IMPACT OF FINANCIAL LEVERAGE ON FIRM PERFORMANCE: THE CASE OF LISTED OIL REFINERIES IN PAKISTAN

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Abstract

The Optimal capital structure has a great importance to every manager and board of directors of the company. The financial leverage is also a puzzle for the management, when it comes to form the best leverage that is most suitable for the firm's needs. Failure to put considerations on capital structure might lead to less profitability, loss, bankruptcy and decrease in the value of the firm's value. This study set out to investigate the impact of financial leverage on firm performance of the listed oil refineries in Pakistan. It took performance measures in a wider perspective by using ROE. In addition to financial leverage the study expanded its explanatory variables by controlling for liquidity and firm age. The data was collected from the financial statements of listed oil refineries in Pakistan. The study employed pooled regression analysis, from the secondary data taken from the financial statement of the listed oil refineries in Pakistan, from 2012 to 2016. It was founded that firm performance, measured by the proxy of return on equity had a significant negative relationship with financial leverage. On the other hand the control variables, firm age and liquidity had insignificant relationship with variable return on equity

Key Words: Return on equity, financial leverage, liquidity and firm age

Introduction

Every business wants to maximize its value through gaining profits. The financial decisions are one of the most important decisions for any firm. There are normally two types of financial decisions, long and short term decisions. The long term financial decisions regarding the capital structure are mostly about capital formation and dividends issuance. While the short term financial decisions are mainly concerned with liquidity and working capital. In this way when it comes to financial decisions making, the financial leverage is best utilized for the firm's performance.

The financial leverage is normally the amount of debt that a firm uses to finance its operations and buy more assets. Leverage is used to balance and avoid using too much equity to finance the operations of the firm. Similarly, an excessive amount of financial leverage increases the risk of loss, since if it's in excess amount; it becomes more difficult to repay the loan. So in this regard well balanced and an optimal financial leverage is required, which not only enhances the working of the firm, but also brings it profits.

The capital structure of an entity is the mix of its debt and equity that the entity uses to finance its real investments (Myers, 2001).

The decisions regarding the optimal capital structure (mix of debt and equity)that will ensure maximization of the firm's value falls under the financial managers (Maina and Kondongo, 2013).

Firm's performance and profitability is very important not only for the company itself, but also for the country's economy. If the firm's performance is good, then it will have positive effects on the socio economical atmosphere. The Government of the host country will be able to earn more taxes, which can be used further for the public welfare.

The oil refinery sector is one of the most important sectors of any economy. The energy is the key factor for the economy's growth. Although Pakistan is mostly an oil importing economy, however its refineries play a vital role for converting and refining different oil products. Since the past years the global oil industry has been in financial turmoil, with decreasing oil prices. The

OPEC and Non OPEC member states have come up with different solutions to overcome the global oil crisis, through the reduction of the oil supply and other agreed ways. The decisions of the OPEX and Non OPEC member's states have brought the global oil industry into a more stable position in the present state. The macro and micro economic factors have affected the oil refineries in Pakistan sternly.

The financial decisions, concerning the best use of financial leverage in order to have a positive performance of the oil refineries in Pakistan is essential. Therefore this research study sheds light on the impacts of financial leverage on profitability of thelisted oil refineries in the Pakistan stock exchange (PSX).

Objectives of the study

The present study attempts to measure the impact of financial leverage on the performance of the four listed oil refineries at Pakistan stock exchange (PSX), for a five year time period 2012 to 2016.

Review of Literature

Impact of leverage on firm's Performance

This section presents both theoretical and empirical literature review on financial leverage and how it affects profitability of the firms. It concludes with an overview of the literature and identifies the research gap.A large number of research studies in different industries and countries have been conducted to assess the impact of financial leverage on firm's performance.

Modigliani and Miller (1963) have documented that the value of levered firm's is higher because of the effects of tax- shield.

In the case of ten developing countries (Pakistan, India, Turkey, Malaysia, Thailand, Zimbabwe, Mexico, Brazil, South Korea, and Jordan), the negative relationship was founded between the financial leverage and firm performance measures (Booth et al., 2001).

Myers (2001) founded that's firms manage their priorities in financing, first by using internal financing, then debt and lastly new equities.

As for the US firms of banking industry, the results show thatthere is a strong relationship between higher financial leverage and firm performance (Berger et al., 2006).

Sanjay Bhayani (2009) in their research study founded that financial leverage has no impact on the firm's valuation in the Indian cement industry.

Ebaid, (2009), have studied listed non-financial Egyptian firms for a time period of 1997-2005 and founded that capital structure decision has a very weak to no significant impact on the firm's financial performance.

Sunderkötter (2011) studied the impacts of how expected stock return is affected by the fuel mix structure in power generations for European power companies. The sample size consisted of twenty two biggest listed European power producers from the period, January 2005 to December 2010. The results showed that the fuel mix generation significantly affects the stock returns of the biggest Europeanpower producing companies.

Pouraghajan and Malekian (2012) studied the impact of financial leverage on the firm's financial performance for firms in Tehran. They founded that there exists a significant negative relationship between financial leverage andfirm's financial performance.

Quang and Xin (2012) carried out research investigation of Vietnamese based firms and concluded that the financial leverage has a significant negative impact on firms financial Performance, the firm's performance was measured by using proxies of ROA and ROE.

Akhtar et al (2012) investigated the relationship between financial leverage and financial performance of fuel and energy firms in Pakistan. The sample size consisted of 20 listed companies from fuel and energy Industry, the time span was for the year 2000-2005.

Results of the researchshowed that the financial leverage has positive relationship with financial performance of the firms. The fuel and energy sector companies can enhance their financial performance and growth of economy if the optimal capital structure is improved.

Mireki, Mensah and Ogoe (2014), carried a research investigation, the impact of the market and book value's on the firm performance. The sample size was taken from listed firm in the Ghana stock exchange for the period, 2002-2007. It was founded that the financial leverage has an impact on the firm's performance; however the market value of the debt has a much higher impact than the book value.

Velnampy and Anojan (2014)studied the impact of Capital structure and liquidity on firm's profitability. The sample size consisted of all the listed telecommunication firms at the Colombo Stock Exchange, of the time period 2008-2012.The results fromcorrelation and regression showed that there is no significant impact of both liquidity and financial leverage on the firm's profitability.

Chadha and Sharma (2015) carried a research investigation on 422 BSE listed manufacturing firms of India from 2004 to 2013 to assess the impact of leverage on firm financial performance. They founded that financial leverage has no impact on the financial performance of the firm. The firm's financial performance was measured by using the proxy of ROA and Tobin's Q.

Hypothesis

The hypothesis that set for this paper is:

$H0_A$: Financial leverage has no significant positive relationship with firm financial performance of listed oil refineries in Pakistan

$H1_A$: Financial leverage has significant positive relationship with firm financial performance of listed oil refineries in Pakistan.

$H0_B$: Financial leverage has no significantnegative relationship with firm financial performance of listed oil refineries in Pakistan

$H1_B$: Financial leverage has a significant negative relationship with firm financial performance of listed oil refineries in Pakistan

METHODOLOGY

Introduction

This research is based upon secondary data. The secondary data is a quantitative data with empirical evidence; it's used to investigate the relationship among different variables.

It is normally assumed that financial leverage affects the performance of the firm. This study will investigate the impact of financial leverage on the financial performance of the listed oil refineries in Pakistan stock exchange (PSX). To test the hypothesis, the main variables used in the study consist of a dependent variable which is financial performance of oil refinery sector on the other hand independent variablesin the study consist of financial leverage of oil refinery sector. The control variables used in this study are liquidity and firm age.

The sample size consists of four listed oil refinery companies selected from the Pakistan stock exchange (PSX). The data for this research is collected from relevant annual reports of the oil refinery companies listed in the Pakistan stock exchange (PSX). Following is the list of the oil refinery companies that are taken in this research study:

Table 1 shows List of companies taken as sample for this study

Name of companies	PSX Symbol
1. Attock Refinery Limited.	ATRL
2. BYCO Petroleum Pak Ltd.	BYCO
3. National Refinery Ltd.	NRL
4. Pakistan refinery Ltd.	PRL

The Empirical Model Specification

The study used the following econometric models: -

ROEit = α +β1Lit +β2Liqit + β3Sizeit+β 4Ageit+ εit

Where:

α = constant term

β is the coefficient term

ROEit is the ROE of firm i at time t.

Lit is the leverage of firm i at time t

Liqit is the liquidity of firm i at time t.

Ageit is the age of firm i at time t.

εit – idiosyncratic disturbance t / error term

Previous studies that have used similar model include, Mule et al (2013) and Muriu (2011), and were modified appropriately

Definition and measurement of variables

The study aims at measuring the relationship of two mentioned variables. The financial performance will be measured by employing the two key proxies. The dependentvariableused for financial performance is return on equity (ROE). Inam and Munir (2014) also used this dependent variable to check the relationship between firm's financial performance and leverage of the energy and fuel industry in Pakistan. The independent variables to measure the financial leverage as a proxy would be leverage, while the control variables are firm age and liquidity. Leverage, firm age and liquiditywere also used by Ali (2013), to check the impact of financial leverage on firm performance of the non-financial firms in Kenya.

Dependent Variables

Return on equity (ROE)

Return on equity it's a firm's financial performance measure which shows the returns on shareholders' equity (Owalabi and Obida, 2012). Return on equity is the ratio of net income to average common stockholder's equity (Ross et al, 2003).

ROE =   Net Income /Average stockholders' equity

Independent Variables

Leverage (LV)

Leverage is defined as a ratio debt to total assets; it shows the extent in to which the firm depends on the debt financing, (Ross et al, 2003).

Leverage is measured by:

Leverage = Total debt /Total Equity   (Subaciene and Villis 2010)

Firm age (FA)

Coad et al (2013) founded both positive and negative relationship between firm age and its profitability. It is generally assumed older the firm the more experienced and resilient it becomes in the economic and financial situational. It can withstand market shocks and challenges. The number of years in operation was used as a proxy to firm age in this study.

Liquidity (LQ)

The liquidity refers to the ratio between the assets to liabilities of a firm. It assess the debtors ability to pay off short term debt. Firms use its liquid assets to handle commitments that are unexpected (Almajali 2012). In this study it was measured by:

Liquidity = Total current assets /Total current liabilities (Almajali, 2012).

Data analysis and results discussions

In this section, the results and analysis of the financial leverage and its particular effectiveness on performancesof the selected oil refineries are given. Hence, analysis was done by using the statistical software Eviews.

The below analysis shows the statistical results of thedifferent variables used as a proxy for financial leverage and the firm performance.

Table 2 shows Descriptive statistics

	ROE	LEV	FA	LQ
Mean	-20.55100	901.5190	48.50000	0.856052
Maximum	33.80000	4970.690	70.00000	1.844550
Minimum	-177.2000	41.64000	18.00000	0.232550
Std. Dev.	62.43663	1301.980	18.08605	0.446570
Skewness	-1.487128	2.052405	-0.708525	0.834921
Jarque-Bera	7.852850	24.17798	2.313474	2.323661

According to theanalysis of the data, maximumfinancial leverage is 4970.690 % in Pakistan's refinery sector and minimum is 41.64000 %. This also shows that most of the refinery firms are using leverage with the combination of equity.

The firms with high leverage ratio are more elastically capable in adverse situations. A high level of stockholder's equity provides a better edge and which can be regarded as a financial strength of the firm. On the other hand, return on equity (ROE) has a maximum and minimum value of 33.80% and -177.20%, respectively. Furthermore, Firm age (FA) has maximum 70 years since its commencement of business, while the minimum value is of 19 years. The firms having more years of business has a much better and mature management, which is associated with good firm's performance. Liquidity (LQ) on the other hand has a maximum and minimum value of 1.8445 and 0.2325 respectively. The mean value is 0.8560, which is less than 1. This indicates that liquidity isn't well maintained of the oil refinery companies.

Table 3 shows correlation matrix

	ROE	LQ	LEV	FA
ROE	1.000000			
LQ	0.205418 0.3849	1.000000		
LEV	-0.796221 0.0000	-0.203006 0.3907	1.000000	
FA	0.210479 0.3731	0.488638 0.0288	-0.075356 0.7522	1.000000

Table 3 shows, correlations of the sample size that is taken in the current research. In this, Pearson correlations (Table 3) show number of associations between the variables, with the

significance level. The return on equity (ROE) has statistically non-significant correlation coefficient with liquidity (LQ),(0.2054) and Firm Age (FA), (0.210).On the other hand, return on equity (ROE) has a statistically significant correlation with Leverage (LEV), (-0.796221) at 0.05%.

Table 4 shows Hausman Test

Correlated Random Effects - Hausman Test

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	3.317942	3	0.3452

In this current research, regression's analysis of panel was used. In previous studies, such as Ahmed et al (2012) also used regression analysis of panel data.

The Hausman test was used to check which model is appropriate. The results show that Probability level is greater than 0.05, which is an indication to reject the alternative hypothesis (fixed affect model appropriate); therefore we accept the null hypothesis (random affect model appropriate). In this regard, Random effect model is used.

Table 5 Shows the value of random effects model (ROE);

Dependent Variable: ROE

Method: Pooled EGLS (Cross-section random effects)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LVG	-0.037940	0.007095	-5.347497	0.0001
C	-10.16749	28.19669	-0.360592	0.7231
LQ	-5.309550	23.64124	-0.224588	0.8251

FA	0.584860	0.573210	1.020323	0.3228

Random   Effects

(Cross)

ARL--C	-4.17
BYCO--C	-9.85
NRL--C	6.47
PRL--C	4.50

Effects Specification

	S.D.	Rho
Cross-section random	1.08E-06	0.0000
Idiosyncratic random	39.41163	1.0000

Weighted Statistics

R-squared	0.657799	Mean dependent var	-20.55100
Adjusted R-squared	0.593636	S.D. dependent var	62.43663
S.E. of regression	39.80128	Sum squared resid	25346.27
F-statistic	10.25204	Durbin-Watson stat	2.043617
Prob(F-statistic)	0.000524		

The table 5 shows the results of the regression; we can see the dependent variable is return on equity (ROE) which is used as a proxy for firm performance. Similarly, in this model there are three independent variables, Leverage (LEV), Liquidity (LQ) and Firm age (FA). The prob (F statistics) is 0.000524, which is less than 0.005. This clearly shows that the model is appropriate furthermore the independent variables do jointly influence the dependent variable. Furthermore, we can see that leverage (LEV) has a significant negative relationship with return on equity (ROE), at 0.0001, which is less than 0.005. This implies that one unit increase of the leverage leads to the decrease of -0.037940 units of return on equity (ROE), holding other things constant. As for the previous research study, Nadeem et al (2015) also founded a significant negative relationship between leverage and firm's performance.

On the other hand, liquidity (LQ) and Firm age (FA) has insignificant relationship with return on equity (ROE), at 0.8251 and 0.3228 respectively. In a previous research study, Rehman et al (2015) also had an insignificant relationship between return on equity (ROE) and Liquidity (LQ).

Discussion of results

The correlation result shows insignificant correlation between the return on equity (ROE) and firm age (FA) and Liquidity (LQ). On the other hand, shows that return on equity (ROE) is negatively correlated with leverage (LEV).

As for the results from the regression, we can see that liquidity (LQ) and firm age (FA) have insignificant relationship with return on equity (ROE). Similar previous studies,Rehman et al (2015) also showed insignificant relationship between return on equity (ROE) and liquidity (LQ).

As for the insignificant relationship between Firm age (FA) and firm's performance, which is measured by using the proxy of return on equity (ROE), reasons why this relationship is insignificantand not positively related can be found in the previous studies, Lodererand Waelchli (2010), documented that as firms grow older, their profitability declines, firstly it consists of increase of costs, decline of growth, assets becoming obsolete due to technological advancement, and R&D falls.Their hypothesis was also supported that when firms age, they normally have large boards and high pays to the management and CEO.

In this study it was founded that leverage (LEV) has a negative relationship with return on equity (ROE), which is measure of firm's financial performance. As for a previous financial literature,Nadeem et al (2015) also founded a significant negative relationship between firms leverage and its performance. Similarly,Kunga (2015) also founded a negative relationship of financial leverage and performance of the firms listed in the Nairobi securities exchange. According to Kunga (2015), documented that the firms that finance themselves using debts, since the debt are costly, this might expose the firms to financial adversities.

Based upon the results and their analysis, it's founded that financial leverage has a significant negative relationship with the firm performance of the listed oil refineries in Pakistan. Therefore, the hypothesis, **H1$_B$**is accepted, while all the other hypotheses are rejected.

Conclusion

Based upon the findings it's therefore revealed that the financial leverage is negatively related with the performance of the listed oil refinery firms in Pakistan stock exchange (PSX). The study hence, concluded that the oil refinery firms should also consider taking alternative methods to financial their different projects instead of totally relying on the financial leverage. Thus, it can be argued that financial leverage can lead to the unsatisfactory performance of the oil refineries, due to the reasons of incurring extra costs of financing ofdebts that could overturn the profits from the projects in which investment is made. It's also that high level of financial leverage isn't good for the firm's financial health; on the contrary lower financial leverage is favorable, indicating less risk.

Recommendations

This research study recommends that listed oil refinery firms in Pakistan should alsoseek fordifferent ways of financing their projects other than using only financial leverage. Moreover the oil refinery firms listed in Pakistan stock exchange (PSX) should try to have lower values of financial leverage.

Suggestions for future research

The study recommends that future researchers interested in this particular area of research should consider investigating also in other sectors of the economy, along with other controllable variables.

References

- Ali, (2013). The Impact ofFinancial leverageonfirmperformance: The case of non-financial firms in Kenya. *University of Nairobi Digital Repository*

- Akhtar.S, Javed.B, Maryam.A, Sadia.H 2012, Relationship between Financial Leverage and Financial Performance: *Evidence from Fuel & Energy Sector of Pakistan. European Journal of Business and Management ,4(11)*

- Alkhatib, (2012).The determinants of leverage of listed companies.*International Journal of Business and Social Science Vol. 3 No. 24(PP.78-83).*

- Barclay, M.J., C. Smith, and R.Watts, (1995).The determinants of corporate leverage and dividend policies, *Journal of Applied Corporate Finance 7, 4-19.*

- Black, Fischer and Myron Scholes, (1973).The Pricing of Options and Corporate Liabilities."*Journal of Political Economy 81, pp.637-654.*

- Geske, Robert, (1979). The Valuation of Compound Options.*Journal of Financial Economics 7, pp. 63-81.*

- Inam and Mir (2014), the Impact of Financial Leverage on Firm Performance in Fuel and Energy Sector, Pakistan.*European Journal of Business and Management, Vol.6, No.37, 2014*

- Kunga (2015), the relationship between financial leverage and profitability of firms listed at the Nairobi securities exchange. *University of Nairobi research archive,*

- Loderer and Waelchli (2010), firm age and performance.*Munich Personal RePEc Archive*

- Myers, S. C. (1984*). The capital structure puzzle. Journal of Finance, 39(3), 575-592.*

- Miller, M. H. (1977).Debt and taxes,*Journal of Finance 32 (2), 261–275.*

- Modigliani, F. & Miller M.H. (1958).The cost of capital, corporation finance and the theory of investment*, American Economic, 48 (3), 261-297.*

- *Mauer, D.C. and A.J. Triantis, (1994).*Interaction of corporate financing and investment decisions: a dynamic framework, *Journal of Finance 49, 1253-1277.*

- Nadeem et al (2012), the Effect of Leverage on Financial Health of the Firms: A Study from Cement Industry of Pakistan. *Industrial Engineering Letters,Vol.5, No.5, 2015*

- Owolabi and Obida (2012), Liquidity Management and Corporate Profitability: Case Study of Selected Manufacturing Companies Listed on the Nigerian Stock Exchange. *Business Management Dynamics Vol.2, No.2, Aug 2012, pp.10-25*

- Pouraghajan and Malekian (2012),The Relationship between Capital Structure and Firm Performance evaluation measures: Evidence from the Tehran Stock Exchange. International journal of business and commerce. Vol.1, N0.9: May 2012 [166-181]

- Ross, Westerfield, and Jaffe (2003).*Corporate Finance, 6th Edition. McGraw-Hill/Irwin.*

- Velnampy and Anojan (2014), Capital Structure, Liquidity Position and Their Impact on Profitability: A Study of Listed Telecommunication Firms in Colombo Stock Exchange (CSE), Sri Lanka. *Research Journal of Finance and Accounting. Vol.5, No.9, 2014*

- Qureshi, M.A., Imdadullah, M., &Ahsan, T. (2012). What determines leverage in Pakistan? apanel data analysis. *African Journal of Business Management, 6, 3, 978-985.*

- Subaciene and Villis (2010), a systemof analysis ofthe total liabilitiesto total assets ratio.. *EKONOMIKA 2010 Vol. 89(2)*

- Rehman et al (20150, Investigating Liquidity-Profitability Relationship: Evidence from Companies Listed in Saudi Stock Exchange (Tadawul). *Journal of Applied Finance & Banking, vol. 5, no. 3, 2015, 159-173*