FIRM SIZE AND FIRM FINANCIAL PERFORMANCE: PANEL EVIDENCE FROM NON-FINANCIAL FIRMS IN NAIROBI SECURITIES EXCHANGE, KENYA

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Abstract: Non-financial firms listed in Nairobi Securities Exchange (NSE) contribute 31.4% of GDP which is far below the global average of 50% for the non-financial listed firms in the developed world. Moreover, some of them have suffered suspension and delisting according to statistics from NSE. Despite the underlying discrepancies, most studies have focused on either individual accounting and the results of these prior studies have been mixed; while some researchers reported positive relationships, others reported negative however, an analysis of firm size, and financial performance of non-financial firms in (NSE) using Business Performance Composite Index proxy of performance and panel methodology was sought. Therefore, the purpose of this study was to analyze firm size and financial performance of non-financial firms listed in NSE, Kenya. The study was anchored on Economic, trade-off and Signaling theories. Population consisted of all the forty non-financial firms listed at NSE where purposive sampling was used. The study was based on correlational research design. Secondary data from 2010 - 2016 was obtained from financial reports using data collection sheet. The data was subjected to unit root test to check on stationarity. The data was analyzed using panel correlation and fixed effects multiple regression analysis by pooling the data of 28 firms over 7 years period to get 196 data points. The findings revealed that firm size accounted for insignificant variance of 2.65% in BPCI and with positive coefficient of .057844. Findings form this study may be helpful to shareholders in making prudent investment decisions; Management in formulation of policies; and academia as a basis of further research in finance and capital structure decisions.

Keywords: Firm Size, Firm Performance, Business Performance Composite Index

INTRODUCTION

Firm size has been considered as a fundamental variable in explaining firm performance by the researchers and a number of studies have investigated the effects of size on firm performance (Serrasqueiro and Nunes, 2008). The underlying theoretical basis for arguing that firm size is related to firm performance can be found in the traditional neoclassical view of the firm and the concept of economies of scale. According to Papadogonas (2006), Economies of scale occurs when a large firm negotiates for better interest rates or better discounts and rebates due to a large quantity that it buys. Further, he opined that specialization and division of labor as well as division of high fixed costs across large production volumes may often give rise to economies of scale. In line with this concept, the author postulated that large firms are generally financially robust hence the relevance of the economic theory. Economies of scale may occur for various reasons such as financial; organizational reason; technical reason etc. The theory of economies of scale postulates that large firms

perform better than smaller firms due to discounts they access on large quantity buying, better interest rates and division of high fixed costs across large number of units. These firms also enjoy specialization of labor and can take advantage of fields requiring huge capital outlay. This theory would help this research in establishing the extent to which the firms' financial performance are anchored on the economies of scale due to their sizes. In line with this concept, a positive relationship between firm size and performance is expected.

A review of validity across different firms globally indicate that Amato and Burson (2007); Lee (2009); Vijayakumar and Tamizhselvan (2010); Akbas and Karaduman (2012); Pervan and Višić (2012); Akinyomi and Olagunju (2013); Mehrjardi and Ngahu (2012); Bisher (2011) and Kaguri (2013) have found a positive relation between firm size and performance using ordinary least square regression, multiple regression model, multivariate statistical method and multi ratio model and either single accounting or market based measures of performance. On the contrary, Becker *et al.,* (2010), Jonsson (2007), Salawu, *et al.,* (2012) have found a negative relation between firm size and performance using Pooled OLS, Generalized Method of Moment panel model, fixed effect dynamic panel data model, regression model, correlation analysis and either single accounting or market based measures of performance thereby contradicting the theory of economies of scale. An attempt to determine the relationship between firm size and financial performance of non-financial firms listed in NSE using Business Performance Composite Index as measures of performance and panel methodology has not been done.

A review of literature on corporate financing has nonetheless postulated firm size as a key determinant of financing structure. Specifically, firm size which refers to the production and turnover capacities possessed by a firm (Surajit & Saxena, 2009); has been shown to be positively associated to corporate gearing levels. Researchers have attributed this relationship to the fact that lenders often perceive larger firms as less risky consumers of credit because of their superior collateral structure (Mule & Mukras, 2015).

OBJECTIVE OF THE STUDY

The main objective of the study was to establish effect of firm size on financial performance of non-financial firms listed in NSE, Kenya.

RESEARCH METHODOLOGY

The present study focused on the empirical analysis of the effect of financial leverage on financial performance of non-financial firms listed in the Nairobi Securities Exchange (NSE), Kenya. A correlational research design was proposed for this study. The study area was Nairobi City, the capital of Kenya. Nairobi Securities Exchange (NSE) which is located in Nairobi, where sixty five (65) firms are listed is the single major open capital market in the country. Nairobi Securities Exchange (NSE) is a market that deals in exchange of securities by the publicly quoted firms. The securities market has developed over the years with 65 firms being listed by the close of 2016 (NSE, 2016). It has also automated its trading system to improve its efficiency. Therefore, the study was restricted to non-financial firms which are listed at the NSE. All information required for this study was therefore easily available hence the preferred area of study.

The population of the study comprised all firms listed at NSE Kenya from 2010 to 2016. The financial firms were excluded from the study because they are highly regulated by Central Bank of Kenya and other regulatory bodies. Therefore, their leverages are highly regulated. As at June 2016, there were forty (40) non-financial firms quoted at NSE (NSE Handbook, 2017). The time frame considered for this study envisages to capture period after the 2007/2008 financial crisis originating in the developed world. Besides that, it also captured the

period within which the revision of corporate governance rules with guidelines issued in 2002 by Capital Markets Authority (CMA) were revised (in 2010) and enforced after the financial crisis.

In this study, the researcher used purposive sampling technique where 28 firms were studied. The data was collected for the seven year period from 2010 to 2016 from the 28 firms which would result in a sample of 196 firm year observations. This is consistent with Lai (2010) who asserted that at least 20 firms in any sector in a year are adequate to provide sufficient observations for estimation purposes.

The study used secondary data since the nature of the data is quantitative. Secondary data was extracted from published and audited annual reports deposited with the CMA as required by law and NSE publications on financial reports of different non-financial firms. Data on the relationship between financial leverage and performance of listed non-financial firms was extracted from financial reports of listed companies and summaries provided by the NSE. Use of secondary data extracted from published and audited annual reports deposited with the CMA as required by law and NSE publications on financial reports of different non-financial firms is considered to be reliable since such accounts are prepared based on International Accounting Standards (IAS) and International Financial Reporting Standards (IFRS) adopted globally.

The majority of accounting measures and marketing measures have focused on measuring return, rather than focusing on risk. An example of an accounting risk measure is the debt-equity ratio. This measures the risk of becoming bankrupt. Most risk measures are linked to market measures because most risks derive from the market.

Asset tangibility also influence both financial performance and financial leverage (Hassan and Butt, 2009). Larger firms hold high tangible assets that they can use as collateral while borrowing external debt. Consequently, these larger firms access the debt market easily at lower cost to gain tax advantages. To conform to previous studies that have studied asset tangibility (Haris and Raviv, 1991; Mule and Mukras, 2015), asset tangibility was measured by the ratio of non-current assets to total assets.

Firm age is also to be controlled since older firms have financial leverage decisions at the center stage which may influence firm performance. The older the firm the more experienced and resilient it becomes. The market shocks and challenges that they have endured give them an added advantage in terms of profitability, sales growth and stability. On other hand firm performances deteriorates with age as older firms experience inertia in profitability. Also older firms have obsolete assets, high labor costs, declining investments and rent seeking behaviors like large boards and higher CEO pay. Firm age can be measured in two ways; number of years since incorporation or number of years since listing in the securities exchange. In tandem with previous studies, (Loderer & Waelchli, 2010), firm age was measured by the number of years since incorporation.

The data was analyzed by use of quantitative approaches such as descriptive statistics, panel multiple regression analysis by pooling the data of 40 firms over 7 years period to get 280 observation points. The purpose of descriptive statistics is to enable the researcher to meaningfully describe a distribution of scores or measurements using a few indices or statistics (Mugenda & Mugenda, 2005). In this study, mean, median and standard deviation were used in analyzing the descriptive statistics. Pearson's analysis was used to determine the direction and strength of the bi-variate relationships between financial leverage and financial performance.

Model Specification

To conform to previous moderation studies, this study adopted the model used by Yung-Chieh (2013) with some modifications. The study used panel data estimation which has the characteristics of both cross sectional

and time series to study the effect of firm size on the relationship between financial leverage and financial performance of non-financial firms listed in the Nairobi Securities Exchange in Kenya.

A panel regression model was used in this study by pooling the data of 40 firms over 7 year period to get 280 observations of each variable. Its equation is differentiated from simple cross sectional or time series equation by adding the subscripts (i,t) with each variable. The panel regression model of this study or the Econometric model of the research is expressed as follows:

Model 1 is developed to study the relationship between firm size and performance

$$BPCI_{it} = \alpha + \beta_1(FS)_{it} + \beta_2(TANG)_{it} + \beta_3(FAGE)_{it} + \varepsilon_{it} \quad \text{... (3.1)}$$

Model 1 is a panel regression of the dependent variable and independent variable.

Equation (1 and 2) measures firm size determine financial performance

$BPCI_{it}$ = (Business Performance Composite Index) is the measure of
Performance of firm i during time t;

$\beta_1, \beta_3, \beta_3$ = the intercept/regression coefficients for model 1, 2 and 3

FS_{it} = firm size. This variable was measured by ratio of sales to total assets of firm i during time t;

α = the slope of the regression; it measures the unit change in y associated with a unit change in x

$TANG_{it}$ = Asset Tangibility of Firm i during time t.

$FAGE_{it}$ = Firm Age of Firm i during time t.

ε_{it} = the error term within a confidence interval of 5% at time t

RESULTS AND DISCUSSION

Three regression model were also applied; the pooled OLS, fixed effects and random effects regression models. In the pooled OLS regression model, two factors were considered, first, without controlling for the effect of asset tangibility and firm age and second, controlling for the two variables. The findings are presented as shown in Table 1

Table 1 Effect of Firm Size on Financial Performance of Non-Financial Firms

	Using BPCI; no of Grps=28, ave=7		
	FE	RE	OLS
R-sq: within	0.0012	0.0012	
Between	0.1045	0.1045	
R^2 overall	0.0325	0.0325	0.0325
corr(u_i, Xb)	-0.3648		
corr(u_i, X)		0 (assumed)	
Wald $\chi^2(1)$		0.95	
Prob > χ^2		0.3300	
FS coef	.018122	-.0268546	-.0510196
Cons	.175852	.2323022	.2626317
FS: Std. err.	.0405337	.0275681	.0199959
Cons; Std. err.	.0518301	.0401246	.027769
FS: t/z	0.45	-0.97	-2.55
Cons: t/z	3.39	5.79	9.46
Df;	F(1,167)=0.20		F(1,194) = 6.51
Prob > F	0.6554		0.0115
P>|t|/P>|z|	0.655	0.330	0.011
Con;P>|t|/P>|z|	0.001	0.000	0.000
FS: [95% Conf. Interval]	-.0619026	-.0808871	-.0904569 -.0115823
	.0981465	.027178	
Cons: [95% Conf. Interval]	.0735254 .2781787	.1536595	.2078639 .3173995
		.3109449	
sigma_u	.11473692	.09344633	
sigma_e	.13873133	.13873133	
Rho	.40617641	.31210343	
F test that all u_i=0	F(27, 167) = 4.15		
	Prob > F = 0.0000		

The findings in Table 1 indicate the results on the effect of firm size on financial performance of the non-financial firms listed under NSE. Based on the pooled OLS model summary results, firm size has a significant effect on financial performance as indicated by a negative coefficient of -.0510196 that is significant and not by chance, P>|t|= 0.011, and accounts for 3.25% variance in financial performance (BPCI), F(1,194)=6.51, p=0.0115. The model coefficient though significant, is negative. This implies that firm size has a negative effect on BPCI, therefore, larger firms have low BPCI while smaller firms have large BPCI. This was further illustrated using a one way analysis of variance method. The findings are presented as shown in Table 2.

Table 2 Firm Size Differences

size in	Summary of BPCI	
quarters	Mean	Std. Dev.
small	.21509877	.17367122
medium	.09783333	.07830127
large	.144875	.14563693
Total	.19859694	.16872772

From the findings, it is clear that small firms had an overall mean BPCI of .21509877 which was larger than larger firms which had an overall mean BPCI of .144875. However, medium firms had a smaller BPCI as compared to both larger and smaller firms (.09783333).

Table 3: One way ANOVA Model Significance

Analysis of Variance					
Source	SS	df	MS	F	Prob > F
Between groups	.273050488	2	.136525244	4.99	0.0077
Within groups	5.27841267	193	.027349288		

The one way ANOVA model significance revealed that the overall model was significant, implying that there were significant differences in the performance of the firms based on the size of the firms. This is indicated by F value, $F_{(2, 193)}=4.99$, p=.0077. An examination of the Bartlett's test for equal variances indicated significant results: $chi^2(2) =$ 13.1963 Prob>chi2 = 0.001, implying that indeed there were significant differences.

After controlling for the effect of firm age and asset tangibility , the pooled OLS regression findings revealed that all the three variables accounted for 7.09%, (R squared=.0709, $F(3, 192) = 4.88$) and only the effect of asset tangibility was significant as indicated by a coefficient of .1073475 which was positive and significant (P>|t|= 0.023. This is indicated in Table 4

Table 4 Effect of Firm Size on Performance after Controlling for the Effect of Asset tangibility and age of the firm

Source	SS	df	MS			
Model	.393457054	3	.131152351	Number of obs =	196	
Residual	5.1580061	192	.026864615	F(3, 192) =	4.88	
				Prob > F	= 0.0027	
				R-squared	= 0.0709	
				Adj R-squared =	0.0564	
Total	5.55146316	195	.028469042	Root MSE	= .1639	
BPCI	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
newfirmsize	-.035354	.0214951	-1.64	0.102	-.0777509	.0070429
AT	.1073475	.0467453	2.30	0.023	.0151473	.1995477
firm_age	.0005412	.0003788	1.43	0.155	-.0002059	.0012884
_cons	.1502535	.0485498	3.09	0.002	.0544941	.246013

 Firm size and firm age coefficients were not significant and therefore age of the firm and asset tangibility may intervene on the effect of firm size on financial performance. However, putting all other variables constant, it can be concluded that the size of the firm has an influence on the financial performance based on the BPCI.

The second alternative of measuring the effect of firm size on financial performance was using the assumption that there were varying constants, or slopes and intercepts across all the firms at all the times. Therefore a fixed effect regression model was carried out for both measures of financial performance of the firms. The effect of Firm size as indicated in the Table based on fixed effects revealed that firm size did not account for a significant variance in business performance composite index, R^2 within =0.0012, R^2 between = 0.1045, overall R^2= 0.0325, $F(1,167)=0.20$, Prob > F=0.6554. Furthermore, the model on fixed effects coefficients was not

significant. However, an, F test that all u_i=0: indicated that there are significant differences in the error components, $F(27, 167) = 4.30$, Prob > F = 0.0000.

An analysis of the effect of firm size on financial performance using the random effect model was also carried out. The findings revealed that there was no significant percentage variance in financial performance (BPCI), as indicated by R^2 within=.0012, R^2 between=.1045, overall R2=.0325, Wald chi2(1) = 0.95, Prob > chi2 = 0.3300. There were also no significant model coefficients, except for the constant.

There is no significant temporal variation as opposed to the significant variation in firms. The effect of firm size also emerged not to vary over time as revealed by non-significant slope variation, except for the companies. These findings agree to some extent and also disagree with other studies. Becker *et al.,* (2010) measure of firms' size in terms of total assets, total sales and number of employees guaranteed a negative non-significant relationship with firms' profitability. Thus Becker *et al.,* (2010) findings contradict the presented studies that gave a positive relationship whose firm size was measured as the ratio of sales to total assets to measure firm size. Other studies such as Amato and Burson (2007), Akbas and Karaduman (2012), Jonsson (2007), fail to support the present studies on the direction and significance of the relationship. Almost similar findings by Lee (2009), and Vijayakumar and Tamizhselvan (2010), and Pervan and Višić (2012) supports the present study findings.

In the similarities, the findings that differ have largely vary from the present study in terms of the number of the companies used, nature of the firms, for instance some are financial firms and the variables used. This gives a better basis for concluding the relevance of the present study which indicates a positive relationship. It can thus be concluded that firm size has a positive influence on financial performance of non-financial firms listed under NSE in Nairobi. This implies that the large the firms, the higher the financial performance.

CONCLUSION

The findings indicate that firm size has an effect on financial performance among the firms. Firms' financial performance varies as the firm size varies with insignificant change with time variations. However, across the firms, there are differences in the variance in financial performance accounted for by firm size. It can thus be concluded that firm size has an influence on financial performance of non-financial firms listed in NSE. This however can be affected by the age of the firm and the asset tangibility of the firms, whereby older firms' financial leverage tend to explain much of the variation in the financial performance as compared to the newer firms. It is also clear that large firms have bigger assets and therefore explain greater variance in financial performance

RECOMMENDATION

Since firm size is a determinant of firm performance, it can be recommended that smaller firms implement market favorable was of improving their performance. This can be achieved through merging or expansion into bigger firms. Assets as well as the financial status will increase making them more profitable.

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