

# Impact of Capital Structure on Firm Performance: Evidence from Pakistani Firms

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## Abstract

An attempt was made to analyze the impact of capital structure on firm performance of 63 companies listed on Karachi Stock Exchange. Data comprised of 5 years, 2007 to 2011. Balance Sheet Analysis issued by State Bank of Pakistan was used for data collection. Fixed Effects Model was used as pooled regression model to find the relationship between firm performance (ROA, ROE, ROS) and capital expenditure (DTA, EQA, LDA). Results showed that there does exist a relationship but direction of the relationship was mixed. Capital structure showed positive impact on firm performance when return on assets (ROA) was used as dependent variable. When return on equity (ROE) was used as dependent variable then debt over assets ratio (DTA) showed positive impact but equity over assets ratio (EQA) and long term debts over assets ratio (LDA) revealed negative impact over dependent variable and when return on sales (ROS) was used as dependent variable then DTA and EQA showed negative link to ROS but LDA revealed positive impact over ROS. It was proved that capital structure has impact over firm performance so managers should adopt necessary carefulness while taking decisions regarding capital structure.

**Keywords:** Capital Structure, Firm Performance, Karachi Stock Exchange, Balance Sheet Analysis, State Bank of Pakistan

## Introduction:

The decision about capital structure plays a key role in maximizing firm value and performance of a firm. The decision about capital structure occupies the use of a combination of various sources of funds which a firm uses to finance its operations and for capital investments. These sources comprise the use of short term debt, long term debt, preferred stock and common stock or equity financing. All the firms do not use uniform capital structure; they differ in their financial decisions. It is a difficult task for managers to take decision about capital structure where risk and cost is minimized and can give more profits

and also can increase shareholder wealth. The relationship of decisions about capital structure with firm performance were suggested in a number of theories, most famous are Modigliani and Miller Theory (1958) and (1963), Agency Cost Theory (1976), Trade Off Theory (1977) and Pecking Order Theory (1984).

The Modigliani and Miller (1958) theorem which is also known as the capital structure irrelevance principle was proposed by Franco Modigliani and Merton Miller in 1958. They argue that under very restrictive assumptions of perfect capital market, investor's homogeneous expectations, tax-free economy and no transaction costs, capital structure do not play any role in determining firm value. Their succeeding preference of entirely debt financing is due to tax shield, in 1963, was a denial to traditional approaches, which advise an optimal capital structure, Modigliani and Miller (1963). In actuality, determination of optimal capital structure is not an easy job, Shoaib (2011). He argues that a firm may need to issue a number of securities in a combination of debt and equity to meet an exact mixture that can make best use of its value and having succeeded in doing so, the firm has achieved its optimal capital structure. Tradeoff Theory by Miller (1977) refers to the thought that a company prefers how much amount of debt finance and how much amount of equity finance to be used by considering costs and benefits. According to this, if firms are highly profitable, then they would prefer debt financing for increasing the shareholder wealth, further debt in a firm's capital structure gives more tax benefits. If a firm has low profit, then there is a larger probability of bankruptcy if it uses more debt. Pecking Order Theory (POT) developed by Myers and Majluf (1984) according to this if firms have high profits, then internal financing would be used for new projects which can maximize the value of shareholders. If retained earnings are not enough, then debt financing is preferred and if additional financing is required, equity is issued. The choice of retained earnings is preferred because it has nearly no cost. A range of research studies was performed to check the influence of the decisions of capital structure on the firm performance. As capital structure is chiefly based on two forms of finances that are equity and debt. Use of each form of financing explains the mixed and conflicting conclusion on firm performance. Jensen and Meckling (1976) express the sum of leverage in the capital structure of a firm influences agency conflicts among shareholders and managers, and so can change managers' behaviors and operating decisions, and it is proved by Ebaid (2009). The survival of information asymmetry is also a related concern in the decisions of the capital structure, Sheikh and Wang (2011). Environmental dynamism and competitive environment play a critical role in making the decisions of optimal capital structure.

Berger and Patti (2006) have proved that there is a positive relationship between capital structure and firm performance, Margaritis and Psillaki (2007), Cheng, Liu and Chien (2010), Park and Jang (2013) have also supported Berger and Patti (2006) when they found reliable evidences of a significant relationship between capital structure and firm performance. While, there is also a negative relation too between capital structure and firm performance, according to Antoniou, Guney and Paudyal (2008) and Soumadi and Hayajneh (2012). In this study, mixed results were founded regarding the impact of capital structure on firm performance. Some determinants of capital structure showed positive impact over firm performance while others showed negative.

The study is organized as follows:

In second section, relevant literature is discussed which showed different relationships among capital structure and firm performance. In third part, testable hypotheses are developed. Fourth part is comprised of research methodology. In fifth part

tests, results and discussions are explained regarding this study and study is concluded in sixth and last part and also showed some recommendations along with conclusion to this study.

### **Objectives of Study**

The study is conducted on non-financial firms fall under KSE 100 index of Karachi Stock Exchange. Objectives of study are as follows:

- To find out if there is any relationship between capital structure and firm performance.
- And if a relationship exists, then to find out direction of relationship that whether relationship is positive or negative.
- In case of existence of relationship between capital structure and firm performance it would also be revealed in this study that to what extent capital structure affect firm performance.

### **Limitations of Study**

There are total 652 companies listed on Karachi Stock Exchange (KSE) out of which non-financial companies were selected which were included in KSE 100 index, but due to unavailability of required data study sample reduced to 63 non-financial companies listed on KSE. Balance Sheet Analysis (BSA) available on State Bank of Pakistan's (SBP's) website, was used for data collection and the data was from years 2007 to 2011 because data prior to these years, for some companies, was not available on SBP's website and data after 2011 was also not available there. 13.70% of total firms were deducted due to unavailability of data.

### **Literature Review**

Raheman, Zulfiqar and Mustafa, (2007) conducted research on 94 non final companies listed on the Islamabad Stock Exchange (ISE) and used data from 1999 to 2004. Pearson's correlation and regression analysis to find relationship between capital structure and firm profitability were used and after analyzing financial statements of companies it is proved that capital structure does impact firm profitability. After studying 400 companies from 12 sectors and listed on the Tehran Stock Exchange (TSE), Pouraghajan, Malekian, Emamgholipour, Lotfollahpour and Bagheri (2012) found that there is a significant relationship between capital structure and firm performance. Nirajini and Priya (2013) used data of trading companies listed in Sri Lanka from year 2006 to 2010 and used correlation and multiple regression analysis and found that there is a significant relationship between capital structure and firm performance.

There are mixed results about the influence of capital structure on firm performance. Some of the researchers have found a positive relation and some found negative while others have concluded that capital structure and firm performance are correlated by both ways, positively and negatively. We also found evidence that there is no relation between capital structure and firm performance. By studying data from 1998 to 2002 of firms in Ghana positive relation was found between firm performance and capital structure, Abor (2005). Berger and Patti (2006) also found a positive relation between capital structure and firm performance as Abor (2005) found. Over the entire range of observed data, the relationship between capital structure and firm performance is positively correlated and increase in debt would lead to better firm performance, Margaritis and Psillaki (2007). Campello (2007) found that if debt is increased and firm's assets are more tangible then firm's performance will also increase compared to the rivals in the market. Jang, Tang and Chen (2008) examined that firm

value increases if only debt is used for financing activities. According to Cheng, Liu and Chien (2010) if the leverage is at a moderate level, then capital structure will be positively related to firm performance. Champion (2010) and Morogio and Erah (2010) also favored Margariti and Psillaki (2007) by finding that profitability is positively related to capital structure of firms. Chowdhury and Chowdhury (2010) conducted a research on 77 companies listed on the Dhaka Stock Exchange (DSE) and Chittagong Stock Exchange (CSE), results showed that capital structure does impact a company's performance and the correlation was strongly positive. Capital structure and firm performance are related to each other positively, Shoaib and Siddiqui (2011). Mustapha, Ismail and Badriyah (2011) randomly selected 235 Malaysian companies listed. It was concluded that a positive relation between leverage and profitability, asset tangibility and firm growth. Firm profitability is related to capital structure in a positive relation, that is, if capital structure increases, then profitability will also lead to a reasonable change increase, Aman (2011). Park and Jang (2013) also found a positive relation between capital structure and firm performance after examining the data from 1995 to 2008 of 308 restaurant firms. Debt can efficiently be used to reduce free cash flows and to increase firm profitability, Park and Jang (2013). Capital structure does impact firm performance in a positive way, Nirajini and Priya (2013) found after analyzing financial statements of companies in Sri Lanka. Mitani (2014) chose 799 manufacturing firms listed on the Tokyo Stock Exchange (TSE) and presented the evidence of positive correlation between leverage and market share under both types of competition, Cournot competition and Bertrand competitions.

Huang and Song (2006) conducted research on Chinese firms and found negative relation between capital structure and firm performance. Ghosh (2007) came to know that leverage is inversely correlated with profitability. Rao, Hameed, Hayee and Syed (2007) studied Oman firms and found that capital structure is negatively and significantly related to firm performance. Firms will be at competitively disadvantage which are indebted more than industry competitors, or which do not introduce new products on time, Chen, Chung, Ho and Lee (2007). When firms decide to find more investment opportunities, then they issue more debt they deviate from the optimum capital structure level, DeAngelo and DeAngelo (2007). The capital structure is negatively correlated with firm performance, King and Santor (2008). Firm profitability, share price performance and growth opportunities decline with an increase in leverage in market-based economies (UK and USA) and bank-based economies (France, Germany and Japan), reported by Antoniou, Guney and Paudyal (2008). Companies listed on the New York Stock Exchange (NYSE), excluding banking sector, were chosen to study the relationship of capital structure and firm performance and the results showed that debt ratio and profitability are negatively related and debt is also negatively related with growth and age but the asset structure has a positive relation to firm size, Talberg, Winge, Frydenberg and Westgaard (2008). After studying 650 Chinese companies, Cheng et al. (2010) came to know that capital structure and firm performance are negatively correlated as the high debt ratio. Onalapo and Kojala (2010) also proved that profitability is negatively affected by leverage. More profitable firms prefer lower leverage, Jang (2011). Soumadi and Hayajneh (2012) studied 76 Jordanian firms, including high financial leveraged companies and low financial leveraged companies and found that firm performance and leverage are correlated negatively. Capital structure has a negative relationship with operational firm performance, Muritala (2012). Mohamad and Abdullah (2012) used companies listed on Bursa Malaysia to identify the relationship between capital structure and firm performance and the impact of leverage on performance was negatively significant. Salim and Yadav (2012) used the data of

237 companies listed on the Bursa Malaysian Stock Exchange, from 1995 to 2011, and they found that debt is negatively related to profitability, but growth has a positive impact on firm performance, profitability was measured by return on assets (ROA), return on equity (ROE) and earnings per share (EPS). Smith, Chen and Anderson (2012), after studying 100 companies listed on the New Zealand stock exchange (NZX), proved that leverage has a positive relation with sales growth but it also decreases return on assets (ROA). Pouraghajan et al. (2012), used 400 companies listed on the Tehran Stock Exchange (TSE) which belonged to 12 sectors and they found that debt ratio is significantly and negatively related to firm performance. Tongkong (2012), by analyzing 39 real estate companies listed on the Stock Exchange of Thailand (SET), supported pecking order theory because the results showed that firms with higher growth opportunities prefer high levels of leverage and firms having higher profitability choose lower leverage level and they also found that capital structure and firm performance are negatively correlated. Al-Taani (2013) used short term debt to total assets (STDTA), long term debt to total assets (LTDTA) and total debt to equity (TDE) as indicators of capital structure and used return on assets (ROA) and profit margin (PM) as performance indicators to study 45 companies listed on the Amman Stock Exchange (ASE) and capital structure and firm performance were correlated negatively and insignificantly.

Firms with moderate level of long term debt, as in the market, will face an increase in sales, but firms with higher levels of debt standard will not have significant growth in sales or in market, Campello (2006). Seven European countries were used to find the relation between capital structure and firm performance and we come to know that in Spain and Italy, the relationship between capital structure and firm performance is significant and positive and that is negative in Germany, France, Belgium and Norway but insignificant in Portugal, Weill (2007). Low growth firms have a positive effect between capital structure and performance and high growth firms have a negative relation between capital structure and firm performance, Agarwal and Zhao (2007). A study conducted on 133 privatized firms in Europe and found that privatized firms are more profitable, less leveraged in French and Scandinavian zones while results are opposite in British zone, but the results are positively correlated in Easter zone, Arcas and Bachiller (2008). Relationship of capital structure is positively related to return on equity (ROE) but leverage's impact was negative in return on assets (ROA), Meng, Wang and Zhou (2008). Tsangao, Kuie-Chiu, Yao-Men and Chia-Hao (2009) found that impact of capital structure on firm performance is positive as well as negative too. Arbabiyan and Safari (2009) studying 100 Iranian firms found that short term debt and total debt are positively related to profitability while long term debts are in negative relation with ROE. Balance sheets and income statements of large sized enterprises (LSEs) of the manufacturing factory of Greece were used to find relation between capital structure and firm performance and it was proved that there is a significant relation between capital structure and gross and net profit and asset growth, Voulgaris, Asteriou and Agiomirgianakis (2010). Cheng et al. (2010) found evidence that if debt ratio is between 53.97% - 70.48%, then there is a positive relation between leverage and firm performance, but if the debt is more than 70.48% then that relation would be in reverse, these results were found after studying 650 Chinese firms. The relationship between leverage and firm performance is dual sided which means that performance is affected by capital structure positively and negatively also, Meng et al. (2010).

Some of the studied have revealed zero or very poor relation between leverage and firm performance, Tang and Jang (2007). Ebaid (2009) researched relationship between capital structure and firm performance. Data of 64 Egyptian firms between 1997 and 2005 and gross profit margin, return on assets (ROA) and return on equity (ROE) were used as



measures of performance and concluded that capital structure has poor on no impact on firm performance. Saeedi and Mahmoodi (2011), after using data from 2002-2009 of 320 firms listed on the Tehran Stock Exchange (TSE), found that there is no significant relation between capital structure and firm performance.

### **Hypotheses Development**

The relationship between capital structure and firm performance: Tang and Jange (2007) explained that there does not exist any relationship between firm performance and capital structure. Pearson's correlation and regression analysis were used to find the relationship between firm performance and capital structure and it was concluded that there exists a significant relationship between capital structure and firm performance, Raheman et al. (2007). Data of 64 Egyptian firms from 1997 to 2005 was used and it was found that there is no impact of capital structure on return on assets and return on equity, Ebaid (2009). There is no relationship between firm performance and capital structure, Saeedi and Mahmoodi (2011) found after studying 320 companies listed on the Tehran Stock Exchange and data was from 2002-2009. Nirajini and Priya (2013) also found that there is a relationship between capital structure and firm performance. After analyzing previous studies, we have concluded that there are two schools of thoughts regarding the relationship between capital structure and firm performance. One says that there is no relationship, but the other says that there exists a reliable relationship between capital structure and firm performance. So, designed null hypothesis and alternative hypothesis for this study are as follows:

H<sub>01</sub>: Capital structure does not have any relationship with firm performance.

H<sub>11</sub>: There exists a relationship between capital structure and firm performance.

Positive and Negative relationship between capital structure and firm performance: There is a positive relationship between capital structure and firm performance in Ghana, Abor (2005). Increase in debt lead to an increase in firm performance which shows a positive relationship between capital structure and firm performance, Margaritis and Psillaki (2007). Chowdhury and Chowdhury (2010) also explained that firm performance is in a positive relationship with firm capital structure after studying 77 companies of Bangladesh. Mustapha et al. (2011) also found a positive relationship between capital structure and firm performance when they analyzed financial statements of 235 companies listed in Malaysian stock exchanges. Restaurant firms were used to analyze the relationship of capital structure on profitability and results showed that there exists a positive relationship, Park and Jang (2013). Nirajini and Priya (2013) also found that capital structure has a positive influence on profitability. Mitani (2014) chose 799 firms from Japan and showed that leverage does have a positive relationship with firm performance.

There is a negative relationship between capital structure and firm performance of Chinese firms, Huang and Song (2006). Profitability and share price performance reduce with an increase in leverage, Antoniou et al. (2008). Negative relationship exists between capital structure and firm performance in companies listed on the New York Stock Exchange, Talberg et al. (2008). As debt ratio increases, firm profitability decreases in 650 Chinese companies, Cheng et al. (2010). Soumadi and Hayajneh (2012) proved that capital structure and firm performance are correlated negatively in Jondanian firms, whether these are highly leveraged firms or low leveraged firms. Mohamad and Abdullah (2012) also found a negative relationship between capital structure and firm performance in companies listed on Bursa

Malaysia. Debt is negatively related to profitability in 237 companies listed on Bursa Stock Exchange Malaysia, Salim and Yadav (2012). Tongkong (2012), gave the evidence of a negative relationship between leverage and profitability in 39 real estate Thailand firms. Al-Taani (2013) also explained the nature of the relationship between capital structure and firm performance, which was negative in nature. Under consideration of these above mentioned references, null and alternative hypotheses as follows:

H<sub>02</sub>: There exists a negative relationship between capital structure and firm performance.

H<sub>12</sub>: There exists a positive relationship between capital structure and firm performance.

## Research Methodology

### Sample and Data Source:

Raheman et al. (2007) selected 94 non-financial firms, listed on Islamabad Stock Exchange (ISE), for their study and they used data from year 1999 to 2004 and used financial statements for data collection but in our study first of all we selected non-financial companies, 26 sectors, listed on Karachi Stock Exchange (KSE) and which also fall under KSE 100 Index, which were 73 in number and then we excluded companies which did not have sufficient data and our sample further reduced to 63 non-financial firms and due to unavailability of insufficient data one more sector named Technology Hardware & Equipments was excluded from study sample. In this study Balance Sheet Analysis (BSA) available on State Bank of Pakistan's (SBPs) website is used to extract useful data from the year 2007 to 2011 and reliable data prior to this time period and after 2011 was not available in BSA. In study sample, 25 sectors are included and excluded sectors named Commercial Banks, Non-Life Insurance, Equity Investment Instruments, Real Estate Investment and Services and Life Insurance and detail about included sectors is given in the following table.

Table 01:

*Details of Sample Sectors*

Sr. #	Sample Sectors	Total Firms in KSE 100 Index	Sample Firms	% of Sample Firms
1	Oil and Gas	9	9	14.2857
2	Fixed Line Telecommunication	1	1	1.5873
3	Electricity	6	4	6.3492
4	Chemicals	9	6	9.5238
5	Construction and Materials (Cement)	9	9	14.2857
6	Multi-utilities (Gas and Water)	2	2	3.1746
7	Food Producers	5	4	6.3492
8	Personal Goods (Textile)	6	5	7.9365
9	Industrial Metals and Mining	2	1	1.5873
10	Support Services	1	1	1.5873
11	Household Goods	1	1	1.5873
12	Pharma and Bio-Tech	2	1	1.5873
13	Tobacco	1	1	1.5873
14	General Industrial	5	5	7.9365
15	Industrial Transportation	1	1	1.5873

16	Forestry (Paper and Board)	1	1	1.5873
17	Automobile and Parts	3	3	4.7619
18	Software and Computer Services	1	1	1.5873
19	Health Care Equipment & Services	1	1	1.5873
20	Media	1	1	1.5873
21	Engineering	1	1	1.5873
22	Travel and Leisure	1	1	1.5873
23	Electronic and Electrical Goods	1	1	1.5873
24	Beverages	1	1	1.5873
25	Liesure Goods (Miscellanious)	1	1	1.5873
<b>Total</b>		<b>73</b>	<b>63</b>	<b>100</b>

### Variables

Three types of variables are used in this study which are firm performance as dependent variables (measured by ROA, ROE and ROS), independent variable which is capital structure (measured by D/A, LTDA and E/A) and variables other than independent variables, control variables, which also affect firm performance are assets utilization (measured as assets turnover), size of the firm (measured as net assets and net sales), earnings (measured as earnings per share), dividend payout (measured as dividend payout ratio), share performance (measured as share price) and growth (measured as capital expenditure ratio, change in assets and change in sales).

Table 02:

#### Details of Variables

<b>Dependent Variables</b>			
<b>Variable</b>	<b>Measurement</b>	<b>Formula</b>	<b>Reference</b>
Firm Performance	Return on Assets (ROA)	$\frac{\text{Earnings Before Interest \& Tax (EBIT)}}{\text{Total Assets}}$	Joliet and Muller (2013), Al-Taani (2013), Visic (2013), Mitani (2014)
	Return on Equity (ROE)	$\frac{\text{Earnings Before Interest \& Tax (EBIT)}}{\text{Total Equity}}$	Pouraghajan et al. (2012), Visic (2013), Nirajini and Priya (2013)
	Return on Sales (ROS)	$\frac{\text{Earnings Before Interest \& Tax (EBIT)}}{\text{Total Sales}}$	Kahle and Shastri (2005), Voulgaris et al. (2010), Al-Taani (2013)
<b>Independent Variables</b>			
<b>Variable</b>	<b>Measurement</b>	<b>Formula</b>	<b>Reference</b>
Capital Structure	Debt to Assets (DTA)	$\frac{\text{Total Debts}}{\text{Total Assets}}$	Pouraghajan et al. (2012), Tongkong (2012), Nirajini and Priya (2013)



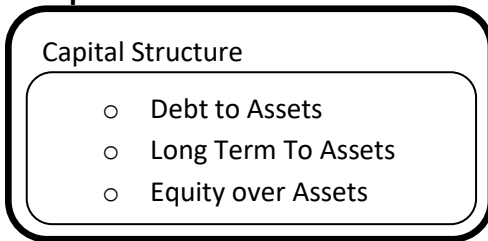
Equity over Assets (EQA)	Total Equity / Total Assets	Lee and Hsieh (2013), Nirajini and Priya (2013)
Long Term Debt to Assets (LDA)	Long Term Debt / Total Assets	

<b>Control Variables</b>	<b>Measurement</b>	<b>Formula</b>	<b>Reference</b>
Assets Utilization	Assets Turnover (SLA)	Sales to Assets Ratio	Voulgaris et al. (2010), Muritala (2012), Pouraghajan et al. (2012), Smith et al. (2012), Soumadi and Hayajneh (2012), Dewalheyns and Hule (2012)
Size	Net Assets (AST)	ln(assets)	
	Net Sales (SAL)	ln(sales)	Tongkong (2012), Park and Jang (2013), Mitani (2014), Antoniou et al. (2008)
Earnings	Earnings per Share (EPS)	Net Profit after Tax / No. of Ordinary Shares	Antoniou et al. (2008), Chowdhury and Chowdhury (2010)
Dividend Payout	Dividend per Share (DPS)	Dividend / No. of Ordinary Shares	
Share Price Performance	Market of Share (MPS)	Market Price of Share	Antoniou et al. (2008), Chowdhury and Chowdhury (2010)
Growth	Capital Expenditure over Assets (CEA)	$(\Delta \text{ in Assets} - \Delta \text{ in Liabilities}) / \text{Total Assets}$	Smith et al. (2012)
	Percentage Change in Assets (PRA)	$((\text{Current Year's Assets} / \text{Previous Year's Assets}) - 1) * 100$	Voulgaris et al. (2010), Salim and Yadav (2012), Soumadi and Hayajneh (2012),
	Percentage Change in sales (PRS)	$((\text{Current Year's Sales} / \text{Previous Year's Sales}) - 1) * 100$	Smith et al. (2012), Dewaelheyns and Hulle (2012), Park and Jang (2013),

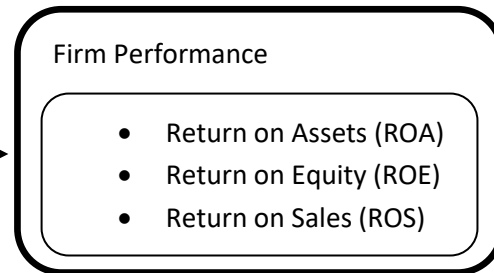
### Conceptual Model

Park and Jang (2013) and Nirajini and Priya (2013) also used conceptual model. The conceptual model for this study is given below:

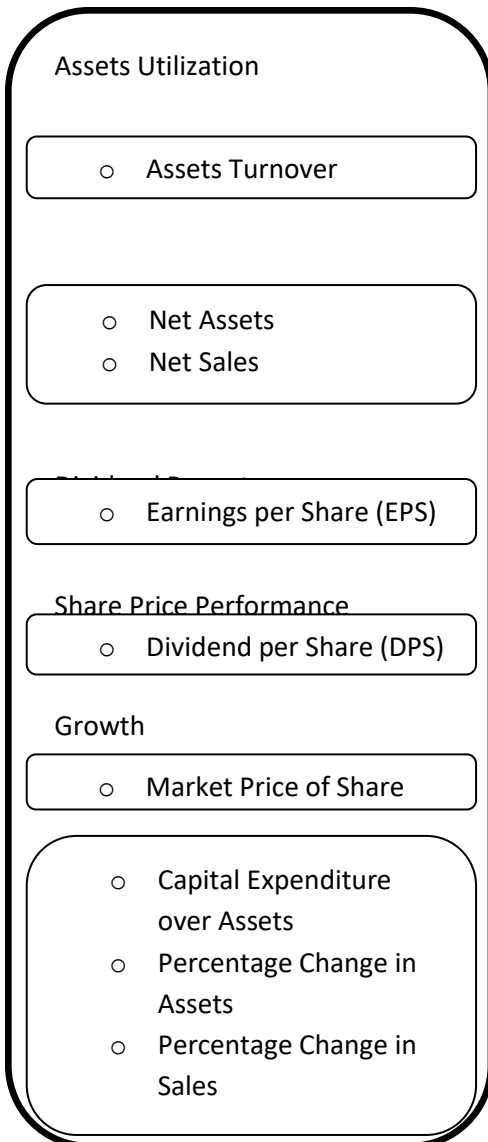
**Independent Variable**



Dependent Variable



**Control Variables**



Conceptual model shows independent and control variables affecting dependent variable.

For analysis of sample data, regression model will be used as Raheman et al. (2007), Chowdhury and Chowdhury (2010), Muritala (2012), Park and Jang (2013), Mitani (2014) used for their studies. For all of three measurements of dependent variable, multiple regression models are as follows:

$$ROA = C + \beta_1 DTA_{i,t} + \beta_2 EQA_{i,t} + \beta_3 LDA_{i,t} + \beta_4 AST_{i,t} + \beta_5 CEA_{i,t} + \beta_6 DPS_{i,t} + \beta_7 EPS_{i,t} + \beta_8 MPS_{i,t} + \beta_9 PRA_{i,t} + \beta_{10} PRS_{i,t} + \beta_{11} SAL_{i,t} + \beta_{12} SLA_{i,t} + \epsilon_{i,t}$$

$$ROE = C + \beta_1 DTA_{i,t} + \beta_2 EQA_{i,t} + \beta_3 LDA_{i,t} + \beta_4 AST_{i,t} + \beta_5 CEA_{i,t} + \beta_6 DPS_{i,t} + \beta_7 EPS_{i,t} + \beta_8 MPS_{i,t} + \beta_9 PRA_{i,t} + \beta_{10} PRS_{i,t} + \beta_{11} SAL_{i,t} + \beta_{12} SLA_{i,t} + \epsilon_{i,t}$$

$$ROS = C + \beta_1 DTA_{i,t} + \beta_2 EQA_{i,t} + \beta_3 LDA_{i,t} + \beta_4 AST_{i,t} + \beta_5 CEA_{i,t} + \beta_6 DPS_{i,t} + \beta_7 EPS_{i,t} + \beta_8 MPS_{i,t} + \beta_9 PRA_{i,t} + \beta_{10} PRS_{i,t} + \beta_{11} SAL_{i,t} + \beta_{12} SLA_{i,t} + \epsilon_{i,t}$$

Where;

ROA = return on assets, dependent variable, measurement of firm performance

ROE = return on equity, dependent variable, measurement of firm performance

ROS = return on sales, dependent variable, measurement of firm performance

DTA = debt over assets ratio, independent variable, measurement of capital structure

EQA = equity over assets ratio, independent variable, measurement of capital structure

LDA = long term debt over assets ratio, independent variable, measurement of capital structure

AST = ln of assets, control variable, measurement of size

CEA = capital expenditure over assets ratio, control variable, measurement of growth

DPS = dividend per share, control variable, measurement of dividend payout

EPS = earnings per share, control variable, measurement of earnings

MPS = market price of share, control variable, measurement of share price performance

PRA = percentage of assets, control variable, measurement of growth

PRS = percentage of sales, control variable, measurement of growth

SAL = ln of sales, control variable, measurement of size

SLA = sales over assets, control variable ratio, measurement of assets utilization

C = constant coefficient (intercept)

B = slope coefficient of independent and control variables

i = number of firms (63 in our case)

t = time period (5 years in our case)

$\epsilon$  = error term

## Tests, Results and Discussion

## Descriptive Statistics:

Table 03:

*Descriptive Statistics*

	<b>Obs.</b>	<b>Mean</b>	<b>Median</b>	<b>Max.</b>	<b>Min.</b>	<b>Std. Dev.</b>	<b>Skewness</b>	<b>Kurtosis</b>
ROA	315	12.8113	10.9150	58.2300	-59.2400	16.0762	0.0483	4.6590
ROE	315	25.4340	23.6800	442.4900	-451.9700	52.5161	-1.2722	37.8732
ROS	315	12.1452	9.6954	225.2833	-183.0716	23.9952	0.8750	35.4043
DTA	315	51.3665	52.1788	137.9368	2.3719	23.4289	0.0867	2.5428
EQA	315	48.0569	46.4471	130.8559	-37.9368	25.7139	-0.0998	2.6515
LDA	315	15.8874	9.1682	80.2902	0.0000	17.1236	1.1921	3.9114
AST	315	16.5171	16.6300	19.3864	12.2677	1.4090	-0.2574	2.8893
CEA	315	7.2502	5.8276	107.2326	-172.4206	19.9159	-1.2815	31.1976
DPS	315	8.6709	2.5000	125.0054	0.0000	18.4798	3.9286	19.7241
EPS	315	19.4890	9.4800	223.3800	-124.2000	35.4930	2.2214	12.3138
MPS	315	194.0967	69.8200	3597.1100	0.0000	416.0259	4.7963	30.7459
PRA	315	21.4416	14.0529	328.1966	-73.4443	36.6437	4.1440	31.9731
PRS	315	18.4063	14.9816	587.0531	-233.9018	45.9215	5.7163	79.0522
SAL	315	16.4534	16.4161	20.5255	0.0000	1.7623	-2.6199	25.8956
SLA	315	125.8464	98.7307	556.1798	0.0000	101.3191	1.7249	6.4406

The above table shows descriptive statistics of sample study, which includes a number of observations, mean values of variables, median, minimum and maximum values and standard deviation from the mean. According to above results number of total observations is 315 and mean value of return on assets is 13, return on equity has a mean of 25, return on sales show a good return with a mean value of 12, mean value of debt to assets ratio, which an independent variable and determines capital structure, is about 51, equity over assets is again independent variable and its mean value is 48, long term debt's mean is 16, natural log of assets has a mean value of about 16.52, capital expenditure ratio's mean is 7, dividend per share's mean is about 8.67 and mean of earnings per share is about 19.50, MPS's mean value is 194, percentage change in assets has a mean value of about 21, percentage change in sales is again good because mean value is about 18, natural log of sales shows mean value of about 16.50 and mean of sales over assets ratio is about 126.

Skewness is negative for return on equity, equity over assets ratio, natural log of assets, capital expenditure over assets ratio and natural log of sales, curve is negatively skewed in this case because extreme values are to the right and skewness is positive for return on assets, return on sales, debt over assets ratio, long term debt over assets ratio, dividend per share, earnings per share, market price of share, percentage change in assets, percentage change in sales and sales over assets ratio so we can say that data is positively skewed because extreme values are to left. Balanced normal distribution of skewness is zero.

Kurtosis is used to show the peakedness of flatness of the data. There are three types of kurtosis, platykurtic distribution, which shows low degree of peakedness or flatness, normal or mesokurtic distribution show normal distribution curve and leptokurtic distribution show high peakedness of the data. If kurtosis is less than 3 then its platykurtic distribution, if its equal to 3 then its mesokurtic distribution and if kurtosis shows values more than 3 then its leptokurtic distribution. Return on assets, return on equity, return on sales,

long term debt over assets ratio, capital expenditure over assets ratio, dividend per share,

Table 04:

*Pearson's Correlation Coefficients*

	ROA	ROE	DTA	EQA	LDA	AST	ROS	CEA	DPS	EPS	MPS	PRA	PRS	SAL	SLA
ROA	1.000														
ROE	0.571	1.000													
DTA	-0.369	-0.064	1.000												
EQA	0.291	0.049	-0.709	1.000											
LDA	-0.296	-0.241	0.328	-0.338	1.000										
AST	-0.017	-0.018	0.330	-0.380	0.202	1.000									
ROS	0.564	0.339	-0.302	0.216	-0.173	0.108	1.000								
CEA	0.324	0.063	-0.190	0.085	-0.082	0.046	0.138	1.000							
DPS	0.362	0.234	-0.070	0.044	-0.182	-0.028	0.093	0.065	1.000						
EPS	0.483	0.352	-0.121	0.044	-0.203	-0.001	0.298	0.133	0.802	1.000					
MPS	0.320	0.224	-0.013	0.027	-0.162	-0.039	0.060	0.050	0.809	0.722	1.000				
PRA	-0.042	-0.124	0.170	-0.170	0.080	0.081	0.097	0.218	0.009	0.080	0.013	1.000			
PRS	0.085	0.033	0.011	-0.045	0.038	0.024	0.089	0.079	0.042	0.085	0.016	0.094	1.000		
SAL	0.002	0.089	0.160	-0.132	-0.114	0.321	0.321	-0.004	0.053	0.151	-0.019	0.313	0.044	1.000	
SLA	0.184	0.234	0.146	-0.112	-0.336	-0.094	-0.152	-0.124	0.227	0.232	0.256	-0.117	0.078	-0.011	1.000

earnings per share, market price of share, percentage change in assets, percentage change in sales, natural log of sales and sales over assets ratio have kurtosis values more than 3, which shows leptokurtic distribution. Debt over assets ratio, equity over assets ratio and natural log assets have kurtosis value less than 3, which reveals flatness of data and it is platykurtic distribution.

**Correlation Analysis:**

If correlation is equal to or less than 0.20 then it's a weak correlation and if it's greater than 0.20 and equal to or less than 0.40 then it's not a good or better than bad correlation. Correlation above 0.40 and equal to or less than 0.60 then it's a moderate correlation and if it's more than 0.60 but equal to or less than 0.80 then it's a good correlation but if correlation is more than 0.80 then it's a very strong correlation. Significant or perfect correlation is at '1.0'. In above correlation, results are within range and are acceptable. Two correlation values are greater than 0.80 which show multi-co-linearity but it's ignored and acceptable in panel data analysis.

**Regression Analysis:**

For regression analysis, Fixed Effects Model is used after finding that which model would be efficient, Fixed Effects model or Random Effects model. For this purpose, we first used F-Test between Common Effects model and Fixed Effects model and found significant results supporting the use of Fixed Effects model, tabulated F-Test value was 1.32, and then the Hausman test is used to make decision regarding the use of either Fixed Effects model or Random Effects model. Drobetz and Wenzelried (2006), Chowdhury and Chowdhury (2010), Voulgaris et al. (2010), Tongkong (2012), Park and Jang (2013) and Mitani (2014) also used Hausman test.

**ROA as a Dependent Variable:**

For finding results, first of all return on assets was used as a dependent variable and results regarding return on assets as dependent variable are shown in table below;

Table 05:  
*Fixed Effects Model*

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	27.0765	24.3128	1.1137	0.2665
DTA	0.0027	0.0612	0.0437	0.9651
EQA	0.0698	0.0580	1.2030	0.2301
LDA	0.0288	0.0517	0.5566	0.5783
AST	-1.3371	1.3298	-1.0055	0.3157
CEA	0.1663	0.0289	5.7569	0.0000
DPS	-0.0052	0.0598	-0.0868	0.9309
EPS	0.1825	0.0208	8.7796	0.0000
MPS	-0.0006	0.0021	-0.2803	0.7795
PRA	-0.0180	0.0116	-1.5501	0.1224
PRS	-0.0050	0.0082	-0.6019	0.5478
SAL	-0.3891	0.4791	-0.8121	0.4175
SLA	0.0496	0.0109	4.5288	0.0000
R-squared	0.8962		F-statistic	27.9992
Adj. R-squared	0.8642		Prob. (F-stat.)	0.0000

Confidence Interval Significance is 95%

After applying Fixed Effects model, it was found that, in case of return on assets, calculated F-test value is greater than tabulated F value which tells that null hypothesis must be rejected and so it can be said that capital structure does have an impact on firm performance and first alternative hypothesis is accepted. Adjusted R square value also clearly define that 86.42% change in return on assets is due to leverage and other variables which are explained in the study and the variables which have not been used for this research have only 13.58% effect on return on assets. 0.00 values of probability show that model is perfect and is 100% significant and there are no much errors. This study also tells that correct variables were chosen for identifying the impact of capital structure on return on assets. Value of coefficient of intercept is 27.0765, which means that leverage is minimum 27.0765 for all the companies and it can also be concluded that leverage must have impact on performance of all companies and we also can say that all companies use a mixture of equity and debt. Coefficient of slope determines that due to one unit change in independent variable, dependent variable would change at given rate. In this study, in results from above table, slope coefficient will tells that how much change would occur in return on assets in case of one unit change in capital structure for all companies. Coefficient of slope also reveals positive or negative relation between capital structure and firm performance.

In these results, debt of assets ratio has an impact of 0.0027 on return on assets, which means that one unit change in debt over assets ratio would result in 0.0027 change in return on assets. Standard error is 0.0612 and after correcting standard error, results will get little different and debt over assets ratio will show negative impact on return on assets. But the



results showed in above table regarding relationship between return on assets and debt over assets ratio are highly insignificant at 0.9651 probability, this might be because of fewer number of years used in our study.

Coefficient of slope between equity over assets ratio and return on assets is again low, but better than debt over assets and return on assets relationship. In this case slope coefficient is at 0.0698, which shows that one unit change in equity over assets ratio will lead to a change in return on assets of 0.0698. Standard deviation is 0.0580, after correcting this error we would still have a positive relation between equity over assets and return on assets. Probability value is 0.2301, which is very low than that of previous case which again shows preference of firms over equity rather than debt.

Coefficient of slope of relationship between long term debts and return on assets is 0.0288, which reflects positive relationship of long term debt over assets ratio with return on assets but standard error for this relation is higher than slope coefficient, which tells that after correcting standard error of 0.0517, then long term debt over assets ratio would have negative impact on return on assets. Probability for relation between return on assets and long term debt over assets ratio is 0.5783, which is again insignificant like previous both relations but it is better than debt over assets ratio' relationship with return on assets and worse than relationship of return on assets with equity over assets ratio.

When the relationship of return on assets with control variables is analyzed then the results show that natural log of assets, dividend per share, percentage change in assets, percentage change in sales and natural log of sales have negative and insignificant relationship with return on assets. Market price has insignificant but very low negative impact on return on assets. Capital expenditure over assets ratio, earnings per share and sales over assets ratio have positive impact on return on assets and these all have significant impact on return on assets.

#### ROE as a Dependent Variable:

Table 06:

Fixed Effects Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-215.4796	158.9814	-1.3554	0.1766
DTA	0.4562	0.3991	1.1431	0.2541
EQA	-0.2968	0.3784	-0.7845	0.4335
LDA	-1.1277	0.3375	-3.3418	0.0010
AST	12.1000	8.6914	1.3922	0.1652
CEA	0.5147	0.1884	2.7318	0.0068
DPS	-0.1633	0.3901	-0.4185	0.6760
EPS	0.6785	0.1366	4.9660	0.0000
MPS	0.0003	0.0136	0.0191	0.9848
PRA	-0.4094	0.0756	-5.4173	0.0000
PRS	-0.0227	0.0537	-0.4223	0.6732
SAL	1.9834	3.1262	0.6345	0.5264
SLA	0.0879	0.0714	1.2317	0.2193
R-squared	0.5838		F-statistic	4.5300
Adj. R-squared	0.4549		Prob. (F-stat.)	0.0000

Confidence Interval Significance is 95%

When return on equity used as dependent variable and analyzed the relation of return on equity with independent variables, it was found that there exists a relation of capital structure with return on equity because F-value of this model which is 4.53, is greater than F tabulated, which is 1.32 and null hypothesis of first case is rejected and there exists a relation between firm performance and capital structure. Probability of 0.00 shows the fitness of this model and adjusted R square value is 45.49%, which shows that 45.49% change in return on equity is due to the independent variables used in this study and variables which were not used have 54.51% impact on return on equity. Coefficient of intercept is very low in this case which is -215.4796 and it tells that if return on equity is considered as dependent variable then all of the companies do not use debt at all, instead all companies go for equity and leverage is zero then. Standard error of estimation is 158.9814 for coefficient of intercept, that means that if standard error is equalized then there would again be a negative intercept and that would again tells that firms do not go for debt financing. Coefficient of slope determines the rate of change in dependent variable due to independent variable. Probability is 0.1766, and it is insignificant.

Debt over assets ratio has a positive relation with return on equity, so second null hypothesis. One unit change in debt over assets ratio would lead to a change in return on equity of 0.4562. Standard error of estimation is 0.3991, which shows that debt over assets ratio has a positive impact on return on equity even if standard error is minimized or removed. But these results are insignificant at 0.2541 probability level, that might be because less number of years used in this study, less number of firms and not a handsome number of sectors used in this study.

Equity over assets ratio has a negative impact on return on equity that is -0.2968. it means that one unit change in equity over assets ratio would decrease return on equity by -0.2968, impact of equity over assets ratio on return on equity can be positive if standard error of estimation is removed, which is 0.3784. and this result is again insignificant because probability is 0.4335.

In this study, coefficient of slope is -1.1277 which prove that one unit change in long term debt over assets would lead to a change of -1.1277 in return on equity but its standard error is 0.3375 which would convert results in case of removal of standard error of estimation. Result is highly significant because in this case probability is 0.0010 which is less than 0.05. From this result it can be said that firms which go for long term debt will face reduction in return and will also face bankruptcy risk but they can save tax cost.

Natural log of assets, capital expenditure over assets ratio, earnings per share, market price of share, natural log of sales and sales over assets ratio have positive impact on return on equity and only capital expenditure over assets ratio and earnings per share have significant results. Dividend per share, percentage change in assets and percentage change in sales have negative impact over return on equity but only percentage change in assets have significant relation with return on equity. From this results, we also can say that market price of share has very poor impact over return on equity.

### ROS as a Dependent Variable:

Table 07:

Fixed Effects Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	62.9898	51.0837	1.2331	0.2188
DTA	-0.1727	0.1286	-1.3429	0.1806

EQA	-0.0524	0.1219	-0.4298	0.6677
LDA	0.1899	0.1087	1.7470	0.0819
AST	-12.3145	2.7940	-4.4075	0.0000
CEA	0.1318	0.0607	2.1723	0.0308
DPS	-0.3784	0.1257	-3.0114	0.0029
EPS	0.3834	0.0437	8.7801	0.0000
MPS	0.0000	0.0044	-0.0085	0.9932
PRA	0.0202	0.0243	0.8285	0.4082
PRS	-0.0135	0.0173	-0.7836	0.4340
SAL	10.2019	1.0067	10.1341	0.0000
SLA	-0.0972	0.0230	-4.2267	0.0000
R-squared	0.7923		F-statistic	12.3713
Adj. R-squared	0.7283		Prob. (F-stat.)	0.0000

Confidence Interval Significance is 95%

Adjusted R square is 72.83%, which means that 72.83% change in return on sales is due to independent variables used in the study or it can also be said that independent variables used in this research have 72.83% impact over return on sales. Adjusted R square value proves that capital structure does have an impact over firm performance. F test value is 12.3713 and tabulated F test value is 1.32 so it can be said that there exists relationship between capital structure and firm performance and first null hypothesis can be rejected here. 0.00 probability value shows fitness of the model used in this study which is Fixed Effects Model. The value of coefficient of intercept is 62.9898 which shows that in this case firms are highly levered and managers prefer debt financing over equity finance. Standard error for intercept is 51.0837 and if its removed even then coefficient of intercept would be in positive, which would reflect that firms prefer to take debt risks rather than equity risks. Probability value is 0.2188 which is more than 0.05 and which shows that this result is insignificant. Insufficient number of years' data can cause this insignificance. Coefficient of slope determines the rate of change in dependent variable, which is return on sales in this case, due to one unit change in independent variables. Coefficient of slope also determines the direction of slope, which means it also tells that whether relationship between depend and independent variable is negative or positive.

Debt over assets ratio has a negative impact over return on sales. That is -0.1727, it tells that one unit change in debt over assets ratio would lead to a -0.1727 change in return on assets and this result reveals that firms do not go for debt financing, they use equity and manage decide to bear tax cost. Standard error of estimation is 0.1286 and if its managed to be minimized or even eliminated standard error, even then debt over assets ratio would affect return on sales inversely. Probability value is 0.1806, which is greater than 0.05 and is insignificant.

-0.0524 value of coefficient of slope in case of equity over assets ratio shows that after one unit change in equity over assets ratio, return on sales will change by -0.0524. Equity over assets ratio has negative impact over return on sales, because firms of sample tells that as long as firms keep to increase equity, their value of return on sales will tend to decrease and firms may face heavy losses. Standard error of estimation is 0.1219. Probability value is 0.6677 which shows that results are insignificant and need to be made significant.

Relationship between long term debts and return on equity is in positive and this relation's value is 0.1899. This value shows that long term debts over assets ratio has positive impact over return on sales and one unit increase in long term debt over assets ratio will lead to 0.1899 change in return on sales.

Natural log of assets, dividend per share, percentage change in sales and sales over assets ratio have negative impact over return on sales and natural log of assets, dividend per share and sales over assets ratio show significant results. Capital expenditure over assets, earnings per share, market price of the share, percentage change in assets and natural log of sales have positive impact over return on sales and only capital expenditure over assets, earnings per share and natural log of sales show significance of the results. In this study, along with finding evidence of impact of capital structure over firm performance, one more important evidence was also found that market price of share does not have any impact on return on sales.

**Discussion:**

This study is supported by Modigliani and Miller Theorem (1958) that if other things remain constant then capital structure does not have any impact over firm performance. But in today's world and in economy like Pakistan it is impossible to hold all the things at constant so above mentioned theorem is not applicable. Modigliani and Miller (1963) also explained that if other things get involved, then debt over assets ratio would be one that means that all of the financing is due to debt and equity is not used at all. In results found in this study, it can be proved that in some cases firm do prefer to use debt over equity. Equity over debt, assets over debt and long term debts over assets ratios are in positive in case of ROA as dependent variable and here MM theory (1963) can also be applied that if firms only use debt then they would have maximum profit. Coefficient of return on assets and return on sales is positive which shows that firms do use leverage. Muritala (2013) and Al-Taani (2013) also found positive coefficient of intercept.

This study is also supported by Trade-off Theory, which was presented by Miller in 1977, in this theory, it is said that firms can only earn high profits if their leverage is at optimal level. It is very difficult to choose optimum leverage level so there are always chances of errors while making choice between debt financing or equity financing. Debt over assets has positive impact over return on assets. Nirajini and Priya (2013) and Park and Jang (2013) also showed positive relation between debt over assets ratio and return on assets. Companies should use more debt to increase their profitability and firm performance. So, it can be said that in case of Pakistani firms, debt lead to an increase in profitability. Salim and Yadav (2012) and Nirajini and Priya (2013) in their study also showed positive relationship between return on assets and long term debt over assets ratio. In this study, coefficients of ROA and ROE are positive and it can also be said that slopes coefficients shows optimum level of leverage, which is very important to get maximum profit but it is very difficult to have optimum level of leverage because managers own will power can make them take inefficient decisions, which in short term might benefit company but in long term may cause damage. This is because of information asymmetry which was proposed by Jensen and Mecklin in 1976 as Agency Theory. Agency problem can be reduced by giving managers ownership in the company so that they would consider their own interest while making decisions of choosing capital structure and then they might be able to develop an optimum capital structure for the firm but when managers do not have ownership in the firm then they might not consider advantage of shareholders and might decide to invest by acquiring more debt rather than issuing new stocks. In this study, in case of ROE, debt over assets ratio is 0.4562 which determines

managers' behavior regarding capital structure that they decide to use 45.62% debt and 54.38% equity for financing activities.

Pecking Order Theory, which was proposed by Myers and Majluf in 1984, determines that firms first of all decide to use internal financing such as retained earnings and reserves and then they decide to go for debt financing, after debt financing preferred stocks are issued and issuance of common stocks is considered as last resort. 62.9898 value of intercept in case of ROS shows that when managers have to decide that which source of financing is to be used first then they decide to use internal resources and if those are not sufficient then firms would acquire debt, as in this case, and if more investment is required to finance in projects then firms will issue stocks. Managers prefer to take risk regarding bankruptcy but they don't want bear tax cost. Big firms take decisions of acquiring more debt than equity because they don't have much risk of bankruptcy. When managers go for issuing equity rather than using debt than that means that firms avoid to bear bankruptcy risk but managers prefer to manage tax costs and explained by Soumadi and Hayajneh (2012) and Mohamad and Abdullah (2012) in their studies.

It can be said that there exists a relationship between capital structure and firm performance as Raheman et al. (2007), Pouraghajan et al. (2012) and Nirajini and Priya (2013) showed in their studies. In this study it is also found in some evidences that there exists positive relationship between capital structure and firm performance which was also proved by Margaritis and Psillaki (2007), Chowdhury and Chowdhury (2010) and Mitani (2014) in their researches. In some of the variables it was also found that also capital structure has negative impact over firm performance and we followed Muritala (2012), Mohamad and Abdullah (2012), Salim and Yadav (2012) and Al-Taani (2013).

### **Conclusion and Recommendations:**

From above research it can be concluded that there exists mixed relationships among capital structure and firm performance. In this study we have proved that capital structure does have an impact over firm performance and we can reject first null hypotheses. Acceptance and rejection of second null hypothesis depends upon variability of results. When we see relationship of return on equity with equity over assets ratio and long term debt over assets ratio and in case of impact of debt over assets ratio and equity over assets ratio on return on sales, in all four above scenarios we would accept second null hypothesis and would reject second null hypothesis in remaining cases regarding impact of capital structure over firm performance.

We have studied non-financial firms registered on Karachi Stock Exchange. Future studies can be done to find the impact of capital structure on firm performance of Asian firms or it can be used for world wide data, determinants of capital structure and finding optimal capital structure can also be used for study.

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