

RESEARCH ARTICLE

Risk and Return Analysis of Listed Financial Companies in Ghana (A Study of Cal Bank, Ecobank GH Ltd, Ghana Commercial Bank (GCB) and Standard Chartered Bank (SCB))

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Abstract:

Globally, Investors as well as businessmen and women are very optimistic about the future and therefore defer current use of resources for use at a later period with a higher expected rate of return. This is not so different in the case of Ghana. The main objective of the study is to analyse the risk and return of listed financial companies in Ghana. A sample of four financial companies listed on the Ghana Stock Exchange (Cal Bank Limited, Ecobank Ghana Limited, GCB Bank Limited and Standard Chartered Bank Ghana Limited) were selected and financial ratio (return on equity, return on asset, current ratio, quick ratio and financial leverage) computed using excel and analyzed using STATA. The study fitted a Pooled Ordinary Least Square (OLS) and Least Square Dummy Variable (LSDV) regression model with fixed effect model since fixed effect was tested to be statistically significant in the model. Empirical analysis of the data revealed that Banks with high risk levels proved to have a higher profitability as compared to the other banks under study. Standard Chartered Bank Ghana Limited and Ecobank Ghana Limited showed the highest levels of profitability, with Standard Chartered Bank Ghana Limited topping the charts in most years. However, on average, Cal Bank Ghana recorded the lowest rates of profitability. Also, a positive relationship existed between profitability (return on equity) and current ratio and financial leverage whilst an inverse relationship between return on equity and quick ratio. Overall model for both the Pooled OLS and the LSDV regression

regression model tested to be statistically significant and a greater percentage (99.99%) of the total variability in return on equity was explained by the independent variables (return on asset, current ratio, quick ratio and financial leverage).

Keywords: Risk, Return, Pooled OLS regression model, LSDV regression model.

Introduction

Background of the study

There is no single definition of risk. Economists, behavioral scientist, risk theorists, actuaries and financial analyst have their own concept of risk. Based on this, George E. Rejda, (2014) defined risk as the uncertainty concerning the occurrence of loss. Individuals and corporate bodies make investment decisions which have a significant influence on the productivity of a firm. These decisions however must be made for a business to be run and may hold a positive outcome or an undesired one. A return (financial return), in its simplest terms, is the money made or lost on an investment (AG1, 2015). A return can be expressed nominally as the change in the value of an investment over time and it is also expressed as a percentage derived from the ratio of profit to investment. Globally, Banks play an important role in supporting economic growth and development. This has in effect proved to be more volatile than the pure diversified equity funds which make some of them a high risk proposition (Naveen, 2016).

Ghana in recent times (2010-2019) is facing diverse challenges in the banking industry. Bank of Ghana (BOG), the Central Bank in Ghana on the urge of putting measures in place to prevent bank runs in the mid 2017 led to the revoke of the license of several banks, two of which were classified as Ghanaian owned banks, UT Bank and Capital Bank. According to the AGI report, BOG classified these two banks as “heavily deficient in capital and liquidity” which has caused loss of confidence in most banks in Ghana as it is riskier to invest in those banks.

There has been different reform proposals in the banking sector globally to enhance growth in the sector one of which is the Bank of International Settlements (1999) which have been made with the objective of improving bank regulation, and several others after the global financial crisis of 2007–2009 (Accenture, 2000).

Between 2018 and 2019, seven more banks in Ghana lost their license for other regulatory breaches which was associated with mismanagement and unavailability of their Stated Capital when BOG increased minimum reserved requirement to GHS400,000,000. These banks losing their license is an indicator of high risk. (Boahene et al., 2012) seeking evidence of the relationship between credit risk and profitability of some selected banks in Ghana revealed a positive and significant one.

Modern Portfolio Theory (MPT) and Capital Asset Pricing Model (CAPM) are some of the financial theories which support the opinion that risk and return play an important role in arriving at good investment making decisions.

The MPT attempts to amplify the expected return of a portfolio for a given amount of portfolio risk by purposefully choosing specific proportions of various assets. MPT takes the assumption that investors are generally risk averse, meaning that given two different portfolios giving the same expected return, investors will prefer the one which has a lower risk (Markowitz, 1952).

According to the Global risk management banking report 2017, Investors are skeptical when entering an investment that have liquidity issues. There is an urgent need for financial institutions and risk regulators to exercise due diligence when handling liquidity issues. The collapse of these banks in Ghana brought about controversies with different schools of thought. Some believing that it's a step in the right direction by the Central Bank to ensure economic stability, others see the initiative to be of political conundrum. According to Nana Addo Dankwa Akuffo-Addo, the President of the Republic of Ghana, the ongoing exercise by the Bank of Ghana was not as a result of his government collapsing certain banks in the country but instead, geared towards cleansing the sector to pave way for indigenous banks to compete with foreign banks.

In mid-2018, when the financial sector in Ghana was recovering from its crises, Credmap technology, a civic movement in Ghana dedicated to the use and promotion of various technologies to encourage truth and integrity in public life issued a public statement on a survey conducted on ranking of Commercial Banks in Ghana using the Ghana Banking Credibility Index. Standard Chartered Bank emerged as the most credible bank.

Problem Statement

Investors defer current use of resources for use at a later period in the future, with higher expected rates of return (Kalyan & Subramanyam, 2018). The problem however is, which company they should invest in to obtain maximum returns without using too much capital and losing out on investments. Theoretically whilst financial leverage and other risk factors are used to generate revenue and increase profit margins, larger indebted of these indicators can cause disinvestment and inhibit profitability. MPT takes the assumption that investors are generally risk averse, meaning that given two different portfolios giving the same expected return, investors will prefer the one which has a lower risk (Markowitz, 1952).

Research on Risk and return analysis of listed financial companies in the developed countries has been undertaken which has in effect educated citizen on the financial institutions they should invest in. Even in that case, not much has been done pertaining to risk indicators such as Quick ratio and financial leverage. Also, not much of such works have been done in Africa and Ghana to be precise. This has rendered some inadequacies in the financial sector due to the lack of knowledge about risk and return on behalf of the citizenry.

In Ghana, there are quite several avenues for investments. The measurement of financial institutions' efficiency is crucial because it helps investors and the citizenry to know the performance (Ross, Westerfield, & Jordan, 2003). A lot of investors pay much attention to their returns without giving relevance to risk (Ketchen et al., 2018). With every level of returns, there is a given level of risk associated with it. Therefore, to select a company to invest in, it is important to find out how the company is faring as compared to other companies by taking both risk and return into consideration. This study is therefore aimed at assessing

the financial risk and return of financial institutions listed on the Ghana Stock Exchange using financial ratios (liquidity and profitability ratios).

Objectives of the study

The general objective of the study is to assess the financial risk and return of listed financial companies in Ghana

Specifically;

- To study the trend of financial risk and return indicators of the listed companies under study.
- To formulate a model that can predict the financial return of the listed companies under study.
- To test if the level of financial risk has a significant influence on the returns of the company.

Significance of the study

- The study of risk and return would help investors to know the best performing financial institution on the Ghana Stock Exchange
- It will add up to existing literature on risk and return analysis of listed companies in Ghana and Sub-Saharan Africa at large.
- It would help individual business men and women as well as co-operate bodies to make informed decisions on which company to invest.
- It would help the banking institutions restructure and make policies that will help reduce risk and increase returns.

Literature review

Theoretical and empirical review

Literature review on performance evaluation of financial institution is enormous. Various studies have been carried out in developed and developing countries. There are studies on the Ghana Stock Exchange (GSE) to evaluate the performance of financial institutions over time due to its significant contribution to academia and industry.

The economics of banking literature acknowledges various determinants of bank profitability. The profitability of a bank is most crucial to its growth and development. Some of these determinants include the size of the bank; the extent to which the bank is diversified; the attitude of the bank's owners and managers towards risk; the bank's own characteristics; and the level of external competition the bank encounters. These, in one way or the other, affect the financial position of the institution (JOHN GODDARD, 2004).

(Jensen Michael C., Blank & Sholes, 1972) took efforts to investigate the stock market as an efficient and the purpose for which they took all scripts of New York Stock Exchange and divided into ten portfolios with the span of 35 years. The study found that higher risk portfolios fetched higher return and further they found that the stocks those of belonging to the category of lower risk were

undervalued whereas the stocks those of belonging to the category of higher risk were overvalued.

(Strahan, 1997) investigated the role of diversification in US banking and found that large banks had lower capital reserves and were more active than their specialized counterparts in high-risk lines of business such as derivatives. According to Basel committee on Bank supervision (2008), the basic role of banks during maturity transformation of short-term deposits into long-term loans makes them essentially vulnerable to liquidity risk of the bank as an institution and the market as a whole (systemic).

(Singh, 1986) disclosed the basic rules for selecting the company to invest in. She opined that understanding and measuring return and risk is fundamental to the investment process. According to her most investors are 'risk averse'. To have a higher return, the investor must face greater risk.

(Jones, 1996) reviewed how to estimate security return and risk. To estimate returns, the investors must estimate cash flows the securities are likely to provide. Also, investors must be able to quantify and measure risk using variance or standard deviation. Variance or standard deviation is the accepted measure of variability for both realized returns and expected returns. He suggested that the investors should use it as the situation dictates. He revealed that over the past 12 years, returns in stocks, bonds, etc. have been normal. Blue-chip stocks have returned an average of more than 16% per year. He warned that the investors who believe that these rates will continue in the future also will be in trouble.

This existence of influential observation is a positive outcome since it provides evidence for a link between economic activity and cross - sectional variation in average returns. According to (Shoaib Khan, 2012) “non - normality can occur when the sample contains outlier observations that are extreme by virtue of their absolute size”. Also, outliers can crop up due to errors in the data or extreme observation. (Shoaib Khan, 2012), given the observed October 1987 return as an example. It is not always easy to identify outliers; however, plotting the data will make them more obvious. Outliers can be treated by OLS estimation or contained within the OLS estimation. The outlier can be excluded from the sample and a dummy variable included to reflect the consequence of the outlier.

Methodology

Data source and description of the data

A secondary data for this study is obtained from the Ghana Stock exchange website over the years from 2007 to 2016. This data is the financial statement of all companies listed on the stock market. Investment indicators such as Returns on Assets (ROA), Returns on Equity (ROE), Current Ratio (CR) and Quick Ratio (QR) is obtained calculated from the data and used for analysis. Returns on Equity (ROE) measures profitability of a firm whilst risk determinants are the other variables under study.

Description of variables

A brief description of the variables is presented in the sub-sections below:

Returns on Equity (ROE): This is the amount of net income returned as a percentage of shareholders' equity. Return on equity measures a corporation's profitability by revealing how much profit a company generates with the money shareholders have invested. (Investopedia)

Returns on Assets (ROA): This is an indicator of how profitable a company is relative to its total assets. ROA gives an idea as to how efficient management is at using its assets to generate earnings. Calculated by dividing a company's annual earnings by its total assets. (Investopedia)

Current Ratio (CR): This compares current assets with obligations which will be due in the same period (i.e. total current liabilities) and it indicates whether there are enough short-term assets to meet the short-term liabilities.

Quick Ratio (QR): This shows that, provided creditors and debtors are paid at approximately the same time, a view might be made as to whether the business has enough liquid resources to meet its current liabilities.

Financial Leverage (FL): This is a measure of how much assets a company holds, relative to its equity. It measures the amount of equity used by financial institutions to meet debt obligations as they fall due.

Statistical tools to be used

Panel Data Modelling

Panel data, also known as longitudinal data or cross-sectional time series data, is data derived from a number of observations over time on a number of cross-sectional units such as individuals, households, firms, cities, states or countries. In this study, panel data are analyzed. Specifically, economic and investment indicators such as Returns on Assets (ROA), Returns on Equity (ROE), Current Ratio (CR), Quick ratio (QR) and Financial Leverage (FL) for four commercial banks in Ghana over the years from 2007 to 2016 are investigated. Therefore it is a time series panel with sample size 40.

The study begins by fitting a Pooled Ordinary Least Square (OLS) regression model. Then the Least Square Dummy Variable (LSDV) regression model is employed. It is worth mentioning that we have long panel, i.e. $T > n$, to take into account possible non-stationary in our data we use natural log of each variable instead of level data in our regression model.

Pooled Ordinary Least Square (OLS)

The Pooled Ordinary Least Square (Pooled OLS) is applied as the benchmark. Assuming individual effect (time specific effect) does not exist, the Pooled OLS is able to produce efficient and consistent estimates.

The Pooled OLS model is as following:

$$\ln ROE_{it} = \alpha + \beta_1 \ln ROA_{it} + \beta_2 \ln CR_{it} + \beta_3 \ln QR_{it} + \beta_4 \ln FL_{it} + \varepsilon_{it} \quad (1)$$

Where

α = constant

ε_{it} = random error component.

$\ln ROA_{it}, \ln CR_{it}, \ln QR_{it}, \ln FL_{it}$ = the regressors in the model

$\beta_1, \beta_2, \beta_3, \beta_4$ = the coefficients of the regressors in the model.

Least Square Dummy Variable Regression model

The Least Square Dummy Variable (LSDV) regression model, an OLS with a set of dummies, is a fixed effect model used in panel data analysis which allows individual differences in intercepts (heterogeneity). In this study we introduce three dummy variables to represent the individuality of the commercial banks.

The LSDV model is as following:

$$\ln ROE_{it} = \alpha + \gamma_1 D_1 + \gamma_2 D_2 + \gamma_3 D_3 + \gamma_4 D_4 + \beta_1 \ln ROA_{it} + \beta_2 \ln CR_{it} + \beta_3 \ln QR_{it} + \beta_4 \ln FL_{it} + \varepsilon_{it} \quad (2)$$

where

α = constant

D_i = a set of dummy variables with $i = 1, \dots, 4$.

ε_{it} = random error component.

$\ln ROA_{it}, \ln CR_{it}, \ln QR_{it}, \ln FL_{it}$ = the individual regressors in the model

$\gamma_1, \dots, \gamma_4$ = The coefficient of the dummy variables in the model

$\beta_1, \beta_2, \beta_3, \beta_4$ = The coefficient of the regressors in the model.

Specifically, α is the intercept representing the expected profitability rate given that there are no regressors and no dummies in the model. $\beta_1, \beta_2, \beta_3, \beta_4$ are the slopes of $\ln ROA_{it}, \ln CR_{it}, \ln QR_{it}$, and $\ln FL_{it}$, respectively which measure the expected changes in profitability for per percentage change in the changes in corresponding independent variable given that all other regressors and dummies are constant in the model. $\beta_1, \beta_2, \dots, \beta_4$ may take positive or negative values. A negative value of $\beta_1, \beta_2, \dots, \beta_4$ shows that profitability rate would decrease by $\beta_1, \beta_2, \dots, \beta_4$ if their corresponding individual regressor increases by one percentage unit. On the other hand, a positive value of $\beta_1, \beta_2, \dots, \beta_4$ shows that profitability rate would increase by $\beta_1, \beta_2, \dots, \beta_4$ units if their corresponding individual regressor increases by one percent.

It is worth mentioning that D_1, D_2, D_3, D_4 are three dummy variables created which represent CAL Bank Ghana Ltd (CAL), Ecobank Ghana Ltd (EBG), Ghana Commercial Bank (GCB) and Standard Chartered Bank (SCB) respectively. On the other hand, $\gamma_1, \dots, \gamma_4$ are parameters (mean profitability) of the group dummy variables. $\gamma_1 D_1$ for instance is the real impact of profitability rate that CAL Bank has on the group constant (Profitability rate). This value is added to the group coefficient to have a new constant for a defined regression model for CAL Bank. This applies to other banks where $\gamma_2 D_2, \gamma_3 D_3, \gamma_4 D_4$ represent CAL Bank Ghana Ltd (CAL), Ecobank Ghana Ltd (EBG), Ghana Commercial Bank (GCB) and Standard Chartered Bank (SCB) respectively in this study.

Analysis

Preliminary Analysis

Table 1 reports descriptive statistics of the variables in this study.

Table 1: Descriptive Statistics of the variables

Variables understudy	Mean	Standard deviation	Skewness	Kurtosis	Minimum	Maximum
Ret. on Equity	.2917894	.1159091	-0.39966	2.447223	.0143267	.4917748
Return on Asset	.0390008	.0167536	-0.20142	2.342357	.003039	.0696098
Current Ratio	1.046622	.1219913	-1.35721	4.20164	.6666762	1.182895
Quick Ratio	.2737285	.1591932	-0.09141	2.830976	-.0800785	.5872572
Fin. Leverage	6.810343	1.752554	1.147168	4.793988	4.455894	12.80369

Financial statements were obtained from the Ghana Stock Exchange for the companies under study. Financial risk and return indicators such as Return on Equity, Return on Asset, Current Ratio, Quick Ratio and Financial Leverage Ratio was computed for each company over the years under consideration. Further analysis of the study revealed, the minimum and maximum return on equity recorded over the years under consideration was 0.143267 and 0.491778 respectively with an average return on equity and standard deviation recorded over the years considered was 0.2917894 and 0.1159091 respectively. The negative value of skewness suggests that the sample is negatively skewed; as the value of kurtosis is smaller than 3, it indicates that the sample has lighter tails than a normal distribution.

The minimum and maximum Return on Assets recorded over the years considered was 0.003039 and 0.0696098 respectively, with an average and standard deviation of 0.03008 and 0.0167536, respectively. Similarly as return on equity, the sample for return on assets is also negatively skewed with a lighter tails.

On the other hand, the minimum and maximum recorded on Current Ratio was 0.666762 and 1.182895 respectively. Whereas the average and standard deviation 1.046622 and 0.1219913 respectively. Obviously, the sample for current ratio is heavily negatively skewed with much heavier tails comparing to a normal distribution.

The minimum and maximum Quick Ratio recorded over the years considered was -0.0800785 and 0.5872572 respectively, with an average and standard deviation 0.2737285 and 0.1591932 respectively. The sample for this variable is also negatively skewed with a lighter tails.

The Financial Leverage Ratio over the years considered recorded a respective minimum and maximum of 4.455894 and 12.80369, with an average of 6.810343 and a standard deviation of 1.752554. Unlike other variable in this study, the Financial Leverage Ratio is significantly positively skewed with a much heavier tails comparing with a normal distribution.

Graphical Representation of Profitability (Return on Equity)

Time series plots for all the variables in this study are reported in Figures 4.1-4.5. By observing the pattern of these graphs, we aim to study the trend of financial risk and return indicator of the listed companies under study (objective 1 in our study).

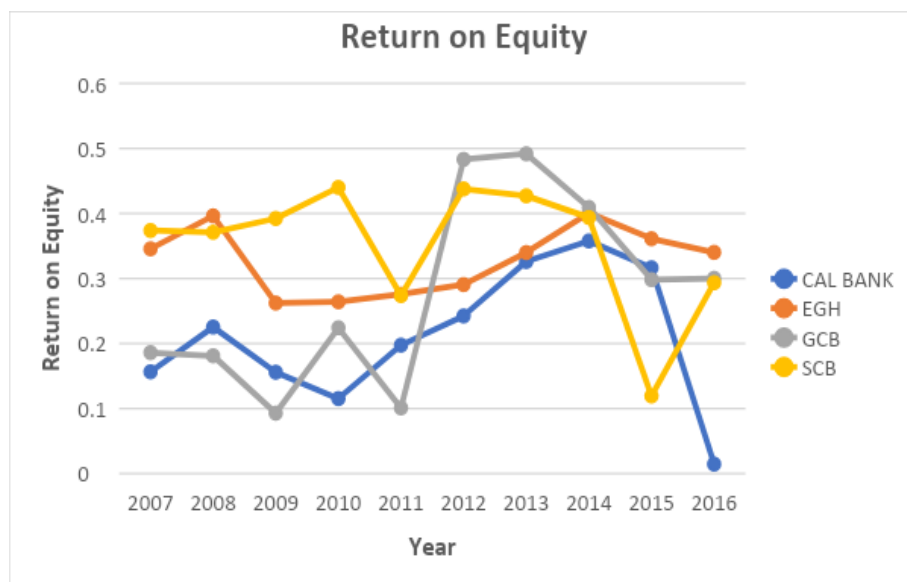


Figure 4.1: Time series plot of Return on Equity of the bank from the year 2007 to 2016

Figure 4.1 shows a time series plot representing the profitability (Return on Equity) over the ten-year period of the four companies under study, Cal Bank Limited, Ecobank Ghana Limited, GCB Bank Limited and Standard Chartered Bank Ghana Limited. Standard Chartered Bank Ghana Limited had recorded a relatively higher return on equity over the years from 2007 to 2014. However, they had a heavy decline in the year 2015. GCB Bank Limited on the other hand has a relatively lower return on equity over the years from 2007 to 2011. During 2011 to 2013, GCB Bank Ltd had a massive increase in their return on equity, but had a decline in subsequent years. CAL Bank has been experiencing a fluctuation in their return on equity. They recorded an increase in return on equity between the years from 2011 to 2014. However, over the years under consideration, CAL Bank recorded the lowest return on equity amongst the four companies and this occurred in the year 2016. In the year 2008, Ecobank Ghana Ltd recorded the highest return on equity amongst the four companies, then after a short time period decline, it experienced an upward trend till 2014, following by a slightly decline during 2015-2016 time period. Ecobank Ghana Ltd's return on equity has been higher than that of CAL bank over the whole sample period.

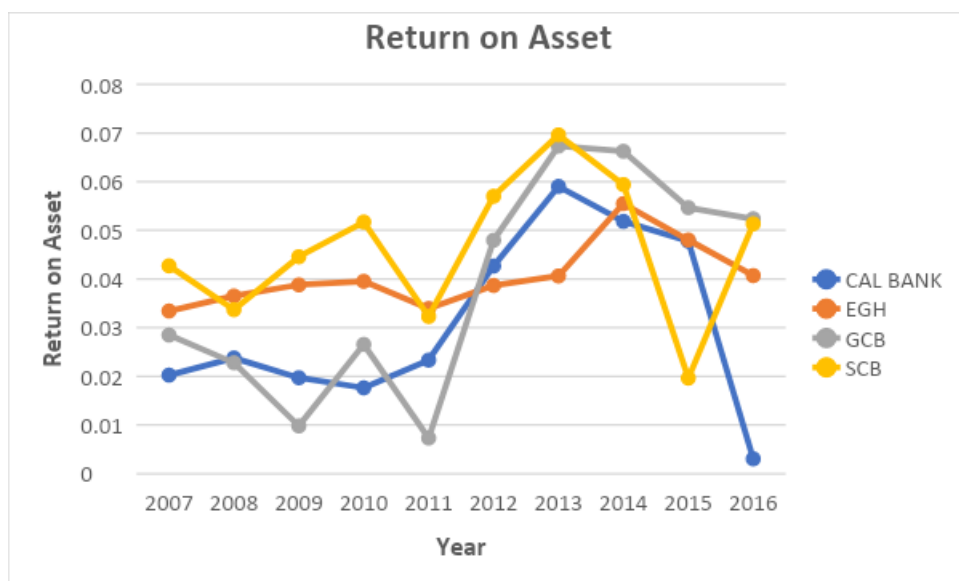


Figure 4.2: Time series plot of Return on Asset of the bank from the year 2007 to 2016

Figure 4.2 displays return on assets of the four companies. Similarly as return on equity, CAL Bank recorded the lowest return on asset in the year 2016 over the ten-year period. GCB Bank, on the other hand, despite their lower values in the early years had a massive increase in return on asset during 2011- 2013. Overall all four companies experienced a downward trend during 2013-2016 time period except that Standard Chartered Bank Ghana Limited had a significant increase in return on assets during 2015-2016.

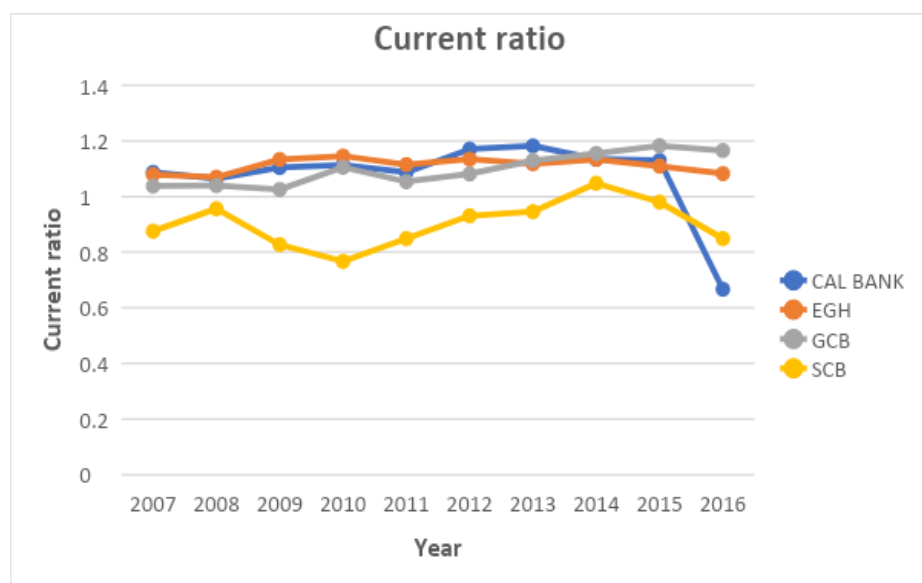


Figure 4.3: Time series plot of Current Ratio of the bank from the year 2007 to 2016

Current ratio time series plots for the four companies are reported in Figure 4.3. Current ratio has been close amongst CAL Bank Ghana Ltd, Ecobank Ghana Ltd and GCB Bank. CAL Bank however experienced a significant decline during 2015-2016 time period whereas the other two companies were relatively

stable during the whole sample period. On the other hand, over the ten-year period Standard Chartered Bank recorded the lowest current ratio comparatively.

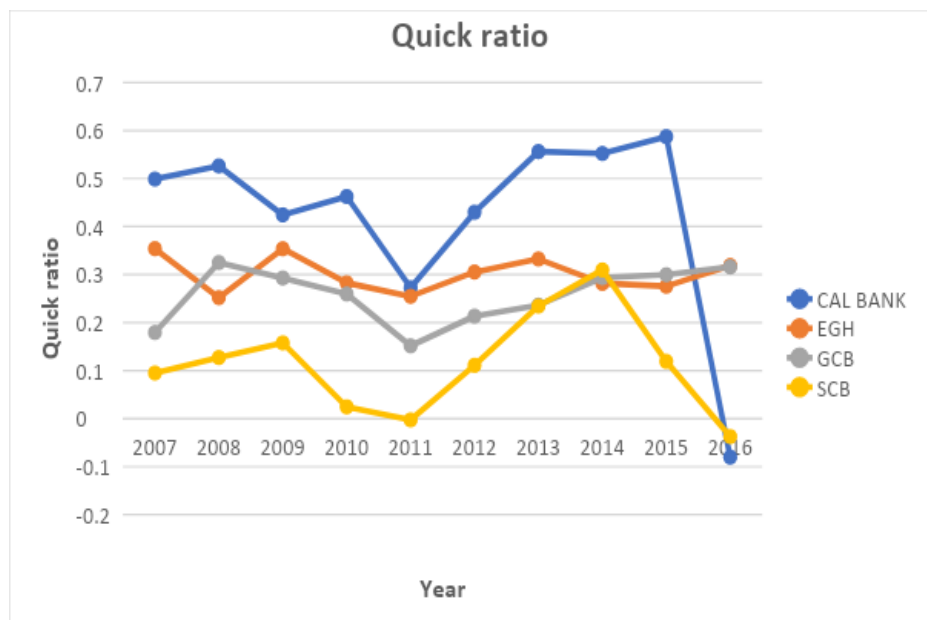


Figure 4.4: Time series plot of Quick Ratio of the bank from the year 2007 to 2016

Figure 4.4 represents Quick Ratio time series plots for the four companies. CAL Bank over the sample period recorded the highest Quick ratio compared to the other companies with Standard Chartered Bank recording relatively lower values. There was a massive turn in the year 2016 as CAL Bank recorded the lowest Quick ratio while it recorded the highest amongst all the other banks in the year 2015. On the other hand, SCB declined significantly during 2014-2016 time period. Both EGH and GCB exhibit relatively smooth pattern during the whole sample period.

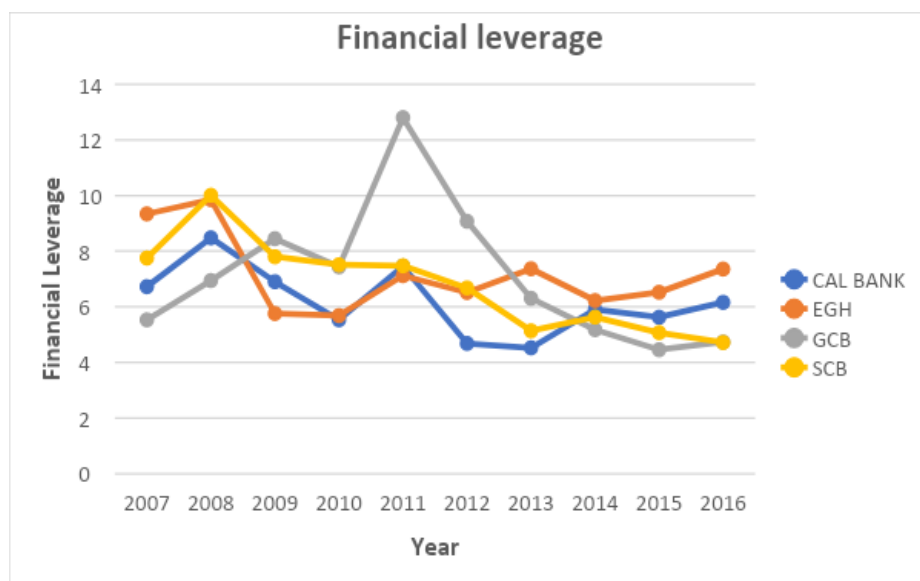


Figure 4.5: Time series plot of Financial leverage of the bank from the year 2007 to 2016

In terms of financial leverage reported in Figure 4.5, Ecobank Ghana Ltd recorded the highest amongst the other banks at the beginning of the sample period but had a decline from 2008 to 2009; it then started to increase from 2009 and continued to lie above the other banks. GCB Bank Ltd had a massive increase in financial leverage in the year 2011 after a persistent increase in the earlier years but experienced a decline in the years after 2011. The values of financial leverage for this company continued to be the lowest among four companies from 2014.

Overall we observe CAL Bank suffered significant decline during 2016 time period for most variables, the decrease in the performance of CAL Bank in 2016 is attributed to the instability in the banking industry associated with Bank runs as customers reduce their investment with the company. According to the AGI 2017 report, these affected their stocks which in the long run affected their return on assets, return on equity and other financial indicators.

The Pooled Ordinary Least Square (OLS) regression model.

Table 2 reports the Pooled OLS regression result, which is used as a benchmark model to predict the financial return of the listed companies under study (objective 2 in this study). Column 2 represents the coefficients; whereas columns 3 and 4 display t statistics testing the significance of each individual independent variable, and the associated p-value, respectively. Specifically, if all the risk factors are zero, the estimated profitability will be 0.3739463%. There exists positive relationships between profitability and return on asset, Current Ratio and financial leverage ratio, but an inverse relationship exists between profitability and the quick ratio. Specifically, the profitability would increase by 0.9981604% when return on asset increases by one percent; one percentage increase in Current Ratio will lead to 0.0224569% increase in profitability; and the profitability would increase by 0.872142% for every one

percentage increase in Financial Leverage; on the other hand, one percentage increase in Quick Ratio will lead to 0.0030508% decrease in profitability.

One-sample t-test is applied to test the significance of individual financial risk variable in the Pooled OLS regression (objective 3 in this study). The t-statistics are relatively high with the associated p-value smaller than 10 percent level of significance for most independent variables except for the Quick Ratio, suggesting that Return on Asset, Current Ratio and Financial Leverage significantly affect the profitability whereas Quick Ratio does not play a significant role in explaining the profitability.

Table 2: The Pooled Ordinary Least Square (OLS) regression model.

Variables	Coefficient	t-statistic	P > t
Return on Asset	0.9981604 (0.0015385)	648.79	0.000*
Current Ratio	0.0224569 (0.0119319)	1.88	0.069**
Quick Ratio	-0.0030508 (0.0019236)	-1.59	0.123
Financial Leverage	0.872142 (0.0034644)	251.74	0.000*
Constant	0.3739463 (0.0068525)	54.57	0.000*
*Significant	p - value = 0.0000	R² = 0.9999	Adj R² = 0.9999

The Least Square Dummy Variable (LSDV) regression model.

Table 3 presents the LSDV regression result, which takes into account fixed-effect among companies in predicting the financial return of the listed companies understudy (objective 2). Column 2 represents the coefficients; whereas columns 3 and 4 display t statistics testing the significance of each individual independent variable, and the associated p-value, respectively. It is worth mentioning that CAL Bank Limited was omitted from the study with the LSDV regression models due to collinearity.

Applying the LSDV when all the risk factors as well as the dummies are zero, the estimated profitability will be 0.3651051%, similar to the Pooled OLS result.

There exists positive relationships between profitability and return on asset, Current Ratio and financial leverage ratio, but an inverse relationship exists between profitability and the quick ratio. Hence the signs of coefficients for these risk factors are consistent to those applying the Pooled OLS procedure.

Specifically, the profitability would increase by 0.9985742% when return on asset increases by one percent; one percentage increase in Current Ratio will lead to 0.0469455% increase in profitability; and the profitability would increase by 0.8764547% for every one percentage increase in Financial Leverage; on the other hand, one percentage increase in Quick Ratio will result in 0.0030103% decrease in profitability.

Similarly as the Pooled OLS, one-sample t test is applied to test the significance of individual financial risk variable in the LSDV regression (objective 3 in this study). The t-statistics are relatively high with the associated p-value smaller than five percent level of significance for most independent variables except for the Quick Ratio, suggesting that Return on Asset, Current Ratio and Financial Leverage significantly affect the profitability whereas Quick Ratio does not play a significant role in explaining the profitability.

Regarding the heterogeneity among the companies, we find Ecobank Ghana Limited has a baseline intercept of profitability of -0.002731% which lowers the constant of the LSDV regression model. This is however statistically insignificant at even 10% level as the P-value equaling to 0.215, indicating the heterogeneity for EcoBank Ghana Limited is insignificant. The GCB Bank has a baseline intercept of 0.0007942% which further increased the constant of the LSDV regression model, but it was not statistically insignificant at 10% alpha level given the P-value 0.715. On the other hand, the Standard Chartered Bank Ghana Limited has a baseline intercept of 0.0052034% which was above the constant of the model. This is again not statistically significant at 10% alpha level since P-value is 0.150. Overall we conclude that the heterogeneity does not significantly exist among the companies in this study, and the Pooled OLS and LSDV produce similar regression results.

Table 3: The Least Square Dummy Variable (LSDV) regression model.

Variables	Coefficient	t-statistic	P > t
1.CAL Bank Ghana Ltd (Dummy)	0 (omitted)	0	0
2. Ecobank Ghana Ltd. (Dummy)	-0.002731 (0.0021554)	-1.27	0.215
3. Ghana Commercial Bank. (Dummy)	0.0007942 (0.002151)	0.37	0.715
4. Standard Chartered Bank. (Dummy)	0.0052034 (0.0035227)	1.48	0.150
Return on Asset	0.9985742 (0.0015939)	626.50	0.000*
Current Ratio	0.0469455 (0.0173905)	2.70	0.011*

Quick Ratio	-0.0030103 (0.002199)	-1.37	0.181
Financial Leverage	0.8764547 (0.0037307)	234.93	0.000*
Constant	0.3651051 (0.0081218)	44.95	0.000*
*Significant	p – value = 0.0000	R² = 0.9999	Adj R² = 0.9999

Comparative statics between the pooled OLS and the Least Square Dummy Variable (LSDV) regression model.

Comparative statics between the pooled OLS and the Least Square Dummy Variable (LSDV) regression model.

Variables	Pooled OLS	LSDV Regression Model
Number of observations	37	37
F(n, N)	99999.00	71913.16
Prob > F	0.0000	0.0000
R-squared	0.9999	0.9999
Adj R-squared	0.9999	0.9999
Root MSE	0.00405	0.00382

Both Pooled Ordinary Least Square Regression Model (OLS) and the Least Square Dummy Variable Regression Model (LSDV) tested to be statistically significant since the Pooled OLS revealed an F-statistic of 99999.00 with a P-value of $0.0000 < 0.050$ and the LSDV Regression Model revealed an F-statistic of 71913.16 with a P-value of $0.0000 < 0.050$.

They are both statistically significant at 1%, 5% and 10% level of significance.

Also, in both models 99.99% of the total variability in profitability was explained by the independent variables (return on assets, current ratio, quick ratio and financial leverage).

Conclusion and Recommendation

Conclusion

The study looked at the analysis of risk and return of listed financial companies, namely Cal Bank Limited, Ecobank Ghana Limited, GCB Bank Limited and Standard Chartered Bank Ghana Limited. Financial ratios (liquidity and profitability ratios) were obtained from annual financial statements over a ten-year period (2007 to 2016). GCB Bank Limited recorded the highest profitability rate over the ten-year period in 2013, but on average, Standard Chartered Bank Ghana Limited recorded the highest rates of profitability. The lowest profitability rate was recorded by Cal Bank Limited in the year 2016.

The Pooled Ordinary Least Square and the Least Square Dummy Variable Regression model were used in assessing the financial risk and return of the listed companies, and the variables of the models proved to be statistically significant. Risk had a significant influence on the returns of the companies.

Recommendation

- Investors have independent risk levels. In order to gain high returns on investments, investors should not only have to look at the profitability of the company but take a close look at the risk of the company.
- Investors are advised to invest based on how risk averse they are or how much risk they are willing to take in. Investors who have a high risk appetite may invest in banks that have a high risk with equally high returns such as Standard Chartered Bank Ghana Limited.
- Stock prices over the years should be taken into consideration in the analysis of risk and return analysis, since the price of a stock also affects how much an investor is willing to make.

References:

- Accenture. (2000). Exposed: The hidden value of risk in Banking. *Connecticut Insurance Law Journal*, 6(2), 365–380. <https://doi.org/10.1525/sp.2007.54.1.23>.
- Anthony Saunders, M. M. (2006). *Financial Institutions Management: A Risk Management Approach*. McGraw-Hill/Irwin.
- Asamoah, G. N. (2011). Beta risk estimation of companies listed on the Ghana stock exchange. Emerald Group Publishing Limited.
- Benton E. Gup, J. W. (2005). *Commercial Banking: The Management of Risk*.
- Boahene, S., Dasah, J., & Agyei, S. (2012). Credit risk and profitability of selected banks in Ghana. *Research Journal of Finance and Accounting*, 3(7), 6–15. <http://iiste.org/Journals/index.php/RJFA/article/view/2628>
- Carlsen. (1970).
- GSE. (2016). Ghana Commercial Bank annual report, 2016. Ghana Stock Exchange, 1-2.
- Jensen Michael C., Blank & Sholes. (1972). The Capital Asset Pricing Model: Some Empirical Tests. In S. I. Markets. Praeger Publishers Inc., 1972.
- John Goddard, P. M. (2004). The profitability of european banks. The Manchester School.
- Jones, C. P. (1996). *INVESTMENT: Analysis and Management*.
- Joseph Aharony, C. P. (n.d.). An Analysis of Risk and Return Characteristics of Corporate Bankruptcy Using Capital Market Data.

- Kalyan, N. B., & Subramanyam, P. (2018). A study on risk and return analysis of selected securities in India. *International Journal of Engineering, Technologies and Management Research*, 5(4), 79–86. <https://doi.org/10.5281/zenodo.1244735>
- Ketchen, D. J., Combs, J. G., Russell, C. J., Shook, C., Dean, A., Runge, J., Lohrke, F. T., Naumann, S. E., Haptonstahl, D. E., Baker, R., Beckstein, B. A., Handler, C., Honig, H., & Russell, C. J. (2018). *Organizational Configurations and Performance: A Meta-Analysis* Published by: Academy of Management Stable URL: <http://www.jstor.org/stable/257028> REFERENCES Linked references are available on JSTOR for this article: You may need to log in to JSTOR to . 39(4), 949–969.
- Markowitz, H. (1952). Modern Portfolio Theory (MPT). *Journal of Finance*.
- McDonald, J. G. (1974). Individual Investors and Mutual Funds.
- Michael C. Jensen. (1968). The performance of mutual funds in the period 1945–1964.
- Michael C. Jensen. (May 1968). The performance of mutual funds in the period 1945–1964.
- Nataliia Pogorelenko, V. V. (2016). Wavelet Coherence as a Research Tool for Stability of the Banking System (The Example of Ukraine).
- Naveen, M. (2016). A Study on Comparative Analysis of Risk and Return with reference to Selected stocks of BSE Sensex index , India . *International Journal of Scientific Research and Modern Education*, I(04), 101–114. www.rdmodernresearch.com
- Oliver de Bandt, M. C. (2016). A DGSE Model to Assess the Post-Crisis Regulation of Universal Banks.
- Samuel Hymore Boahene, J. D. (2012). Credit Risk and Profitability of Selected Banks in Ghana.
- Santomero, A. (1997). Commercial Bank Risk Management: An analysis of the process, Conference on Risk Management in Banking, 13–15 October, Wharton Financial Institutions Centre.
- Shoib Khan, Y. S. (2012). Capital structure and managerial ownership: Evidence from Pakistan.
- Singh, P. (1986). Investment Management; Security Analysis and Portfolio Management. In P. Singh, Security Analysis and Portfolio Management (p. 576). Himalaya Publishing House.
- Strahan, D. a. (1997). The role of diversification in US .
- Tanzania, B. o. (2010). (Bank of Tanzania ANNUAL REPORT).
- Thao, T. H. (2015). The Impact of Corporate Governance on Financial Risk in Vietnamese Commercial Banks.
- Theodora A. Odonkor, J. Y. (2011). Bank risk and performance in Ghana.
- Van Greuning, H., & Brajovic Bratanovic, S. (2009). *Analyzing Banking Risk : A Framework for Assessing Corporate Governance and Risk Management*, Third Edition.
- Verschuren , P., & Doorewaard, H. (2010). *Designing a research project*. The Hague: Eleven International Publishing.