



EMPIRICAL EXAMINATION OF APPROPRIATENESS OF PROFITABILITY RATIOS MODEL IN PREDICTING SHAREHOLDER WEALTH OF NAIROBI SECURITIES EXCHANGE LISTED NON-FINANCIAL FIRMS, KENYA

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Abstract

Financial statements based on requirements of international accounting standards and specific legislative requirements are considered by users to be objective indicators of performance, financial strength and shareholder value of an organization. Financial statement analysis is structured and scientific basis on which investment decisions of a firm are anchored. Studies on profitability ratios have mostly been carried out in developed capital markets with little emphasis on developing securities markets such as Nairobi Securities Exchange (NSE). The objective of this study was to evaluate appropriateness of profitability ratios model in predicting shareholder wealth of non-financial firms listed at NSE. Correlational research design was used. The study population was all firms listed at NSE during five financial years 2012 to 2016. A census of all non financial firms was conducted because study population was small. It was established that information provided by profitability ratios pre-tax margin (PTM), net profit margin (NPM), return

on assets (ROA) and return on equity (ROE) were not statistically significant in influencing choice of shareholders of non financial firms listed at NSE. Also profitability ratios model was not statistically significant appropriate in predicting shareholder wealth of non financial firms listed at the NSE.

Keywords: Profitability Ratios Model, Profitability ratios, Average rate of change in market price of shares, Pre-tax margin (PTM), Net profit margin (NPM), Return on assets (ROA) and Return on equity (ROE)

INTRODUCTION

Background of the Study

Information on financial performance of an entity is often expressed in monetary terms and communicated to users by accountants. The communication objective is often achieved through preparation, presentation, analysis and publication of financial reports based on prescribed international accounting standards and specific legal requirements (Barry & Jamie, 2011). Financial statements and reports therefore ought to reflect a true and fair view of financial conditions they purport to represent. It is necessary that efforts be put in place by the global investing public to address the ever increasing need to accurately measure performance and financial strength of firms (Pandey, 2013). Dita and Murtaqi (2014) have shown that there are several user groups who rely on financial statements for decision making. Financial statements prepared based on requirements of international financial reporting standards and the specific legislative requirements are considered by users to provide an objective indication of performance, financial strength and shareholder value of an organization.

Robinson et al (2009) have indicated that firms usually differ significantly in size, and on that basis it's of no use comparing their performance using absolute money amounts. Information contained in annual financial statements should be analysed and interpreted by users to facilitate prediction of financial strength, liquidity and operational efficiency of firms in terms of future capital gains and dividend earnings. Analysis and interpretation of financial statements will enable investors make decisions on investment opportunities that will cause them to realize their investment objectives. Edmonds et al (2016) asserted that despite the usefulness of financial statements, they are designed for general purposes and not aimed at achieving the needs of a specific user group. Research findings by Ngure (2012) indicate that investors use information contained in financial reports, and consequently share price

behavior upon announcement of financial results is significantly different from its behavior during other times. Tugas (2012) asserted that financial statement analysis is one of those structured and scientific bases on which investment decisions of a firm are anchored. According to Edmonds et al (2016) due to diversity of users, varied information needs and the general nature of financial statements a variety of analytical techniques have been developed to assist in deriving meaning from financial statements. Robinson et al, (2009) asserted that ratio analysis is considered to be a prominent and preferred tool of analysis because it does not use absolute money amounts to compare performance of firms, and also by eliminating the size factor ratio analysis facilitates more relevant comparison of financial statements. Further ratio analysis groups financial statements information into distinct categories with each category measuring a different aspect of performance of a firm. Categorization facilitates comparison and investigation of relationships between financial reports information and return on shares (Ross, Westerfield & Jordan, 2010). Further Ross, Westerfield and Jordan (2010), Robinson et al (2009) have shown that due to the large number of ratios and for ease of use, ratios should be grouped into five broad categories that include activity, liquidity, solvency, market valuation and profitability.

According to Wandera and Kibe (2013) users of financial statements rely heavily on analysis of audited and published financial statements to make investment decisions. Financial indicators of performance such as profitability, liquidity, operational efficiency, leverage or solvency, and market performance or value ratios or metrics constitute significant tools of deriving meaning from financial statement information. The end result of the analysis and interpretation process is that investors, both current and potential, are able to make appropriate investment and financial decisions that will help them realize their strategic goals, based on their perception of corporate governance practices of firms they are investing in. Damodaran (2010) has asserted that although share price is assumed to be the markets measure of shareholder wealth, there exists a possibility of markets making mistakes in their assessment, yet investors follow the trend of share prices when making decisions on stocks to invest in. Irungu and Gatuhi, (2013) have shown that, whenever there is a change in accounting earnings share price also changes in the same direction and this response may generate abnormal returns. Further they revealed that majority of securities investing public rely on word of mouth to obtain information for making investment decisions, which sometimes turns out to be misleading when making key share investment decisions. In conclusion they recommended that stock brokers and market analysts ought to include key financial indicators in their advice to clients, because financial performance has statistically significant influence on share prices.

Statement of the Problem

According to Ndeda (2013) in Kenya the link between the public and financial markets has continued to face challenges such as unpredictable market environment, that has made it difficult to give proper advice to investors and failure by market regulators such as capital markets authority, central bank, retirement benefits authority and insurance regulatory authority to regulate trading at the Nairobi Securities Exchange (NSE). This has caused the NSE at times to send wrong signals concerning performance of listed firms, as is indicated by their profitability levels. Studies on profitability ratios have mostly been carried out in developed capital markets with little emphasis on its applicability in developing securities markets such as NSE. This occurrence has been the basis of great interest to capital market researchers in accounting. Through the development and establishment of appropriateness of profitability ratios model in predicting share prices investors will be able to gain insight on performance of firms leading to rational and efficient allocation of capital to the most deserving investment alternatives.

Research Objectives

The objective of this study was to evaluate the appropriateness of profitability ratios model in predicting shareholder wealth of non-financial firms listed at Nairobi Securities Exchange.

Research Hypotheses

The research hypothesis was:

H_{01} : Profitability ratios model does not have statistically significant appropriateness in predicting shareholder wealth of non-financial firms listed at Nairobi Securities Exchange.

LITERATURE REVIEW

Theoretical Literature Review

Principles and Concepts of Financial Statement Metrics of Profitability

According to Arkan (2016) profitability ratio category assists investors in assessing the ability of a company to earn profit on sales, assets and equity. An assessment of long term profitability of a company is important in determining its survival as well as projecting benefits that are likely to accrue to investors from the company. Anaja and Onaja (2015) indicated that investors contemplating investment in a firm expect returns on their investment in form of dividends and capital gain. These forms of shareholder wealth depend on expected future profitability of the firm. According to Edmonds et al (2016) profitability refers to a firm's ability to generate earnings from resources at its disposal. Management and external users assess the success of a firm in generating profits during a given period through the use of profitability ratios (metrics).

Robinson et al (2009) have indicated that return on sales profitability ratios express subtotals on the income statement (such as gross profit, operating profit, net profit) as a percentage of sale or revenue, while return on investments profitability ratios measure income relative to asset, equity or total capital employed by a company. Profitability ratios can be categorized into two. First, are return on sales profitability ratios that include gross profit margin, operating profit margin, pre-tax margin and net profit ratio, and second are return on investments profitability ratios that include operating return on assets (OROA), return on assets (ROA), return on total capital, return on equity, and return on common equity.

Empirical Literature

Profitability Ratios Model and Shareholder Wealth

Anwaar (2016) conducted a study to establish the impact of firm performance on stock return by considering firms listed on FTSE-100 index, London Stock Exchange during the period 2005 to 2014. In this study firm performance was measured using five independent variables earning per share, quick ratio, and three profitability ratios; return on assets, return on equity and net profit margin, while the dependent variable was stock return. Data was analysed using panel regression analysis method. The results obtained indicate that profitability ratios: net profit margin ratio and return on assets ratio had significantly positive impact on stock returns, while return on equity had insignificant impact on stock return. The study by Anwaar (2016) considered only three profitability category ratios, one market performance ratio and one liquidity ratio. No consideration was given to other ratio categories such as solvency and operational efficiency which are important indicators of performance among investors and other stakeholders such as creditors. Also London Stock Exchange is a more advanced security exchange compared to Nairobi Securities Exchange that is considered to be an emerging security market.

Arkan (2016) studied the importance of 12 financial ratios in predicting trends of stock prices in emerging markets by obtaining data from 15 companies distributed in three sectors of Kuwaiti financial markets over the years 2005–2014. A multiple regression model was used to estimate the stock price in each sector after non-effective variables were eliminated using Stepwise method. The results for the industrial sector indicated that return on assets, return on equity and net profit ratio had strong positive and significant relationship on stock price trends. While for the investment and service sector there was a positive significant relationship between return on assets, return on equity with stock price. Net profit ratio had a positive significant relationship with stock price among the service sector companies. The study by Arkan (2016) only considered three sectors of the financial market; industrial, investment, and service sector.

Other sectors were not considered to establish how they influence the movement of market share prices. This is unlike the current study that considers all the sectors of the securities market.

A study conducted by Stefano (2015) sort to identify whether, simultaneously and individually, financial ratios had significant impact on stock return of property sector companies listed in Indonesia Stock Exchange by considering only one ratio for each of the ratio categories. The results obtained showed that individually only return on assets had significant impact on stock return of property sector industry in Indonesia. Further a study by Wijaya (2015) revealed that partially, return on assets had significant effects on stock returns. Stefano (2015) only considered one ratio for each of the ratio categories, yet multiple ratios are more preferred in corporate performance evaluation analysis.

Dita and Murtaqi (2014) in their study endeavored to establish the relationship between net profit margin (NPM), price to book value (PBV), and debt-equity ratios (DER) on stocks return of consumer goods companies listed in Indonesia Stock Exchange during the period of 2009 – 2013, using the multiple linear regression analysis method. From the results NPM, PBV, and DER had significant effects on stock return. NPM and DER had positive significant impacts to the stocks return, while PBV had a significantly negative relationship to stocks return. NPM gave the most significant influence to the stocks return, followed by the PBV, and the last one is the DER. It's worth noting that Dita and Murtaqi (2014) only considered consumer goods sector firms listed on the Indonesia stock exchange. Also not all the five ratio categories were considered by Dita and Murtagi, who only dealt with profitability and solvency measures of performance.

Razdar and Ansari (2013) conducted a study aimed at establishing the effect of profitability ratios (which consists of gross profit margin, financial expenses ratio, return on equity, return on assets) on return on assets and stock price of a sample of 66 companies listed on the Tehran Stock Exchange during 2005-2009. The results obtained indicate that there is a positive significant relationship between gross profit margin ratio and stock price, there is no significant relationship between financial expenses ratio and stock price. Lastly there is a positive significant relationship between return on assets ratio and stock price, and also the relationship between return on equity ratio and stock price is positive and significant.

Kabajeh, Nu'aimat and Dahmash (2012) in their study examined the relationship between return on assets (ROA), return on equity (ROE) and return on investment (ROI) ratios combined together and separately, with share price of Jordanian public insurance companies during the period 2002-2007, using four regression models to test the hypotheses. Based on empirical evidence several conclusions were made. First, the three ratios ROA, ROE and ROI

together showed a strong and positive relationship with market share prices of Jordanian public insurance companies, thereby implying a strong explanatory power. Second, the results from the separate analysis showed a positive but low relationship between each of ROA and ROI ratios and market share prices of public Jordanian insurance companies. However, the separate analysis showed no relationship between ROE ratio and market share prices of public Jordanian insurance companies thereby implying no explanatory power. Razdar and Ansari (2013); Kabajeh, Nu'aimat and Dahmash (2012) only considered profitability ratios of firms listed at the security exchange without consideration to other indicators of performance such as liquidity, solvency, operational efficiency and market performance, relevant to other stakeholder groups. Also unlike the current study where all non financial sector firms are considered, Kabajeh, Nu'aimat and Dahmash (2012) only considered firms in the insurance sector.

RESEARCH METHODOLOGY

Correlational research design was used in this study because it allowed quantitative measures of variables to be studied. The study population was all firms listed at the Nairobi Securities Exchange (NSE) during the five financial years 2012 to 2016. Since some NSE listed firms had their financial year 2016 ending during the year 2017, the five financial years 2012 to 2016 were considered to be most appropriate, consecutive and current for provision of time series data that was used to conduct this study. A census of all non financial firms listed at the NSE was conducted because the study population involved was small. Purposive sampling was used to select firms whose published financial statements were available and complete throughout the five financial years giving a sample size of 36 non financial firms. Secondary data used in this study was collected through computation of average rate of change in market price of shares and computation of profitability ratio. Panel data was analysed using descriptive statistics and inferential statistics. Inferential statistics involved development and testing of predictive ability of profitability ratios. Average rate of change (AROC) in market price of shares was used as a measure of change in shareholder wealth during the window period of -20 trading days to +20 trading days. The Fixed effects model and random effects model were considered for use in this study since pooled regression (constant Coefficient) model assumes that intercepts and slope coefficients are the same over time and for all the cross-sectional units, and therefore would end up ignoring important differences that exist over time or between cross-sectional units. In order to decide which model between fixed effects model and random effects model was suitable for evaluating the effect of profitability ratios on market price of shares the Hausman test was conducted (Halcoussis, 2005).

ANALYSIS AND DISCUSSION OF FINDINGS

Descriptive Statistics of Profitability Ratios

Descriptive statistics provide information on how data obtained in respect to the dependent and independent variables of interest relate to each other (KIM 2009). Descriptive statistics were used to summarize the overall tendencies of the data used, and also to provide an understanding of how varied the financial statement analysis ratios and average rate of change in the market price of shares were in comparison with others (Creswell, 2012). The descriptive statistics used in this study included measures of central tendency (measured using mean) and measures of dispersion (measured using standard deviation and range).

In this section the study sought to describe the characteristics of the independent variables pre-tax margin (PTM), net profit margin (NPM), return on assets (ROA) and return on equity (ROE) in terms of measures of central tendency and variability. The mean, standard deviation, minimum and maximum values of the profitability ratios are presented in Table 1 below together with the total number of observations used to derive the descriptive statistics.

Table 1: Descriptive Statistics of Profitability Ratios

Variable	Mean	Std Deviation	Minimum	Maximum	Observation (N)
PTM	0.0674829	0.3958314	-2.60464	1.263843	180
NPM	0.0840905	0.4521311	-1.543206	4.864481	180
ROA	0.0475503	0.1587272	-0.518895	1.431822	180
ROE	0.0958499	0.4884255	-2.321594	4.177741	180

The results presented in Table 1 above show that the non financial firms listed at the NSE had a mean pre-tax margin (PTM) ratio of 0.0675 and a standard deviation of 0.396. The minimum and maximum PTM ratio for non financial firms listed at the NSE was -2.60464 and 1.263843 respectively for all the 180 observations made during the period 2012 to 2016. The mean net profit margin (NPM) ratio was 0.0841 with a standard deviation of 0.4521. The minimum and maximum NPM ratio for non financial firms listed at the NSE was -1.5432 and 4.8645 respectively for all the 180 observations made during the period 2012 to 2016. Return on Assets (ROA) and Return on Equity (ROE) had a mean of 0.04755 and 0.09585, with associated standard deviation of 0.1587 and 0.4884 respectively for all the 180 observations made during the period 2012 to 2016. The results therefore show that the means of all the profitability ratios were positive and less than unit. This implies that on average the non financial firms listed on the NSE during the period 2012 to 2016, and which were used in this study, had a pre-tax return (earnings before Tax) of Kenya shillings 0.0675 in every Kenya shilling of sales, a net profit of

Kenya shillings 0.0841 in every Kenya shilling of sales, a net income (return) of Kenya shillings 0.04755 in every Kenya shilling of average total assets invested and a net income (return) of Kenya shillings 0.0958499 in every Kenya shilling of average total equity invested by shareholders.

The value of ROE for non financial firms used in this study was found to be higher and almost double the value of ROA. These findings are in agreement with the assertions of Edmonds et al (2016) that ROE is usually higher than ROA because of financial leverage. Further according to Robinson et al (2009) a company's sustainable growth rate is viewed as a function of its profitability which is measured in terms of ROE. A higher ROE of 9.585 % is an indication of an overall higher sustainable growth rate of non financial firms listed at the NSE. An estimate a company's growth rate is a factor that is commonly used in equity valuation and selection of investment alternatives by shareholders. Financial leverage refers to a situation where firms use debt financing to increase the amount of assets available to a business beyond the amount of assets that are financed by owner's equity. As long as a firm's ROA exceeds its cost of borrowing (interest expense), the owners will earn a higher return on their investment in the company by using borrowed money (Edmonds et al, 2016).

Despite the fact that results obtained from non financial firms listed at the NSE had mean profitability ratios that were positive and less than unit, indicating positive returns on sales, assets and equity, some of the firms encountered negative returns on sales, assets and equity as indicated by the negative minimum values for all the profitability ratios. The worst observation was a negative pre-tax return of Kshs 2.60464 in every Ksh of sales, followed by a negative return of Kshs 2.321594 in every Ksh of equity invested by the shareholders. Also, it is apparent from the results obtained that some non financial firms listed on the NSE registered positive returns on sales, assets and equity, that were greater than unit, as indicated by the positive maximum values for all the profitability ratios. The best case was a positive net profit of Kshs 4.864481 in every Ksh of sales, followed by a positive return of Kshs 4.177741 in every Ksh of equity invested by shareholders.

According to Edmonds et al (2016) non financial firms that make up the Dow Jones Industrial Average had on average a ROA of around 9 percent, ROE of 26 percent, and NPM of 12 percent in the recent years. Comparatively, results obtained for non financial firms listed on the NSE and used in this study showed that on average ROA had a mean of 4.76 percent, ROE had a mean of 9.58 percent, and NPM had a mean of 8.41 percent. These results therefore clearly show that on average non financial firms listed on the NSE performed below the average standard as provided by the Dow Jones Industrial Average. This situation therefore signals the

need for shareholders to take up active roles, such as monitoring affairs of firms in which they have invested their wealth, with an ultimate objective of improving performance.

Inferential Statistics for Appropriateness of Profitability Ratios Models in Predicting Shareholder Wealth

The approaches to panel data analysis used for this study were the fixed effects model and random effects model. The Hausman test was conducted in order to decide which model between fixed effects model and random effects model was most suitable for evaluating the appropriateness of financial statement analysis models in predicting shareholder wealth of non financial firms listed at the NSE.

Panel Estimates of Profitability Ratios Model for Predicting Shareholder Wealth Based Fixed-Effects Regression

Based on fixed-effects regression model the panel estimates for assessing the appropriateness of profitability ratios model in predicting shareholder wealth were established and Table 2 below shows a presentation of the results obtained.

Table 2: Panel Estimates of Profitability Ratios Model based on fixed effects regression

AROC1	Coefficients	Std. Err.	t	P> t 	[95% Conf. Interval]	
PTM	-0.000932	0.010602	-0.09	0.930	-0.021894	0.020030
NPM	0.004249	0.014735	0.29	0.773	-0.024883	0.033381
ROA	-0.012280	0.043599	-0.28	0.779	-0.098477	0.073918
ROE	-0.000517	0.006061	-0.09	0.932	-0.012499	0.011465
Constant	0.003209	0.002743	1.17	0.244	-0.002214	0.008632
Sigma u	0.01430279					
Sigma e	0.03273235					
rho	0.1603241	(fraction of variance due to u_i)				

Based on the results presented in Table 4 on Hausman test, the fixed effects model was found to be unsuitable for evaluating appropriateness of profitability ratios model in predicting shareholder wealth of non financial firms listed at the NSE because the p value = 0.9195 obtained was greater than 0.05 set for this study resulting in the decision not to reject the null test hypothesis that random effects model was the suitable estimation method. Instead alternative test hypothesis that fixed effects model was the suitable estimation method was rejected. The fixed effects model was therefore not subjected to further interpretation and

evaluation in relation to its appropriateness in predicting shareholder wealth of non financial firms listed at the NSE.

Panel Estimates of Profitability Ratios Model for Predicting Shareholder Wealth Based On Random-Effects Regression

The panel estimates for profitability ratios model used in predicting shareholder wealth were also determined based on random-effects regression model and the results presented in Table 3 below.

Table 3: Panel Estimates of Profitability Ratios Model based on random effects regression

AROC1	Coefficients	Std. Err.	Z	P> z 	[95% Conf. Interval]	
PTM	0.004079	0.007908	0.52	0.606	-0.011422	0.0195796
NPM	-0.000334	0.011178	-0.03	0.976	-0.0222423	0.0215755
ROA	0.000651	0.030821	0.02	0.983	-0.059757	0.0610584
ROE	-0.000865	0.005475	-0.16	0.875	-0.011596	0.009867
Constant	0.002672	0.002588	1.03	0.302	-0.002401	0.007745
Sigma u	0.002112					
Sigma e	0.032732					
rho	0.004149	(fraction of variance due to u _i)				

Based on the Hausman test results in Table 4 where $p = 0.9195$ realized was more than 0.05 set for this study, implying there was enough statistical evidence not to reject the null test hypothesis. The random effects model was considered to be the most suitable model for assessing appropriateness of profitability ratios. The random effects model presented in Table 3 was therefore chosen and subjected to further interpretation and evaluation regarding appropriateness of profitability ratios model in predicting shareholder wealth of non financial firms listed at the NSE. The random effects regression model showed an interclass correlation of 0.41% ($\rho = 0.004149$), which implied that 0.41 % of the total variance (between unit variance and within units variance) of AROC in the market price of shares (dependent variable) was due to differences across panels (between unit variance). Being a measure of how strongly units (AROC) in the same group (firm) resemble each other, the intraclass correlation coefficient of 0.41 % was an indication of low level of serial dependence.

The panel estimates in table 3 show the relationship between profitability ratios PTM, NPM, ROA, ROE and AROC in market price of shares of non financial firms listed at the NSE. It was established that all the profitability ratios, PTM, NPM, ROA, and ROE, did not have

statistically significant influence on AROC in market price of shares as reflected by their respective p values 0.606, 0.976, 0.983 and 0.875, that were greater than 0.05 level of significance set for this study. The profitability ratios PTM and ROA had statistically insignificant positive influence on AROC in market price of shares of non financial firms listed at the NSE as indicated by their respective coefficient values 0.004079 and 0.000651. On the other hand the profitability ratios NPM and ROE had statistically insignificant negative effect on AROC in market price of shares of the same non financial firms as indicated by their respective coefficients -0.000334 and -0.000865. These coefficients provide an indication of individual average effect of PTM, NPM, ROA, and ROE over AROC in the market price of shares of non financial firms listed at the NSE when PTM, NPM, ROA, and ROE change across time and between firms by one unit, assuming the other ratios involved were held constant. The results in Table 4.10 can also be interpreted to mean that for each additional unit of AROC the estimated average effect of PTM on AROC increased by 0.002672 +0.004079 units when the other profitability ratios, NPM, ROA, and ROE, were held constant in the profitability ratios model. Also for each additional unit of AROC the estimated average effect of ROA on AROC increased by 0.002672 + 0.000651 units when the other profitability ratios, PTM, NPM, and ROE were held constant in the profitability ratios model. For the case of NPM that had negative coefficient of -0.000334 it was established that for each additional unit of AROC, the estimated average effect of NPM on AROC in market price increased by 0.002672-0.000334 units when the other profitability ratios, PTM, ROA, and ROE, were held constant in the profitability ratios model. Further for the case of ROE that also had negative coefficient -0.000865, it was established that for each additional unit of AROC, the estimated average effect of ROE on AROC in market price increased by 0.002672-0.000865 units respectively when the other profitability ratios, PTM, NPM and ROA were held constant in the profitability ratios model.

The results in Table 3 on panel estimates of profitability ratios model based on random effects model indicate that none of the profitability ratios had statistically significant influence on AROC in market price of shares of non financial firms listed at the NSE. This was based on the observation that the corresponding p-values for all profitability ratios were greater than the significance level of 0.05 set for this study. Therefore it was established that information provided by profitability ratios PTM, NPM, ROA and ROE was not statistically significant in influencing the choice of investment opportunities among shareholders of non financial firms listed at the NSE.

A study by Anwaar (2016) on firms listed at the London Stock Exchange during the period 2005 to 2014 established that ROA and NPM ratios had statistically significant positive impact on stock returns. This was partly in agreement with the findings of this study that ROA

and NPM had statistically insignificant positive effect on AROC in market price of shares listed at the NSE. Also a study by Arkan (2016) established that ROA, ROE and NPM ratio had strong positive and significant relationship on stock price for investment and service sector of firms listed at the Kuwaiti financial markets over the years 2005–2014. Dita and Murtaqi (2014) in their study established that NPM had positive statistically significant impact on stocks return of consumer goods sector firms listed on the Indonesia stock exchange.

Hausman Test on Suitability of Fixed Effects or Random Effects Model for Evaluating Profitability Ratios Model

The Hausman test was conducted to determine the suitable model between fixed effects model and random effects model. The null test hypothesis was that random effects model was the suitable estimation method and alternative test hypothesis was that fixed effects model was the suitable estimation method. A significant Hausman statistic (i.e. $p\text{-value} \leq 0.05$) implied that the null test hypothesis that random effects model was the suitable estimation method be rejected in favour of alternative test hypothesis that fixed effects model was the suitable estimation method. Table 4 below shows the results obtained from the Hausman test.

Table 4: Hausman Test on Suitability of Fixed Effects or Random Effects Model for Evaluating Profitability Ratios Model

Test Summary	Chi-Sq. Statistic	Chi-Square d.f.	Probability
Cross-section random	0.93	4	0.9195

The results in Table 4 indicate that Chi-square test statistic was 0.93, while $p = 0.9195$ implying no statistical significance at 5 percent significance level. The results implied that null test hypothesis was not to be rejected in favour of alternative test hypothesis. The random effects model was therefore taken to be the most suitable estimation model for establishing the appropriateness of profitability ratios model in predicting shareholder wealth of non financial firms listed at the NSE. The Hausman test revealed that random effects were significant in the study as indicated by $P = 0.9195$ that was more than 0.05 significance level.

The choice of random effects model was an indication that there were unique, time constant (invariant) attributes among non financial firms listed at the NSE that were as results of random variation and which did not correlate with the individual regressors. The selection of random effects model for evaluation of appropriateness of profitability ratios model in predicting shareholder wealth was in agreement with Abdulkadir (2016) who asserted that random effects model was adequate for drawing inferences about the whole population and not only the

examined sample. The findings were also in agreement with assertions of Oscar (2007) that the rationale behind random effects model was that, unlike the fixed effects model, the variations across entities were assumed to be random and uncorrelated with the predictor or independent variables included in the model and as a result allowed for generalization of inferences beyond the sample.

Panel Estimates of Appropriateness of Profitability Ratios Model in Predicting Shareholder Wealth

The overall appropriateness of the profitability ratios model in predicting shareholder wealth of non financial firms listed at the NSE was established and the results obtained presented in Table 5 shown below.

Table 5: Overall Appropriateness of profitability ratios model in predicting shareholder wealth

R-sq:		corr(u _i , X) =	0 (assumed)	Wald chi2(4) =	0.38
Within =	0.0001	Number of observations =	180	Prob > chi2 =	0.9844
between =	0.0267	Number of groups =	36	theta =	0.010255
overall =	0.0022				

An assessment of the overall appropriateness of the profitability ratios model yielded a p-value of 0.9844 which was greater than the significance level of 0.05. These results indicate that all the profitability ratios used in this study had no combined effect on AROC in market price of shares listed at the NSE. Further, it can be interpreted to mean that, overall all the profitability ratios used in this study did not provide statistically significant information on changes that occurred in AROC in market price of shares listed at the NSE. Consequently, profitability ratios model was not statistically significant appropriate in predicting shareholder wealth of non financial firms listed at the NSE.

Diagnostic Test for Evaluating Random Effects in the Profitability Ratios Model

The Breusch and Pagan Lagrangian multiplier (LM) test for random effects helped decide between random effects regression and simple OLS regression. The LM test yielded a p-value of 0.3788 which signified that there was no significant difference across the non financial firms listed at the NSE (it means that variances across the non financial firms listed at the NSE was zero or these firms had similar variances in their profitability ratios) and as a result there was no panel effect. Since there was no evidence of significant differences across non financial firms listed at the NSE, it was possible to run a simple ordinary least square (OLS) regression. These

findings are in line with the assertions of Oscar (2007) that whenever no evidence of significant difference across entities exist the random effects regression is considered not to be appropriate and as a result one can run a simple OLS regression.

CONCLUSION

Despite the fact that results obtained from non financial firms listed at the NSE had mean profitability ratios that were positive and less than unit, indicating positive returns on sales, assets and equity, some of the firms encountered negative returns on sales, assets and equity as indicated by the negative minimum values for all the profitability ratios. Fixed effects model was found to be unsuitable for evaluating appropriateness of profitability ratios model in predicting shareholder wealth of non financial firms listed at the NSE. The random effects model was considered to be the most suitable model for assessing appropriateness of profitability ratios. Therefore it was established that information provided by profitability ratios PTM, NPM, ROA and ROE was not statistically significant in influencing the choice of investment opportunities among shareholders of non financial firms listed at the NSE. Profitability ratios model was not statistically significant appropriate in predicting shareholder wealth of non financial firms listed at the NSE.

RECOMMENDATIONS AND AREAS FOR FURTHER RESEARCH

The study established that profitability ratios pre-tax margin, net profit margin, return on assets and return on equity ratios were not significantly utilized by investors in analysis of investment decisions. In order to enhance utilization of profitability ratios in making investment decisions among shareholders, it was recommended that policies be put in place to ensure that investors (both current and potential) at the NSE are provided with financial education on basic concepts and principles of profitability ratios analysis and their likely effect on future changes in market price of shares of listed firms. Also, it was recommended that further research be conducted to establish reasons behind non utilization of profitability ratios by investor in emerging securities markets such as Nairobi Securities Exchange. The study also recommended that further research be conducted on effect of profitability ratios models on market price of shares for each of the industry sectors of firms listed at the NSE.

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