FIRM PERFORMANCE AND SIZE NEXUS: A CASE STUDY OF KSE 100' COMPANIES

[1]Aamir Azeem, [2]Shahid Ali, [3]Muhammad Toseef Aslam, [4]Shrafat Ali Sair
[1,,3]Department of Management Sciences, Virtual University of Pakistan
[2]University of Lahore
[4]School of Business Administration, National College of Business Administration and Economics, Lahore, Pakistan
aamirazeem@vu.edu.pk, toseefaslam@vu.edu.pk, alivu.pk@gmail.com

ABSTRACT: *This study is orchestrated to scrutinize Firm's performance in relation to its size. Firm's performance has always been a climacteric and decisive issue for the management, stakeholders and owners of a firm. Firm size has a main concern with its performance. Earning capacity of a firm results in diminution or expansion of firm size. To examine the effect of firm performance on its size, secondary data, collected from dynamic and versatile 7 major sectors of Pakistan. Final sample and data span consisted of 98 firms listed from 2001 to 2012. In a nutshell, selected profitability proxies and liquidity parameter have statistically positive significant relation with firm size during period of study. However, marketability proxy is not statistically significant but capital structure (DE) is negatively related with the firm size. The research infers a highly significant negative relation between debt to equity and firm size. This finding is also justified because, with an inclusion of higher level of debt in capital structure, different factors affect firm size like bankruptcy cost, higher required return of debt investor, higher required return of equity holders and influence of lending parties. These factors negatively impact firm size which hinders it towards optimal flourishing. It is concluded on the basis of analysis that size of a firm is dependent upon its performance. Better performance leads towards the growth of firm size.*

Key words: Firm's Performance, Firms size, profitability, Marketability, liquidity, capital structure.

INTRODUCTION:

In business research literature, two schools of thought are considered prominent to trace determinant of performance. One of them relies on traditional approach and emphasizes the external factors which are determined by market expectations for firm success. The other steam of thinking focuses on sociological and behavioral aspects for the success of a business. Both streams of research (thought) are aligned with thinking that success of the business promotes size of business [1].

Firm size growth is not only beneficial at firm level for its long run survival but it also provides tremendous opportunities of employment [2]. The employment level ultimately reduces uneasiness in economy, promotes living standard of people and enhances economic development [14,19]. It brings about eloquent employment opportunities for entrepreneurs and workers. Small & Medium scale firms in Pakistan portray 90% of enterprises and hire about 80% of nonagricultural workforce. In this regard, the performance of different size firms is a dynamic and pivotal issue [3]. The towering performance of any industry is backed by the massive performance of the firms, which belong to that particular industry. Performance and size of firms is the pillar of an industry to make it work and retain it into an economy.

The Objective of current study is to determine the performance of firms belonging to different industries and establish the relationship between the performance of the firm and its size. Financial Performance is an assessment of efficiency and effectiveness of firm's operation [4] . It is the procedure of quantifying the outcomes of operations and strategies of a firm. It seeks out the efficiency of firm in bringing out the revenue and use of investment. Often return on asset, return on investment and value added are used as a parameters in performance valuation. Sometimes analyst and investors consider the declining debts and growing return ratios for determining the performance of firm. Performance estimation is ongoing operation to judge the magnitude and worth of firm and to analyze the value delivered by firm to its customers and stakeholders [5]. Financial performance is measured over a period of time and in aggregation. The number of employees is the most applicable method for measuring the size of firm but in present research the size of firm is determined by total sales of firms because firms categorized the hired workers as part time workers and full time workers and figures of number of employees do not reported in the financial documents of a firm.

Large scale production is the building block of large size firms and the targeted performance of firm can be achieved by minimizing per unit cost of a product [5]. Both objectives are inter-related and can be accomplished by economies of scale. Larger the size of firm, larger the production capacity and low per unit cos [5]On the contrary with high profits and revenues the production of a firm can be increased.

This topic is preferred by writers because it is related to three disciplines at a time that are Finance, Economics, and Management and have universal versatility and applicability. From last few decades the performance of firms is critical issue. Entrepreneurs wants to beat the market by offering low price products and services to their customers, good returns to their investors and sound financial health and creditability of a firm along their own utilities and returns. On the other hand they want to grow their firm size to take the advantages of large firm size [6]. So writer has tried to analyze these dynamic factors in the context of Pakistan.

The primary objective of this research is to examine the influence of firm's performance on its size in the context of Pakistani industries. In this regard detailed analysis of Pakistani industries and their firms are carried out to study their past performance and impact of their performance on their size.This research will be able to generalize the relation of performance determinants with the size of firm and will provide the information that to what extent the good performance can change the size of firm and vice versa. [7] analyze the relationship of firm size and firm performance in

financial sector in linear and cubic form. In linear form he suggested the negative impact of performance on size which statistically not true and acceptable. In the cubic form he studied the relationship of ROA and firm size and concluded that both have positive relation.

To investigate the relationship between the firm size and its performance is inexhaustible topic for the researcher and practitioners.

LITERATURE REVIEW:

The size of firm and its performance are co-related with each other and always remain the central interest area for the researchers. Many researches have been conducted in this regard and state different results. Some Researchers claimed positive relationship between firm's size and its performance and other submitted the negative relationship between them. It was also concluded that the influence of other factors have a significant role the determination of this relationship about firms.

Kumar, Rajan and Zingales [8] contributed in this regard by evaluating the determinants of firm size. Analysis was done in two disciplines across industries and across countries. Data was collected for year 1992 for all European countries from industrial structure Statistics (1997). A sample of 15 European countries was selected and number of employees of each firm was used as an indicator of firm size in industrial analysis and data of number of firm was used as an evaluator of firm size across countries. Descriptive Statistics and Regression Analysis were applied to check the association of firm size and its determinants. It was found that on average the firms having the larger markets can easily increase their size. Large market size leads to large size of firms. At industrial level in European countries the utility sector has larger firms because these firms have monopoly over industry. The industries with larger capital, high wages and high research and development facilities have larger firms

Symeou [9] examined the role of the potential of growth of a firm in relation to firm's size and its performance. For the collection of data annual reports of top telecommunication firms were used. This research was dynamic because it considered mobile phone technology as well. Firms those have only one service fixed line or mobile been not counted in the sample. Firms that operate at both domestic and international levels were excluded from dataset so the initial sample of firms reduced from 80 to 54 firms. Size of economy was measured by using size index that include two factors i.e. population, GDP and Arable area. Data related to economic variables was obtained from United Nations reports of "Human Development, Indicator of World bank" about development of economy. Data about 214 economies for the period of 1990 to 2008 was gathered. Work quality of political institutions kept controlled because it highly affects the results and performance of firms and economy. For analysis purposes Stochastic Frontier Analysis was applied to 54 firms belonging to telecommunication sector from an equal number of economies for the time period of 1990 to 2007. Some factors that influenced the potential growth of firm like Competition, Risk, Inter Alias, and governance of firm remained control or fixed during the analysis. The results indicate that firm growth potential behave differently for different size of firms. Performance of Telecommunication firms in small economies has negative impact as small economies have less potential of growth. Growth potential is important for the firms that are operating at a small scale as compare to firm serving at a large scale. Both firms in large and small economies can work effectively and growth potential was not an essential factor in this regard.

Azam and Haider[10] attempted to find out the relationship of working capital with firm's performance. They selected KSE-30 index non-financial firms of Pakistan. Panel data from 2001 to 2010 used for analysis purposes, extracted from the annual reports, financial statements, SBP and Federal bureau of Statistics. Working capital is measured inventory turnover, time period of supplier pay, cycle of cash conversion, NTC (net trading cycle) and liquidity as a current ratio. Working capital was independent variable and performance in considered as dependent variable and it is measured using return on asset & return on equity. In this analysis there are number of dependent variables so dependent variables are considered as metric variable and Statistical technique of Canonical correlation is applied to determine the effect of metric dependent variables on several independent variables. Results indicated that there is significant relationship between working capital and firm's performance. Inventory turnover is negatively related with return on asset and ROE. Which means that by reducing days of inventory performance can be increased. Time period of supplier pay is also positively associated with ROA ROE.. Increase in the supplier pay period leads to better performance. "Cash conversion cycle" (C.C.C) and NTC shows negative association with "RETURN ON ASSET" and ROE . Liquidity is positively related with performance. They further commented that proper inventory management system is required for better performance.

Mukhopadhyay and Amirkhalkhali [11] conducted a research to analyze the relationship of performance of profitability and growth of firm size. They stated that small firms have many constraints like they cannot get funds from outsiders for growth but their growth can indicate better propensity when firm has high internal profits. Small firms have many other constraints as well the management of small firms remains small and it affects their profitability. Small firms have small scale of production and it cannot extend their scale of production while large scale of production results in low per unit cost. For analysis 191 firms of U.S.A were selected for the period of 2000 to 2007 from Fortune 500. First analysis is made by taking the whole sample and 2nd analysis firms were placed into 3 groups in such a way that average size of profits are measured as the percentage of shareholder's equity and firms belonging to upper 25 % placed in one group. Firms having 50 percent and lower to 25 % placed in second an third group respectively. Covariance is calculated for two lags one is from 2000 to 2003 and from 2004 to 2007 separately concluded that firms with large size grow faster and it higher profitability does not leads to higher growth in small firms.

Ammar et al., [12] used statistical models to establish relation of profit with the size of firm. The data from National Bureau of Economic Research, Bureau of Economic Analysis and Mortgage Information services were used from the year 1985

to 1996. First order autoregressive model was used to find out error term. They concluded that the variable of profitability increases as the firms grow. Statistical analysis shows that small, Medium and large size firms differ from one another in term of operating profit, net profit and sales. Profitability increases as volume of sale of firm exceeds $50 million.

Pervan and Visic [3] investigate the influence of firm size on profitability of a firm and also state external and internal factors that influence the size and profitability of firm. Data was selected from Amadeus database and website of Croation financial agency for the year of 2002 to 2010. Because of unavailability of data of small firms, research was limited to medium and large size firms. Return on asset, Return on Equity, Profit Margin and EBIT were used for the determination of profit and size of firm is determined as a natural logarithm of Assets. Fixed effect Panel data estimator is used for analysis and found return on asset and returns on equity and assets of firms are highly associated.

METHODOLOGY:

The objective of present study is to determine the variables that influence the firm size in Pakistani industries. Pakistani industries can be described as average sized, dynamic, potential and developingindustries so it is challenging and best suitable research to determine the association between these two components (firm size and firm performance)in the context of Pakistan.

Data Source:

Data is collected from the financial statements and annual reports of listed companies on Karachi Stock exchange. Data is extracted from Balance Sheet analysis published by State Bank of Pakistan and the official websites all firms.

[1]H0: Firm Performance does not affect the Firm Size.
[2]H0: Firm Profitability does not affect the Firm Size.
[3]H0: Firm liquidity does not affect the Firm Size.
[4]H0: Firm Marketability does not affect the Firm Size.
[5]H0: Firm capital structure does not affect the Firm Size.

Econometrics Model:

1.1 $$FP_{it} = \alpha_i + \gamma(ROCE)'_{it} + \gamma(ROA)'_{it} + \gamma(NETP)'_{it} + \gamma(DE)'_{it} + \gamma(QR)'_{it} + \gamma(EPS)'_{it} + \varepsilon_{it}$$

Econometrics model is the formal presentation of statistical relationship of financial and economical quantities to show their dependence and independence on each other. It establishes the relationship between variables in term of dependent variable at left side of equality sign and independent variables at right sides of an equation. The model of present study is as follows:

Where:

F.S = Firm Size (log of Total Sale) **DE** = Debt to equity Ratio
EPS = Earnings per share **ROA** = Return on Asset
N.P = Net Profit Ratio **ROCE** = Return on Capital Employed
CR = Current Ratio **QR** = Quick Ratio ε = Stochastic variable or error

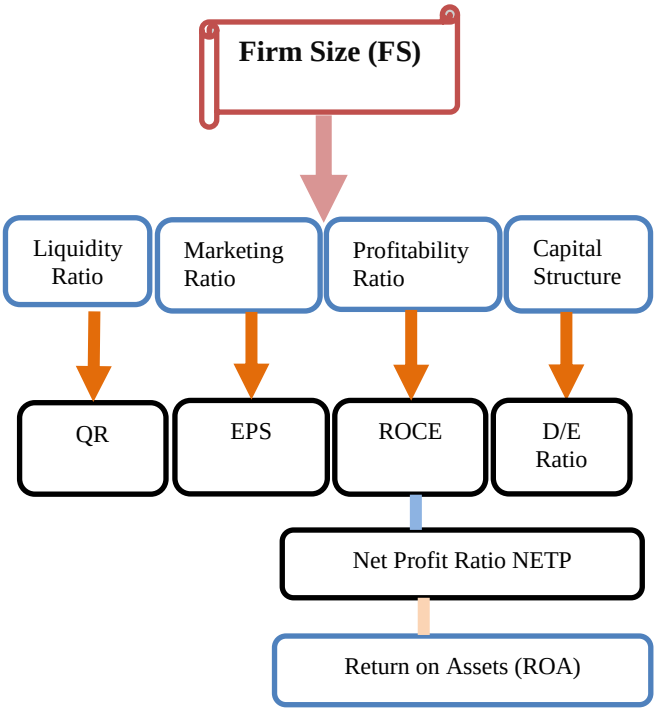

Table 01: Variable Description

ROA	The first and foremost ratio for analyzing the performance of a firm is known as return on assets ratio [13],.ROA shows how much efficiently the invested money is converted into income [3, 14].. Return on Asset = Net Income/average total assets
Debt to equity ratio	Debt to equity ratio determines the proportion of debt and equity of firm, used to increase operations of a firm, to finance their assets and generate more revenue. It is a well-known financial ratio that shows the financial worthiness of a firm Total Liabilities /Equity of shareholders.
ROCE	ROCE is a ratio that measure efficiency and profitability of capital employed in firm. It intimates the user that what is the return on one unit of capital employe. . It implies that what is the gain of a firm from its assets and what is the loss for its liabilities[15]. ROCE= EBIT/capital employed
EPS	EPS is a measure that tells how much rupees a firm paying for one common share to its owner. EPS shows the allocation of profit among each ordinary share. EPS is ratio Net income less preferred share dividend to average number of outstanding shares [16].
Net profit ratio	Another profitability ratio that is net profit ratio is an essential technique to determine the performance of a firm.Net profit ratio is ratio net profit to sales. [23]
Quick Ratio	It measures the short term liquidity of a firm and uses the current assets that are most liquid in nature. For calculation purposes the amount of inventory that is not much liquid is excluded from the current assets.

[1] Firm performance will be tested by Model fitness test or joint significance of the independent variables.
[2] Firm profitability will be tested by t-test on given data of KSE listed companies.
[3] Firm liquidity will be tested by t-test on given data of KSE listed companies.
[4] Firm marketability will be tested by t-test on given data of KSE listed companies.
[5] Firm capital structure will be tested by t-test on given data of KSE listed companies.

	Quick ratio = Current assets - inventory/ short term liabilities
Firm size	Natural log of total sale has been taken as size proxy

Table 02: Estimation of Model

Dependent Variable: LOG(TS)

Method: Panel EGLS (Period SUR)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ROCE	0.000932	0.000107	8.690624	0.0000
ROA	0.007215	0.001801	4.005294	0.0001
QR	0.001983	0.000405	-4.890501	0.0000
EPS	-1.40E-07	3.82E-06	-0.036781	0.9707
NETP	0.000400	4.35E-05	-9.208480	0.0000
DE	-7.75E-05	8.70E-06	-8.898881	0.0000
C	7.609897	0.138258	55.04108	0.0000
R-squared	0.468391	Mean dependent var		0.955903
F-statistic	39.45157	Durbin-Watson stat		1.812001
Prob(F-statistic)	0.000000			

Period Seemingly Unrelated Regression (SUR) technique has been applied to get final results of theoretical model. Overall model fitness is justified by the value of F-stat which clearly rejects null hypothesis of non-goodness fit of the model. All proxies of profitability i.e. ROA, ROCE and NETP positively impact size of firms on individual basis as well as jointly tested by Wald Procedure. Wald test has been adopted by restricting all coefficients of profitability as zero. Rejection of restricted coefficients clearly indicates that all proxies of profitability in the model jointly impact firm size. All selected proxies of profitability are significant at less than 1% level of confidence. This finding reveals that companies should pay special attention to profitability measures in order to improve firm size. Higher profit amount is further invested to enhance the capacity and reach in market that is why firm size improves [21].

Problems	**Test**	**Value**	**P. Value**	**Problem**
Contemporaneous correlation	XtcsdPesaran's test	70.039	0.00	Yes
Hetroscadasticity	Wald test	10134.05	0.00	Yes
Autocorrelation	wooldridge test	62.959	0.00	Yes

Marketability proxy (EPS) does not statistically impact the firm size of KSE selected listed companies. This study infers that firm size is not affected by marketability measure. EPS does not impact firm size in given sample. The sign of relationship is ignored because of insignificance or relationship.

Quick ratio (QR) affects firm size positively; it has statistically significant relation with firm size. It is interpreted as the liquidity (quick ratio) increases; it promotes the size of firm whenever size is measured by natural log of total sales [22].

Capital structure is also having significant relation at 1% level of significance. The research infers highly significant negative relation between capital structure and firm size. Capital structure is measured as debt to equity ratio (DE) in this study. We can generalize with inclusion of debt firm size is reduced [20]. So, debt level should be such as which promotes firm size or firm sales. This finding is also justified because, with an inclusion of higher level of debt in capital structure, different factors affect firm size like bankruptcy cost, higher required return of debt investor, higher required return of equity holders and influence of lending parties. These factors negatively impact firm size which hinders it towards optimal flourishing.

Explanatory power of the model is reasonable; 44 % variation in firm size happens because of the theoretical model which consists of all independent variables. However, 56% variation arises due to other factors which are not included in the model. Standard errors of estimation technique play crucial role for unbiased and efficient results. Standard errors of the model are lower than its coefficients on individual and collective level so finding are more efficient in context of coefficients. Errors are not serially correlated at first lag that is proved by the value of Durbon Watson (DW). DW value of 1.81 touches threshold of 2 which is benchmark to claim no serial correlation at first lag. It has also been inferred that Growth rate for a certain time period has no influence on the growth rate in subsequent time periods [7].

Table 03: Variance Inflated Factor

Variable	**Coefficient Variance**	**Uncentered VIF**	**Centered VIF**
ROCE	1.15E-08	1.595971	1.579078
ROA	3.24E-06	1.067226	1.053195
QR	1.64E-07	1.083160	1.024547
EPS	1.46E-11	1.038646	1.033346
NETP	1.89E-09	1.539964	1.512368
DE	7.58E-11	1.017421	1.017421

Table 03 shows the presence of multicollinearity in data. To gauge the influence of multicollinearity in independent variables, Variance inflated Factor (VIF) mechanism has been applied in the study. Values of centered VIF of all explanatory variables are less than 2 which provide justification to assert no multicollinearity issue in data. So, the findings are not only consistent but also efficient because correlation in explanatory variables is at minimum level.

Table 04: Residual Tests

Table 04 gives residual diagnostic test of error term of equation. First test deals with independence of entities of analysis. Rejection of null hypothesis of this test clearly indicates that all the entities (firms) are not independent. That is the reason, to give unbiased result we have not adopted pool, fixed effect modeling or random effect modeling[17].

Pool data or panel data often faces the problem of Hetrosacdaistity. To scale the impact of Hetrosacdaistity in this model, group wise Wald test has been applied. Probability value of Wald test clearly rejects null hypothesis about existence of homoscedasticity on basis of probability value of test.

DW test of autocorrelation gives us clue that residuals are not correlated at first lag but further the impact of serial correlation on differ lag is quantified by Wooldridge test. This test indicates that serial correlation exists in the residuals at lag 2 and higher lags. Only lag 2 results are provided in the Table 04.

In this dataset, Contemporaneous correlation, Hetroscadasticity and Autocorrelation exist at a time which provides us to choose other statistical techniques which may provide better results instead of Pool estimation, fixed effect modelling or random effect modeling. In plain words, entities are not independent, residual are serially correlated and having no constant variance. Whenever, Contemporaneous correlation, Hetroscadasticity and Autocorrelation exist in residuals then Period SUR method is superior to other conventional methods. it provides better and consistent results in case of all the problems in data.

Table 05: Descriptive Statistics

	TC	DE	EPS	NETP	QR	ROA	ROCE	ROE	CR
Mean	5177.59	144.67	15.71	19.09	53.78	8.03	6.63	6.201	68.57
Median	1029.65	18.05	3.80	4.40	17.55	5.56	0.32	14.79	23.10
Maximum	130073.4	30980.00	11582.83	20489.62	974.20	423.25	1561.5	2454.76	1036.00
Minimum	-2326.14	-1604.52	-4118.73	-696.73	0.01	-90.16	-857.15	-5665.00	0.10
Std. Dev.	12920.57	963.59	360.58	599.47	81.3	22.078	59.14	216.19	94.54

Table 05 delineates descriptive statistics of all under study variables for the time period of 12 years i.e. 2001 to 2012 related to 98 firms listed on Karachi Stock Exchange and regulated by SECP in Pakistan. Total number of observations are 1176 for every variable, the mean of Total sales indicate that on average the volume of sales of market during study period was about 7.7 % in Pakistan. On average, firms were able to get gain of 6.6 Rupee against the investment of 1 rupee as mean of Return on Capital employed disclosed. Return on asset, exhibits the mean of 8.03 percent which shows that on average firms earned 8 percent from their assets. Quick ratio has a mean value 53.78 that evince that on average firms were highly liquid investments and were able to meet their short term debts and obligations with a highest standard deviation of 53.78 that shows wide spread among the value of quick ratio of different firms. Earnings per share of all firms on average remain 15.7 percent during 12 years describes that 16 percent firms pay dividend to their ordinary shareholders. Net profit has mean value i.e. 19 % it demonstrates that on average firms earn profit up to 19 percent. Debt to equity ratio manifestation of proportion of equity and debt in the capital structure of a firm, the mean of DE i.e. 00.14 disclose that on average firms have low tendency of financing their assets by heavy debts.

CONCLUSION:

Firm performance has been measured by using different financial parameters; mostly it has been computed as a profitability ratio. In present study, firm performance is measured by combining various financial ratios to check the overall impact of performance on the size of firm.

Final sample consisted of 98 listedfirmsfrom 2001 to 2012 and statistical technique for inference is based upon Zullner (1992) known as Period SUR procedure because of existence of Contemporaneous correlation, Hetroscadasticity and Autocorrelation at a time in residuals[17]. Explained variable is size of firm (log of sales) and explanatory variables are categorized into profitability, liquidity, marketability, liquidity and capital structure parameters. Firm profitability parameters are ROA, ROCE and NETP; firm marketability proxy is EPS, and firm liquidity proxy is QR and capital structure testing has been performed by adding DE ratio. All proxies of profitability i.e. ROA, ROCE and NETP positively impact size of firm on individual basis and jointly tested by Wald procedure. All selected proxies of profitability are significance at less than 1% level of confidence. Marketability proxy (EPS) does not statistically impact the firm size in KSE selected listed company. This study infers that firm size is not affected by marketability measures. Quick ratio (QR) affects firm size positively, it has statistically significant relation and it is interpreted as the liquidity (QR) increases it promotes the size of firm whenever size is measured by natural log of total sales. Capital structure is also having significant relation at 1% level of significance. The research infers highly significant negative relation between capital structure and firm size. Capital structure is measured as debt to equity ratio (DE) in this study.

In a nutshell, selected profitability proxies and liquidity parameter have statistically positive significant relation with firm size during period of study. However, marketability proxy is not statistically significant but Capital structure (DE) has a significant relation at 1% level of significance. The research infers a highly significant negative relation between debt to equity and firm size. This finding is also justified because, with an inclusion of higher level of debt in capital structure, different factors affect firm size like bankruptcy cost, higher required return of debt investor, higher required return of equity holders, influence of lending parties and creditor influence are factor which hinder firm size towards optimal flourishing.

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