

# A Study of the Effect of Firm Size on the Financial Performance of LuSE Listed Companies

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## ABSTRACT

The Zambian Economy has gone through various financial changes in the recent past. The economy is a growing economy with great potential to expand to great heights. The Lusaka Stock Exchange (LuSE) plays a crucial role in how the economy is faring. Although it has been recording poor liquidity rates, it has since listed a total number of 24 firms since inception. These firms, their size and performance play a crucial role in understanding how both internal and external functions are aligning. The size of a firm has proven to be an important characteristic especially in these modern times where competition is at its all-time high. The research aimed to investigate this topic and determine what models, policies or procedures different sized firms should undertake in-order to survive. The main objective of this study was to evaluate if there a relationship between firm size and financial performance. The target population of this study was all the firms listed on the financial sector of the Lusaka Stock Exchange. The data collected spanned a period of 10 years- from 2012 to 2022. The three independent variables; total debt, total assets and total number of employees measured firm size while the dependent variable- Return on Assets (ROA), measured financial performance. The relationship between the independent variables and the dependent variable were found to be all statistically significant in the long run. However, total assets were found to be statistically insignificant in the short run. The study therefore concludes that firms with more assets, more employees and less debt are more likely to enjoy greater financial profitability in their long run periods. This implies that a positive relationship is expected between the size of the firm and the profitability levels. The association between the two is positive when ROA is employed as the proxy for firm performance.

**Keywords--** Firm Size, Firm Performance, Total Assets, Total Debt, Total Employees

sizes and capacity are contributing to the success of the global economy through various ways and means. The success of these firms depends on a wide range of factors chief among these is the subject of this paper. The business world has taken interest in researching if the size of a firm can affect its overall performance. Financial performance of a firm implies how a firm is able to achieve certain factors and maintain certain standards as well as collect and allocate finances through measurement of factors such as liquidity, solvency, efficiency, leverage and profitability (Fatihudin & Mochklas, 2018).

Financial performance in an organisation is highly considered in any economy, Zambia included. Firm efficiency and firm size productivity have risen to levels of being an objective in Zambia's growth and other third world countries. Zambia's Gross Domestic Product (GDP) in the past years has recorded a decline of about 4% (Chita, 2011). Various economic sectors have experienced a decline in productivity as well. Having such economic conditions has led to growing concerns over the status of Zambian firms. Many economic performance indicators are showing negative results, this paper therefore will aim to test if the sizes of these firms also contribute to their overall and financial performance.

Performance is a function of an organization's capacity to acquire and manage resources in multiple ways to achieve competitive advantage (Chen & Wong, 2004). Financial performance and non-financial performance are the two types of performance. Financial performance emphasizes direct financial report-related variables. The performance of a company is evaluated in three dimensions. The first dimension is the company's productivity, or the efficiency with which inputs are transformed into outputs. The second dimension is profitability, or the extent to which a company's earnings exceed its expenses. The third dimension is market premium, or the extent to which the market value of a company exceeds its book value (Walker, 2001). Performance is a challenging concept, both in terms of definition and measurement. It has been defined as the result of activity, and it is believed that the measure to

## I. INTRODUCTION

The global economic and business platform is growing rapidly, and the emergence of various firms and start-up businesses has increased significantly. Firms of all

evaluate corporate performance depends on the type of organization being evaluated and the objectives to be attained through that evaluation.

Researchers in the field of economics have developed numerous models for analysing financial performance. Nonetheless, there is little agreement on what constitutes a valid set of performance criteria. For example, researchers have suggested that financial performance studies should incorporate multiple criteria analysis. This multidimensional perspective on performance implies that various models or patterns of relationship between corporate performance and its determinants will emerge to illustrate the various sets of relationships between dependent and independent variables in the estimated models (Tangen, 2003). Various standards, including gross profit, net profit, return on equity, and return on assets, have been used to evaluate financial performance. This study will utilize return on assets, which is determined by dividing net profit by net assets employed. Return on assets (ROA) is taken as a measure of profitability and (Ritab, et al., 2004) in their research concluded that ROA taken into account of assets, being highly important for revenue generation. Further, ROA has been used as an indicator of performance (Yamneesri & Lodh, 2004).

Recent studies have provided additional evidence on the determinants of firm performance, but it is difficult to generalize their empirical findings due to their reliance on data from large firms, a single year, or numerous industries. This research aims to fill this void. Specifically, we examine the determinants of firm profitability, focusing on the role of firm size, by analysing data from a single industry. In addition, a regression technique will be employed as it combines panels of cross-section data for the years 2012 to 2022. This panel data model will permit us to shed light on the dynamic nature of firm performance over the past decade.

In this chapter, the researcher elaborates the background of the study, statement of the problem, objectives of the study, research questions, significance of the study and finally the limitations of the study.

## II. STATEMENT OF THE PROBLEM

Financial performance of a firm is critical information of an organisation. This information is used by many stakeholders which aids them in making informed and correct investment decisions. The main reasons investors invest in firms is for them to earn good returns from the money put in, therefore, guarantee that there is an upward trend in the price and value of stocks in a firm is a key factor in determining whether investors will release funds.

Low liquidity on the LuSE has been a running theme from inception. The poor liquidity level is one remarkable characteristic of the LuSE. Several distortions observed in both demand and supply of stocks help to explain the liquidity. The small number of listed companies and small number of public stocks available are the main reason for the low supply of stocks traded on the LuSE (Marone, 2003). The market is highly dependent on the government to create incentive for participation in the market. This poor participation therefore begs the question of where the firms are getting income for growth. The research, therefore, delves into the companies individually in order to assess if their growth is brooding from internal aspects such as their employees, assets and how much debt they are accumulating.

There are sparse studies of such nature in Zambia and particularly on the financial sector of the listed firms on the Lusaka stock exchange. This is an extremely important and influential industry in Zambia and generally worldwide as it provides varying services to citizens to enable them go about their operations efficiently (Catalano, 2021). Firm performance and factors that influence it are important to various decision makers today, especially in these times of intense competition and changing economic conditions. Therefore, the impact of firm size on performance remains a key conversation.

The studies carried out on the relationship between size and financial performance include, (Mwale, 2012), who studied the effect of size and profitability of banks in Zambia. This study measured profitability using net profits and only had firm size as the independent variable. (Mbogo, 2012) studied the effect of portfolio size on the financial performance of portfolios of investment firms in Kenya. (Musonda, 2012) who studied relationship between prior period dividends and financial performance of firms listed at the LuSE evaluated the determinants of financial performance of micro-finance institutions in Zambia.

Though the area of firm size and financial performance has been studied, the previous studies did not include the independent variables and measures that the current study used. The study is also different from other studies as it includes firms of all sizes according to the Organisation for Economic Cooperation and Development. Little focus has been paid in relation to the effect of firm size and financial performance of firms listed on the financial sector of the LuSE. This study will be different from some of the studies listed as it will use a measure of size that is more applicable to the study and area/firms being analysed. The highlighted firms and the variables being analysed shall determine whether the sizes of the firms of the companies listed on the LuSE in the financial sector affect their overall financial performance. It may be unwise to assume that various firms play a key role in the

success of global and economic markets and that their performance is of extreme importance to various stakeholders. It may be imperative therefore to carry out this study to establish for certain that size does indeed affect profitability in general and more specifically in Zambia.

#### **Main Hypothesis**

1. H0: Total debt, total assets and total number of employees positively influence the financial performance of a firm.
2. H1: There exists a positive relationship between firm size and financial performance.

### **III. EMPIRICAL LITERATURE REVIEW**

Data collected from the Central Bank of Kenya from 1992 to 2012 by (Kioko, 2013) reported that three of the four variables used were statistically significant. The study had the objective of evaluating the relationship that exists between firm size and financial performance. The research was carried out using a correlation and regression design with secondary data collected from 43 commercial banks. The firm size was measured using net assets, total loans, total deposits and total number of employees. Financial performance was measured by Return on Assets (ROA). The results after the regression revealed that there was a moderate correlation.

Between three of the studied factors of bank size which include total deposits, total loans and total assets. The relationship between three of the independent variables, namely, total loans, total deposits, and total assets and the dependent variable (financial performance-ROA) of commercial banks were all found to be statistically significant. Total deposits and total loans had relatively stronger effects on financial performance compared to total assets. There was no significant relationship between number of employees and financial performance for commercial banks in Kenya. The study recommends the need for bank policies that give greater importance to the determination and evaluation of their loan portfolios, customer deposits and asset quality. The study further recommends that for Kenyan commercial banks to remain profitable, they must ensure good portfolio management which will aid in making good and informed decisions in favour of increased profitability.

The same study was conducted in Kenya by (Muhindi & Ngaba, 2018) five years apart. Reasoning behind the study was to prove that firm size does indeed matter in the new era of increased competition. The research sought to determine the effect of firm size on financial performance of commercial banks in Kenya. The variables entailed; the number of branches, capital base, number of customer deposit, the loan and advances and

return on Assets (ROA) was selected as the dependent variable. The data from a total number of 42 commercial banks and 1 mortgage finance company was used. The data was collected from the bank's financial reports over a period of 5 years from 2012-2016. The researcher increased the sample size of the sources of data to increase the level of reliability and validity of the results. The study showed that all variables had a strong significant relationship with the dependant variable after running a multiple linear regression. The results of the study can be used by various stakeholders to the organisation such as academicians, policy formulators, investors and customers. Various studies have been carried out outside of Africa relating to the topic. Despite these studies being carried out in a different region geographically and economically, it may be imperative that the results and variables used are assessed to establish a trend.

A study conducted by (Abbasi & Malik, 2015) studied 50 firms listed on the Karachi Stock Exchange in Pakistan. The main determination of the research is to pinpoint the moderating inspiration of firm size between the relationship of firm growth and firm performance. In the study Null and alternative hypothesis have been constructed, Null hypothesis is concerning the negation of the moderating effect of firm size, while alternative hypothesis is pertaining to the acceptance of the moderating inspiration of firm size between the relationship of firm growth and firm performance. The results of the regression analysis are demonstrating that the alternative hypothesis of the research that firm size has moderating inspiration between independent variable (Firm growth) and dependent variable (Firm performance) is accepted.

The positive relationship confirmed by (Putri & Irwandi, 2016) concluded that firm size had a significant effect on internet financial reporting and profitability. The objective of the study was to analyse the effects of firm size, profitability, liquidity, leverage, listing age and auditor reputation on internet financial reporting. The sample size contained 82 manufacturing firms listed on the Indonesian Stock Exchange. After conducting a multiple regression analysis, results showed that firm size had a significant effect on internet financial reporting. However, other factors such as liquidity, leverage and listing age had no significant effect on the financial reporting. The study is useful to investors as a reference point in relation to investment in Indonesia.

According to another study by (Doğan, 2013) where 200 active companies on the Istanbul Stock Exchange between the years 2008-2011 were analysed. The aim of the study was to investigate the effects of firm size on profitability. "Return on Assets" (ROA) was used as an indicator of a firm's profitability and total assets, total sales and number of employees have been used as

indicators of size. The result of analysis indicates a positive relation between size indicators and profitability of firms. Control variables such as age of the firms and leverage rates were found in a negative relation with ROA, but liquidity rate and ROA had been determined to have a positive relation.

A study carried out by (Akinyomi & Adebayo, 2013) focused on the effects of firm size on the Nigerian manufacturing sector. Panel data was obtained from audited financial reports over the period of 2005-2012. Return of assets was used as a proxy for profitability while log of total assets and log of turnover were used as proxies for firm size. The results of the study showed that firm size, both in terms of total assets and total sales, had a positive effect on the profitability of Nigerian manufacturing companies.

Despite most firms having found positive and significant results, there are some studies that indicated firm size and financial do not have a positive relationship. (Simon, 1959) actualised that there was no significant relation between firm size and profitability. The objective of the paper was to test two of the commonly held truths in the insurance industry about size, strength and profit. Generally, it is assumed that larger firms would be more efficient and perform better. However, results of the study showed that larger firms have found that the advantage of size in terms of efficiency does not increase without bound. The larger the firm grows, there is mishandling of assets, and this leads to the break-down of the firm. It was further observed that smaller firms could produce good efficient operations and better performances.

A study in the UK conducted by (Whittington, 1980) reported an insignificant relationship between firm size and financial performance. The study focused on data from 1960-1974 for manufacturing firms listed on the exchange. The researcher was particularly interested in the relationship between profitability and firm size for two main reasons; Firstly, to determine its likely effect on industrial concentration and secondly its possible implications for return to scale and monopoly power. The results of the study claimed that the regression of growth and profitability might not identify as a causal relationship from profitability to growth but rather a relationship in the reverse direction.

(Hagedoorn & Cloudt, 2003) reported weak relations between firm size and profitability. The objective of the study was to determine if there is an advantage in using multiple regression when measuring firm performance. The paper had a sample of nearly 1200 companies in four- tech industries using a variety of indicators. The indicators included R&D inputs, patent counts and patent citations to new product announcements. These results suggested that firm size is not the major determinant of profitability, and that profitability would

depend largely on how well firms cope with size and exploit the opportunities associated with it (Kioko, 2013).

(Pervan & Visic, 2012) reported that firm size had a weak positive impact on the success of a firm's profitability. The objective of the study was to evaluate firm size and its influence on firm performance/profitability. Using data collected between 2002 to 2010, results revealed a significant but weak relationship between firm size and profitability. The researcher pointed out that other than firm size, firm performance is affected by various internal and external factors. With that said, the study concluded by stating that other results showed that asset turnover and debt ratio statistically significantly influence firm's performance while current ratio did not. The author agrees with the economic theory agreeing that economies of scale play a great deal in giving larger firm the financial advantage.

## IV. THEORETICAL LITERATURE REVIEW

### *The Agency Theory of a Firm*

The Agency theory is an economic theory that views the firms as a set of contracts among self-interested individuals (O'Donnell & Sanders, 2002). The nature of the theory is that the principle gives authority to the agent and cannot observe the agent's actions. Problems arise in arrangements when there are differences in goals and information asymmetry. The agency theory is rooted in one of the oldest problems of the political and philosophical world. It highlights the understanding of the relation between the 'Master' who is given socially legitimate control over certain actions and the 'servant' who controls the information on which the 'master' acts (Nguyen, 2009). The relationship between the firm size and financial performance is elaborated in the agency theory. Considering how the managers are almost always concerned with putting their needs and objectives first, increasing the firm size will normally increase cash inflow. Naturally, managers will opt to increase size of the firm in order to receive large payments and rewards to enjoy expected private benefits from the encouraged growth (Muhindi & Ngaba, 2018). The theory therefore predicts a negative relationship between firm size and the financial performance. If managers are left to their desires, they may run a firm into long term difficulties. The human need to always put themselves first might drive the firm into chaos through trying to give themselves better perks, salaries and prestige.

While it is not impossible to eliminate the agency problem, principles can take steps to minimize the risk known as the agency cost (Chen, 2022). The principle-agent relationship can be regulated through ensuring separation of powers and by implementing rules or contracts to ensure

fair play. These measures would encourage agents to in better accordance with the principles best interest.

#### ***The Economic Theory***

The economic theory assumes that every investor and consumer is rational and efficient (Levy, et al., 2000). It is believed that humans make the best choices for themselves. Investors therefore would find it rational to grow a firm and earn extra income. According to the economic theory, growing the size of the firm yields to more benefits and success through economies of scale. The growth of a firm also enables the firm to gain more market power and control. This in turn discourages more firms to enter the market dominated by few powerful players. The greater the difficulty in penetrating a market, the lesser the chances of increased competition and the greater the profits earned by existing firms (Kioko, 2013). This theory is in line with study as it explains how the growth of a firm size-wise can lead to improved performance through economies of scale.

#### ***The Human Capital Model***

The Human Capital Model supports the notion of training individuals during an initial period to receive returns to their investments in subsequent periods (Veum, 1995). Workers pay for training by receiving a wage which is lower than what could be received elsewhere while being trained. Since training is thought to make workers more productive, workers collect the returns from their investment in later periods through higher marginal products and higher wages. Human capital is a loose term that refers to the educational attainment, knowledge, experience and skills of an employee (Ross, 2021). The theory has an incentive to seek productive human capital and to add to the human capital of their existing employee.

The findings are that earnings rise with firm size has been widely interpreted in this framework. The human

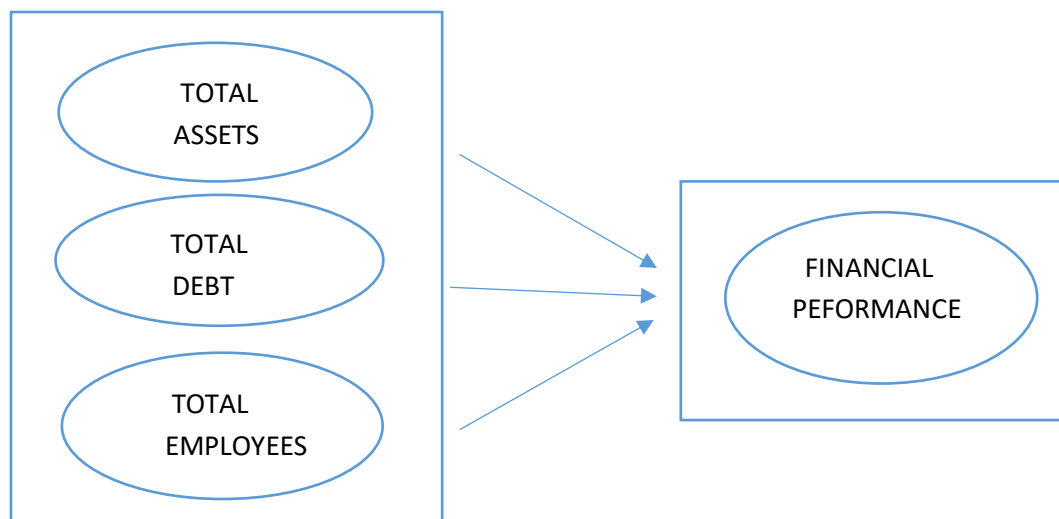
capital explanation is that the vector of relevant productive skills is partially unobserved, and that the significance of firm characteristics in earnings regressions essentially reflects unobserved labour quality. This is under the assumption that large firms hire more abled individuals than do small firms. This model illustrates that firm size positive correlation exists between the size of a firm and earnings, which is in line with labour markets that are highly competitive.

#### ***The Modern Portfolio Theory***

The Modern Portfolio Theory (MPT) refers to an investment theory that allows investors to build an asset portfolio that enables investors to maximise the expected return for a given level of risk (CFI, 2022). The theory assumes that investors are risk averse and that given the chance, investors will always prefer the less risky portfolio. The theory was developed by Professor Harry Markowitz in 1952. He advanced the idea that it is possible to make an efficient frontier of optimal portfolios, resulting into the maximum return at a certain level of risk. It is not enough to concentrate on the risk and return of stock. Investors ought to invest and diversify their portfolios. It will lead stable returns and help in risk reduction. The risk levels had an influence on the financial performance on firms and their investments. The theory is relevant to the variables in the study as firms will invest wisely to get maximum returns from the investments they venture into.

## **V. CONCEPTUAL FRAMEWORK**

The study follows the Conceptual framework outlined in Figure 1 below:



**Figure 1:** Conceptual Framework

### **Total Debt**

Theoretically, results suggest that debt may have a negative effect on the financial performance of a firm. Companies with a large firm size are advised to not increase their physical assets through debt because it may affect their earnings. Instead, firms should focus on improving firm performance through increased sale. The study anticipates total debt to affect the firm's performance negatively.

Total debt to total assets however influences the return on equity directly. In most cases, firms that have a large debt ratio have better return on equity (Kasesbeh, 2021).

### **Total Number of Employees**

It is said that human resource is the most important resource that a firm can have. Therefore, it imperative that the number of staff involved in the day to day running of the firms are selected in a proper recruitment and selection process and undergo training and development activities and feel a sense of job security in order to ensure high performance. Another controversial issue in the number of employees concerns the linkage to performance. There are several trends and studies about how the number of employees connects to organisational performance. They concluded that there exists a direct positive relationship between the number of employees and firm performance.

### **Total Assets**

Total assets of a firm show the company's worth-everything owned. The assets owned by firms are usually of economic value which are expected to yield a benefit for the business owners. Assets are an important feature of any firm and are anticipated to have a significant and positive relationship to financial performance. It is expected to have a positive coefficient indicating that increase in the total assets in the firms will lead to an increase to the return on assets.

## **VI. RESEARCH METHODOLOGY**

### **Research design**

This research used a correlation design with secondary data collected. A correlational research design determines or quantifies relationships between variables, without the research controlling or manipulating any of them (Bhandari, 2021). In other words, a research design is a strategy for answering your research questions using empirical data. Correlational research is a type of research method in which a researcher measures variables and understands and assesses the statistical relationship between them. An advantage to using this research design is that correlational research can be used to determine prevalence and relationships among variables, and to forecast events from current data and knowledge which

can be helpful to stakeholders in the business world as the results tend to be more applicable to the everyday life.

A correlation reflects the strengths and/or direction of the relationship between two or more variables, and how the variables influence other variables. The relationships can either be negative or positive. The ability of forming a casual associative relationship between the variables will make the design appropriate to the study to relate firm size and financial performance.

### **Population of the Study**

A target population is generally defined as a group or population that researchers are interested in analysing. Sample sizes are usually drawn from target populations to give smaller or narrow representation of the of the whole population. The target population of this research comprised the firms listed on the LuSE in Zambia for 2012-2022 classified into large, medium and small firms. As at 20th December 2022, there were 23 firms listed on the LuSE (African Markets, 2022).

### **Sample and Sampling Procedure**

Sample size refers to the number of participants or observations included in a study (IWH, 2008). Some other texts define it as the representative portion of the whole population. A sample size was selected because it aids in reducing bias and accurate representation of the population. In some cases, sample sizes aid in answering some objectives and or research questions. A total sample of 7 firms were used – as that was the highest number of firms in the sectors listed in the sectors on the LuSE. The choice of this sample size is justified in the sense that the results obtained would reflect the prevailing situation on the ground those are the only firms listed under the financial sector and they have a diversity to them in terms of structure and function that will not lead to bias and or monotonous type of reporting.

The firms selected had their data collected from their financial reports that spanned a period of 10 years, from 2012 to 2022. About 70 financial reports were analysed. This timeline was selected because information concerning what affects firm size is constantly changing and hence using a much larger period might lead to inaccurate and outdated reporting.

Sampling is the selection of many study units from a defined population and can be anything ranging from people, cases, objects among others. For this study convenience sampling was used to select the sample as the 7 firms were the highest number among all sectors and the information was relatively easier to gather as they are listed companies. This study opted to pick this sampling method because rather than firms being drawn at random from a sea of financial firms, the selected few were easily available to the researcher as they are listed firms on the LuSE.

### Data Collection

The study used time series data over a ten-year period (2012-2022) to examine the effects of firm size on the financial performance of a firm. The data collection method involved secondary research, which essentially involved reviewing data sources that have been collected for some other purpose like the study at hand. Thus, all the relevant data for this study was available in secondary form. The data was extracted from financial reports published by these firms for the period 2012-2022. The data variables were as follows.

- Size of a firm; Return on Assets (ROA)
- Total debt
- Total Assets
- Total Number of Employees

This was done through desk search techniques by visiting the LuSE website.

### Data Analysis

The data collected in this study was analysed with the aid of statistical tool - E-Views. The data was run using correlation and regression statistics. The following were the variables used in the analysis and the regression was as follows;

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon$$

Where, Y = Performance of Financial firms as measured by Return on assets

B0 = Constant

$\beta_i$  = coefficients of the independent variables

X1 = Total assets

X2 = Total debt

X3 = Number of employees

$\varepsilon$  = Error term

The equation was used to determine relationships between the variables. As observed in the equation, the dependent variable 'Y' represented firm performance that was proxied by Return on Assets (ROA). The independent variables on the other hand represented firm size. Firm size

is a size or scale of a company and is often measured through total assets or sales among others (Sudrajat, et al., 2020). This paper therefore conducted research in the financial sector on the LuSE whose firm size was proxied by total assets, total debt and number of employees. According to studies, it was expected that the greater the firm size the higher the chances the firm will perform better financially.

## VII. RESEARCH RESULTS AND ANALYSIS

### Data Analysis

The data used in the study was obtained from the seven firms listed on the LuSE under the financial sector. The period of this data is 2012-2022. The information collected on all the firms included total assets, total debt, number of employees and ROA. The relationship between the dependent variable (ROA) and the independent variables was econometrically established using regression and the Ordinary Least Squares OLS method was employed. The statistical software used was E-Views.

### Graphical Analysis

The stationary test can first be performed by observing and by plotting the observed values of the data series over time as presented below in figure 4.0. This is in order to have an idea of whether the given data is a stationary time series or not. Non-stationarity implies that the mean, variance and standard deviation of a time series variables are not constant, and the use of such data can lead to spurious regression problem. Graphical analysis creates pictures of the data, which will help to better understand the patterns and the correlation between the parameters. Usually, graphical analysis is the starting point for any problem solving.

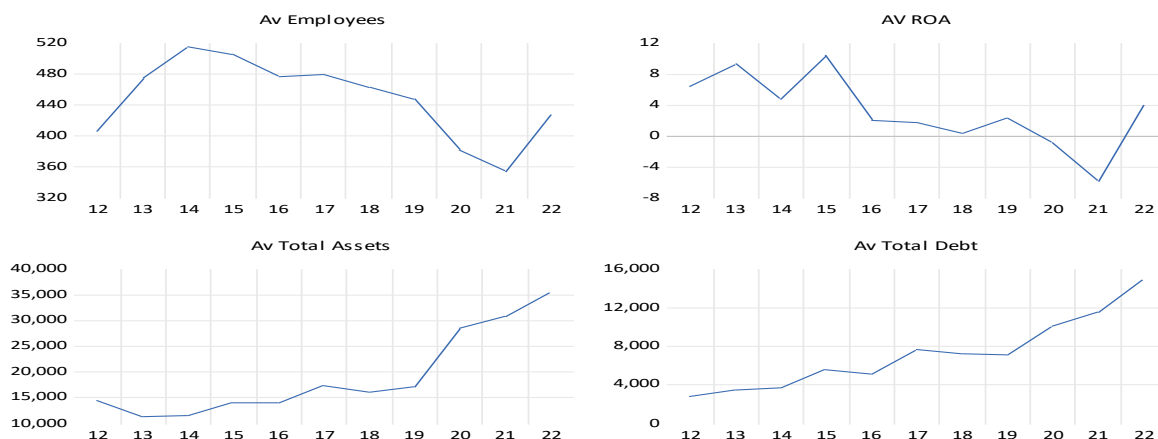


Figure 2: Graphical analysis

Total Assets and Total Debt are trending upwards indicating that mean value of these series has been going increasing overtime. There was spike in 2019 and a steady upward trend thereafter. On the other hand, Employees and ROA both have a downward trend. There was a significant drop in 2021 and then a steady upward trend indicating non stationarity.

#### Unit Root Test

The unit root test was conducted using the augmented dickey fuller (ADF) in order to determine the stationarity of the variables. The main purpose of conducting the unit root test was because nonstationary can lead to false regression results. The test was done both at level and at first difference and only at first difference did the test indicate stationarity.

Variable	ADF at Level		ADF at 1 <sup>st</sup> Difference	
	t-statistic	p-value	t-statistic	p-value
Number of Employees	-2.658762	0.0904	-1.616057	0.4650
Total Assets	0.249786	0.9724	-2.374120	0.1554
Total Debt	1.275984	0.9980	-1.217216	0.6559
ROA	-1.348818	0.5957	-2.040287	0.2691

**Table 1:** Unit Root Test

Determining stationarity and non-stationarity depends on the p vales of the variables. If the expected (calculated) value, in absolute term, is greater than the table vae or p- value more than 5%, this means that the data are non- stationary. From the table able above, we can deduce that all variables are non-stationary at 5% level of significance as the p vales of all variables were found to be

greater than 0.05. This was true for both the 1<sup>st</sup> difference and Level phases.

#### The Cointegration Test

The co-integration test pays focus on whether the long-term linear relationship between two or more time-series is stationary even if there is no liner relationship in the short-run.

No. of CE(s)	Trace		Max- eigenvalue	
	Trace Statistic	Probability	Max-Eigen Statistic	Probability
None	53.70142	0.0128	31.59301	0.0144
At most 1	22.10842	0.2925	11.61492	0.5859
At most 2	10.49350	0.2447	7.942405	0.3846
At most 3	2.551097	0.1102	2.551097	0.1102

**Table 2:** The Integration Test

Trace test indicates 1 cointegrating equation(s) at the 0.05 level

\* denotes rejection of the hypothesis at the 0.05 level

Max-eigenvalue test indicates 1 cointegrating equation(s) at the 0.05 level

\* denotes rejection of the hypothesis at the 0.05 level

The null hypothesis is that there is no co-integrating equation and the alternative hypothesis is that

there is co-integration. The null hypothesis is rejected if the Trace or the Max-Eigen value is higher than the 0.05 critical values. From the table above, both the Trace statistic and the Max-Eigen criteria rejects the hypothesis of no co-integrated equation at the 5% level of significance. Hence, the study concluded that a long-run relationship exists among the five variables.

### **The Long Run Relationship**

To test the long run relationship between the independent and dependent variables were as follows;

Dependent Variables; Return on Assets (ROA)				
Variables	Coefficient	Standard Error	t-Statistic	Probability
C	-351.2948	70.42005	-4.988562	0.0000
Ln TOTAL ASSETS	21.62707	4.604225	4.697223	0.0000
Ln TOTAL DEBT	-15.76260	2.453158	-6.425430	0.0000
Ln EMPLOYEE	46.04457	7.514034	6.127809	0.0000
R-Squared	0.821309	-	-	-
Adjusted R-Squared	0.806821	-	-	-
F-statistic	56.68721	-	-	-
Durbin-Watson	0.502048	-	-	-
Probability(F-statistic)	0.0000	-	-	-

**Table 3:** OLS Regression Results (Co-integration Regression)

From the above regression results, the following co-integrating equation is constructed:

$$\text{Ln ROA} = -351.294 + 21.627 (\text{Ln TAST}) - 15.762 (\text{Ln TDBT}) + 46.044 (\text{Ln EMP})$$

$$t = \quad (-4.988) \quad (4.697) \quad (-6.425) \\ (6.127)$$

$$R^2 = 0.821309 \quad \text{Adj } R^2 = 0.806821$$

From the above results, the p-value of the F-statistic (.00000) shows that the long run model is statistically significant. This implies that the variables, which are, total assets, total debt and number of employees have significant effect on the Return of Assets (ROA) in the long run.

The coefficient of Total Assets (TAST) indicates that, ceteris paribus, a 1% increase in total assets acquired, will lead to a 21.627% increase in Return on Assets. This is a significant impact due to the p-value being less than 0.05 level. The ROA is therefore sensitive to changes in the total assets acquired in the long run. Secondly, the regression coefficient of the Total Debt (TDBT) indicates that a 1% increase in total debt acquired, will lead to a

15.762% decrease in Return on Assets, ceteris paribus. Similarly, a 1% increase in number of employees hired, will lead to 46.044% increase in Return on Assets (ROA). Both variables have a significant impact on ROA in the long run because both their p-values are significant at 0.05% level.

### **The Short Run Relationship**

The main purpose of the error correction model is to capture the time-series properties of variables, through the complex lag structures allowed, while at the same time incorporating an economic theory. This model enables us to analyse the long-run and short run effects of the variables as well as to see the adjustment coefficient, which is the coefficient of the lagged residual terms of the long run relationship identified. The term error-correction relates to the last-period's deviation from a long-run equilibrium, the error, influences its short-run dynamics. Therefore, the ECMs directly estimates the speed at which a dependent variable returns to equilibrium after a change in other variables.

The table below shows the error correction model results.

Dependent Variables; Return on Assets (ROA)				
Variables	Coefficient	Standard Error	t-Statistic	Probability
C	-351.2948	70.42005	-4.988562	0.0000
Ln TOTAL ASSETS	21.62707	4.604225	4.697223	0.0000
Ln TOTAL DEBT	-15.76260	2.453158	-6.425430	0.0000
Ln EMPLOYEE	46.04457	7.514034	6.127809	0.0000
R-Squared	0.821309	-	-	-
Adjusted R-Squared	0.806821	-	-	-
F-statistic	56.68721	-	-	-
Durbin-Watson	0.502048	-	-	-
Probability(F-statistic)	0.0000	-	-	-

**Table 4:** Error Correction Model (ECM) Results

The short run equation reads as follows;

$$D(\text{LnROA}) = -0.6036 + 5.455 D(\text{LnTAST}) + 9.0107 D(\text{LnTDBT}) + 33.8230 D(\text{LnEMP}) + 0.1868(\text{ECT})$$

The results in the table above, indicate that at 5% level of significance Total Debt (TDBT) and Employees (EMP) are significant in the short-run. They have positive influence on the Return on Assets (ROA) in the financial institutions over the selected period. This implies that debt and employees hired have an immediate effect on the return on assets as soon as they are acquired. Total Assets on the other hand indicates that, it does not impact Return on Assets (ROA) in the short run. This implies that the purchase of assets by these firms will not yield immediate results.

The coefficient of Total debt indicates that a 1% increase in the Total Debt in the short run, on average, will lead to a 9.01% increase in the Return on Assets. Similarly, a 1% increase in number of employees will lead

to a 33.82% increase in Return on Assets in the short run, everything else being equal.

#### **Serial Correlation**

Serial correlation displays the relationship between a given variable and a lagged version of itself over various time intervals. It basically measures the relationship between a variables current value given its past values. Positive correlations indicate that values are likely to change in the future time periods in the same way or direction that they have in recent past time periods. Negative serial correlation indicates that values are likely to move in the opposite direction in the future time periods compared to how the values have in the recent past time periods.

To test for serial correlation in the residuals, the study used the Breusch-Godfrey serial correlation LM test, and the results were as follows:

Breusch- Godfrey Serial Correlation LM test			
F-statistic	25.51532	Prob. F(2,33)	0.0620
Obs R-squared	24.29144	Pro. Chi- Squared(2)	0.0730

**Table 5:** Serial Correlation Test

To interpret results, a low p-value would lead to rejection of the null hypothesis. As observed in the above result, the probability value of the chi-squared statistic is above the 5% significance level. We can conclude that there is no serial correlation in the residuals of the model for the study.

#### **Test for Heteroscedasticity**

Test for Heteroscedasticity refers to determining whether the population used in the regression contains unequal variance. The presence of heteroscedasticity in a model leads to a violation of the assumption of the ordinary least square (OLS) regression and tends to

provide biased results. In turn, it renders the results of t or f statistics unreliable. If the P-value is smaller than the

significance level, we reject the null hypothesis, which implies that the model is heteroskedastic.

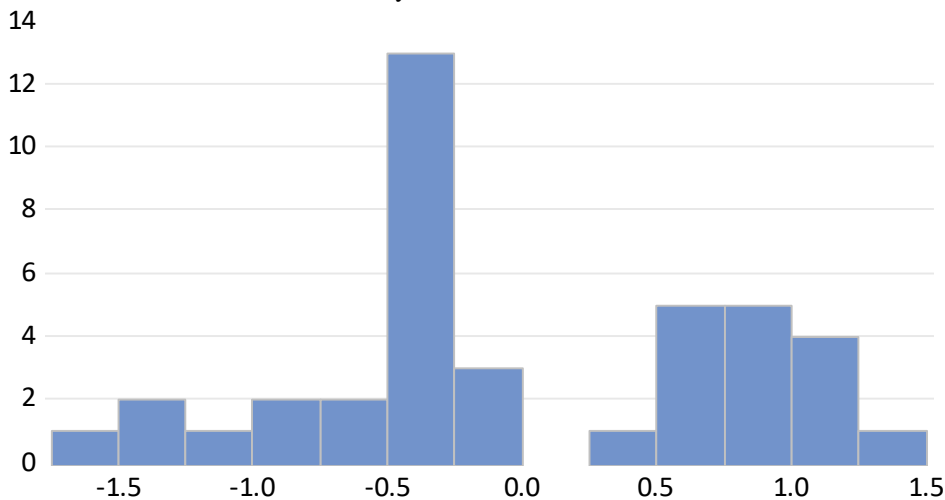
Heteroscedasticity Test-Breusch-Pagan- Godfrey			
F-statistic	3.021724	Prob. F(4,35)	0.0603
Obs R-squared	10.26774	Pro. Chi- Squared(4)	0.362
Scaled explained SS	3.962773	Pro. Chi- Squared(4)	0.4111

**Table 6:** Test for Heteroscedasticity

As seen in the above results, the p-value (0.362) of the observed  $R^2$  is greater than the significant level of 5%, we therefore fail to reject the null hypothesis and can conclude that the model is not heteroskedastic.

#### Normality Test

A normality test determines whether a sample data has been drawn from a normally distributed



Series: Residuals	
Sample 2012Q2 2022Q1	
Observations 40	
Mean	-8.33e-17
Median	-0.277013
Maximum	1.298765
Minimum	-1.657953
Std. Dev.	0.794827
Skewness	0.021797
Kurtosis	2.008181
Jarque-Bera	1.642677
Probability	0.439843

To determinant of normality in a model falls on the significance of the probability. The probability value is greater than 0.05, the data is normal. If it is below 0.05, the data significantly deviates from a normal distribution. The probability value of the Jarque-Bera is 43.98%, which is greater than 5%. This implies that the residuals are normally distributed, and that the model is significant.

#### Discussion

The study sought to evaluate how the sizes of the firm's size affects financial performance; a case study of listed firms on the Lusaka Stock Exchange (LuSE). The study focused on three variables, namely, total debt, total assets and number of employees. These independent variables were regressed against return on assets which was selected as the dependent variable.

Following the analysis, the findings of the study are discussed in the paragraphs below;

population. Generally, it is performed to determine if the data involved in the research have a normal distribution. To test for Normality, the study used the Jarque-Bera test and the results were as follows:

#### The Effect of Total Assets on the Return of Assets (Roa)

One of the study's specific objectives was to determine the relationship between total assets and financial performance of a firm. It has been established, in accordance with results of the study, that total assets had a significant positive relationship with return on assets. A 1% increase in total assets will lead to a 21.62% increase the return on assets in the long run. These findings are similar to the findings of Kioko (2013) who carried out a study to determine the effect of the relationship between firm size and financial performance of commercial banks in Kenya (Kioko, 2013). The study established that net assets were a significant predictor of ROA. It had a significant coefficient indicating that increases in the net assets by a commercial bank in Kenya increases the return on assets.

Similarly, an empirical study carried out by (Njoroge, 2012) focused on the effect of firm size on financial performance of pension schemes in Kenya. The study sought, in one of the objectives, to find out the relationship between the book assets and the financial performance of pension schemes. The value of the book assets was reported in the financial records of the funds. It was established that a unit increase in books assets would lead to an increase in financial performance. A study carried out by (Doğan, 2013) to investigate if firm size affects profitability- case study of Turkey, also observed a positive relation between total assets and profitability of the firms studied.

The results further show that total assets have an insignificant positive relationship with return on assets in the short run. The p-value was greater than the 0.05% significance level. This implies that assets will have no direct impact on assets acquired in the short run period.

These results are supported by the Modern Portfolio Theory. This theory illustrates that investors will build an asset portfolio that enables them to maximise the expected return for a given level of risk. The theory suggests that investors or firm owners ought to diversify and own a variety of assets that will lead to stable returns and help reduce risk

#### ***The Effect of Total Debt on the Return of Assets (Roa)***

Another specific objective was to determine the relation between total debt and firm performance. The study shows that a 1% increase in total debt will lead to a 15.76% decrease in the return on assets in the long run. The study indicates a significant relation as the p-value found is less than the 0.05% significance level. This result is aligned with the findings of (Mahzura, et al., 2016) which state that debt leverage has an impact on the firm's value. The study states that the lower a firm's debt ratio, the better the company's ability to pay its long-term obligations.

(Filipovic & Demirovic, 2016) had similar findings. The researchers showed that there is negative impact of debt (leverage) on profitability on companies. The study carried out research on the relationship between debt and profitability of stock companies in Montenegro. The increase in debt reflected a decrease in return on equity. Lastly, findings by (Bafana, 2016), revealed that leverage have negative influence on the financial performance of firms in Kenya.

The results of this study further show that total debt has a positive impact on return on assets in the short run. A 1% increase in debt in the short run will lead to a 9.01% increase in the return on assets. Debt acquired in the short run enables for a firm to have readily available cash on hand. This helps a firm keep up and meet operational needs when the revenue streams are temporarily insufficient.

These results are supported by the Economic Theory. This theory illustrates that every investor and firm owner will be rational and efficient. It believes that humans will make the correct decisions based off rationality. Therefore, investors will look for alternative ways to improve their financial status and nor resort to debt financing.

#### ***The Effect of Number of Employees on the Return of Assets (Roa)***

The final objective that involves a variable is to determine the relationship between of employees and the firm's performance. The study deduced that number of employees have a positive significant relationship with the financial performance of a firm. a 1% increase total number of employees will lead to a 46.04% increase in return on assets in the long run. These findings are in line with (Njoroge, 2012) and (Doğan, 2013). The studies indicate that an increase in hired employees leads to an increase in financial performance in a firm.

In contrast, (Kioko, 2013) states that number of employees has no significant influence on return on assets. A rise in number of employees would not lead to a positive effect on the return on assets.

Results of the study further shows that number of employees has a positive impact on return on assets in the short run. A 1% increase in number of employees would lead to a 33.82% increase in the return on assets.

These results are supported by the human capital theory. This model illustrates that firm size positive correlation exists between the size of a firm and earnings, which is in line with labour markets that are highly competitive.

## **VIII. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS**

### ***Summary of Findings***

The results of the study were obtained from a regression carried out in E-Views. The following are the summary of the results.

### ***Summary of Total Assets***

A 1% increase in total assets acquired, will lead to a 21.627% increase in Return on Assets. This is a significant impact due to the p-value being less than 0.05 levels. The ROA is therefore sensitive to changes in the total assets acquired in the long run. This indicates that total assets are a significant predictor of ROA. The positive coefficient of 21% indicates that an increase in total assets by these firms selected would positively influence ROA in each firm.

In the short run, however, Total Assets do not impact ROA. This implies that the purchase of assets by these firms will not yield immediate results. The probability of total assets in the short run at 26.50% is

greater than the 5% significance level, making the result insignificant.

#### **Summary of Total Debt**

A 1% increase in total debt acquired, will lead to a 15.762% decrease in Return on Assets, *ceteris paribus*. The study indicates a significant relation as the p-value found is less than the 0.05% significance level. The significance can aid to conclude that total debt can be used as a predictor of ROA. The negative coefficient of -15% indicates that an increase in total debt acquired would lead to a decrease in ROA in the long run.

The short run however, shows that total debt has a positive coefficient. Thus implies that in the short run, total debt will lead to a positive boost in ROA. A 1% increase in debt in the short run will lead to a 9.01% increase in the return on assets.

#### **Summary of Number of Employees**

A 1% increase in number of employees hired, will lead to 46.044% increase in ROA. The variable has a significant impact on ROA in the long run because the p-value is significant at 0.05% level. The significance can aid to conclude that total debt can be used as a predictor of ROA. The positive coefficient of 46% indicates that an increase in total assets by these firms selected, would positively influence ROA in each firm.

The same applies to the short run, a rise in number of employees would lead to a positive effect on the return on assets.

#### **Conclusions**

The study embarked on determining the relationship between firm size and the financial performance. The study focused on four main variables, Total assets, Total debt, Number of Employees as the independent variables and a Return on Assets (ROA) as the dependent. The independent variables were regressed against the dependent variable, ROA in E-Views to detain the relationships among the variables. Based on the results of data analysis and the discussion carried out in the previous chapter, this study produced several conclusions including the following.

The main of the objectives of the study were to firstly, determine if total debt, total assets and number of employees have an influence on financial performance. The study also evaluated the relationship that exists between firm size and financial performance. Further, the study established the association between firm size and firm's financial performance as measured by ROA.

The study established that the relationship between the three independent variables, namely, total assets, total debt and number of employees and the dependent variable- ROA of all the firms in the financial sector of the LuSE were all found to be statistically significant in long run. Same applies to the short run, with the exception of total debt, which seemed to be statistically

insignificant in this period. Overall, total number of employees and total debt seemed to have a relatively stronger relationship than total assets as this variable was only significant in one period.

The study also concludes that there is a relative strong relationship between firm size and financial performance. The variables used in the study found strong significant ties to the dependent variable.

Lastly, it has been established the association between firm size and firm's financial performance as measured by ROA was determined. The study shows that firms with more assets, more employees and less debt are more likely to enjoy greater financial profitability in their long run periods. This implies that a positive relationship is expected between the size of the firm and the profitability levels. The association between the two is positive when ROA is employed as the proxy for firm size.

The study concludes that firms listed in the financial sector of the LuSE should invest in assets as they lead to greater benefits in the future. They should also employee sizeable and highly qualified employees that can aid in achieving their goals. Firms should also aim to manage their debt well to avoid future complications with too much debt to pay off.

Larger firms with greater assets and greater capacity to hire will more likely have more returns on their assets. This implies that firms such Zanaco, Standard Chartered Bank, Investrust Bank and Madison Insurance which are categorised as large firms with an average of 300 plus employees in each of the years studied, will have greater return on assets. This therefore goes to show that employee affect firm performance.

They are more likely to manage their resources efficiently than smaller firms. They will rise superior as they are able to enjoy economies of scale and hence won't need to borrow as much as small firms will, in order to mitigate their costs and boost their financial performance.

#### **Recommendations of the Study**

The study aimed at investigating if the size of the firm affects its financial performance. The variables used in the study were total assets, total debt and total number of employees. All variables were found to have statistical significance.

The study recommends the following

- For these listed financial institutions to improve their financial performance, they must all allocate resources for the investment of assets and a good set of qualified employees that can contribute significantly to the growth of the firm and aid in the achievement of the firm's objectives. They must develop efficient company policies on debt management, should they decide to use debt financing as a source of income.
- The study also recommends that firms put in place proper employee policies that ensure that all workers

are working at their maximum potential as they affect the work flow and productivity of the firms. They are considered the most valuable assets a firm has. Therefore, they must be managed well as their abilities, knowledge and experience cannot be replaced.

#### **Recommendation for Future Studies**

During the study, a major limitation faced was obtaining financial reports from the firms listed on the financial sector of the LuSE. This was due to their privacy policies. Firms were not willing to disclose some reports as they were only accessible to senior management despite them being publicly listed. The firms were still reluctant despite informing them the information was solely for academic purposes. The reluctance assumedly stemmed from the firms thinking the information would be handed to competitors despite not this being the case.

Another major limitation was that the data used in the research was secondary and historic. The data was collected from LuSE and statistical websites. The study results may therefore not be fully comparable to other countries or industries as they are specific to Zambia and the LuSE.

Lastly, an already conducted study on this topic relating to the financial sector on the LuSE was difficult to find and therefore, the study did not have any benchmark from within the country with which to compare results.

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