firm.

Attaullah Shah and Safiullah Khan 2007 by using two variants of panel data analysis argued that variables like volatility of earning and depreciation are not in line with the prediction of trade off theory in Pakistan's non listed firms. Other variables like growth predicts confirm the agency theory hypothesis. Size of the firm is also found relative to the trade off hypothesis of capital structure. Risk which is considered as uncertainty regarding the occurrence of an event has been identified in literature as an essential factor in firms financing decision. A lot of empirical studies have carried out on the relationship between risk and financial policy of a firm but they do not provide clear cut answer to whether an increase in the risk level of a firm should reduce the debt proportion in capital structure. Kale et al. (1991) Existing literature proposed an inverse relationship between business risk and optimal debt level because large proportion of debt in the capital structure increases the probability of bankruptcy.

Previous studies showed that along with these bankruptcy costs operating risk of the firm also influence the financial policy of the firm because higher business risk is positively correlated to bankruptcy cost and resultantly making cost of debt financing greater for the firms which have high risk profile. Hurdle (1974) by using cross sectional data on 228 United States manufacturing firms proposed that firms with market power do have lower risk so they will not go for higher debt proportion in their capital structure as compared to low market power firms.

Marsh (1982) by examining a sample of UK companies throw light on the importance of market condition as a major the determinant of firms choice between debt and equity according to him past history of security price heavily influence in choosing between equity and debt. Which support that the market risk is also associated with the financing decision of the firms. Nishat (2000) emphasies the importance of leverage in its research entitled The Systematic Risk and Leverage Effect in the Corporate Sector of Pakistan. In this investigation he concluded that the main cause of of initial public failing in high levered firm is due to Poor corporate financing policies, non-competitive role of institutional development. Schwert (1989) demonstrated how a change in the leverage of the firm causes a change in the volatility of stock returns. Another well renowned research done by and Haugen and Wichern (1975) examined the association between leverage and relative stability of stock value and resulted that the duration of debt is an essential feature in assessing the effect of leverage on stock volatility. High volatility represents

Firms that have high operating (business risk) may intend to less rely on the debt. The reason for this argument is that due to this risk there is high probability that firm will not earn sufficient cash flows to meet debt obligation. Systematic risk which is defined as Risk caused by factors that affect the prices of virtually all securities simply we can say that it is responsiveness of security price with respect to market. Barton and Gordon (1988) find out that profitability and firm size along with earning risk which is the systematic risk of the company is inversely related to debt level of firm

French et al. (1987); Schwert (1989) and black (1976) argued that volatility of the stock is effected by many other factors along with leverage. According to the leverage effect if the price of a firm shares decreases it will reduce the equity value of a company, in due course increases the debt to equity ratio and also risk level of the firm. Resultantly financers will hesitate to

finance these companies and requires more return on their investment. This situation will lead to raise the firm cost of capital Paroma et al (2008) proposed that market risk (systematic risk)of the firm significantly influence the debt level of a firm and fined out negative relationship between market risk and debt level of a firm.

Based on the above discussion we may posit that

2.2 Hypothesis

Ho = Risk of the firm does not influence the debt to equity of a firm.

Hi = Risk of the firm influence the debt to equity of a firm.

CHAPTER 3

Data and Methodology

3.1 Data and Methodology:

The main purpose of this research is to investigate how financial policy is affected by risk factor. On the light of previous researches and capital structure theories the following static equation of financial policy is specified.

$$Y_{it} = \alpha + \delta RISK_{it} + \mu t$$

Where subscript i ,t represents the firm and time span respectively, Y represent a determinent of financial policy. Risk is calculated by the Altman (1968) Z-Score (probability of survival), The Z-Score calculates the probability of survival of a firm for one year a head time period. The model is empirically described in this form

3.2 $Z=1.2X_1+1.4X_2+3.3X_3+.6X_4+.999X_5$

Whereas

X_1= (Working Capital/Total Assets)

X_2= (Retained Earnings/Total Assets)

X_3= (Earnings before Interest and Tax/Total Assets)

X_4= (Market Value of Equity/Total Liabilities)

X_5= (Sales/Total Assets)

Altman (1968) published Z-score for predicting bankruptcy he served as Assistant professor in the field of finance at New York University in USA at that era. According to him this method may be employed to forecast the probability that a firm will turn into default within particular time period. Z-scores are incorporated to find out and forecast firm's defaults and provide a

simple way to calculate, control, parameters for financial distress scenario of firms in academic procession. Z-score employs balance sheet values and various corporate incomes to gauge the financial strength of a company. The Z-score model is comprise of linear combination of five general financial ratios associated with coefficients. These coefficients were anticipated by finding out a set of firms that had affirmed bankruptcy and then accumulating a related sample of firms which had survived, with matching by industry and approximate size (assets). Altman used econometric model is discriminate analysis of public limited manufacturing companies. This model was re estimated based on other sets of data for service oriented firms, private manufacturing concern firms and non manufacturing firms. The original dataset sample comprises of 66 firms, All manufacturing concern businesses were used in the database and small companies which had assets size of less than 1000000(1 million) were eliminated. Altman's research is constructed upon the research of _Beaver (1966) and others belonging to the field of accounting and finance. In the early era of 1930s and on, Mervyn and some others scholars had gathered matched samples and examined that a variety of financial accounting ratios found to be significant in predicting bankruptcy. Z-score developed by Altman's is a tailored edition of the discriminate analysis method of Fisher (1936). The unique work by William Beaver's, published in 1966 and 1968, initially he had applied a statistical method, t-tests to predict bankruptcy for a pair-matched sample of firms. Beaver (1966 1968) used this model to estimate the significance of each of various accounting ratios based on univariate analysis; He used each financial accounting ratio once at a time. Altman's basic development was to employ a statistical method, of discriminate analysis, which could take into consideration multiple variables at the same time

In its preliminary analysis, the Z-Score devolved by Altman was found to be 72% precise in forecasting bankruptcy two years preceding to the occurrence, with a Type II error (false positives) of 6% (Altman, 1968). In a series of following tests covering three different time periods over the next 31 years (up until 1999), the model was instituted to be approximately 80-90% accurate in predicting bankruptcy one year prior to the event, with a Type II error (classifying the firm as bankrupt when it does not go bankrupt) of approximately 15-20% (Altman, 2000).

Z-scores model attained extensive recognition by analysts, auditors, management Scholars, financial accounting practioner,s used for credit evaluation from about 1985 onwards (Eidleman). The model approach has been used in a diversity of constructs and geographical locations; even though Z score approach was developed formerly for manufacturing concern public limited firms with total assets value of greater than $1 million. Afterward improvements by Altman were considered to be pertinent to private limited companies (the Altman Z'-Score) and firms from non-manufacturing sector. But there are no recommended models including Altman for financial companies. The core reason for this argument is that the dullness of financial companies' balance sheets, and their generally use of off-balance sheet items. Some other measures based on market value are adopted to forecast the default of firms from financial concern like Merton Model, but these models have inadequate predictive value because they completely depends upon market data (fluctuations of stock and options prices to imply fluctuations in asset values) to predict a market event (default, i.e., the decline in asset values below the value of a firm's liabilities).

3.3 Zones of Discrimination:

If $Z > 2.99$ – it will be considered in to safe zone

If $1.81 < Z < 2.99$ - it will be considered in to gray zone

If $Z < 1.81$ - it will be considered in to distress zone

Beta is also used as proxy for systematic risk. The study represents market risk by the firm's beta, β_{it}, which is used as a determinant of the sensitivity of a stock return with respect to the market. For the calculation of beta monthly stock prices were examined with respect to market index. Financial data of six sectors is used for the calculation of Z-score and Beta from the period 2002 to 2007. The sample include more than 229 companies of

Textile Sector,

Cement Sector,

Technology and Communication,

Paper and Board,

Fuel and Energy,

Tobacco Sector

Theses sector were included because they represent the major portion among the firms listed on stock exchange. OLS is used for analysis.

Commonly renowned Ordinary least square technique is employed to check the fixed effect and random effect in this study

For the calculation of beta 5 years monthly observation is taken for analysis.

Companies return and market return are computed on the basis of following equation.

Return = $R_t = \ln (P_t / P_t - 1)$

$\mathbf{R_t}$ = Returns gainned for specific Period's

$\mathbf{P_t}$ = closing price

$\mathbf{P_{t-1}}$ = opening price

ln = Natural Logarithm

Beta (proxy for Systematic risk) is computed on the following formula.

β_{it}= **Cov (Security return, Market return)/Variance of Market return**

Two methods of financial policy are adopted in this analysis.

3.4 Financial leverage= (The Debt-Equity Ratio)

Financial leverage= (Total Debts Divided by Total Capital employed

Y_t = Financial Leverage

Here Y_t represents the proxy of financial leverage that is average of Debt-Equity Ratio and Total Debts Divided by Total Capital employed.

Panel data technique is adopted as it permits a larger set of data points. There for degree of freedom are augmented. It also improved the efficiency of economic estimate and also reduced the co linearity among the explanatory variables. Another advantage of panel data is that it can control individual heterogeneity because of secreted factor. Descriptive statistics, correlation and regression analysis fixed effect model and random effect models are employed to justify the

relationships among the variables regarding to each sector. Further the study used the robustness test which is explained as follow

Robustness test

Simply we can also specify the model as under

FP_{it}=C.S=$\alpha+\boldsymbol{\beta_1}_{(Z.Score)} + \boldsymbol{\beta_2}_{(S.x)} + \boldsymbol{\beta_3}_{(Size)} + D_1+D_2+D_3+D_4+D_5$

FP= Financial policy

CS = Capital Structure

Where as subscript *i, t* represents the company and time, FP, CS is independent variable and measure of financial policy. $\boldsymbol{\beta_1}, \boldsymbol{\beta_2}, \boldsymbol{\beta_3}$ are independent variables.

$\boldsymbol{\beta_1}$ is measure for Zscore that represent the operational risk of the firm

$\boldsymbol{\beta_2}$ is measure of systematic risk and

$\boldsymbol{\beta_3}$ measure the firm size(natural log of total asset)

3.5 Panel Data

In social science, economic and financial studies, management science panel (data) technique (statistical method), is extensively used that deals with two-dimensional data for such sort of data analysis. The data is usually composed over the scale of time and over the same individuals/firms and then a regression model is run over these two dimensions. In panel data Multidimensional analysis is a statistical instrument in which data are collected over more than two dimensions (typically, individuals/firms, time and some third dimension).

The representation of a common panel data regression model is as follow

$$yit = a + bxit + \varepsilon it,$$

In the above equation model y represent the dependent variable, the independent variable is represented by *x, a* and b are coefficients, i and t are indices for individuals and time intervals. The standard error εit is very important in this analysis. The assumptions about the error term find out whether we articulate of fixed effects or random effects. In a fixed effects model, εit is supposed to vary non-stochastically over *i or t* making the fixed effects model analogous to a dummy variable model in one dimension. In a random effects model, εit is assumed to vary stochastically over i or t requiring special treatment of the error variance matrix.

Panel data analysis has three more-or-less independent approaches:

- Independently pooled panels;
- Random effects models;
- Fixed effects models or first differenced models.

The choices between the methods adopted usually rely upon the core objective of the analysis of study and also the problem concerning the exogeneity of the explanatory variables.

3.6 Fixed and Random effects Model

Greene (1991) there is a lot of prose cone of having repeated observations per individual.

- The observations are not independent
- We can use the repetition to get better parameter estimates

Biased estimates would be found in OLS if all observation is simply pooled up. By using random and fixed effect model that take account of the repetition fixed or random individual's effects can be controlled. These models are recognized in econometrics as correctional time series model because we have time series of observations at individual rather than aggregate level. We can simply fit a dummy for the individual if we have a small number of individuals. If we pooled the observations and used e.g., OLS we would have biased estimates. If we fit fixed-effect or random-effect models which take account of the repetition we can control for fixed or random individual differences. In the econometrics literature these models are called `cross-sectional time-series' models, because we have time-series of observations at individual rather than aggregate level. If we have a small number of individuals, we can simply fit a dummy for the individual:

3.7 Housman test (1978)

The Housman test helps to evaluate the significance of an estimator versus alternative estimator. Housman specification test was developed by Jerry A. Hausman like

$$y = bX + e$$

In the above mentioned equation of regression y is univariate where as X represent the vector of regression represent coefficients and e represent the error term. In the below mentioned equation there are two estimators for b is b_0 and b_1. These two estimators are consistent for null hypothesis but b1 is efficient because it has the very little asymptotic variance, at least in the class of estimators containing b_0. Under the alternative hypothesis, b0 is consistent whereas b1 isn't.

Housman model can be represented in statistical form as:

$$H = (b1 - bo)'\left(Var(bo) - Var(b1)\right)^{\dagger}(b1 - bo)'$$

In the above equation † represent the Moore–Penrose pseudo inverse. This statistic has asymptotically the chi-square distribution with the number of degrees of freedom equal to the rank of matrix Var (b0) – Var(b1).

Housman also shows that the covariance between an efficient estimator and the difference of an efficient and inefficient estimator is zero

CHAPTER 4

Results and Discussion

4.1 Results and Discussion

To analyze the data this study has used different statistical tools to verify the hypothesis of the study. Following results are attained through STATA software which is as under

4.2 Table 1 Descriptive Statistics

Variables	Obs	Mean value	Std. Dev. value	Min value	Max value
fp	1143	1.132955	3.759662	0.0758767	49.7
Z-score	1144	6.591873	17.97048	-186.2129	241.1147
beta	1144	0.9889493	0.1890087	0	1.676455
size	1144	6.657165	1.763128	-2.302585	11.92275

The statistical summary of dependent and independent variables are given in Table 1. Among Z-score there is very high standard deviation (17.97) which indicates that selected companies have high operational risk with greater volatility. This element also indicates that companies operating in Pakistan have operational risk which varies a lot form one another. Where as other variables like financial policy along with 3.75 standard deviations indicates the level of risk as expressed by this statistical parameter. Market risk and size have standard deviations of .18 and 1.76 respectively. More over the beta has astonishing range level with a maximum value of 1.67 and minimum value at 0.Secondly Z-score and size also have maximum values 241.11, 11.92 and minimum values at -186.212, -2.30 respectively. In last our dependent variable of financial policy has 1.132 mean values along with range commencing from 49.7 to .075 which indicates the sensitivity of the perceived risk for the existence of financial leverage. To visualize the

bivarriate relationship among the variables, study employed correlation analysis. The results for the correlation coefficients' are presented in Table 2

4.3 Table 2 Correlation Matrix

	Fp	Z-score	Beta	Size
fp	1			
Z-score	0.0375	1		
beta	0.0076	0.0067	1	
size	-0.3289	-0.1562	-0.0303	1

Empirical Results presented in table 2 indicates that correlation is positive between Financial policy(Y) and operating risk (Z) of the firm with the value of (r=0.0375, p <0.001). But it is not significant. On the other hand there is positive association between market risk (BETA) and debt policy (Y) having the correlation value (r=0.0076, p<.001). Financial policy and size have significant negative relationship with the value of (-.3289). This element indicates that if the size of the firm increases then debt to equity ratio would be decreased and the financial risk will increase because cost of equity is Larger than cost of debt. As the firm will adopt other options to generate capital structure rather than debt and will generate negative signals to the market. The said statistical values of financial policy and Z-score provide guide line to us that the firms which employee more debt in their capital structure will face more financial risk as well as operating risk. When companies' operational risk would be increased then they become unlikely to get capital from the investors in the form of debt and finally they will move toward costly alternative that is equity which clearly means the dilution of ownership. These situations guide us that firm's operational risk increases as if they will adopt more debt in their capital structure. As far as market risk which is beta will also increased when companies will employee more debt

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in their capital structure. But their situation will provide positive signal to the market players and will cause to attract the stream of benefits from higher risk

The study estimates both fixed and random effect specification as well. In this investigation business risk is described as in the form of Altman Z-score that represent the survival probability of a firm. There fore higher Z-score suggest that higher business risk. And low probability of survival defined as the numerical value of R square (R2=0.106) depicts that the independent variable explain

4.4 Table 3 Regression Model

Number of obs	1143
F(3, 1139)	46.14
Prob>F	0
R-squared	0.1084
Adj R-squared	0.106
Root MSE	3.5548

source	SS	Df	MS
Model	1749.08555	3	583.028517
Residual	14393.1469	1139	12.6366523
Total	16142.2325	1142	14.1350547

fp	Std.Err	t	P>[t]	[95% Conf	Interval
Z-score	0.0060224	-0.5	0.616	-0.014836	0.0087965
beta	0.5565598	-0.08	0.933	-1.138791	1.045204
size	0.0609361	-11.69	0	-0.8316231	-0.5925039
cons	0.7060846	8.42	0	4.558698	7.329443

Independent variables explained up to 10.6% to the dependent variable which is not too much significant but size has significant impact on the firms financial policy because p=<.05 But Z-score and beta proxy fails to explain the financial policy in a well mannered way.

These results shows that Z-score has no significant impact on financial policy which means that non Financial sector financial policy of the firms will not be influence by the operational risk of the firm. There are other variables that will influence the decision regarding to the choice of debt and equity. As far as beta is concerned which is the proxy for market risk is also insignificant with financial policy which means what ever the market risk would be it will not influence the choice of the firm to choose debt and equity. Size of the firm will have a major impact on the financial policy of the firm with the value p value of (.000) and t value (11.96). These results guide us that size of the influence the financial policy in a well mannered way.

4.5 Table 4 Fixed effect Model

fp	Std. Error	t	P>[t]	[95% Conf	Interval
Z-score	0.0025215	-14.06	0	-0.0404092	-0.0305126
beta	0.2200407	-0.05	0.961	-0.4426648	0.4209815
size	0.0584678	0.5	0.615	-0.0853048	0.1441777
cons	0.4606746	2.56	0.011	0.2738087	2.081929

According to Table 4 fixed effect model indicate s that financial policy is strongly influenced by Z-score which means that financial distress has strong influence on financial policy of the firms operating in Pakistan because the p value is less than .05. As illustrated by Table 4 the coefficient for Z-score is -.035 and for beta is -.0108 and for size is .029 and the constant α =1.17

for the said model. To further justify the relationship among the variables we used random effect model as presented in Table 5

4.6 Table 5 Random Effect Model

fp	Std.Err	t	P>[z]	[95% Conf	Interval
Zscore	0.0025411	-13.47	0	-0.0392138	-0.0292527
beta	0.2221281	-0.16	0.871	-0.4713918	0.3993343
size	0.0552053	-1.61	0.107	-0.1972652	0.0191354
cons	0.5056853	3.92	0	0.9936138	2.975864

According to Table 5 random effect model elaborates that again financial policy is strongly influenced by Z-score which means that financial distress has strong influence on financial policy of the firms operating in Pakistan because the p-value is < 0.05. The difference between fixed effect model and random effect model is that in fixed effect model t-statistics is used to inference the statistical significance but on the other hand in random effect model z-statistics is used for statistical inferences. As illustrated by Table 5 the coefficient for Z-score is -.034 and for beta is -.036 and for size is -.089 and the constant α =1.9 for the said model. To further visualize the relationship among the variables we used Housman effect model as presented in

Table 6.

4.7 Table 6 Housman Effect

	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
	Fe	re	Difference	S.E
Zscore	-0.0354609	-0.0342332	-0.0012276	
beta	-0.0108416	-0.0360288	0.0251872	
size	0.0294364	-0.0890649	0.1185013	0.0192578

Table 6 indicates the difference between the standard coefficient as explained by the fixed effect model and random effect model. The results indicate that the z-score for (FE) is greater than (RE) with a value -0.0012 and beta value for (FE) is less than (RE) with a value 0.025. Size for (FE) is greater than (RE) with a value of 0.118. The sqrt of SE is 0.0192 which indicate the variance.

CHAPTER 5

Conclusion and Discussion

5.1 Conclusion and Discussion

This research thesis examined the effect of risk on firm financial policy of a less developed country over a period of 2002 to 2007. The core contribution of this investigation is that it contributes to the existing knowledge by identifying risk, in term of business risk, systematic risk firm size and their influence on firm financial policy. The study reveals that firms having high probability of survival will have to adopt more debt in their capital structure due to low cost of debt because of tax inducement. It stands to reason that high business risk firms would be discouraged from accepting more financial risk associated with debt integration. The companies that have more business risk would ultimately face insufficient cash flows and they might be unable to retire their debt obligation and resultantly this position will negatively affect their capacity to gain more debt. This element further attracts to the individual investors and institutional investors toward the firm that persist low business risk by perceiving that the debt incorporation as a positive signal to the equity market. Debt incorporation in the firm capital structure means that the firm is in a growth perspective. Due to this reason investors sentiments move towards investment in such growth firms. Ultimately the market value of the share will rise and will enhance the wealth of the existing shareholder. If we visualize the results at a glance it is inferred that Z-score has very high standard deviation which indicates that selected companies have high operational risk with greater volatility. This element also indicates that companies operating in Pakistan have operational risk which varies a lot form one another. To visualize the bivarriate relationship among the variables, study employed correlation analysis. There is positive correlation between financial policy(Y) and operating risk (Z) of the firm. Side by side there is positive association between market risk (BETA) and debt policy. Financial policy and size have significant negative relationship. This element indicates that if the size of the firm

increases then debt to equity ratio would be decreased and the financial risk will increase because cost associated with the use of equity is bigger than cost of associated with debt. As the firm will adopt other options to generate capital structure rather than debt and will generate negative signals to the market. The said statistical values of financial policy and Z-score provide guide line to us that the firms which employee more debt in their capital structure will face more financial risk as well as operating risk. When companies' operational risk would be increased then they become unlikely to get capital from the investors in the form of debt and finally they will move toward costly alternative that is equity which clearly means the dilution of ownership. These situations guide us that firm's operational risk increases as if they will adopt more debt in their capital structure. As far as market risk which is beta will also increased when companies will employee more debt in their capital structure. But their situation will provide positive signal to the market players and will cause to attract the stream of benefits from higher risk. The study estimates both fixed and random effect specification as well. In this investigation business risk is translated in the form of Altman Z-score that represent the probability of survival of a firm. There fore higher Z-score suggest that higher business risk. Independent variables explained up to 10.6% to the dependent variable which is not too much significant but size has significant impact on the firm's financial policy but Z-score and beta proxy fails to explain the financial policy in a well mannered way.

This result shows that Z-score has no significant impact on financial policy which means that Pakistan's non financial sector financial policy of the firms will not be influence by the operational risk of the firm. There are other variables that will influence the decision regarding to the choice of debt and equity. As far as beta is concerned which is the proxy for market risk is also insignificant with financial policy which means what ever the market risk would be it will

influence on the choice of the firm to choose debt and equity. Size of the firm will have a major impact on the financial policy of the firm. These results guide us that size of the influence the financial policy in a well mannered way. Fixed effect model indicate s that financial policy is strongly influenced by Z-score which means that financial distress has strong influence on financial policy of the firms operating in Pakistan. Random effect model elaborates that again financial policy is strongly influenced by Z-score which means that financial distress has strong influence on financial policy of the firms operating in Pakistan. The distinction between fixed effect and random effect model is that in fixed effect model t-statistics is used to inference the statistical significance but on the other hand in random effect model z-statistics is used for statistical inferences. The H_0 of study is that risks of the firm positively influence the debt level of a firm. After the whole discussion the hypothesis of the study is accepted in the light of fixed effect model and random effect model regarding to the firm financial distress risk but fails to explain the influence by the proxy of market risk.

This study clearly in line with past studies and the prediction of the trade off models that firms that have high risk would have lower borrowing capacity, On the other side if look at the supply side it is expected that finance provider may be hesitate to lend their capital to those firms due to the possibility of default. Size of the firm is also identified as a significant determinant of capital structure decisions in Pakistan's non financial sector. The empirical results of this thesis generally have suggestions for appropriate risk management and how they effect the financing decision of firms from less developed countries. This empirical research suggests the need for further research on firm's financial policy with different innovative models.

5.2 Future Research

This study is concluded by signifying the importance of risk and financial policy and proposing the need for further research along with other method of calculation for business, financial and market risks on financial policy. Coming era's investigations could also ponder and postulate on advancements in financial markets and financial policy by including the other measures of risk and financial policy. Moreover it adds value to the present literature of capital structure by giving risk effect on financial policy's empirical results of evolving market firms

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