The Impact of Leverage on the Investment of the Firms

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ABSTRACT---- *This research report was performed in order to find out the relationship and the impact of leverage on the investment of the firms). Firstly the literature was studied to form the basic structure to move forward in this topic of research. The literature review recommended that investment of the firm is affected by a number of factors and leverage is one of them. The Research studies carried out in other parts of the world recommended that the relationship involving the leverage and the investment is a negative one. And the literature also recommended that the impact of leverage had to be looked closely by taking into account the other financial factors as well like sales of the firm, cash flows, liquidity, net fixed assets, profitability of the firm etc.*

When taking into consideration the model for the research these factors were also seen so as to get a joint effect. In this regard the model selected was that Aivazian, Ge and Qiu (2005)).*which considers the following features sales of that firm, net assets of the firm, liquidity of that firm, profitability of the firm , the cash flows of the firm and their impacts on investment.*

The Next step was to select a sample and then collect the data. In this study 29 firms from 29 different sectors within Pakistan were selected and the firms were selected on the basis of the highest total assets. The data was collected from the annual reports, and State Bank of Pakistan's official website. And the share prices data was collected from the KSE s website.

After collecting the data regression was run on the data. The results of regression showed that the ROA, Cash flow, and Liquidity are the significant variables. Leverage and sale are insignificant here. The Cash flow and Liquidity are inversely related to the dependent variable. And while ROA, is in a positive relation with the dependent variable.

The recommendations in this regard are that this research can be used as the basis for further research in this area and if further research is to be done in this area the sample size is to be increased

Keywords--- Leverage, Investment, Profitability, Growth

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1. INTRODUCTION

The corporate firms play an important role in contributing to the economic growth. In order to achieve their goals and objectives, firms need to effectively and efficiently manage their finances. And to respond to the international competition firms need to make enormous capital investment in the infrastructure, modern technologies, product development, and product promotion and so on. Such investments may promote efficiency and productivity. There are several sources of financing those investments. And financial leverage is one of them.

In its simplest type, financial leverage is the quantity of debt used to finance a firm's assets and projects. Since knowing the benefits of debt i.e. the tax advantage it gives, it has always been considered that to what proportion of debt should be utilized in order to attain the maximum advantage out of this tax benefit. And In addition to this it has been researched that there are other impacts that the debt has on businesses, in which one of the factor is that how the utilization of debt impacts on the investment, growth and profitability. Thus, if a company has to start a project the amount of leverage that the firm uses would affect the decision of the investment opportunity for the firm. One more thing in this study is to see whether the decision on the debt has got any impact on the growth of the company
The Research studies done in the other parts of the world recommends that using more leverage has a negative effect on the investment. Then we have to see whether this relationship holds for the companies in Pakistan.

This research study will be based on the firms with the highest total assets in their respective sectors of Pakistan. And this research study will be used to check whether this relation is held true for the companies based in Pakistan or not.

Besides this the research will tell about the other financial factors that can influence the investment and the growth prospects of the companies. The financial factors in this regard can be sales of that firm, net fixed assets of the firm, liquidity of the firm, profitability of the firm, the cash flows of the firm etc.

1.1: Research objectives
- How the firms growth and investment are affected by the use of Leverage
- What are the impacts of other financial factors on growth and investment
- To understand the benefits of leverage.

1.2: Research hypothesis
H1: Leverage has a positive impact on firm's investment.

1.3: Scope

The report will provide knowledge on the leverage impact on firms in investment decisions for investors. It will also explain the extent to which a firm can be levered without raising its risk which would deem the investment as a liability to the investor.

1.4: Methodology

The Data that is required for the study was collected from the annual reports of the firms and from the website of State Bank of Pakistan (SBP) therefore the data collection source was secondary in nature. The official website of KSE will be utilized to get share prices of the firms. So in this study 29 firms from 29 different sectors were selected on the basis of highest total assets and the remaining firms from other sectors had to be dropped due to lack sufficient data required for the research. And lastly the major part of the analysis checking will be dependent on the already available data in the form of the financial statements and the other published sources of financial data

1.5: Limitations

The limitations faced during the research were the unavailability of data for few sectors which meant that those firms in those sectors had to be left. Although the ideal case would have been to include the total population for research purpose but the lack of availability of data regarding certain sectors forces the researcher to exclude them from the research.

1.6: Scheme of the report

The research report has been separated into a number of chapters for easy understandability and simplicity. It comprises of four chapters and the detail is given as under

Section 1: contains Introduction as given above that has further been broken down into various parts

Section 2: is about the Literature review of the topic

Section 3: data collection and explanation of the model involved and its analysis

Section 4: would contain the conclusion and recommendations

2.   LITERATURE REVIEW

2.1: Investment and Leverage

It is disputed that the firm's investment policy must be made only on the features that shall enhance its profitability, net worth of a firm or its cash flows. We should not "waste our limited worrying capacity on the second-order and largely self-correcting problems like financial leveraging" (Modigliani and Miller 1958)

It has been analyzed that probable externalities produced by the debt on the (and management's) and shareholders' best possible strategy of investment. The scheme is that the debt hangs over, lessens the encouragement of the management-shareholder association in managing of the company to make investment in optimistic net-present-value venture

opportunities or prospects, and since the incentives or benefits accumulate, at least to a degree, towards the bondholders somewhat than accruing or accumulating completely to the shareholders. And Hence, firms that are highly levered are least expected to take advantage of important growth opportunities or prospects as compared to the lowly leveraged firms .So a linked theory of underinvestment centers on the effect of liquidity in the firms with the commitments of large amount debt will do less investment without knowing the nature of their growth prospects or opportunities. (Myers 1977)

It has been argued that the companies having more within or internally produced funds than the positive net present value venture or investment opportunities or prospects, and the existence of debt in the capital structure of the firm may compel its managers to operate the funds or finances in servicing the debt and which might have been employed in invested or spent in the projects having negative net present value at the disadvantage of shareholders significance. Such a condition can be created as the over -investment trouble or problem. (Jensen 1986) .Results have shown that the leverage can have a negative effect on growth. And In research they did, they represented the growth in the form of book-to-market ratio.(Long and Malitz 1985)**.**

A study suggested that the investment is highly sensitive to the earnings of the highly levered firms. (Cantor 1990).A further study suggests that leverage is inversely linked with the growth and investment of the firm**.** (Smith and Watts 1992), and Barclay and it has been showed how the investment is highly sensitive to the cash flow in the companies with high leverage as compared to the companies with low leverage. (Whited 1992). It is also suggested that the leverage is negatively linked with growth and investment. (Smith and Watts 1995) studies conducted further examines and shows there is inverse relation between leverage and growth and also founded this relationship to be correct while doing further research across seven countries. (Rajan and Zingales 1995)

In further studies conducted showed they had employed the variables of the balance sheet as separate or detached regressors in the equation of investment and they had argue that the following impacts are not significant. And there was support for both of the under-investment and the over-investment theories in the existing empirical literature. (Kopcke and Howrey 1994)
An illustration that for the firms with high growth the relationship among leverage and corporate value is negative, and whereas that for the firms with low growth the relationship between leverage and corporate value is positively correlated. And then they used the term of Tobin's Q to show the growth in the firms, i.e. low Tobin's Q for low growth prospects or opportunities and viceversa. (Mc Connell and Servaes 1995)

A pooling regression had used by a researcher to measure and estimate the equation of investment and mostly the studies done have also employed a pooling regression technique. And they have also revealed that the relationship between leverage and growth is a negative one at the individual firm level as well for the diversified firms, and same the case at business segment level. And the growth for the firms is not reduced by debt financing that have recognized to have fine investment opportunities. And at the same time it has a negative relation to the growth for the firms where capital markets either not recognized their growth. (*Lang et al* 1996)
 It is disputed that the financial elasticity supports the option of short-term debt thus spectacularly lessens the agency costs of over-investment and under-investment. Though the lessening in the agency costs may not support the firm to raise leverage, while the firms original debt level preference is dependent on the kind of growth alternatives in its investment preference or opportunity set. (Childs et al 2005)

A study was conducted in Canada and its aim was to find out the impacts of leverage on a firms investment and it was concluded in their result that showed that the leverage and investment have a negative relation for the Canadian firms and the firms with less growth prospects or opportunities had got a additional negative or inverse effect of leverage. The research further suggested that still if there is controlled regression for the growth opportunities the relation or link between growth and leverage will still be inverse or negative because the managers have a tendency to bring a decrease in the leverage when they are expecting that there are some investment opportunities in the coming future, (Varouj A. Aivaziana,, Ying Ge, Jiaping Qiu 2005)so according to Varouj A. Aivaziana,, Ying Ge, Jiaping Qiu leverage can be considered as the indication of what are the thoughts of the management in terms of investment, and it provides information on their investment prospects or opportunities.

2.2: Profitability and Leverage

Most of the empirical studies have examined that there is a negative or inverse relationship between profitability and leverage .For example (Huang and Song 2002), (Booth et al.2001), Titman and Wessels (1988), Friend and Lang(1988), (Kester 1986), and (Rajan and Zingales 1995) for G7 countries except for Germany all have shown that there is a negative relation between probability and leverage.

Therefore it was recommended that the retained earning was better than using debt while the use of debt is considered better than equity if there was external financing being used. Therefore profitability would have inverse or opposite

relationship with leverage. And the Managers have the extra advantage which is not known to the common investors is the use private and personal information regarding the characteristics of the firm's return on that investment or the investment opportunities. (Myers 1984)

The work conducted on the G-7 countries except Germany it was concluded that the profitability is negatively or inversely correlated in all the countries and it was analyzed that size was positively correlated with the leverage except in Germany. Rajan and Zingales (1995)

Further analysis was concerned with those variables that indicate the level of leverage in firm. It shows that there is a negative relation among growth and leverage of the firm. Size of the firm is negatively correlated with the leverage of the firm hence smaller firms are accepted to increase the profitability of going private. Rao, Waters and Payne, (1995)

It is suggested that the firms having less investment prospects or opportunities use high leverage. And they also suggested that the firms that are more profitable use less leverage. Wolfgang and Fix (2003) Further more it is being found out that the profitability of firms were negatively or inversely correlated with leverage. And therefore this rejected the theory of static trade off, which showed a positive relation. Hijazi. S and Y.B Tariq (2006)

2.3: Growth and Leverage

According to a study the firms that have higher future growth prospects or opportunities should employ a higher level of equity financing, for the reason that a higher levered firm is most probable to pass up the profitable investment opportunities. Myers (1977)

The results show a negative relationship between leverage and growth. So In a research it is argued so as to the industries that have greater tendency or propensity to grow are lowly leveraged. Bradley, Jarrell and Kim (1984) As in another research it was showed that There is a negative relation between the growth opportunities and the leverage is predicted. Huang and Song (2002, p.9)

As the market-to-book ratio is employed in order to proxy for the growth opportunities, as there is one extra reason to suppose a negative relation – as Rajan and Zingales ((1995,p.1455) pointed out:" The theory forecasts that the firms with the higher market-to-book ratio have higher costs related to financial distress, that is why we presume a negative correlation."

Some of the empirical studies confirm the theoretical prediction, as Rajan and Zingales (1995),Kim and Sorensen (1986),and Titman and Wessels (1988) report.However,for example,Kester (1986),and Huang and Song (2002)reveal a positive relation between the growth opportunities and the leverage. And In this study, the P/B ratios (market-to-book ratio)is used as a proxy for the growth opportunities.

2.4: Share Holders, Bond Holders and Leverage

Leverage commonly refers to the magnified effect fluctuations in total earnings have on a firm's common stock income due to fixed payments to bonds and preferred stock. Thus, high leverage refers to a relatively high proportion of debt which raises average return to owners while increasing the risk of financial problems. The choice of a leverage measure here is based partially on precedent (Hall and Weiss, 1967)

The result shows the disagreement of interest among the debt-holders and the shareholders over the practice of investment will generate a possible underinvestment and overinvestment incentives whereby investment and financing decisions are interrelated (Jensen and Meckling 1976) and (Myers 1977)

Therefore, the employment of debt hence lessens the tax amount to be paid by the firm andthe returns to the shareholders increases at the same time as the employment of the equity does not benefit from such an advantage. And besides the advantage of tax , the cost of the debt is normally low as compared to the equity due to the lesser risk associated with the debt as the debt holders have the foremost claim in the case of bankruptcy or insolvency (Damodaran, 1999: p.10)

Furthermore, it has been concluded "such an investment efficiently shifts wealth from the stockholders to the debt holders." thus there is a negative relation between the growth opportunities and the leverage is expected. (Huang and Song 2002)

2.5: Stock Returns and Leverage

Results have indicated how a change or modification in the firms leverage may cause a change in the volatility in the returns of the stock. (Schwert 1989)It has been examined that the relationship between the leverage and the relative stability of the stock value based on the actuarial science 1 and it founded that the period of the debt is an essential attribute in evaluating the impact of leverage on the stocks volatility. And If the leverage is constant, or is changing eventually due to the extra debt being issued, or if the firms are trying to alter the risk of holding the common stock they have to return back the debt. (Haugen and Wichern 1975)

It is dispute that a clearly defined metric for the benefit of the debt financing is the differentiation in the rates of return earned by the optimally levered and the unlevered firms, and the net of the return premium to reimburse or compensate for the potential insolvency costs. (Kane, Marcus, and McDonald 1985)The firm-wise study specify that the stock returns volatility increases after the prices fall [Black (1976); Christie (1982) and Cheung and Ng (1992)]. The Two probable explanations are the given leverage and the time-varying risk premium. And The leverage impacts posits that the stock price of firm decline and move up the firm's financial leverage, and the result is an increase in the instability of equity [Black (1976); Christie (1982)].A decline in the value of the firm's assets will fall (almost) entirely on the value of equity, thereby raising the firm's debt/equity ratio and raising the future volatility of stock returns [Christie (1982)].

The theory underlying the leverage effect shows that highly levered firms should exhibit a stronger negative relation between stock returns and volatility than should less highly levered firms. (Cheung and Ng 1992) find an inverse relation between period *t* firm stock returns and changes in firm stock return volatility from period *t* to t+1. They also find that this inverse relation is stronger for firms with large debt/equity ratios. (Cheung and Ng 1992) note that this inverse relation is also stronger for smaller firms. However, in a research it is argued that the reaction of stock volatility to the way of returns is too huge to be making clear by leverage single-handedly.

According to the leverage effect, a decrease in the equity worth would move up the debt to equity ratio, and therefore increasing the riskiness of the firm as apparent in an increase in the future volatility. And As a result, the future volatility shall be negatively linked to the present return on the stock. [(Black 1976), and others French, Schwert and (Stambaugh 1987); (Schwert1989)]

It is further showed that If any change in the leverage ratio substitutes for any change in a firm's debt capacity, so the increase in the leverage shall result in a lesser stock price, keeping others factors unchanged and constant. So our empirical findings will be consistent with this argument. (Anh, Denis, and Denis 2006)

2.6: Tax Advantage and Leverage
It has been stated that there are no consistent theoretical forecast or prediction on the impact of profitability on the leverage. And according to the point of view of the trade-off theory, the highly profitable companies shall have more leverage, because they have additional income to shield themselves from taxes.

So the tax advantage of the debt considerably lessens the cost of debt in a company's capital
structure. And with a 50% corporate tax rate ,the tax deductibility of the interest payments on the debt can create the cost of debt as small as the half of that equity. as a result, debt contributes in accomplishment of a higher return on the equity (Modigliani and Miller, 1963: 433 - 444).

Thus, the Modigliani and Miller theory presumes that the higher use of debt in a capital structure of a firm will maximize its value. And when the debt is used in the capital structure, the average cost of the capital is decreased and its profitability is enhanced (Modigliani and Miller,1963: 434).

Other studies such as (Negash 2001: 115) and (Phillips and Sipahioglu 2004: 33) concluded that the tax advantages of leverage are insignificant. (Negash 2001:118), for the illustration finds that the use of the debt had shown a negative effect on the profitability of the firms that were quoted on the Johannesburg Stock Exchange. (Negash 2001) more further argued that though the possible gains from the leverage over an infinite time period are important and is comparable to what is being reported in the studies from the developed countries, and in accordance with the theory of Modigliani and Miller of the year 1963.though the realized gains, however, are not as oblique by the theory of 1963 because in South Africa the effective tax rate for most of the firms is lesser than the statutory rate. And this is for the reason that the non-debt tax minimization effects such as the amortization (the investment and the not debt related tax shields) and depreciation lessens the impact of the interest deductions and the tax benefits of debt.

3. DATA COLLECTION AND ANALYSIS

3.1: Sample Selection Procedure
The sample in this regard is taken from the firms with the highest total assets within that sector and with taking 2004 as a base year; an individual top firm is selected from the each sector in Pakistan. The sample is drawn is mostly on the basis of the availability of data as for balance sheet, income statement, cash flow statement and stock prices

3.2: ECONOMETRICS ANALYSIS

We estimate a short form of investment equation to examine the impact of leverage on investment and the model has been adapted from Aivazian, Ge and Qiu (2005))

$$I_{i,t}/K_{i,t-1} = \alpha + \beta[CF_{i,t}/K_{i,t-1}] + \beta 2\, Q_{i,t-1} + \beta 3\, SALE_{i,t-1} + \beta 4\, ROA_{i,t-1} + \beta 5\, LIQ_{i,y-1} + u_{i,t}$$

Where,

$I_{i,t}$ is the net investment of the firm *i* in the period t

$K_{i,t-1}$ stands for the net fixed assets

$CF_{i,t}$ represents the cash flow of the firm *i* time t

$Q_{i,t-1}$ represents the Tobin"s Q

$LEVERAGE_{i,t-1}$ shows the leverage

$SALE_{i,t-1}$ represents for the net sales of the firm I

$ROA_{i,t-1}$ stands for the profitability of the firm

3.3: justification of the model

The following model was selected for performing this study was due to the fact that the literature review of study recommended that and beside leverage the other financial features that also have an effect on the firm performance and its investment. And because this particular model also contains the other financial features of the firm such as sales, cash flows, liquidity and profitability so this particular model is the most appropriate one in conducting my studies and it serves the best on the needs of my studies.

3.4: List of Variables and their explanation

K: refers to the Net Fixed Assets

LEV: LEV stands for Leverage. We had used the similar definition of leverage as that of Lang *et al*, to be exact the ratio of the long-term debt s book value to the of total assets book value. This evaluation would not show current changes in the markets regarding the valuation of the firm.

TOBIN Q (Q): We use Tobin Q as a proxy for growth opportunities defined as the market value of total assets of the firm divided by the book value of assets. Market value of the firm is the sum of total liabilities, the value of equity shares and the estimated value of preference shares. The market value of preference shares is calculated as Preference dividends multiply by ten.

SALE: Sale can be calculated as the net sales divided by the net fixed assets.

PROFITABILITY (ROA): The profitability can be calculated in terms of the linkage between net income and total assets. It is measured as the earnings after tax and add interest minus tax benefits on the interest divided by the total fixed assets. It shows the total operating efficiency of the funds over the investments of a firm.

CASH FLOW (CF): The cash flow can be measured as the net sales or the total of the earnings before the extraordinary items and its depreciation.

LIQUIDITY (LIQ): The liquidity ratio is calculated by current assets divided by current liabilities.

3.5: ANALYSIS

Model 1: Fixed-effects, using 145 observations

Included 29 cross-sectional units

Time-series length = 5

Dependent variable: investment_Net

	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
const	-0.880114	3.19266	-0.2757	0.78332	
cash_flow___lev	-6.50453e-06	1.15753e-06	-5.6193	<0.00001	***
Leverage	5.59329	4.82573	1.1591	0.24892	
Sale	-1.00894	0.829728	-1.2160	0.22657	
ROA	2.83071	0.538957	5.2522	<0.00001	***
Liquidity	-0.00846558	0.00256564	-3.2996	0.00130	***

Mean dependent var	0.719047	S.D. dependent var	11.36802
Sum squared resid	9082.258	S.E. of regression	9.045559
R-squared	0.511953	Adjusted R-squared	0.366858
F(33, 111)	3.528397	P-value(F)	3.70e-07

prob>F is 0.00

3.6: Interpretation: fixed effects results show that cash flow, ROA and Liquidity are the significant variables here. Values for ROA, Liquidity and cash flow are .00001, .00130 and .00001 respectively .sale and leverage is insignificant here

Liquidity and cash flow are inversely related to the dependent variable. ROA, on the other hand, is in positive relation to the dependent variable that is investment

3.7 RESULTS AND DISCUSSIONS
We opted for fixed effects model, after applying the hausman statistics and its value was less than 0.05 which means fixed effect model should be selected.

Discussion on fixed effect model results

F-Statistics
F-statistic is used to find the total significance of the model we use. The prob>F is 0.00 which also suggests that the model is significant. And the significance level of this model is 36%.

R-square
R-square is known as coefficient of determination. It calculates the variations in the dependant variable which are caused by the independent variables. In our model results the value of R-square is 0.511 it shows that 51% changes in the investment are caused by the changes in leverage, sales, cash flow, net fixed assets ,profitability and whereas the rest of the changes are due to the other variables.

Coefficient
The Coefficients of independent variables verify the relationship among the independent and the dependent variable. And the values of the coefficient explain magnitude and the direction of the dependant variable with the changes in the independent variable. The positive value of the coefficient means that the relationship among the independent and the dependent variable is a positive one while if the value of the coefficient is a negative one it means that the relationship is a negative one. And the value also suggests about the magnitude of change, so if the value is huge it suggests that change in the dependant variable with the change in the independent variable will also be huge. So in our result of fixed model regression the coefficient has positive values for leverage, sale and profitability respectively, which proves that the

investment in a firm increases with increase in leverage, sales and profitability. While the values for liquidity and cash flow are negative which explain that as these variables are increased the investment of the firm has decreased.

P value

The P value shows that the independent variables are significant or not and on that basis we can accept or reject the null hypothesis. And we reject the null hypothesis If the p value of a independent variable is smaller than 0.05 and it proves that the variable has a significant effect on the dependent variable and we accept the null hypothesis if the p value is larger than 0.05 than and it proves that the independent variable has no significant effect on the dependant variable. In our fixed model result of regression the p value is significant for ROA, Liquidity and cash flow where as for leverage and sale its value is greater then 0.05 which suggests that it's insignificant.

4. CONCLUSION AND RECOMMENDATIONS

The study conducted in this research is based on finding out the impact of leverage investment of a firm and to find the effects of an increase or decrease in the leverage of a firm in Pakistan. The sample data has been collected for a period of 5 years from 2004-08 from firms with the largest assets structure in each sector. Analysis of the data showed three significant variables i.e. cash flow, profitability and liquidity.

From the results of the analysis, it is clear that as the profitability of the firm increases, its investment also increases in the same manner. Investment, however, is hampered by an increase in the amount of cash that a firm holds. In case of increase in cash holdings, the firm will have more idle resources and fewer resources in circulation. A decrease of resource circulation indicates decline in investment of the firm.

As the return on assets increase, earning of the firm increases. The additional earnings lead to increase in investment. Profitability therefore increases the firm's ability to invest more or expand.

The outflow of cash from the firm leads to decrease in investment. The reason of cash outflow can be a failed project, manufacturing faults and so on. As the resources are utilized with no end product, the level of cash decreases in the firm due to losses. The result is that investment decreases.

From the above analysis, it can be concluded that leverage has no effect on the investment of a firm in Pakistan. Profitability, cash flow and liquidity are the three factors affecting investment capabilities of Pakistani firms

The recommendations in this view are that this research study can be used as the basis for further researches in this area and the sample size is to be increased for that purpose and the sample should also be increased by including more firms from their individual sectors.

5. CONCLUSION AND RECOMMENDATIONS

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