CORRELATION BETWEEN STOCK PRICE AND FINANCIAL PERFORMANCE OF ZSE QUOTED BANKING FINANCIAL INSTITUTIONS (DECEMBER 2009-JUNE 2018)

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ABSTRACT
This research is a quantitative study of the correlation between stock price and financial performance of the ZSE quoted banking financial stock for the period 31 December 2009 to 30 June 2018. A period fixed effects panel regression model was adopted in the explanation of stock performance relative to financial performance. The variables included earnings per share (EPS), earnings yield (EY), return on assets (ROA), return on equity (ROE) and return on investment (ROI). Earnings yield was later on dropped as an explanatory variable due to high correlation with earnings per share and poor explanatory power relative to earnings per share on the market stock price (MSP). The study established evidence to the effect that, return on investment (ROI) has a significant and positive influence on the market stock price of the ZSE quoted banking financial stock. Return on Assets (ROA), return on equity (ROE), and earnings per share (EPS) have an insignificant yet negative influence on the market stock price variation of the publicly trading banking financial stock. Further, the study revealed that when combined, earnings per share (EPS), return on assets (ROA), return on equity (ROE) and return on investment (ROI) account only for 42.81% of market stock price variation. The implication of this research is that macroeconomic fundamentals dominate market stock price variation within the ZSE quoted banking financial institutions.

1.0 INTRODUCTION

Stock markets play a fundamental role in the development of any country's economy. They provide a platform for capital formation and economic growth through buying and selling of financial securities (Anita and Yadav, 2014). Thus stock markets enable diversification for the investing public and draw savings from various parties to avail huge sums of money to banks and other financial sector players like insurance companies for optimal utilisation of the pooled resources (Kwai-yee, 2016). Investment in stocks results in investment income to the investor while insurance provides security of interests to both the investor and the general public (Ghasempour and Ghasempour, 2013). The philosophy of managerial policies in most businesses including banks is positively skewed towards wealth maximization for the stockholders (Capello, 2015). Increase in stockholder value may take the form of a religiously rising stock price, and that sums up to wealth creation not only for the stockholders but also for the economy in general (Arkan, 2016). While the idea of shareholder value maximization may appear to encourage ethical egoism for businesses, it is only normal for any rational investor in a bank stock to expect more to less return though the investor may not necessarily be involved in the day to day management of the bank (Pascareno and Siringoringo, 2016). In most cases bank stockholders expect bank managers to take more but reasonable risk so that they earn above average returns hence the remuneration of bank managers is mostly tied to some form of performance say earnings (Madura, 2015). Thus stockholders ratios are said to be the best indicators of any return that accrues to stockholders for holding stocks in a corporate but are they sufficient to influence stock price movements in publicly trading stocks?

1.2 Relevance of the Study

There has been so much literature with regard to the relationship between financial performance and stock performance from developed and emerging markets (Ping-fu and Kwai-yee, 2016). Results from those markets regarding the various measures of financial performance's role in stock performance are contrasting. Despite the current mantra 'Zimbabwe is open for business', in the Zimbabwean context, there has not been any literature known to this researcher regarding the relationship between the two variables. Therefore, this research seeks to establish the relationship and causal effects between financial performance and stock prices of banking financial institutions trading on the ZSE.

2.0 LITERATURE REVIEW
2.1 Review of theoretical literature
Firm Valuation Theories
Tax Preference Theory

The tax preference theory was developed by Litzenberger and Ramaswamy in 1979 who were alert to the fact that capital gains tax was less than tax on dividend (Naveed 2013). Thus a corporate that pays dividend will consequently have an inferior value as shareholders will be taxed on dividend. Limited to this theory, investors prefer earnings returning firms to dividend paying firms because they expose them to less tax in form of capital gains tax (THEOGENE et al. 2017). When the effective capital gains tax is less than tax rate on dividend, some shareholders, due to their particular tax positions, may choose a high retention or low pay-out policy. That is, investors are profit oriented and would seek to maximise on returns even through tax avoidance. Thus a company that generate profit but does not pay dividend is highly valued according to tax preference theory. In that regard profits are expected to influence the price of a stock (Correia et al. 2013).

Discounted Valuation Models

These models are based on the forecasted cash flows and risk adjusted discount rates. The models' approach is easy to apply on corporates whose cash flows are currently positive and can be projected with some reliability and the amount of risk is simple to estimate (Correia et al. 2013). Thus investors are not only interested in profits but in sustainability of those profits and predictability of risk associated with those profits. Limited to these models, firm value is equals to discounted expected future accounting measures that are based on current financial information (Aveh et al. 2017). That is, an analysis of a firm's expected earnings is done through discounted valuation models. These valuation models consider earnings attributable to the firm for a number of forecasted years into the future (at most five years) (Correia et al. 2013). The forecasted earnings are discounted at a risk adjusted discount rate back to the present value and it follows that, the value of expected earnings is expressed in current terms to arrive at the value of the firm. Amongst the discounted valuation models are free cash flow to the firm (FCFF), free cash flow to equity (FEFE) and the dividend discount model (DDM). Both the tax preference theory and discounted valuation models are compatible with certain firm financial performance (Maswadeh 2016). The firm has to be generating profits for these valuation models to be estimated with ease.

Financial performance analysis

Financial performance of any firm is measured by the financial statements of that firm: comprehensive income statement, the balance sheet and the cash flow

statement (Obala and Olweny 2018). The financial statements are a summary of the transactions and events that took place in the firm's drive to achieve its objectives (Christian 2015). The analysis of the relationship between the income statement and the balance sheet brings to light the profitability status of the firm among other financial ratios that aid financial information users to comprehend the true and fair economic standing of a firm (Yao et al. 2018). A firm's revenues are a residue of the firm's ability to satisfy its clients' needs (Wang et al. 2013). Thus banks that religiously exceed clients' expectations usually generate positive returns which are a function of profitability (Opio et al. 2014). During investment, investors' decisions are moderated by financial ratios since financial ratio analysis include the assessment of the firm's ability to pay its obligations, business prospects, and managerial contribution to business and statutory firm performance (Sami 2018). Blessing and Onoja (2015) concurs that profitability, assets, debts and equities are fundamental points of ascertaining performance reports of firms and for investment decisions making. Profitability ratios constitute among them return ratios which generate a lot of interest from investors and potential investors (Warren et al. 2014).

Return ratios

Return on Assets (ROA) constitutes membership to return ratios and is a reflection of the firm's ability to post profits in the past which can then be modelled by investors to forecast the firm's profits (Rosikah et al. 2018). Anwaar (2016) argues that ROA can be a point of reference in ascertaining the efficiency of a firm's management in the generation of revenues from total assets financed by both stockholder equity and debt. Thus ROA resides at the crux of profitability and efficiency hence business planning and control is always zeroed on increasing the ratio (Correia et al. 2013). A good ROA ratio is found within the range of 1.2% to 1.4% (Goel, 2014). ROA is calculated as follows:
ROA = (Net Profit after tax/Total Assets) * 100

When it comes to the banking sector, ROA is usually very small due to the huge value of assets and is viewed as a true reflection of the bank management's ability to deploy assets in profit making positions (Issah and Ngmenipuo 2015). It is true that ROA is not the only return or profitability ratio that investors are interested in, a better version of return ratio is available in the form of ROE (Goel 2014).

Return on equity (ROE) is of great interest to both bank stock holders and potential investors since it gives a reflection of stockholder wealth maximization and is mostly acceptable when it is in the range of 11% and above (Issah and Ngmenipuo, 2015). Wijaya and

Yustina (2016) concur that ROE is a measurement of profit generated by the equity invested by stock holders. The ratio is explained by the product of profit margin, sales turn over and equity multiplier (Doorasamy 2016). Blessing and Onoja (2015) concur that profitability, assets, liabilities and stocks are important ways of appraising performance reports of firms and for making investment pronouncements. Thus according to afore mentioned researchers, ROE is established as follows:
ROE = (NPAT/Sales) * (Sales/Total Assets) * (Total Assets/Total Equity)

Pandey IM (2017) opines ROE formula as:

ROE = (NPAT/Shareholder's fund) * 100

The long and short of the above ROE formulas is they all come to one fraction, that is net profit after tax as a percentage of investment of by stockholders.

As a financial performance measure, ROA has less sensitivity to leverage as its strength though the ratio is very sensitive to working capital, since it has tendency of decreasing should there be an equal increase in current assets and current liabilities, so to mitigate against the weaknesses of ROA, it is encouraged that ROI be considered in investment decision modelling (Berk et al. 2015). Return on investment (ROI) in the same vain as ROA and ROE is a profitability measure that also captures the firm management's ability to generate profits from investor funds at its disposal (Obala and Olweny 2018). ROI is calculated as follows:

ROI = [(EBIT (1-t))/ (Capital employed)] * 100

The higher the ROI rate the better for any rational investor (Hill et al. 2015).

Earnings ratios

Investors are also interested in the earnings ratios which include among them earnings per share (EPS) that measures the profit is gained by stockholders for every stock they hold and is also used in evaluation of firm management executive operations since it is also a measure of profitability (Shabani et al. 2013). Pradhan and Paudel (2014) concurs that EPS represents business' capacity to generate profit for each share of stock held by a stockholder. It is Rajiv and Anil (2017)'s position that earnings per share is calculated as follows:

EPS = (NPAT – Preference dividend)/ Number of equity stocks

Earnings yield (EY) is also a performance measure that is mainly influenced by earnings and market capitalisation of the firm per reporting period

(Vermeulen 2015). Thus earnings yield is a true reflection of economic value generated relative to economic value invested (Ahmadi, et al 2018). Vermeulen (2015) presents EY in the following financial matric:

EY = Earnings / Market capitalisation

Ahmadi, et al (2018) concur with afore researcher when they calculate it as follows:

EY = Earnings per share (EPS) / Market stock price (MSP)

Abraham et al (2017) simplifies Earnings yield as net-income to market stock price of a firm and asserts that a north-west movement of the earnings yield rate is a reflection of an out manoeuvred stock price rate of growth by the earnings yield growth. The authors go on to argue that an increased growth in earnings yield can also be as a result of operational efficiency and operational efficiency is measured by return on asset (ROA) but an indication of low stock demand on the market.

2.1 Review of Empirical Studies

Recent research has shown that financial performance as measured by financial ratios are a significant tool employed by investors to predict stock returns that are mainly influenced by stock price movement (Musallam, 2018). Sami goes on to make specific reference to examination of financial ratios to predict stock prices by most investors. Vora (2018) argues that while past studies have employed an array of financial indicators and economic variables to explain stock prices, EPS ratio is highly and positively able to predict the market stock price. Vora was motivated to carry out that research by the fact that not all researchers on the impact of financial indicators on firm value concur. Through a multivariable regression equation, Obala and Oweny (2018) shows that ROA, D/E, current ratio and asset growth ratio have a moderate yet positively skewed influence towards stock returns of the ten Nairobi Securities Exchange quoted banks. Return on Assets (ROA) is one of the most important ratios and is a reflection of the firm's ability to post profits in the past which can then be modelled by investors to forecast the firm's profits (Rosikah et al. 2018). Thus confirmation of the important role played by financial information in discounted cash flow models. Imran (2018) concludes that for the Pakistan quoted stocks, price-earnings ratio, dividend yield, and book to market ratios can be used to predict stock prices. Causal effects between the dependent variable and the independent variables were not an issue in all afore mentioned works. Ascertaining causal effects between dependent variable and independent variables

is important in modelling solutions with regard to the research gap (Inyama 2015).

Evidence from Amman banking sector revealed that earnings per share, price earnings ratio, dividend pay-out ratio and dividend per share had a positive influence on the market stock price of Amman Stock Exchange quoted bank stocks while size of stock has an inverse relationship with the banks' market stock price (Almumani 2014). Interestingly, the afore mentioned researcher did not test for causality effects between the independent variable and the dependent variables nor did he tested for co-integration between the independent variables, he chose multiple regression and correlation models to explain market stock price of the banks. The inclusion of price earnings ratio in the research effort was deemed to measure investor sentiments, an assertion supported by Gautam (2017). However Gautam (2017)'s work reveals contrasting evidence with regard to EPS which he empirically confirmed to be negatively associated with the market stock price for Nepalese Commercial Banks. Though the latter tested for causality effects on his variables, earnings yield was not part of the explanatory variables. Din (2017) used the ordinary least square to model the predictability of stock price using financial ratios and it emerged that asset turnover ratio, EPS, inflation, interest rate, GDP highly and negatively explained stock returns of the PSX 100 Index firms while the opposite was true for the debt ratio, return on sales, firm size, market return, and Tobin's-Q ratio. Din advises against the use of financial ratios in isolation and drawing those ratios from unaudited financial statements. However Din does not ascertain if there are any causalities between the independent variables and dependent variable. A sample of 18 companies was drawn from the Indonesian stock exchange for the period 2010-2013, financial performance was measured by liquidity, leverage, profitability ratios and the data was modelled in to a regression equation to explain the stock value of the sample elements, and it was established that financial performance had no effect on value of the firms (Pascareno and Siringoringo, 2016).

However Arkan (2016) established that ROA, ROE and Net Profit Ratio (NPR) have the highest predicting power on the industrial stocks while ROA, ROE, P/E and EPS have the highest predicting power on the service sector stock price. Interestingly, Arkan used a multivariable regression equation that factored in the step wise method to do away with unnecessary variables in the prediction of stock price of both the industrial sector and the services sector. While using panel regression model to investigate the predicting power of financial performance on share returns, Anwaar (2016) emphasises that financial ratios are a residue of financial statements that are a barometer to a firm's financial performance hence should be

considered as a summary of the interaction between income statement, balance sheet and cash-flow statement. Naseer and Tariq (2015) claim that price earnings and dividend yield ratios were modelled into time series data and analysed to predict stock market behaviour. The two further claim that, where dividend yield were used to predict stock prices movements, its predictive power could not hold for certain stocks. Saleh (2015) conducted an investigation on the relationship between firm's financial performance and stock return in the oil and gas industry, where the stationarity of the panel modelled data and relationship between the variables was ascertained. The results of the study revealed that the variables were strongly correlated while net profit margin and ROA had low and negative influence on the stock returns, and the opposite was also true for ROE relative to stock return. When the impact of asset and equity ratios on stock returns of the Malaysian based firms was explored using OLS, it was concluded that both ratios had high predictive power over stock returns (Har and Gafar 2015). Hamidar (2015) zeroed his effort on the Indonesian banking sector, analysed the impact of ROE and ROCE among other financial ratios in a multiple variable modelled regression equation and established that only ROE was negatively related to stock return. Empirically, it was proved that ROE has a high predictive power than ROA, when an investigation on the impact of the two ratios on the market stock price of the Ghana Stock Exchange (GSE) quoted banking and financial institutions stocks (Issah and Ngmenipuo 2015). While panel regression models were used in all the three works mentioned, causal effects between the variables were not ascertained.

Wijesundera, et al. (2015), examined the predictability of stock returns on Colombo Stock Exchange using historical financial information (ROE, EPS and MV/BV) for 60 listed companies. They used the OLS technique to model the simple and multiple panel data sets to ascertain the predictive power of historical financial information with regard to stock returns. That is, Wijesundera et al. (2015) was mainly concerned with the relationship and not causality of historical financial information on stock returns though they concur with other researchers in the area of finance that in deed ROE, EPS and MV/BV are highly and positively correlated with stock returns. Inyiama (2015, p.69) examined the effects of financial performance on the stock price of the Nigerian Banking Industry for the period 2004-2013, where he did not only sought to show the relationship between financial ratios and share prices of the banks but also showed that there was a "unidirectional granger causality running from market price of stock to earnings per share and a bidirectional granger causality running from return on assets to earnings per share and from earnings per share to return

on assets". However earnings yield which is one of the market related ratios that measures investor expectation was not one of the explanatory variables.

3.0 METHODOLOGY
3.1 Population of the Study
Only banking financial institutions listed on ZSE were considered in this research. Currently, there are five (05) banking financial institutions listed at the ZSE and these are Barclays Bank Zimbabwe (BBZ), First Bank Corporation Zimbabwe (FBCZ), and Commercial Bank of Zimbabwe (CBZ), Ned Bank Zimbabwe (NBZ), and Zimbabwe Bank (ZB).

3.1 Data Collection
Limited to this work, only secondary data was used. Secondary data refers to data recorded and compiled by others specifically not for this research (Curran-Everett 2018). The data on banks' financial performance was drawn from published semi-annual and audited annual financial statements by the respective banks while data on stock performance was collected from the ZSE. It is important to note that data on the historical stock performance would not have been provided by any accurate source other than the ZSE who are the primary source of such data. Financial performance data was compiled and published by the banks themselves. The data collected covers the period 2009-2018. Thus only period after the dollarization of the Zimbabwe economy was considered. Period after dollarization was considered because the data was deemed to be at least free from the spiral inflation that characterised the period before dollarization.

3.2 Trial regression analysis
A pooled regression analysis was carried out as a trial run analysis that would include all the variables (Nguyen and Nilsson, 2014). A pooled ordinary least squares regression analysis assumes homogeneity between variables and that assumption is often dismissed by researchers since they argue that heterogeneity exists among variables and also time has a say in the characteristics of a variable and may have influence in the estimation of regression coefficients (Feng et al. 2014). The empirical model adopted for the test run regression adopted the following form:

$$Y_{it} = \beta_0 + \beta_{it} X_{it} + U_{it} \qquad (1.0)$$

Where $Y_{i,t}$ is the dependent variable within the model. Thus $Y_{i,t}$ is the stock market price (SMP) for the bank at time t while α represents banks specific intercepts. The coefficient of the vectors of parameters will be β while $X_{i,t}$ represents a set of variables for ith bank in the ith period and U_{it} is the error term. The results from the pooled regression analysis gave the researcher an idea as to how the independent variables

would explain market stock price if homogeneity was to be assumed for all the dependent variables. In order to drop one variables between EPS and EY, two more pooled OLS equations were run, EPS explaining MSP, and EY explaining MSP. The resultant R-squared were used in determining the variable to be dropped.

3.3 Panel model selection

As alluded to earlier on that Pooled OLS has got its weakness that may imply that the regression coefficients would not be best linear unbiased estimators (BLUE), the researcher had to settle for either the fixed effects panel model or the random effects model. It is important to note that the two models have differing strengths and weaknesses. Random effects model is consistent and efficient when estimating general effects in models and is inconsistent when it comes to being particular about the time effects and uniqueness of variables in explaining the dependent variable (Nguyen and Nilsson, 2014). Fixed effects model is consistent and inefficient when predicting general effects of explaining variables on the explained variable and is particular when explaining particular variables effects in a regression model (Feng et al. 2014). Thus a Hausmen test was necessary to make a choice of the regression model.

3.4 Hausmen test

The Hausman test was carried out for the purposes of choosing the most appropriate panel regression model between the period effects model and the random effects model. The hypothesis of the test is as follows:

H_0:Period random effects is the appropriate model (thus no correlation between independent variable and the error term in the model)

H_1:Period effects is the appropriate model (implying correlation between the error term and the independent variable)

The rule of thumb is: reject H_0 for a Hausman statistic that has a p-value of $< 5\%$.

3.5 Model specification

Guided by the Hausman test results, the researcher settled for the fixed effects model and the empirical regression model for attempting a regression analysis was as follows:

$$Yi,t = \alpha + \beta Xi,t + \varepsilon i,t \qquad (2.0)$$

Where Yi,t is the dependent variable within the model. Thus Yi,t is the stock market price (SMP) for the bank at time t while α represents banks specific intercepts. The coefficient of the vectors of parameters will be β while Xi,t represents a set of variables for *ith* bank in the *ith* period. The disturbance term is $£i,t$ and it indicates the residue of disturbance since $£i,t = \mu i + vit$ where μi represents an individual unobservable individual bank effect. The set of moderating variables are ROA, ROE, ROI, EPS and EY. Fixed effects model is perceived to be an appropriate specification when one is concentrating on a definite set of corporates (Kurt Schmidheiny 2016). Therefore, the researcher adopted a fixed effect model in predicting the relationship between MSP and financial performance of banks. Thus the researcher's model was specifically as follows:

$$Y_{i,t} = \beta 1ROA_{i,t} + \beta 2ROE_{i,t} + \beta 3ROI_{i,t} + \beta 4EPS_{i,t} + \varepsilon_{i,t} \qquad (3.0)$$

Where:

$Y_{i,t}$ is the stock market price (SMP) of a specific bank at a specified period.

$ROA_{i,t}$ is the return on asset for a specific bank at a specified period.

$ROE_{i,t}$ is the return on equity for a specific bank at a specified period.

$ROI_{i,t}$ is the return on investment for a specific bank at a given period'

$EPS_{i,t}$ is the earnings per share for a given bank at a specified period

The research was premised on a panel least squares model. The validity of the model and its explanatory power was tested using the F-statistic and R-squared.

4.0 DATA ANALISIS AND PRESENTATION
4.1 Descriptive statistics

All the variables' data was not normally distributed as was confirmed by the significant p-values of the Jarque-Bera statistic. All the normality tests on variables are presented in table 1(a).

Table 1(a): Descriptive statistics

	EPS	EY	MSP	ROA	ROE	ROI
Mean	0.073533	1.482535	0.082859	0.016848	0.100650	0.040494
Median	0.023650	0.288438	0.070000	0.015050	0.087000	0.021050
Maximum	0.920000	15.62500	0.360000	0.100000	0.668400	0.325100
Minimum	-0.060000	-1.638889	0.008000	-0.062700	-0.069900	-0.062700
Std. Dev.	0.156383	3.426437	0.062767	0.018037	0.094653	0.063959
Skewness	3.372510	2.829920	1.852956	0.077391	2.404994	2.959164
Kurtosis	15.08181	10.03548	8.060825	10.67769	15.64488	12.55011
Jarque-Bera	717.9951	305.7440	147.5465	221.1406	686.3585	473.3670
Probability	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Sum	6.617990	133.4282	7.457300	1.516281	9.058478	3.644492
Sum Sq. Dev.	2.176545	1044.902	0.350638	0.028956	0.797361	0.364078
Observations	90	90	90	90	90	90

The minimum of EPS is -6 cents and the maximum is 92 cent an indication that banks are posting good profits sufficient to attract investors and the volatility of EPS is a mild 15%. While earnings yield ranges from -106 cents to 15062 cents, the volatility of 3.426437 in the distribution of earnings yield that has potential of discouraging investment in the sector. ROA has a minimum of -6 cents and a maximum of 10 cents. According to literature, ROA in the range of 1.2 cents to 1.4 cents is perceived to be excellent (Goel 2014). The risk of missing ROA is a paltry 1.8% as measured by the standard deviation. ROE has a minimum of 6.99% and a maximum of 66.84%. Though the risk of missing on ROE is 9.46% as reflected by the standard deviation, empirical literature has it that, ROE value that is in excess of 10% is considered strong (Osman and Iddrisu 2015). ROI has minimum of 6.27 cents and maximum 32.5 cents while the chances of missing on ROI are 6.39 cents as reflected by the standard deviation. From the table above it is clear that in all the variables data is not normally distributed given that the Jarque-Bera statistic's p-value in all variables is < 5%. Kurtosis and Skewness must be 0 and 3 respectively if normality can be said to be prevailing. Thus in this scenario one can safely conclude that the data distribution in all variables is not normal given that not even one variable passes the JB statistic, Kurtosis and Skewness tests. These results are consistent with those of Inyama (2015). The data was log transformed to try and make it normally distributed; table 1(b) shows the results after log transformation of the data.

Table 1(b): Log transformed variables descriptive statistics

	LEPS	LEY	LMSP	LROA	LROE	LROI
Mean	-3.974667	-1.240129	-2.767859	-4.179248	-2.454301	-3.705502
Median	-3.581195	-1.097673	-2.659260	-4.081563	-2.379178	-3.772261
Maximum	-0.083382	2.748872	-1.021651	-2.302585	-0.402868	-1.123622
Minimum	-9.210340	-5.940171	-4.828314	-6.410015	-5.713833	-7.418581
Std. Dev.	2.034747	2.034606	0.795460	0.783046	0.833002	1.070919
Skewness	-0.562715	-0.151594	-0.464647	-0.666773	-1.014336	-0.099871
Kurtosis	2.891886	2.837852	2.987100	3.470019	5.094313	4.557632
Jarque-Bera	4.473992	0.413750	3.239078	6.830807	29.04732	8.734159
Probability	0.106779	0.813121	0.197990	0.032863	0.000000	0.012688
Sum	-333.8720	-104.1709	-249.1073	-342.6983	-201.2527	-314.9677
Sum Sq. Dev.	343.6363	343.5886	56.31533	49.66610	56.20523	96.33691
Observations	84	84	90	82	82	85

After variables data was transformed in to its natural logarithm for all the variables with the intention to achieve normality in the distribution of variables data, only three variables (EPS, EY and MSP became normally distributed. The p-values of the JB statistic for ROA, ROE and ROI were all < 5%, thus I fail to

accept the null hypothesis for these variables. These results are consistent with the findings of Curran-Everett (2018) and FENG et al. (2014) who assert that transformed data may remain abnormally distributed or even increase in abnormality and generate results that are far from the obtaining situation, hence data was transformed back to its original form before it was tested for stationarity.

4.2 Panel unit root test

Only the p-values of the respective panel unit root test statistic were included in the following table.

Table 2 (a): Panel unit root test summary of outcomes

Panel unit root test	Levin, Lin & Chu t*	Im, Pesaran and Shin	ADF - Fisher Chi-sq	PP - Fisher Chi-squ
Series: MSP	0.3870	0.2956	0.3674	0.5278
Series: EPS	0.2024	0.0454	0.0027	0.0000
Series: EY	0.0071	0.0210	0.0037	0.0003
Series: ROA	0.0002	0.0002	0.0001	0.0000
Series: ROE	0.0170	0.0008	0.0001	0.0000
Series: ROI	0.0940	0.0396	0.0204	0.0000

MSP results Analysis: in levels the four statistics have a p-value that is > 5%, the implication of these results is , I fail not to accept the null hypothesis hence I conclude that MSP data is not stationary in level. Thus the data was tested for unit root in first difference.

EPS Series Analysis: Im, Pesaran and Shin W-stat, ADF - Fisher Chi-square and PP - Fisher Chi-square tests all have a p-value that is < 5% and confirm that EPS data is stationary in level since 3 out of 4 tests are in concurrence. Thus the data can be used for a regression analysis.

EY results Analysis: all the four unit root statistics are significant in level and that means I fail to accept the null hypothesis and conclude that EY data is ready for regression.

ROA results Analysis: the p-values of all the four test statistics are all significant since their p-values are < 5%, and the implication of these results is, I fail to accept the null hypothesis. Thus ROA data is stationary in level.

ROE results Analysis: all the four unit root statistics are significant in levels as reflected by the p-values that are < 5%. The implication of these results is that I fail to accept the null hypothesis hence, I conclude that the ROE data is stationary in level.

ROI results Analysis: Levin, Lin & Chu t* is the only unit root statistic that is not significant out of all the four unit root statistics. Since the majority test statistics are significant, I fail to accept the null hypothesis and conclude that ROI data is stationary in level. Panel unit root test was repeated on MSP in first difference level. Only the p-values of the respective panel unit root test statistic were included in table 2(I).

Table 2(I): Panel unit root test summary of outcomes.

Panel unit root test: Su	Levin, Lin & Chu t*	Im, Pesaran and Shin	ADF - Fisher Chi-squa	PP - Fisher Chi-square
Series: D(MSP)	0.0000	0.0000	0.0000	0.0000

Detailed unity root outcomes are covered in appendix A

D(MSP) results Analysis: all the four statistics are very significant since their p-values are < 5% and the implication of these results is, I fail to accept the null hypothesis. Thus MSP data is stationary is in first difference.

4.3 Co-integration tests

Table 3: Cointegration test results

Pedroni Residual Cointegration Test
Series: EPS EY MSP ROA ROE ROI
Date: 11/18/18   Time: 21:53
Sample (adjusted): 12/30/2009 6/30/2018
Included observations: 90 after adjustments
Cross-sections included: 5
Null Hypothesis: No cointegration
Trend assumption: No deterministic trend
Automatic lag length selection based on SIC with a max lag of 2
Newey-West automatic bandwidth selection and Bartlett kernel

Alternative hypothesis: common AR coefs. (within-dimension)

	Statistic	Prob.	Weighted Statistic	Prob.
Panel v-Statistic	-0.488201	0.6873	-0.744250	0.7716
Panel rho-Statistic	-0.404468	0.3429	0.569454	0.7155
Panel PP-Statistic	-5.040687	0.0000	-4.267002	0.0000
Panel ADF-Statistic	-5.206687	0.0000	-4.567696	0.0000

Alternative hypothesis: individual AR coefs. (between-dimension)

	Statistic	Prob.
Group rho-Statistic	1.179736	0.8809
Group PP-Statistic	-5.385880	0.0000
Group ADF-Statistic	-3.233516	0.0006

Pedroni Residual Cointegration Test has eleven tests that all test cointegration amongst variables and that has seen it being empirically recommended by the researching community (Allozi and Obeidat, 2016). Only Group ADF-Statistic and Panel ADF-Statistic have a significant statistic with a p-value of 0.0104 and 0.0049 respectively that are confirming cointegration amongst the variables. The implication of this result is there is no cointegration amongst the variables given that the majority of the statistics are not significant hence the researchers cannot fail to accept the null hypothesis.

4.4 Causality tests

An analysis of Pairwise Granger Causality Tests results reveals a unidirectional granger causality effect running from earnings yield to earnings per share, other than that there are no causal effects between market stock price and other explaining variables. This result is consistent with findings of Inyama (2015). The implication of this result is that, there must be other causes of market stock price movements in the banking financial institutions in Zimbabwe other than ROA, ROE, ROI and EPS.

4.5 Multicollinearity tests

Table 5(a): Correlations (I)

	DMSP	EPS	EY	ROA	ROE	ROI
DMSP	1	0.13788548...	-0.0018720...	0.07337255...	0.04201260...	0.18565850...
EPS	0.13788548...	1	0.88866410...	0.15944325...	0.14731822...	0.04788985...
EY	-0.0018720...	0.88866410...	1	0.08324310...	0.08337111...	-0.0039677...
ROA	0.07337255...	0.15944325...	0.08324310...	1	0.53785168...	0.27267806...
ROE	0.04201260...	0.14731822...	0.08337111...	0.53785168...	1	0.17450429...
ROI	0.18565850...	0.04788985...	-0.0039677...	0.27267806...	0.17450429...	1

EPS has a 13.7885% positive relationship with MSP while EY has a negative relationship with MSP of -0.01872%. ROA has a 7.337% positive relationship with MSP. A 4.2013% positive relationship exists between ROE ad MSP. EY and EPS have the highest positive correlation of 88.86%. Accordingly, one of the

variables between EPS and EY must be dropped before running the final regression model (Osman and Iddrisu, 2015). For the purposes of deciding on the variable to be dropped a trial Pooled OLS regression was run.

4.6 Pooled OLS regression results

Table 5(b): Pooled OLS results

```
Dependent Variable: DMSP
Method: Panel Least Squares
Date: 11/18/18   Time: 20:28
Sample (adjusted): 6/30/2010 6/30/2018
Periods included: 17
Cross-sections included: 5
Total panel (balanced) observations: 85
```

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000679	0.006625	0.102500	0.9186
ROA	-0.022224	0.276162	-0.080474	0.9361
ROE	-0.011098	0.051232	-0.216613	0.8291
ROI	0.095418	0.065543	1.455811	0.0694
EPS	0.155053	0.057289	2.706524	0.0083
EY	-0.006262	0.002585	-2.422786	0.0177

R-squared	0.116929	Mean dependent var	0.005355
Adjusted R-squared	0.061038	S.D. dependent var	0.038966
S.E. of regression	0.037758	Akaike info criterion	-3.647258
Sum squared resid	0.112629	Schwarz criterion	-3.474835
Log likelihood	161.0084	Hannan-Quinn criter.	-3.577904
F-statistic	2.092101	Durbin-Watson stat	1.708023
Prob(F-statistic)	0.075042		

4.7 Pooled model coefficient Analysis

The panel data is made up of 17 periods, 5 cross-sections and total panel balanced observations of 85. The model's constant coefficient is 0.000679. ROA has an insignificant coefficient of -0.022224 implying that for every unit increase in ROA there is a 2.2224% reduction in MSP. For a unit increase in ROE, MSP reduces by 1.1098%. These two coefficient results are inconsistent with theoretical literature (Aveh et al. 2017) and empirical findings of (Arkran 2016) respectively. ROI has an insignificant influence on MSP as is reflected by its p-value that is > 5%. The implication of this result is, for a unit increase in ROI, MSP increases by 9.5418% and such influence is not worth noting. EPS has a very significant influence on MSP since the p-value of its statistic is 0.0083. The implication of this result is, for every unit increase in EPS there is a 15.5053% increase in MSP. This result is consistent with the findings of Inyama (2015) and Musallam (2018) but contrary to the findings of Santoso (2013). EY has a very small but significant negative influence on MSP that is implying a 0.6262% decrease in MSP for every unit increase in EY and that can be interpreted a reflection of negative investor expectation relative to the banking financial institutions listed on ZSE.

4.8 Pooled OLS Model robustness Analysis

In any statistical model, Adjusted R-squared represents a proportion of data set variability as accounted by the statistical model. That is, in this research, Adjusted R-squared accounts for percentage variations in market stock price in the publicly listed Zimbabwean banking sector which can be accounted for by changes in the moderating variables namely ROA, ROE, ROI, EPS and EY. Thus 0.116929 of MSP variation can be attributed to changes in ROA, ROE, ROI, EPS and EY. Though the model is economic in standard errors as reflected by 0.037758 standard errors, the model's explanatory power measuring 0.116929 reveals a model that can not sufficiently explain MSP. F-statistic concurs that the explanation given by the model is insignificant since its p-value is > 5%. Having analysed the Pooled OLS model results, we had to take a decision on which variable to drop between EPS and EY. That decision was based on the variables' explanatory power in explaining the dependent variable (MSP) as measured by R-squared. The following table presents results from the two pooled regression equations that were used to decide on which variable to drop.

Table 5(c): R-squared summary

Variable	R-squared
Earnings per share (EPS)	0.019012
Earnings yield (EY)	0.000004

Earnings yield is the variable to be dropped given its limited strength relative to earnings per share variable when explaining MSP. A correlations table after earnings yield variable was dropped, is as follows:

4.9 Multicollinearity tests

Table 6: Correlations (II)

	DMSP	EPS	ROA	ROE	ROI
DMSP	1	0.13788548…	0.07337255…	0.04201260…	0.18565850…
EPS	0.13788548…	1	0.15944325…	0.14731822…	0.04788985…
ROA	0.07337255…	0.15944325…	1	0.53785168…	0.27267806…
ROE	0.04201260…	0.14731822…	0.53785168…	1	0.17450429…
ROI	0.18565850…	0.04788985…	0.27267806…	0.17450429…	1

From the correlations table above, it is clear that all the variables are now within the range -0.7 to 0.7. ROA and ROE have become the highest correlated variables in the new correlations table. A Hausmen test was the next test to determine the best model to be estimated given the available data (Nguyen and Nilsson, 2014).

4.10 Hausman Test
Table 7: Hausman Test results

Correlated Random Effects - Hausman Test
Equation: Untitled
Test period random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Period random	11.510292	4	0.0214

Chi-Sq. Statistic has a significant p-value of 0.0214.the implication of this result is, I fail to accept the null hypothesis that asserts random effects model is the appropriate model. That is, a period fixed effects model was assumed to be the appropriate model.

4.11 Period Fixed Effects panel model results
Table 8(a): Period effects model results

Dependent Variable: DMSP
Method: Panel Least Squares
Date: 11/18/18   Time: 22:43
Sample (adjusted): 6/01/2010 6/01/2018
Periods included: 17
Cross-sections included: 5
Total panel (balanced) observations: 85

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.006883	0.006611	1.041229	0.3017
EPS	-0.011799	0.026049	-0.452963	0.6521
ROA	-0.148886	0.270489	-0.550433	0.5839
ROE	-0.015788	0.051098	-0.308978	0.7583
ROI	0.084785	0.067380	1.258317	0.0488

DMSP = 0.00688327433498 - 0.0117993158722*EPS - 0.148885899617*ROA - 0.0157881450346*ROE + 0.0847848111052*ROI+ [PER=F]

Only return on investment (ROI) has a significant influence on market stock (MSP) given that its p-value is < 5%. The implication of this result is, holding all other variables constant, market price of the banking financial institution increases by 8.4785% should return on investment increases by one unit. Three explaining variables have insignificant influence on the market stock price since their p-values are > 5%.

Thus ROA, ROE and EPS have an insignificant negative effect on market stock price of 14.8886%, 1.5788% and 1.1799% respectively. The implication of these results are that, holding all variables constant for a given period, there is an insignificant chance that market stock price will decrease by 14.8886%, 1.5788% and 1.1799% should ROA, ROE and EPS

increase by one unit respectively. Standard errors in the estimation of the coefficients amounted to 2.6%, 5.1% and 8.48% for EPS, ROE and ROI respectively with ROA estimation standard errors emerging to be the highest amounting to 27.04%. Thus most of the explaining variables were estimated with efficiency except on ROA.

4.12 Period fixed effects model robustness
Table 8(b): Period effects model robustness

R-squared	0.428147	Mean dependent var	0.005355
Adjusted R-squared	0.249443	S.D. dependent var	0.038966
S.E. of regression	0.033758	Akaike info criterion	-3.728840
Sum squared resid	0.072935	Schwarz criterion	-3.125362
Log likelihood	179.4757	Hannan-Quinn criter.	-3.486105
F-statistic	2.395845	Durbin-Watson stat	1.791258
Prob(F-statistic)	0.004396		

It is desirable that a regression model attain a very high R-squared in the range of at least 60% and above (Brooks 2014). In this case R-squared is 42.81% while F-statistic is significant with a p-value of 0.004396. The implication of these results are, ROA, ROE, ROI and EPS when combined are able to account only for 42.81% changes in market stock price of the publicly trading banking financial institution stock and about 57.19% of the stock variation is accounted for by other factors not covered by this model. While of all the independent variables ROI significantly managed to explain MSP and the rest could not significantly explain market stock price individually, the model was economic in standard errors. Thus standard errors were only 3.3758% a confirmation that indeed the data that

was used is stationary. For detailed period fixed effects model results, Appendix D refer.

4.13 Hypothesis test
The researcher's hypothesis was as follows:

H_0: Financial performance explains Stock price

H_1: Financial performance does not explains Stock price

Since the F- statistic's p-value is < 5%, the researcher can safely conclude that financial performance as measured by ROA, ROE, ROI and EPS explain 42.81% of ZSE quoted banking financial institutions stock performance.

4.14.0. Period fixed effects model residual diagnostics
4.14.1. Normality tests

Figure 1
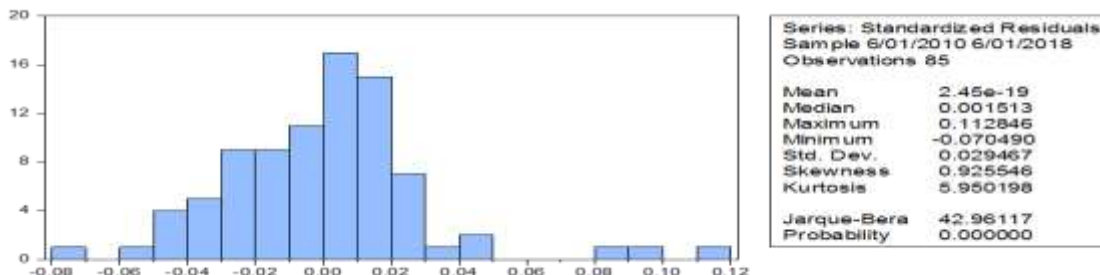
Results of the residual normality tests are revealing an abnormal residual data distribution with a very significant p-value that motivate the researcher not to accept the null hypothesis of normality in residual data distribution. While this result reveals a violation of

the classical linear regression model assumption of normally distributed residual data, literature has it that this is an inherent weakness in panel data models that cannot out-manoeuvre the advantages presented by panel data regression analysis (Vijayamohanan, 2017).

4.15 Autocorrelation tests

When there is no first order temporary autocorrelation, a residue of the run model that measures the presence of autocorrelation called the Durbin-Watson statistic must be within the range of 1.5 to 2.5 (Abdulhafedh 2017). In this scenario the Durbin-Watson statistic is 1.79258 and this means there is no temporary auto correlation. Thus the model is cleared of potentially having omitted some important explanatory variables, or model misspecification or model error term misspecification (Brooks 2014). This result is consistent with Santoso (2013) and Inyama (2015)'s findings and is inconsistent with findings of Mssallam (2017), and Osman and Idrrisu (2015).

5.0 CONCLUSION AND RECOMMENDATIONS
5.1 Conclusions

The researchers conclude that return on investment (ROI) has a significant and positive effect on the market stock price of the ZSE quoted banking financial institutions. This finding is not consistent with that of Issah and Ngmenipuo (2015), and Arkan (2016) who all established that the ROI had an insignificant effect on market stock price yet consistent with Vora (2018)'s findings. ROE has a negative and insignificant effect on MSP given its p-value of 10.35%, a result that is inconsistent with that of Inyama (2013) yet consistent with Vora (2018)'s findings. Earnings per share (EPS) has an insignificant and negative effect on market stock price and this finding contradicts that of Musallam (2018) yet consistent with findings by Santoso (2013). ROA has an insignificant effect on market stock price. This finding is contrary to theoretical literature that asserts that an increase in the ratio must see the stock price rising too (Rosikah et al. 2018). Financial performance as measured by ROA, ROE, ROI and EPS when combined, can only account for around 42.81% of market stock price of a listed banking financial institution and 57.19% of the market stock price variation is reflective of the dominance of macroeconomic fundamentals on the market stock price of a banking financial institutions in Zimbabwe. Financial performance does not granger cause market stock price. This finding is consistent with that of Inyama (2015).

5.2 Recommendations
i. The Reserve Bank of Zimbabwe and ZSE as the highest authorities in the banking sector and capital market in Zimbabwe respectively, ought to compel corporates that fall under their supervision to specifically disclose return on investment ratio when they present their financial statements since the ratio is a key performance indicators for the banking financial institutions.

ii. Boards of directors should require management to set a target particularly for the ROI ratio as a point of reference for comparison and performance analysis over time.

iii. For the purposes of investment growth, banking financial institutions managers must strive to maximise shareholder wealth through both earnings and market stock value by influencing market stock price through increasing ROI, lest a depleted investor confidence in the banking financial sector. Low investor confidence has potential of influencing stock holders to sell their stock, and that has an effect of deriving the market value of the stock downwards.

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