

Effect of Macroeconomic Factors on Commercial Banks Profitability in Kenya: Case of Equity Bank Limited

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Abstract

Commercial banks appear very profitable in Sub-Saharan Africa (SSA), average returns on assets were about 2 percent over the last 10 years, significantly higher than bank returns in other parts of the world. In order to survive in the long run, it is important for a bank to find out what are the determinants of profitability so that it can take initiatives to increase its profitability. However, owing to the fact that there are few studies on the determinants of bank profitability, various studies indicate divergent views on the effect of macroeconomic factors on bank profitability. For these reasons, it is not clear whether or not macroeconomic factors affect bank profitability in Kenya. The main purpose of this study was to establish effect of macroeconomic factors on bank profitability in Kenya with Equity bank in focus to understand country and bank specific characteristics. Specific objectives were to determine, examine and evaluate effect of; economic growth (real GDP), inflation and exchange rate on bank profitability in Kenya with Equity bank in focus respectively. This study was modeled on the theory of production and based on correlation research design. Sample size consisted annual data spanning 5 years from 2008- 2012. Data was obtained from the World Development Indicators, published Equity bank documents (annual reports, investor briefings and financial statements). To accomplish this task the study used Cobb-Douglas production function transformed into natural logarithm. This study employed OLS to establish the relationship between macroeconomic factors and bank profitability. The results indicated that macroeconomic factors (real GDP, inflation and exchange rate) have insignificant effect on bank profitability in Kenya with Equity bank in focus at 5% level of significance. We concluded that macroeconomic factors do not affect bank profitability in Kenya. In view of this, it is clear that internal factors which relate to bank management significantly determine bank profitability in Kenya. The study therefore recommends that banks to adopt policies that enhance managerial efficiency for higher profits to be realized.

Keywords: Macroeconomic factors, Commercial bank Profitability

1. Introduction

Commercial banks play a vital role in the economic resource allocation of countries (Ongore, 2013). They contribute to economic growth of the country by making funds available for investors to borrow as well as financial deepening in the country (Otuori, 2013). Commercial banks appear very profitable in Sub-Saharan Africa (SSA), average returns on assets were about 2 percent over the last 10 years, significantly higher than bank returns in other parts of the world (Flemini *et al.*, 2009). The major reasons behind high return in the region as outlined by Ongore (2013) were; investment in risky ventures and the existence of huge gap between the demand for bank service and the supply thereof. That means, in SSA the number of banks are few compared to the demand for the services; as a result there is less competition and banks charge high interest rates especially true in East Africa where the few government owned banks take the lion's share of the market (Ongore, 2013).

This study on the effect of macroeconomic factors on commercial bank profitability in Kenya with Equity bank in focus is modeled on the theory of production. According to Koutsoyianis (2003), a production process is a combination of factor inputs required for the production of one unit of output. A commodity may be produced by various methods of production. The production process as Koutsoyianis (2003) puts encompasses a production function which represents a technical relation connecting factor inputs and outputs with study employing Cobb Douglas production function.

The performance of commercial banks can be affected by internal and external factors which can be classified into bank specific (internal) and macroeconomic variables (Ongore, 2013). The internal factors are individual bank characteristics which affect the bank's performance, these factors are basically influenced by the internal decisions of management and board. The external factors are sector wide or country wide factors which are beyond the control of the company and affect the profitability of banks (Ongore, 2013).

This study focused on the effect of macroeconomic factors on the profitability of commercial banks in Kenya which are beyond the control of the banks. In order to survive in the long run, it is important for a bank to find out what are the determinants of profitability so that it can take initiatives to increase its profitability by managing the dominant determinants (Podder, 2012). Bank performance is also vitally important for all stake holders, such as the owners, the investors, the debtors, the creditors, the depositors, the managers of banks, the regulators and the government (Podder, 2012). The performance of banks gives directions to the stake holders in

their decision making. As outlined by Podder, (2012); It gives direction to the debtors and the investors to make decision whether they should invest money in bank or invest somewhere else, It also flashes direction to bank managers whether to improve its finance and Regulatory agencies and government are also interested in financial performance for the regulation purposes (Podder, 2012).

The purpose of this study was to establish the effect of macroeconomic variables on bank profitability in Kenya with Equity bank in focus. This is justified on the grounds that there are few studies on the effect of macroeconomic variables on bank profitability in Kenya. Available studies are based on panel data set which gives a general overview rather than focusing on a specific bank. Further, various studies lack consensus on the effect of macroeconomic factors on bank profitability. For instance, Ongore (2013) argue that macroeconomic variables insignificantly affect bank profitability whereas Athanasoglou *et al.*, (2006) found mixed results with regard to macroeconomic variables. For these reasons, it is difficult to conclude whether or not macroeconomic factors affect bank profitability in Kenya. This study therefore, seeks to bridge the inconclusive gap on the effect of macroeconomic variables on bank profitability and the methodological gap of generalization by establishing the effect of macroeconomic factors on bank profitability in Kenya with Equity bank in focus.

1.1 Overview of Banking Sector in Kenya

The Companies Act, the Banking Act, the Central Bank of Kenya Act and the various prudential guidelines issued by the Central Bank of Kenya (CBK), governs the Banking industry in Kenya. The banking sector was liberalized in 1995 and exchange controls lifted (Otuori, 2013). The CBK, which falls under the National treasury cabinet secretary's docket, is responsible for formulating and implementing monetary policy and fostering the liquidity, solvency and proper functioning of the financial system (Otuori, 2013). The CBK publishes information on Kenya's commercial banks and non-banking financial institutions, interest rates and other publications and guidelines (Otuori, 2013). Further according to CBK, (2008) as captured by Otuori, (2013), the banks have come together under the Kenya Bankers Association (KBA), which serves as a lobby for the banks' interests and addresses issues affecting its members.

According to Central Bank of Kenya (2011) Supervision Report as of December 2011 as captured by Ongore, (2013) out of the 43 commercial banks 30 of them are domestically owned and 13 are foreign owned. Ongore, (2013) asserted that, in terms of asset holding, foreign banks account for about 35% of the banking assets as of 2011. In Kenya the commercial banks dominate the financial sector. In a country where the financial sector is dominated by commercial banks, any failure in the sector has an immense implication on the economic growth of the country (Ongore, 2013).

1.2 Overview of Equity Bank Limited

Equity Bank Limited, previously known as Equity Building Society ("EBS"), commenced operations in 1984. In the 1990s, EBS changed its focus to microfinance, targeting the under-served, low income population. The growth in business volumes and penetration necessitated the conversion to a commercial bank in 2004, and the company subsequently listed on the Nairobi Stock Exchange in August 2006 (and later the Uganda Securities Exchange). Equity Bank Limited is the holding company of the group's banking subsidiaries in Uganda, Southern Sudan and recently Rwanda established in 2011 and Tanzania established in February 2012 (Maina, 2013).

According to CBK, Bank Supervision Report 2012 as captured by Maina, (2013), the Bank is the largest listed bank in terms of customer numbers, with a customer base of 8.3 Million and second largest in terms of asset base, which stands at KES 261.5B after KCB with an asset base of KES 369.54B. Equity Bank was the most profitable bank in 2012 with a PBT of KES 16.1B representing a 7.4% and 37.6% increase in RoA and RoE respectively (Maina, 2013). The banking survey 2009 also noted Equity bank as the best bank in Kenya 2009.

1.3 Objectives of the study

1.3.1 Main Objective

The purpose of this study was to establish the effect of macroeconomic factors on commercial banks profitability in Kenya: case of equity bank limited.

1.3.2 Specific Objectives

The specific objectives of this study were to;

- i. Determine effect of economic growth (real GDP) on bank profitability in Kenya with Equity Bank in focus.
- ii. Examine effect of inflation on bank profitability in Kenya with Equity Bank in focus.
- iii. Evaluate effect of exchange rate on bank profitability in Kenya with Equity Bank in focus.

1.4 Research Hypothesis

The study focused on the following hypotheses such that for the;

- i. Effect of economic growth on bank profitability in Kenya with Equity Bank in focus
- ii. H_0 : Economic growth (real GDP) does not affect bank profitability in Kenya.

- iii. H_1 : Economic growth (real GDP) affects bank profitability in Kenya
 Effect of inflation on bank profitability in Kenya with Equity Bank in focus
 H_0 : Inflation does not affect bank profitability in Kenya.
 H_1 : Inflation affects bank profitability in Kenya
- iv. Effect of exchange rate on bank profitability in Kenya with Equity Bank in focus
 H_0 : Exchange rate does not affect bank profitability in Kenya.
 H_1 : Exchange rate affects bank profitability in Kenya.

1.5 Scope of the study

This study on the effect of macroeconomic factors on commercial banks profitability in Kenya: case of equity bank limited was based on annual data for the period 2008 to 2012. It should be noted that in the year 2008 Equity bank was awarded several awards (Best bank in Kenya, best bank in East Africa, best performing Ai 100 company in Africa, Microfinance bank of the year) and it was the most profitable bank in 2012 in Kenya with a Profit before tax of KES 16.1B representing a 7.4% in ROA (Maina, 2013).

1.6 Theoretical Framework and Conceptual Framework

This study was modeled on the theory of production. According to Koutsoyianis (2003), a production process is a combination of factor inputs required for the production of one unit of output. A commodity may be produced by various methods of production. The production process as Koutsoyianis (2003) puts encompasses a production function which represents a technical relation connecting factor inputs and outputs. As applied to this study, the production theory holds that macroeconomic variables - factor inputs would influence bank profitability (factor output), thus there is a functional relationship between bank profitability and macroeconomic variables. This study used Cobb- Douglas production function to represent the functional relationship between factor inputs (macroeconomic variables) and factor outputs (bank profitability) in Kenya. According to Koutsoyianis (2003), Cobb- Douglas production function is one of the most popular and easiest forms of production functions in applied research represented as;

$$Y = AK^\alpha L^\beta$$

(1.1)

Where Y = Output

A = Total factor productivity

K= Capital

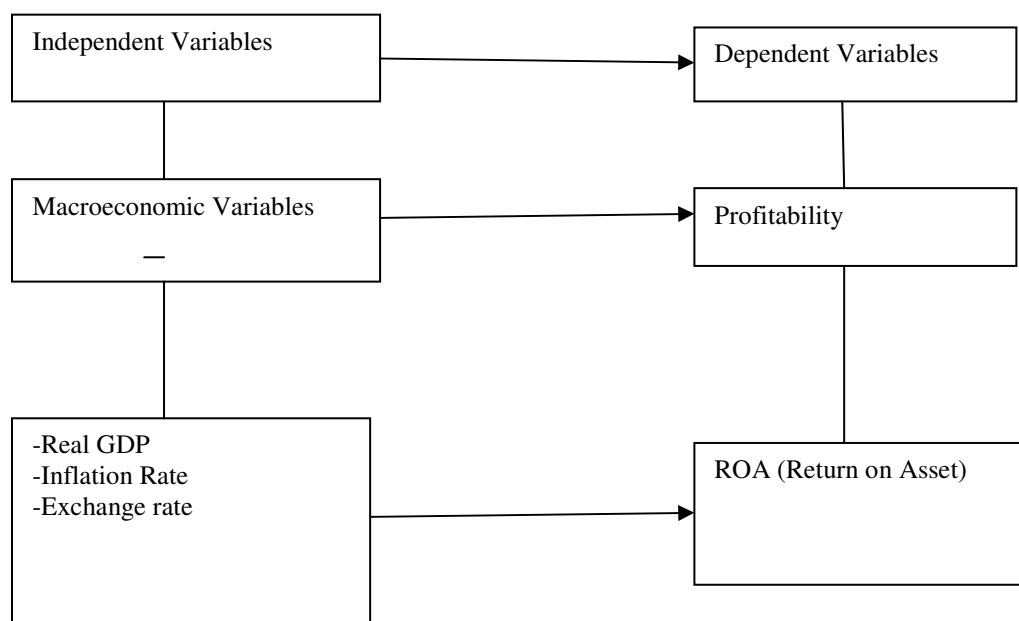
L = Labour

α and β = elasticity coefficients of capital and labor, respectively.

The functional relationship between macroeconomic variables and bank profitability in Kenya is further elaborated by the conceptual framework below;

Figure 1.1: Conceptual Framework for the relationship between Macroeconomic variables and bank

Profitability in Kenya



Source: author's self conceptualization

In the conceptual framework, the independent variables are conceptualized as macroeconomic variables. The macroeconomic variables included; real GDP, inflation, exchange rate. The dependent variable is bank profitability proxied by Return on Asset (ROA). The framework postulates that the macroeconomic variables directly affect bank profitability in Kenya. This relationship in the form of Cobb- Douglas production function (1.1) is represented as;

$$Y_t = AE_t^\pi G_t^\varepsilon I_t^\tau \mu_{1t} \quad (1.2)$$

Where,

Y_t , = Profitability (ROA), A = Total factor Productivity, G_t = real GDP, I_t =inflation, E_t =exchange rate, μ_{1t} = error term, ε, π, τ = elasticity coefficients and $t = 2008, 2009, 2010, 2011, 2012$ denotes time period.

1.7 Organization of the Study

The rest of this paper is organized as follows: Section 2 provides literature on the effect of macroeconomic variables on bank profitability, section 3 outlines the research methodology and measurement of the variables. Section 4 provides results and discussion followed by summary, conclusions and recommendations in section 5.

2. Literature Review

2.1 Literature on Macroeconomic determinants of Bank profitability

Sufian and Kamarudin (2012) identified bank specific characteristics and macroeconomic determinants of profitability in the Bangladesh's banking sector over the years 2000 to 2010 using a sample of 31 commercial banks in Bangladesh. The determinants were identified using multiple regression analysis. The results revealed that macroeconomic determinants significantly influenced profitability. The relationship between economic growth and bank performance is negative and significant while the coefficient of inflation was significant and positive.

Rao & Lakew (2012) explored the key determinants of profitability of commercial banks operating in Ethiopia using panel data set of banks over the period 1999/00-2008/09. The external factors were related to the industry and the macroeconomic scenarios within which the banks operate. The result of the study indicated that external factors had a statistically insignificant effect. Inflation was found to be statistically insignificant but it is positively related to bank profitability. Real GDP growth rate effect was found to be statistically insignificant though with a positive sign.

Haron (2004) investigated the determinants of Islamic bank profitability and found that CPI was positively related to all profitability measures, their relationship was not statistically significant

Dietrich & Wanzenried (2009) analyzed the profitability of commercial banks in Switzerland over the time period from 1999 to 2006. Their sample included 1'919 observations from 453 banks. Besides bank specific characteristics, they included a set of macroeconomic and industry-specific variables into their regression analyses. Their results showed that the GDP growth rate affects bank profitability in Switzerland positively, with the coefficients being significant at the 5% level.

Athanasoglou *et al.*, (2006) examined the profitability behaviour of bank-specific, industry related and macroeconomic determinants, using an unbalanced panel dataset of South Eastern European (SEE) credit institutions over the period 1998-2002. The estimation results indicated that the picture regarding the macroeconomic determinants was mixed. Inflation positively and significantly affects profitability.

Ongore (2013) Studied moderating effect of ownership structure on bank performance by use of linear multiple regression model and Generalized Least Square on panel data of commercial banks in Kenya to estimate the parameters. The findings showed that GDP had an insignificant -0.046 correlation coefficient with ROA, inflation had significant negative relationship with financial performance of commercial banks in Kenya. It had -0.055 coefficients of parameters with ROA.

Constantinos & Sofoklis (2009) investigated the effects of bank-specific and macroeconomic determinants of bank profitability, using a panel data approach of six Greek banks. The inflation rate appeared to have a positive but slight effect on bank profitability. Other macroeconomic variables investigated, such as GDP, were found to be highly insignificant.

Otuori (2013) by investigating the Influence of exchange rate determinants on the performance of commercial banks in Kenya sought to determine the relationship between inflation rate and bank profitability in Kenya. The study found that inflation rate had a negative and significant effect on bank profitability. This effect was significant at 5% level of confidence.

Ramadan et al, (2011) investigating the nature of the relationship between the profitability of banks and the characteristics of internal and external factors using a panel data set of banks in Jordan. For this purpose 100 observation of 10 banks over the period 2001-2010 were comprised. Results associated with the macro-economic

determinants; inflation (INF) and economic growth (RGDP) showed a positive insignificant impact on return on assets.

Jasmine (2011) found out the profitability determinants of commercial banks in Malaysia after the 2008 financial crisis. 8 commercial banks were chosen to represent the commercial banks in Malaysia during the time line from 2004 till 2010. ROA was chosen as a dependent variable to estimate the commercial bank's profit, and 10 independent variables which are base lending rate, gross domestic production, inflation rate, capital adequacy ratio, total income, expenses management, interest coverage, total loans, total deposits, and bank size. It was found that base lending rate is a significant variable while inflation rate was insignificant in determining the profitability of commercial banks in Malaysia.

Flamini et al.,(2009) in their study on the determinants of commercial bank profitability in Sub-Saharan Africa established that Macroeconomic variables significantly affect bank profitability in Africa. In particular, inflation had a positive effect on bank profits; output growth had a significant positive impact on bank profitability.

Li (2009) investigated the impact bank's specific factors and macroeconomic factors on bank's profitability, which is measured by return on average assets (ROAA) in the UK banking industry over the period 1999-2006. The results indicated that macroeconomic variables real GDP and inflation) had insignificant effect which indicated that macroeconomic factors have little impact on profitability of banks.

Zhang and Dong (2011) analyzed the profitability of the U.S banking sector over the period from 2000 – 2008 using OLS. Their profitability determinants included bank-specific characteristic as well as macroeconomic factors. They found that the macroeconomic factors of GDP and interest rate change were significant in explain bank profits.

Babazadeh & Farrokhnejad (2012) examined the effects of foreign exchange changes on Banks' operations and profits by applying Error Correction Model (ECM) on one of the commercial banks in Iran for the period of five years from 2006 to 2010. The results explain that exchange rate was significant determinant of profits.

2.2 Summary and Gap in Literature

From the studies reviewed, it is evident that several research works on the determinants of bank profitability in various parts of the world have been carried out. However, the short coming of these reviews is that most studies have relied on panel data set which gives a generalized overview as opposed to bank specific characteristic. Further from the studies the effect of macroeconomic factors on bank profitability is inconclusive with some researcher finding insignificant effect while others establishing significant influence. This study bridges this gap by use of annual data involving Equity Bank limited (Kenya) to establish bank specific characteristics of the effect of macroeconomic factors on bank profitability in Kenya with Equity bank in focus.

3. Research Methodology

This section encompasses research design, model specification, data collection and data presentation.

3.1 Research design

The study was based on correlation research design. Oso & Onen (2011) argued that correlation design predicts one variable from the other and determines whether, and to what degree, a relationship exists between quantifiable variables. The study established the effect of macroeconomic factors on bank profitability in Kenya with Equity bank limited in focus by use of correlation coefficients and regression analysis.

3.2 Model specification

The model was adopted from the Cobb- Douglas production function for establishing the effect of macroeconomic factors on bank profitability in Kenya with Equity bank limited in focus. The Cobb- Douglas production function represented by equation (1.2) transformed into natural logarithm became;

$$\ln Y_t = \Pi + \pi \ln E_t + \varepsilon \ln G_t + \tau \ln I_t + v_{1t} \quad (3.1)$$

Where $v_{1t} \sim \text{IIDN}(0, \sigma^2)$, which is the natural log for μ_{1t} and $\Pi = \ln A$

3.2.1 Measurement of Variables

3.2.1.1 Dependent Variable

Guru *et al.*, (1999) as captured by Rao & Lakew ,(2012) asserted that ratios instead of the real value of profits are used in measuring bank profitability because ratios are not influenced by variations in the general price level and are the most frequently used ratios in measuring bank profitability in the baking literature.

3.2.1.1.1 Return on Asset (ROA)

Return on Assets (ROA) indicates how effectively a bank manages its assets to generate income (Davydenko, 2010). Computed as the banks' after tax profit over total assets (Flemini et.,2009). ROA according to Flemini et al.,(2009) may be biased due to off-balance-sheet activities, but believe such activities are negligible in SSA banks.

3.2.1.2 Independent Variables

3.2.1.2.1 Macroeconomic Variables

These are country wide factors which are beyond the control of the company and reflect the economic environment within which the commercial banks operate (Ongore, 2013).

3.2.1.2.2 GDP Growth (Annual %)

GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products (World development indicators, 2012). The study used the annual % of GDP growth of Kenya for the period 2004- 2012

3.2.1.2.3 Inflation,

Inflation is measured by the consumer price index and reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly (World development indicators, 2012).

3.2.1.2.4 Exchange rate

Official exchange rate refers to the exchange rate determined by national authorities or to the rate determined in the legally sanctioned exchange market. It is calculated as an annual average based on monthly averages (local currency units relative to the U.S. dollar) (World development indicators, 2012).

3.3 Correlation

Correlation is concerned with finding out whether there is an association between variables and if there is determines its strength and direction. This study used correlation coefficients obtained from the correlation matrix to determine if there exists correlation between macroeconomic factors and bank profitability in Kenya with Equity bank Limited in focus.

3.4 Regression analysis

The study employed multiple regression analysis which refers to testing hypothesis about the relationship between a dependent variable and two or more independent variables and for prediction. In order to develop the relationship between trade openness and economic growth, the research work adopted the Ordinary Least Square (OLS) as the estimation technique. The method of OLS is extensively used in regression analysis primarily because it is intuitively appealing and mathematically much simpler than any other econometric technique (Gujarati, 2003).

3.5.1 Diagnostic Tests

3.5.1.1 Introduction

This study carried out various diagnostic tests to investigate whether the assumptions of classical linear regression analysis are satisfied which refer to; Statistical tests and econometric tests.

3.5.1.2 Statistical Tests

The statistical tests involved t-test and F-tests. The test was necessary in determining the statistical significance of individual parameters and joint significance with the aid of the relevant distribution tables.

3.5.1.3 Econometric Tests

The econometric tests included; serial correlation, multicollinearity, heteroscedasticity and the normality test distribution of random variable.

3.5.1.3.1 Normality Test

Normality test was carried out to verify if the error terms are normally distributed. The Jacque-Bera (JB) test was employed to ascertain this assumption. The JB test statistic is given by; $JB = \frac{n}{6} (S^2 + \frac{(k-3)^2}{4})$ and follows a χ^2 distribution with 2 degrees of freedom ($\chi^2 (2df)$). Where n= no. of observations, s= skewness and k = kurtosis. The test was based on the null hypothesis that the residuals are normally distributed.

3.5.1.3.2 Autocorrelation Test

Autocorrelation or serial correlation refers to the case in which the error term in one time period is correlated with the error term in any other time period. The study employed the Durbin-Watson test. This test was based on the null hypothesis of no serial correlation.

3.5.1.3.3 Multicollinearity Test

Detection was by high pair-wise correlation among regressors. According to Gujarati (2004), the rule of thumb is that if the pair-wise correlation coefficient between two regressors is high, in excess of 0.8, then multicollinearity is a serious problem.

3.5.1.3.4 Heteroscedasticity Test

Heteroscedasticity occurs when the variance of the error term is not constant. The study employed White's General heteroscedasticity Test. Gujarati (2004) asserts that the general test of heteroscedasticity proposed by White does not rely on the normality assumption and is easy to implement.

3.6 Data Collection

3.6.1 Sources of Data

Data used in the study was obtained from official published documents of the World Bank; World Development Indicators, Equity bank; financial statements, investor briefings and Banking Survey.

3.6.2 Data Analysis

The study used inferential data analysis to analyze this quantitative research data. The techniques used included; correlation and regression analysis inferential data analysis techniques. Oso and Onen (2009) asserted that correlation is used when a researcher wants to describe the association between two or more variables in terms of magnitude and direction while regression analysis is used when a study is about prediction of variables from other predictor variables. Data analysis was conducted using Econometric estimation software Eviews.

3.7 Data Presentation

Oso and Onen (2009) describe tables and figures as useful in presenting findings because they can summarize a lot of information in a small space. This study used tables and figures for presentation of data.

4. Results and Discussion

4.1 Discussion of Findings

Descriptive statistics gives initial indication of variables that can be used in regression analysis giving several summarized statistics on a variable, e.g. mean, median, standard deviation and also often the lowest and highest observation (Johansen, 2011). The statistics in table 4.1 indicate that economic growth (real GDP), Inflation, exchange rate and bank profitability (ROA) are normally distributed. Jarque-Bera test confirms that the variables are normally distributed at 5% level of significance since the $JB - statistic < \chi^2 (2df) = 5.99147$ for each of the variables. According to University of Reading (2011), the standard deviation represents the amount of deviation from the mean, (the smaller the standard deviation the more accurate future predictions may be, because there less variability). In table 4.1, the results indicate that bank profitability (ROA), economic growth (real GDP), inflation and exchange rate do not deviate much from the mean (the variables have smaller standard deviation) thus the more accurate are the future predictions. Given that the skewness lies between -3 and +3, it is implied that the variables have normal curves with tails to the left. Further, since the Kurtosis for all the variables are positive there are too few cases in the tails (lighter tails).

Table 4.1: Descriptive Statistics

	LNY	LNG	LNE	LNI
Mean	-2.886488	-3.367717	4.376203	-2.255734
Median	-2.847312	-3.128121	4.372355	-2.364460
Maximum	-2.796881	-2.854233	4.486499	-1.337885
Minimum	-3.057608	-4.179902	4.236712	-3.228926
Std. Dev.	0.102721	0.528365	0.095031	0.689602
Skewness	-1.045857	-0.709959	-0.380452	-0.108376
Kurtosis	2.622439	2.075672	2.072797	2.230690
Jarque-Bera	0.941213	0.598031	0.299725	0.133087
Probability	0.624623	0.741548	0.860826	0.935622
Sum	-14.43244	-16.83858	21.88101	-11.27867
Sum Sq. Dev.	0.042207	1.116677	0.036123	1.902203
Observations	5	5	5	5

Source: authors computation using Eviews 7.1

4.2 Correlation

This study involved identifying the existence of correlation between bank profitability (ROA) and macroeconomic factors (economic growth- real GDP, inflation and exchange rate) using correlation coefficients obtained from the correlation matrix. The results summarized in table 4.2 indicate that there exists a weak insignificant positive correlation between the macroeconomic variables (GDP, inflation and exchange rate) and bank profitability (ROA) at 5 % level of significance. Thus, bank profitability and economic growth ($r = 0.143408$), bank profitability and inflation ($r = 0.221796$), bank profitability and exchange rate ($r = 0.148604$).

Table 4.2: Correlation Matrix

Covariance Analysis: Ordinary				
Date: 11/09/13 Time: 16:54				
Sample: 2008 2012				
Included observations: 5				
Correlation				
t-Statistic				
Probability				
	LNy	LNg	LNe	LNi
LNy	1.000000 ----- -----			
LNg	0.143408 [0.250984] (0.8180)	1.000000 ----- -----		
LNe	0.148604 [0.260280] (0.8115)	0.805176 [2.351639] 0.1002	1.000000 ----- -----	
LNi	0.221796 [0.393975] (0.7199)	-0.808048 [-2.375731] (0.0980)	-0.363438 [-0.675698] (0.5477)	1.000000 ----- -----

Note: () indicate p-value and [] indicate t-statistic, Source: author's computation using Eviews 7.1 version

4.3 Regression Analysis

In order to answer the research objectives, the study employed multiple regression analysis using OLS. The first objective of this study was to determine the effect of economic growth on bank profitability in Kenya with Equity bank limited in focus. The results in table 4.3 indicate that economic growth (real GDP) has an insignificant positive effect on bank profitability at 5 % level of significance. This study therefore does not reject the null hypothesis that economic growth (real GDP) does not affect bank profitability in Kenya with equity bank in focus. our finding of insignificant positive relationship between bank profitability (ROA) and economic growth (real GDP) in Kenya with Equity bank limited in focus is consistent with the findings of Rao & Lakew (2012), Ramadan et al., (2011), Ongore (2013).

The second objective of this study was to examine effect of inflation on bank profitability in Kenya with Equity Bank in focus. The results in table 4.3 indicate that inflation has a positive insignificant effect on bank profitability at 5 % level of significance. Thus, the study does not reject null hypothesis that inflation does not affect bank profitability in Kenya with Equity bank in focus. This finding is consistent with Ongore (2013), Otuori (2013), Jasmine (2011), Rao & Lakew (2012).

The third objective of this study was to evaluate effect of exchange rate on bank profitability in Kenya with Equity Bank in focus. Table 4.3 results indicate that exchange rate has an insignificant negative effect on bank profitability at 5 % level of significance. The study therefore does not reject the null hypothesis that exchange rate does not affect bank profitability in Kenya with Equity bank in focus. The results are consistent with the findings of Babazadeh & Farrokhnejad (2012).

F- Statistic of 2.466380 indicated that the macroeconomic variables jointly have an insignificant effect at 5% level of significance on bank profitability in Kenya with Equity bank Limited in focus.

Table 4.3: OLS Test results

Dependent Variable: LNY					
Method: Least Squares					
Date: 11/09/13 Time: 16:56					
Sample: 2008 2012					
Included observations: 5					
LNY=C(1)+C(2)*LNG+C(3)*LNE+C(4)*LNI					
	Coefficient	Std. Error	t-Statistic	Prob.	
	C(1)	10.94786	6.128289	1.786447	0.3249
	C(2)	0.799461	0.314118	2.545097	0.2383
	C(3)	-2.334141	1.104396	-2.113499	0.2813
	C(4)	0.411095	0.153204	2.683316	0.2271
R-squared	0.880940	Mean dependent var		-2.886488	
Adjusted R-squared	0.523761	S.D. dependent var		0.102721	
S.E. of regression	0.070888	Akaike info criterion		-2.464871	
Sum squared resid	0.005025	Schwarz criterion		-2.777321	
Log likelihood	10.16218	Hannan-Quinn criter.		-3.303455	
F-statistic	2.466380	Durbin-Watson stat		1.880910	
Prob(F-statistic)	0.430451				

Source: author's computation using Eviews 7.1

4.3.1 Diagnostic Test Results

4.3.1.1 Statistical Test of Elasticity Coefficients

This is a first order test for the determination of the statistical significance of the parameters to evaluate their statistical reliability. Statistical tests included; t-test and F- test to test for the statistical significance of individual parameters and model respectively

4.3.1.1.1 t-test

This test involved the use of t-test by testing the below stated hypothesis with the test results presented in table 4.10.

$H_0: \hat{\beta} = 0$, parameter insignificant

$H_1: \hat{\beta} \neq 0$, parameter significant

The rule of thumb was that we reject the null hypothesis if $t_{calculated} > t_{critical}$, otherwise do not reject.

Table 4.4: t- test Results and decision Rule

OLS Model n=5, df=1				
Variable	t-calculated	t-critical	Decision	Conclusion
$\ln G_t$	2.545097	12.706	$t_{cal} < t_{critical}$	Do not reject H_0 , statistically insignificant
$\ln I_t$	2.683316	12.706	$t_{cal} < t_{critical}$	Do not reject H_0 , insignificant
$\ln E_t$	-2.113499	12.706	$t_{cal} < t_{critical}$	Do not reject H_0 , insignificant

Source: author's computation

4.3.1.1.2 F-test

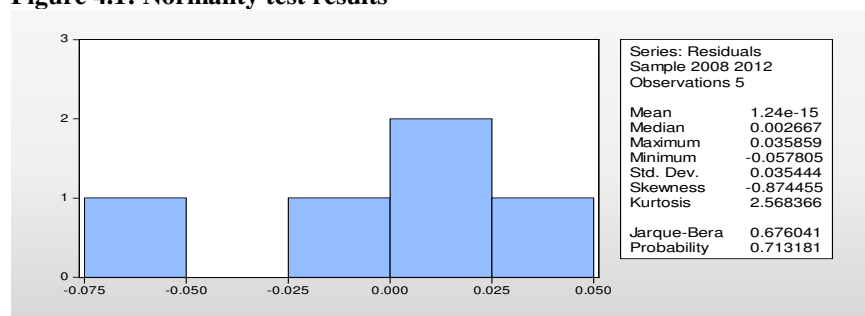
The F-test was employed to establish whether the model is significant. The computed F-value of 2.466380 was compared with F-critical obtained from the F-distribution table with degrees of freedom (k-1, n-k) and $\alpha = 0.05$ level of significance. With an F-critical of 216 it implies that the model is insignificant.

4.3.1.2 Econometric Tests

4.3.1.2.1 Normality

The normality test was based on the null hypothesis of normality distribution of the residuals. The results in figure 4.1 indicate that we do not reject the null hypothesis of normality distribution at 5% level of significance. Thus the residuals are normally distributed.

Figure 4.1: Normality test results



Source: author's computation using Eviews 7.1

4.3.1.2.2 Serial Correlation

The study employed Durbin- Watson test. From table 4.3 the value of 1.880910 (approximately 2) for the Durbin- Watson statistic indicates that the null hypothesis of no serial correlation is not rejected. This implies that the residuals are not serially correlated.

4.3.1.2.3 Heteroscedasticity

Based on the null hypothesis of no heteroscedasticity. The results in table 4.5 indicate that we do not reject the null hypothesis implying that the residuals are homoscedastic.

Table 4.5: Heteroskedasticity Test: White

F-statistic	0.722726	Prob. F(3,1)	0.6757
Obs*R-squared	3.421806	Prob. Chi-Square(3)	0.3310
Scaled explained SS	0.107333	Prob. Chi-Square(3)	0.9909

Source: author's computation using Eviews 7.1

4.3.1.2.4 Multicollinearity

Detection was by high pair-wise correlation among regressors. Results in table 4.2 show that the pair-wise correlation coefficient between two regressors is not in excess of 0.8, hence multicollinearity is not a serious problem.

5. Summary, Conclusions and Recommendations

5.1 Introduction

This chapter presents a summary of the findings of the study on the effect of macroeconomic factors on bank profitability in Kenya with equity bank in focus, conclusions, and policy recommendations.

5.2 Summary of Findings and Conclusions

This study investigated the effect of macroeconomic factors on bank profitability in Kenya with equity bank limited in focus. In view of the inconclusive findings on the effect of macroeconomic factors on bank profitability among researchers, the study was to establish the effect of macroeconomic factors on bank profitability in Kenya with Equity bank in focus. The study specifically sought to determine, establish and examine effect of; economic growth (real GDP), inflation and exchange rate on bank profitability in Kenya with Equity bank in focus respectively using annual data for the period of 5 years spanning from 2008 to 2012. The effect of macroeconomic factors on bank profitability in Kenya with Equity bank in focus was examined using multiple regression analysis.

The OLS results show that macroeconomic factors have insignificant effect on bank profitability in Kenya with equity bank in focus. Specifically; economic growth (real GDP) and inflation have a positive insignificant effect whereas exchange rate has a negative insignificant effect at 5 % level. These results are consistent with the findings of Rao & Lakew (2012), Ramadan et al., (2011), Ongore (2013). It can therefore be concluded that internal factors which are basically influenced by the internal decisions of management and board determine the performance of banks in Kenya. It is therefore prudent for the bank management as Ongore (2013) argued to enhance managerial efficiency that will lead to higher performance.

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Appendix: Data Presentation

Year	GDP(%)	Inflation(%)	Exchnge Rate	ROA (%)
2008	1.53	26.24	69.18	5.9
2009	2.74	9.23	77.35	4.7
2010	5.76	3.96	79.23	5.8
2011	4.38	14.02	88.81	6.1
2012	4.6	9.4	84.53	5.5

Source: Equity Bank, (2007). Annual report and Financial Statements

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