



## Relationship Between Investment and Cash Flow Under High and Low Investment Opportunities:

### Evidence from Pakistani Manufacturing Firms

Imtiaz Zahid

Lecturer Govt. Postgraduate Islamia College, Faisalabad.

Maria Shaikh

Assistant Professor-IBA-University of Sindh Jamshoro

Akmal Khan

Lecturer, University of Sargodha Lyallpur campus, Faisalabad

Aisha Bashir Shah

Assistant Professor-IBA-University of Sindh Jamshoro

Dr. Faiz Muhammd Shaikh

Associate Professor-SZABAC-Dokri

#### Abstract

This paper examines the relationship between cash flow and investment under high and low investment opportunities of 167 Pakistani non-financial manufacturing firms listed in the Karachi Stock Exchange during the period 2004-2013. Tobin's Q is employed to capture the investment opportunities and sales are taken as control variable. A panel regression model is used to investigate the relationship of cash flow, Tobin's Q and sales on investment. In case of high investment opportunities firms, the relationship of investment and cash flow is positive and significant while under low investment opportunities firms, this relationship is also positive but insignificant. These results indicate that the high opportunities firms rely mostly on internally generated cash flow whereas the low investment opportunities firms prefer to distribute its earnings as dividend.

**Keywords:** Cash flow, Tobin's Q, Investment, High and Low investment opportunities.

#### INTRODUCTION

In order to survive and availing better future growth opportunities it is vital to invest presently to generate fruitful financial and cost effective activities. Now the business future can only be determined through the procedure of creating money for long term basis for smooth functioning of operating, investing and financing activities. In any country when the flow of investment and rate of growth of production is sluggish, then it does not only affect business but also the growth rate of economy, resulting workers are forced to take low wages and eventually it increases the unemployment rate which declines their living standards. Keeping in mind the value and importance of investment most of researchers enlighten the worth of investment in different scenario and in different fields of finance and economics. The main focus of this study is to check the relationship of cash flow and investment. Here the term investment means investment in physical assets like tools and equipment, machinery and plants, furniture and fixtures and motor vehicles. According to Miller and Modigliani (1958), the value of firm is independent and does not effect by either it uses internal or external finance due to conventions of capital market free from asymmetric information, no bankruptcy cost, no transaction and taxes costs. The empirical results of Mayer and Majluf (1984) show that investors prefer to reinvest in the business on the basis of cost and the most preferable choice is the use of internal finance due to no cost financing without any barriers and contractual obligations. Straightforwardly, investors desire maximum profits from their investment so they look forward for the highest possible returns.

#### LITERATURE REVIEW

There are lot of factors which affect the level of investment under different conditions like agency problem, bankruptcy costs, and cost of capital, level of size of firm, firm maturity, dividend policy, managerial discretion, sales level, investment opportunities, monetary and fiscal policy of a country, tax structure and political conditions. This study is organized to check the relationship of investment and cash flow under high and low investment opportunities.

Degryse and De-Jong (2005) examined the relationship of cash flow and investment and stated positive correlation among cash flow and investment for both types of manufacturing organizations having low and high investment opportunities. This relationship is more significant for large firms under low investment opportunities and insignificant for smaller firms under high investment opportunities. They classified all firms into three groups on the basis of median with the help of Tobin's Q i.e. average, below average and above average firms. Robert E. Carpenter et al.(2003) investigated the relationship between cash flow, investment and investment opportunities and their findings reveal that the firm's



investment depends upon its respective cash flows which are essential in the process of mitigation of credit frictions. They consider firms with low investment opportunities have more sensitivity of investment and cash flow whereas the high investment opportunities firms face the problem of information asymmetry as well as large level of risk premium. Lang et al. (1996) studied that leverage is adversely affected in the growth of those firms which have low investment opportunities and concluded that these firms are not accepted by market due to their low investment. A lot of pragmatic studies have revealed the recognized constructive association between internal finances and investment as proof of the subsistence of financial restraints Charlton et al. (2002) Cleary (2000), Chapman et al. (1996) Calm and Rizzo (1995), Gilchrist et al. (1995), Chirinko et al. (1995), Schaller, 1993; Fazzari and Peterson, 1993 Hoshi et al. (1991) Oliner et al. (1989) Fazzari et al. (1988). The above mentioned studies tried to recognize features of all those organizations that have financial restraints or have larger difficulties in getting finances from outsiders. The conclusion of their researches express that the reliance of investment levels on firm internal funds is greater for firms with higher financial restraints, in spite of the approaches of measurement of these restraints.

Cleary (1999); Kadapakkam et al. (1998) Kaplan and Zingales (1997), their studies discovered that the investment decisions of monetary unrestrained firms are higher sensitive to the availability of internal finance. Kholdy and Sohrabian (2001) classified the firms on the basis of creditworthiness and found that the sensitivity of investment to the availability of internal finance is very high for firms having good creditworthiness as compare to poor creditworthiness and established that firms give preference to internal cash flow over external for financing their investment because asymmetric information, transaction cost and agency issues make external funds more expensive. Stiglitz and Weiss (1981) recommended that agency costs and difference in access of information are the main causes for the shortage of finances available to undersized firms, and consequently these firms are likely to rely majorly on cash flows. Undersized firms have faced the issue of higher cost of issuance of new securities and difference of access to information for external finance, so these firms are particularly affected from financial restraints (Jalivand and Harris, 1984). Large firms have superior access to external markets for obtaining long term funds due to three reasons (Kadapakkam et al., 1998). First, these firms have better level of information than smaller firms. Secondly, transaction cost is comparatively low for larger firms. Thirdly, agency problems are higher for smaller firms because these firms are unable to meet such issues. They concluded that larger firms have less sensitivity between investment and cash flow as compare to smaller firms and shows positive significant impact in each and every firm all over the world. Fazzari et al. (1988) concluded in their empirical study that the existence of asymmetric information in any market give rise up to a positive association between the internal cash flow and investment of firms keeping constant level of investment opportunities. Lamount (1997) of USA conducted a research and explored that more than three fourth of the overall investment spending of the firms which are involved in manufacturing activities in such developed countries of the world as US are derived from their internal resources. In various researches Tobin's Q is taken as a measure for this purpose, such as, Agung (2000), and Athey and Resser (2000), empirical analysis of the correlation among Tobin's Q and investment expenditure with use of organizational level information from Indonesia and India. Dr. Ravi Thirumalaisamy (2013) investigated the relationship between firm growth and internal cash flow behavior and concluded that top management prefers to distribute whereas investors give privilege to take dividend when the internal growth of firms is low regarding investment opportunities. Watson et al. (2002) stated that when information asymmetry is prominent then cost concerning external financing will increase and due to this issue the association among investment and cash flow increases for the firms with higher investment opportunities. Chen et al. (2007) investigated that the availability of cash flow has a significant impact on investment, and a clear sign of investment activities when firms can arrange cash easily. Jaffari (2004) concluded that there is negative correlation between investment opportunities and debt level, and at the same time there is also an adverse association between growth opportunities and operating cash flows.

## Hypothesis of the study

The firms having good and positive investment opportunities have been differentiated from those firms having low and poor investment opportunities with the help of Tobin's Q. In order to test the objectives of this research that whether the Pakistani firms listed on Karachi Stock Exchange (KSE) during the period from 2004 to 2013, depend on cash flow for additional investment, and further such relationship is strong or weak in case of high and low investment opportunities. The classification of firms is made on the basis of Tobin's Q median, when Tobin's Q is greater than median, it is considered high investment opportunities and when Tobin's Q is less than median, it is considered low investment opportunities and two hypotheses are developed to examine the correlation between cash flow and investment.

**H<sub>1</sub>:** There is significant relationship between investment and cash flow under high investment opportunities manufacturing firms of Pakistan listed in KSE.

**H<sub>2</sub>:** There is significant relationship between investment and cash flow under low investment opportunities manufacturing firms of Pakistan listed in KSE.

## RESEARCH METHODOLOGY

In this study three independent variables (Cash flow, sales and Tobin's Q) and one dependent variable (investment) are taken. Whereas out of three independent variables sales and Tobin's Q are considered as controlled variables.

### Research Model

The model used in this study has already been used by Kapadakkam et al. (1998), Athey and Resser (2000), Hans Degryse and De-Jong (2002) and Abdul Rehman (2004).



$$I_{it} = \alpha_i + \beta_1 CF_{it} + \beta_2 Q_{it-1} + \beta_3 S_{it-1} + \epsilon_{it}$$

$I_{it}$  = Represented the amount of money invested in permanent or fixed assets like tools and equipment, plant and machinery, plant, properties for firm  $i$  during time  $t$ . It is computed through net fixed assets closing plus depreciation less amount of book value of fixed assets at beginning of the year divided by net fixed assets at the beginning of the year.

$CF_{it}$  = The amount of Cash flow of current period. It is measured as net profit after tax plus depreciation divided by net fixed assets at the beginning of the year. Its effect is captured through  $\beta_1$ .

$Q_{it-1}$  = It is the Q (Tobin's Q) at the beginning of the year shows the investment opportunities. The Q (Tobin's Q) is calculated through market value of equity plus book value of debt (market value of firm) and divided by book value of total assets (book value of firm). Its effect is captured through  $\beta_2$ .

$S_{i,t-1}$  = Represent the total sales of previous year divided by net fixed assets at the beginning of the year. It is taken as control variable for accelerator effect. Its effect is captured through  $\beta_3$ .

### Specific Model for High Investment Opportunities Firms

$$I_{it} = \alpha_i + \beta_1 CF_{it} * HQ_{(D)} + \beta_2 Q_{it-1} + \beta_3 S_{it-1} + \epsilon_{it}$$

$CF_{it} * HQ_{(D)}$  = The amount of Cash flow of current period. It is measured as net profit after tax plus depreciation divided by net fixed assets at the beginning of the year. It's the investment and cash flow relationship with interaction terms of cash flow and dummy of Q (Tobin's Q). High Q is one if Tobin's Q is greater than median otherwise zero. Its effect is captured through  $\beta_1$ .

### Specific Model for Low Investment Opportunities Firms

$$I_{it} = \alpha_i + \beta_1 CF_{it} * LQ_{(D)} + \beta_2 Q_{it-1} + \beta_3 S_{it-1} + \epsilon_{it}$$

$CF_{it} * LQ_{(D)}$  = The amount of Cash flow of current period. It is measured as net profit after tax plus depreciation divided by net fixed assets at the beginning of the year. It's the investment and cash flow relationship with interaction terms of cash flow and dummy of Q (Tobin's Q). Low Q is one if Tobin's Q is smaller than median otherwise zero. Its effect is captured through  $\beta_1$ .

### Variable Construction

The variables taken in development of model are explained below with reasons of including in the model.

#### Investment ( $I_{it}$ )

Here investment represents the dependent variable and shown on the left side of the equation. It represents the net investment as Hedge, Asciglu and B. (2008) taken in their study, where as some researchers have taken gross investment like Athey and Reeser (2000) in India and Fazzari et al. (1988) in USA. It is the amount of money invested in permanent or fixed assets like tools and equipment, plant and machinery, properties for firm  $i$  during time  $t$ . It is computed through net fixed assets closing plus depreciation less amount of book value of fixed assets at beginning of the year divided by net fixed assets at the beginning of the year.

#### Cash Flow ( $CF_{it}$ )

Cash flow ratio is calculated as the summation of net income after tax plus depreciation expenses to the level of net fixed assets at the start of the year. Chen et al. (2007) stated about cash flow as an important and significant variable which impact on investment.

#### Tobin's Q ( $Q_{it-1}$ )

Tobin and Brainerd (1968;1969) stated how to check the market worth of the firm as it is fairly valued, undervalued and overvalued with the help of ratio of market value of the firm to book value of the firm. Kee H. Chung et al. (1998) explained book value of assets as the replacement value of firm, So Tobin's Q is the ratio of market value of business to replacement value of business. The process of calculation of market value of firm is the market value of its equity plus market value of its debts to replacement value of assets (book value of assets). In developing countries like Pakistan the market value of shares are easily available and can be attained through business recorder where as there is no any source of obtaining the market value of debts so instead of market value of debts, book value of debts is in spite of market value and is divided on book value of assets to calculate such ratio of Q. If the Q ratio is equal to one; it represented the firm is fairly valued where as if the Q ratio is greater than one; it is the sign of over valuation of the firm and good investment opportunities and if the Q ratio is less than one; it is the signal of under valuation of the firm and bad investment opportunities. Q is commonly used by various researchers to calculate the investment opportunities.

#### Sales ( $S_{it-1}$ )

When the demand of firm products increased ultimately its sales will accelerate which is called "Sales Accelerator" one of the important investment theories. To avoid the issue of multi co linearity a lot of studies prohibited to include the sales of more than one period as predictors. That is the main reason that the ratio of previous year to beginning year net fixed assets are taken as sales.



It also shows all the correlations among the three independent variables and their correlations with the dependent variable (investment). Analysis of the correlation matrix shows that a high level of correlation was not found between any two of the independent variables. It also indicates that the lagged cash flow variable (CF) is most closely correlated with the dependent variable (INV) (0.215). The second highest correlation with the dependent variable is the sales variable (S) (0.152).

**Table 1**  
**Correlation Matrix at Full Observations**

Variables	Investment (log)	Cash Flow (log)	Tobin's Q (log)	Sales (log)
Investment(log)	1.000			
Cash Flow (log)	0.215 (0.000)	1.000		
Tobin's Q (log)	0.096 (0.000)	0.215 (0.000)	1.000	
Sales (log)	0.152 (0.000)	0.371 (0.000)	0.218 (0.000)	1.000

PearsonCorrelation is significant at 0.05 levels

### **Pooled Ordinary Least Square/Fixed/Random Effect**

A method used to assess parameters from a set of panel data is called fixed effect method of estimation. This method is taken by Ordinary least square and provides the basis of change for each time period or each unit from average. When the mean values of study variable are different for each time period and each cross section unit but the values of variance of errors are same.

Ho: When the Constants are Common apply Pooled ordinary least square

H1: When the Constants are not common apply Fixed or Random effect

Initially, the assumption of fixed effect use is taken as cross sections have different constants. The outcome of fixed effect shows following F-statistics:

Test statistic:  $F(166, 1500) = 17.687$  with  $p\text{-value} = P(F(166, 1500) > 17.687) = 1.34753e-253$ . The results obtain from fixed effect model revealed that the use of pooled ordinary least square is not a relevant method due to different cross section have different constants and fixed effect model F-statistics showed that null hypothesis is rejected.

The second method related to confirmation of refusal of pooled ordinary least square method when unit dummies variables are added in ordinary least square model. The result of these unit dummies shows that ninety-five out of one hundred and sixty-six dummies are significant. It is a sign of rejection of null hypothesis and ultimately the rejection of applicability of pooled ordinary least square. The outcome of ordinary least square dummies variables suggests the use of either one fixed or random effect model.

At last to decide the best fit either from these fixed or random is suitable when the pooled ordinary least square is rejected. In order to decide Hausman test is applied to see which model fixed or random is best fit.

Ho = Random effects is best fit model

H1= Random effects is not best fit model

Hausman test statistic:

$H = 114.121$  with  $p\text{-value} = \text{prob}(\text{chi-square}(3) > 114.121) = 1.42328e-024$



International Journal of Management and Information Technology  
As the results shows that the p-value is very low and reject the null hypothesis for use of random effect model as best fit model and ultimately the results favor for use of fixed effects model. The Hausman test shows p-value which is significant and rejects the null hypothesis and recommend the use of fixed effect model.

**Table 2**  
**Descriptive Statistics**

Variables	N	Minimum	Maximum	Mean	Std. Deviation
Investment	1670	-0.0669	2.1659	0.681827	0.5489724
Cash Flow	1670	-0.868	5.214	0.43211	0.843536
Tobin's Q	1670	0.27378	2.4794	1.080771	0.3282548
Sales	1670	0.2543	33.1050	4.483648	3.6050577
CF*HQ	1670	-0.5753	2.2023	0.249790	0.4279829
CF*LQ	1670	-0.8676	5.2136	0.182269	0.7870459

The above table 2 is regarding the results of normal distribution of the data of 1670 observations depicts that the value of lagged sales variable shows higher mean and higher deviation than that of all other variables. The mean value of Lagged sales is 4.48370, with a minimum value of 0.254 and maximum value of 33.105 and the standard deviation of lagged sales is 3.605059. Mean cash flow is 0.43211 with standard deviation of 0.843536 and minimum value of -.868 and a maximum value of 5.214. The mean value of Investment is 0.68184, with a minimum value of -.067 and maximum value of 2.166 and the standard deviation of investment is 0.548986. The mean value of Tobin's Q is 1.08077, with a minimum value of 0.274 and maximum value of 2.479 and the standard deviation of Tobin's Q is .328234. Mean value of cash flow high q is 0.249790 with standard deviation of 0.4279829 and minimum value of -.5753 and a maximum value of 2.1659. and mean value of cash flow low q is .182269 with standard deviation of 0.7870459 and minimum value of -.8676 and a maximum value of 5.2136. The above discussed table of normal distribution of data depicts that the unrefined data lacks normal distribution.

**General Model:**

$$I_{it} = \alpha_i + \beta_1 CF_{it} + \beta_2 Q_{it-1} + \beta_3 S_{it-1} + \varepsilon_{it} \tag{1}$$

**Specific Model: High Opportunities Firms:**

$$I_{it} = \alpha_i + \beta_1 CF_{it} * HQ_{(D)} + \beta_2 Q_{it-1} + \beta_3 S_{it-1} + \varepsilon_{it} \tag{2}$$

**Specific Model: Low Opportunities Firms**

$$I_{it} = \alpha_i + \beta_1 CF_{it} * LQ_{(D)} + \beta_2 Q_{it-1} + \beta_3 S_{it-1} + \varepsilon_{it} \tag{3}$$

$$I_{it} = \frac{NFA_{it} + DEP_{it} - NFA_{it-1}}{NFA_{it-1}}$$

$$CF_{it} = \frac{NI_{it} + DEP_{it}}{NFA_{it-1}}$$

$$Q_{it-1} = \frac{MV_{it-1}}{BV_{it-1}}$$

$$S_{it-1} = \frac{Sales_{it-1}}{NFA_{it-1}}$$

$$CF_{it} * HQ_{(D)} = \frac{NI_{it} + DEP_{it}}{NFA_{it-1}} * HQ_{(D)}$$

$$CF_{it} * LQ_{(D)} = \frac{NI_{it} + DEP_{it}}{NFA_{it-1}} * LQ_{(D)}$$

Where

$I_{it}$  = Represent Investment of firm i at time t.



$CF_{it}$  = Cash Flow of firm i at time t.

Q = Tobin's Q.

MV = Market value of the firm.

BV = Book value of the firm.

$S_{it-1}$  = The ratio of lagged sales to net fixed assets.

NFA = Net Fixed Assets.

$NI_{it}$  = Net Income of firm i at time t after tax.

$DEP_{it}$  = Depreciation of firm i at time t.

$CF_{it} * HQ(D)$  = Cash Flow of firm i at time t with interaction of dummy of Tobin's Q as one otherwise zero when it is greater than median.

$CF_{it} * LQ(D)$  = Cash Flow of firm i at time t with interaction of dummy Q (Tobin's Q) as one otherwise zero when it is less than median

$\alpha_i$  = The constant

$\beta$  = Regression Coefficient.

i = Represents firm i, i = 167

t = The end of year,

t - 1 = The beginning of year

**Table 3**

**Model 1**

$$I_{it} = \alpha_i + \beta_1 CF_{it} + \beta_2 Q_{it-1} + \beta_3 S_{it-1} + \varepsilon_{it}$$

**Dependent Variable: Investment**

**Fixed Effects Model**

Variable	Co-efficient	t-value	P-value
Cash Flow	0.262	5.9131	0.00001
Tobin's Q	0.148	6.0858	0.00001
Sales	0.031	6.7355	0.00001
Constant	0.158	4.8203	0.00002
R-squared	0.405	F-statistics	36.658
Adjusted R-squared	0.393	Prob(F-statistics)	0.0000

From the above table 3 the result of 1670 observations bases on 10 years' data with combined opportunities firms of Karachi Stock Exchange stated that the minimum level of average investment in this period is 0.158. When all predictors considered to be zero that is the least value of average investment which prevails in the manufacturing firms of KSE during this 10 years' period and this value is significant as the P-value of constant is less than  $\alpha = 0.05$ . The co-efficient of cash flow of all firms stated 0.262 positive relationship with investment (average one unit change in cash brings 0.262 units change in average investment) and this relationship is significant because its P-value is less than  $\alpha = 0.05$ . The co-efficient of sales is 0.031 which explains that the relationship between sales and investment is also positive and shows that (average one unit change in sales regress .031 units change in average investment) and this relationship is also significant because the P-value of sales is too much lower from the level of significance when  $\alpha = 0.05$ . In the same period the co-efficient of Tobin's Q 0.148 also shows positive relationship with investment (average one unit change in Tobin's Q effect 0.148 units change in average investment) and this relationship is also significant because its P-value is less than  $\alpha = 0.05$ . The value of R-square 0.405 and Adjusted R-square 0.393 respectively that explains 40.5% variation in average investment explained by cash flow, sales and Tobin's q and it is shows strong impact on investment due to these three predictors. F-statistics shows F (169, 1500) 36.6557 with a P value 0.0000 which is less than  $\alpha = 0.05$  stated highly significant and it is strong evidence that overall model is successful. So, the relationship between cash flow and investment for all firms is positive and significant.

**Table 4**

**Model 2**

$$I_{it} = \alpha_i + \beta_1 CF_{it} * HQ_{(D)} + \beta_2 Q_{it-1} + \beta_3 S_{it-1} + \varepsilon_{it}$$

**Dependent Variable: Investment**

<b>Fixed Effects Model</b>			
<b>Variable</b>	<b>Co-efficient</b>	<b>t-value</b>	<b>P-value</b>
CF*HQ	0.246	11.1837	0.00001
Tobin`s Q	0.128	4.9901	0.00001
Sales	0.030	6.4240	0.00001
Constant	0.197	5.9081	0.00001
R-squared	0.387	F-statistics	36.744
Adjusted R-squared	0.379	Prob(F-statistics)	0.0000

From the above table 4 the result of 1670 observations bases on 10 years' data of Karachi Stock Exchange stated that the minimum level of average investment in this period is 0.197. When all predictors considered to be zero that is the least value of average investment which prevails in the manufacturing firms of KSE during this 10 years' period and this value is significant as the P-value of constant is less than  $\alpha = 0.05$ . The co-efficient of high opportunities firms cash flow stated 0.246 positive relationship with investment (average one unit change in cash brings 0.246 units change in average investment) and this relationship is significant because its P-value is less than  $\alpha = 0.05$ . The co-efficient of sales is 0.030 which explains that the relationship between sales and investment is also positive and shows that (average one unit change in sales regress .030 units change in average investment) and this relationship is also significant because the P-value of sales is too much lower from the level of significance when  $\alpha = 0.05$ . In the same period the co-efficient of Tobin's Q 0.128 also shows positive relationship with investment (average one unit change in Tobin's Q effect 0.128 units change in average investment) and this relationship is also significant because its P-value is less than  $\alpha = 0.05$ . The value of R-square 0.387 and Adjusted R-square is 0.379 respectively that explains 38.7% variation in average investment explained by cash flow, sales and Tobin's q and it shows strong impact on investment due to these three predictors. The Adjusted R-square stated their relative degree of freedom are large so R-square and adjusted R-square is almost same. F-statistics shows F (169, 1500) 36.77418 with a P value 0.0000 which is less than  $\alpha = 0.05$  stated highly significant and it is strong evidence that overall model is successful. So, the relationship between cash flow and investment for all firms is positive and significant in case if high investment opportunities.

**Table 5**

**Model 3**

$$I_{it} = \alpha_i + \beta_1 CF_{it} * LQ_{(D)} + \beta_2 Q_{it-1} + \beta_3 S_{it-1} + \varepsilon_{it}$$

**Dependent Variable: Investment**

<b>Fixed Effects Model</b>			
<b>Variable</b>	<b>Co-efficient</b>	<b>t-value</b>	<b>P-value</b>
CF*LQ	0.002	0.2122	0.83196
Tobin`s Q	0.145	5.8275	0.00001
Sales	0.032	6.9082	0.00001
Constant	0.182	5.4987	0.00001
R-squared	0.405	F-statistics	36.6438
Adjusted R-squared	0.393	Prob(F-statistics)	0.0000



From the above table 5 the result of 1670 observations bases on 10 years' data of Karachi Stock Exchange stated that the minimum level of average investment in this period is 0.182. When all predictors considered to be zero that is the least value of average investment which prevails in the manufacturing firms of KSE during this 10 years' period and this value is significant as the P-value of constant is less than  $\alpha = 0.05$ . The co-efficient of low opportunities cash flow of all firms stated 0.002 positive relationship with investment (average one unit change in cash brings 0.002 units change in average investment) and this relationship is insignificant because its P-value is greater than  $\alpha = 0.05$ . The co-efficient of sales is 0.032 which explains that the relationship between sales and investment is also positive and shows that (average one unit change in sales regress .032 units change in average investment) and this relationship is also significant because the P-value of sales is too much lower from the level of significance when  $\alpha = 0.05$ . In the same period the co-efficient of Tobin's Q 0.145 also shows positive relationship with investment (average one unit change in Tobin's Q effect 0.145 units change in average investment) and this relationship is also significant because its P-value is less than  $\alpha = 0.05$ . The value of R-square 0.4050 and Adjusted R-square is 0.393 respectively that explains 40.5% variation in average investment explained by cash flow, sales and Tobin's q and it is shows strong impact on investment due to these three predictors. The Adjusted R-square stated their relative degree of freedom are large so R-square and adjusted R-square is almost same. F-statistics shows F (169, 1500) 36.64389 with a P value 0.0000 which is less than  $\alpha = 0.05$  stated highly significant and it is strong evidence that overall model is successful. So, the relationship between cash flow and investment for all firms is positive and insignificant in case of low investment opportunities firms.

## CONCLUSION AND RECOMMENDATIONS

Modigliani and Miller has generated to the birth of a debate in their irrelevance theory regarding the cash flows and external financing could be completely replaced with one another and in their results of the theory to this point, numerous models have been planned to explore the investment behavior in the reaction to the accessibility of cash flows and cost linked with both cash flows and external finances in an unsatisfactory capital marketplace consisting of a variety of resistances similar to, agency issues, information asymmetry etc. This study is based on two definite objectives. Those objectives are 1) to investigate the relationship between investment and cash flow under high investment opportunities 2) to investigate the relationship between investment and cash flow under low investment opportunities. The objective of this section is to precise the overall work and summarize its main findings and conclusions. Furthermore, in the section implications as well as limitations of research will be elaborated and at the ends fruitful suggestions will be discussed for those who want to continue for future study. In order to complete the above mention objectives, this research is based on quantitative data along with all necessary information that support to accomplish these objectives. The objective of use of this technique is to investigate the relationship among investment and the level of cash flow of Pakistani firms listed in Karachi Stock Exchange (KSE). In the previous chapter hypothesis were generated to investigate the impact of three predictor variables (Cash flow, Sales and Tobin's Q) on single dependent variable investment. These findings revealed that the investment level in Pakistani firms is influenced due to internally generated cash flow as well as the generation of profits in future. These results are same as attained by Charlton et al. (2002); Kadappaldcam et al.(1998) and Kaplan and Zingales (1997). When the data is further classified with the help of Tobin's Q median into higher and lower investment opportunities (with interaction of cash flow and dummy of 1 and zero for classification of these firms) and then the relationship of these HQ and LQ firms cash flow on level of investment is also investigated.

In case of high investment opportunities firms the relationship of investment and cash flow is positive and significant. So the null hypothesis is rejected. The results are similar as investigated in USA Charlton et al. (2002) and in India Athey and Reeser (2000), they all revealed that the cash flow and investment have positive and significantly related. In the same context Pawlina et al. (2006) stated that the relationship of cash flow and investment is more sensitive for HQ firms because these firms face the problem of asymmetric information. These firms rely mostly on internally generated cash flow to reduce the cost of capital otherwise if the finance is acquired from external sources then it will increase the cost of funds.

In case of low investment opportunities firms such a relationship is also positive but insignificant and weakest explanatory power as compare to other predictors because its t ratio is lowest as compare to other predictors. So the null hypothesis is accepted. These result indicates that the high opportunities firms rely mostly on cash flow whereas the low investment opportunities firms use their cash flow for external investment projects from where they might generate much more as compare to invest internally. The results are very similar to the research of Degryse and De-Jong (2005) they concluded that firms having minor investment opportunities mostly rely on external finance. Their results are against the study of Athey and Reeser (2000) and Charlton et al. (2002) due to the problem of managerial discretion in Netherland. When data is further classified into two shifts of five years, each from (2004-2008) and (2009-2013) to check the impact of cash flow on level of investment. When Investment opportunities are high the relationship between HQ firms cash flow and level of investment is positive and significant in both five years shifts but the sensitivity is stronger in the second shift of five years from 2009-2013 as compare to first five years shift from 2004-2008. On the other hand when investment opportunities are low the association of LQ firms and level of investment is positive but insignificant in both five years shifts.

## Implications of the Study

This study highlighted numerous vital implication and the corporate decision makers as well as policy creator in Pakistan should adopt the results of this study to take effective results. One think is very clear that the use of results of current research in Karachi Stock Exchange (KSE) is very little. That's why the Government, its Ministry of Trade, Industry and Commerce as well all concerned authorities should play an important role together to boost up the Pakistani firms for maximum use of Karachi Stock Exchange (KSE) so that it should contribute effectively for the development of Pakistan's





International Journal of Management and Information Technology  
financial market. On the basis of this study corporate top management, executives as well as managers can take support for making decision for holding and distributing cash, as managing cash is a critical issue for survival and growth of organizations. The findings of this research is also a source of information for those who want to investigate the significance of stock market in less developed countries and motivate them for further study belonging to same issue for effective contribution in enhancing the financial market. This research will also provide assistance in deciding how much to investment as capital expenditure from availability of cash when the firms have higher opportunities and how much to investment when the opportunities are lower to forecast profitability. When profitability will increase it will provide a lowest cost source for investment.

## Limitations and Future Research Recommendations

Though this research has contributed some value in the form of extra understanding about investment and cash flow for financial manager insight but still it contains some limitation due to which a restriction come in the way for its general ability. First of all this study is only about non-financial manufacturing firms listed in Karachi Stock Exchange during 2004 to 2013 but provide no information about financial sector like insurance companies, banks and services sector which is now a day a top business sector in developing country like Pakistan. In calculating the value of Tobin's Q to measure investment opportunities market value of debt and replacement cost of assets are needed which cannot be taken from financial statements of the firms. There is not a single source available in developing countries from where this information can be obtained and it is also the limitation of this study. Furthermore, in this study the impact of firm size, age, energy crisis, managerial discretion, asymmetric information, government taxes on earning and ultimately on investment is excluded and future researchers can enhance the value of financial market by including these variables. Moreover, an alternative method to capture the investment opportunities Euler equation can be used instead of Tobin's Q. In addition, a study relating to comparison between two sectors like financial and non-financial as well as Pakistan's manufacturing firms with other Asian countries manufacturing firms can also be made in future.

## REFERENCES

1. Agung, J. (2000). Financial Constraint, Firms' Investments and the Channel of Monetary Policy in Indonesia. *Applied Economics*, 32(13), 1637-1646.
2. Ascioğlu, A. H. (2007). Information Asymmetry and Investment Cash Flow Sensitivity. *Journal of Banking and Finance*, 1036-1048.
3. Athey, M. J., & Reeser, W. D. (2000). Asymmetric Information, Industrial Policy, and Corporate Investment in India. *Oxford Bulletin of Economics and Statistics*, 62(2), 267-292.
4. Champan, D. J. (1996). Cash flow and firm's investment behaviour. *Applied Economics*, 28, 1037-1044.
5. Charlton, W. L. (2002). Industry and liquidity effects on corporate investment and cash flow relationship. *The journal of applied business research*, 131-142.
6. Chen, Q. G. (2007). Price Informativeness and Sensitivity to Stock Price Investment. *The Review of Financial Studies*, 20(3), 619-650.
7. Chirinko, R. a. (1995). Why Does Liquidity Matter in Investment Equations? *Journal of Money, Credit and Banking*, 27(2), 527-548.
8. Cleary, C. (1999). The Relationship Between Firm Investment and Financial Status. *The Journal of Finance*, 54(2), 673-692.
9. Cleary, C. (2000). The Sensitivity of Canadian Corporate Investment to Liquidity. *Canadian Journal of Administrative Sciences*, 17 (3) 217-232.
10. Degryse, H. &. (2005). Investment and Internal Finance: Asymmetric Information or Managerial Discretion? . *International Journal of Industrial Organization*, , 125-147.
11. Fazzari, S. a. (1993). Working Capital and Fixed Investment: New Evidence on Financing Constraints. *Rand Journal of Economics*, 24(3), 328-342.
12. Fazzari, S. H. (1988). Financing Constraints and Corporate Investment. *Brookings Papers on Economic Activity I*, 141-195.
13. Gilchrist, S. a. (1995). Evidence on the Role of Cash Flow for Investment. . *Journal of Monetary Economics*, 36,, 541-572.
14. Hoshi, T. K. (1991). Corporate Structure Liquidity and Investment : Evidence from Japanese Panel Data. *Quarterly Journal of Economics*, 106,, 33-60.
15. Jafari H. (2004). The relationship between IOS with debt level and operating cash flow,. *M.A. dissertation, Tehran*.
16. Jalilvand, A. a. (1984). Corporate Behaviour In Adjusting to Capital Structure and Dividend Targets: An Economic Study. *Journal of Finance*,, 33-60.



17. Kadapakkam, P. K. (1998). The Impact of Cash Flows and Firm Size on Investment: the International Evidence. *Journal of Banking and Finance*, 22, 2933-20.
18. Kaplan, S. a. (1997). Do Investment-Cash Flow Sensitivities Provide useful Measures of Financing Constraints? *The Quarterly Journal of Economics*, 112., 169-215.
19. Kee H. Chung, P. W. (1998). Investment opportunities and market reaction to capital expenditure decisions., *Journal of Banking & Finance* 22 , 41-60.
20. Kholdy, S. a. (2001). Internal Finance and Corporate Investment. *The Financial Review*, 37 (2), 97-114.
21. Lamount, O. (1997). Cash Flow and Investment: Evidence from Internal Capital Markets. *The Journal of Finance*, 52(1), 83-109.
22. Lang, L. O. (1996). Leverage, investment, and firm growth. *Journal of Financial Economics*, 40(1),, 3-29.
23. Modigliani, F., & Miller, H. M. (1958, June). The Cost of Capital, Corporation Finance and Theory of the Investment. *The American Economic Review*, 48(3), 261-297.
24. Myers, S. C. (1984). Corporate Financing and Investment Decisions When Firms Have Information That Investors Do Not Have. . *Journal of Financial Economics*, 13, 187-221.
25. Oliner, S. a. (1989). Internal Finance and Investment: Testing the Role of Asymmetric information and Agency Cost. *Working Paper (101), Economic Activity Section, Division of Research and Statistics, Federal Reserve System, Oliner.*
26. Pawlina, G. &. (2006). Is Investment Cash Flow Sensitivity Caused by Agency Costs or Asymmetric Information? Evidence from the U K. . *European Financial Management Journal*, 11(4), 483-513.
27. Rahman, M. A. (2004). The Impact of Cash Flow on Investment: The Case of Jordan. *Coventry University, Jordan.*
28. Rizzo, J. a. (1995). Financing Constraints and Investment: New evidence form the Hospital Industry Data. *Journal of Money, Credit and Banking*, 27(4), 1002-1014.
29. Robert E. Carpenter, A. G. (2003). Cash Flow, investment, and investment opportunities: New tests using UK panel data. *Discussion Paper*, 1-34.
30. Schaller, H. (1993). Asymmetric Information, Liquidity Constraints, and Canadian Investment. *Canadian Journal of Economics*, 36 (3), 552-574.
31. Stiglitz J. and Weiss, A. (1981). Credit Rationing in Markets with Imperfect Information. *The American Economic Review*, 71(3), 393-410.
32. Thirumalaisam, D. R. (2013). Firm Growth and Retained Earnings Behavior – A Study on Indian Firms. *European Journal of Business and Management* , Vol.5, No.27 , 40-57.
33. Tobin, J. (1969). A General Equilibrium Approach to Monetary Theory. *Journal of Money, Credit, and Banking*, 15-29.
34. Watson, W. a. (2002). Small and Medium Size Enterprise Financing: A Note on some of the Empirical Implication of a Pecking Order. *Journal of Business Finance and Accounting*, Vol. 29, 557-578.



This work is licensed under a [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/).