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The Relationship between Net Interest Margin and Return on Assets of Listed Banks in Ghana

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Abstract
The purpose of the study was to find out the trends of Net Interest Margin (NIM) and Return on Assets (ROA). It also sought to find out the relationship between the NIM and the ROA of the listed banks in Ghana, considering the period 2005-2011. Seven out of the nine listed banks were considered for the study. The main sources of data were from the annual reports of the selected listed banks, as well as other relevant scholarly journals. Trend analysis was used to find the trend of NIM and ROA of the listed banks. Regression and correlation analyses were used to find the relationship and the strength thereof between NIM and the ROA. The dependent variable was Profitability (ROA); while the independent variable was Net Interest Margin (NIM). The study revealed that there is a strong positive correlation between the NIM and the ROA (Profitability) of the listed banks. The regression equation between NIM (X - Axis) and ROA (Y - Axis) is Y = 0.577X – 1.427. The correlation co-efficient, R^2 is 0.826. This means that 82.6% of ROA is explained by the NIM. When Net Interest Margin decreases, Return on Assets (Profitability) decreases; and vice versa.
Keywords: Net interest margin, return on assets, profitability, relationship, regression, correlation

1.0 Introduction

The banking sector of Ghana plays a fundamental role in economic growth, as it is the basic element in the channelling of funds from lenders to borrowers. In this sense, it is important that this work of intermediation by the banks is carried out with the lowest possible cost in order to achieve greater social welfare. Like all businesses, banks make profit by earning more money than what they pay in expenses. The major portion of a bank's profit comes from the fees that it charges for its services and the interest that it earns on its assets. Its major expense is the interest paid on its liabilities. The major assets of a bank are its loans to individuals, businesses, and other organizations and the securities that it holds, while its major liabilities are its deposits and the money that it borrows, either from other banks or by selling commercial paper in the money market (Thismatter, 2013).

Net interest income, represents the difference between interest earned on assets and interest paid on liabilities. Net interest margin (NIM) is net interest income expressed as a percentage of average interest-earning assets. Net interest margin is a measure of the difference between the interest income generated by banks or other financial institutions and the amount of interest paid out to their lenders (for example, deposits), relative to the amount of their (interest-earning) assets. It is similar to the gross margin of non-financial companies (Wikipedia, 2013). Net interest margin is similar in concept to net interest spread, but the net interest spread is the nominal average difference between the borrowing and the lending rates, without compensating for the fact that the earning assets and the borrowed funds may be different instruments and differ in volume. The net interest margin can therefore be higher (or occasionally lower) than the net interest spread.

The NIM is treated as an important indicator of intermediation efficiency and the expectation is that NIM would decline as the banking industry matures and competition strengthens (Mujeri and Younus, 2009). Interest Rate Spread (IRS) is the difference between the yield on interest-bearing assets and liabilities. Researchers have attributed the existence of high IRS in developing countries to several factors, such as high operating costs, financial repression, lack of competition and market power of a few large dominant banks enabling them to manipulate industry variables including lending and deposit rates, high inflation rates, high risk premiums in formal credit markets due to widely prevailing perception relating to high risk for most borrowers, and similar other factors (Agu 1992, Aryeetey, Hettige, Nissanke and Steel 1997, Barajas et al. 1999, Brock and Rojas-Suarez 2000, Smirlock 1985, Mujeri and Islam 2008).

Loan rates can be separated into two major components – the interest rate paid to depositors and the rate added on by banks. That difference between the deposit rate and the loan rate is commonly referred to as the spread. The size of banking spreads serves as an indicator of efficiency in the financial sector because it reflects the costs of intermediation that banks incur (including normal profits). Some of these costs are imposed by the macro-economic, regulatory and institutional environment in which banks operate while others are attributable to the internal characteristics of the banks themselves (Robinson, 2002).

2.0 Literature Review

According to Grenade (2007) there are two approaches to measuring interest rate spreads. The ex- ante approach and the ex- post approach. The ex-ante interest rate spread is the difference between the contractual rates charged on loans and the rates paid on deposits. These are the rates that the public sees and are easily comparable across banks. The ex-post spread is the difference between the average rate charged on loans and the average rate paid on deposits. The average rate charged on loans is calculated by dividing total interest income received on loans and advances by the average stock of loans and advances, while the average rate paid on deposits is calculated by dividing total interest expense by the average stock of total deposits. The behaviour of both the ex-ante and the ex-post spreads is examined. In most empirical studies, the ex-post spread is the one commonly used as the dependent variable. Demirguc-Kunt et al (1999), argue that the ex–post spread is a more encompassing and useful measure because it controls for the fact that banks with high yields and risky credits are likely to face more defaults.

Chirwa et al (2004) used panel data techniques to investigate the causes of interest rate spreads in the commercial banking system of Malawi over the liberalised period of the 1990s. Their results show that high interest rate spreads were attributable to monopoly power, high reserve requirements, high central bank discount rate and high inflation. Demirguc-Kunt et al (1999) using bank level data for 80 industrial and developing countries over the period 1988-1995 show that differences in interest margins reflect a variety of determinants such as bank characteristics, macroeconomic conditions, explicit and implicit bank taxes and the overall financial structure.

Barajas et al (1999), examine the sources of high intermediation spreads observed in the

Colombian banking sector over the pre-liberalisation period (1974-1988) and the post liberalisation period (1991-1996) and found mixed results. Liberalisation increased banking sector competitiveness, lowered market power and reduced financial taxation from its high 1970s level. The results also show bank spreads to be more responsive to non-financial costs (wages) and changes in loan quality. Afanassieff et al (2000), using panel data techniques to uncover the main determinants of bank spreads in Brazil, found that macroeconomic factors are the most relevant in explaining the spreads. Ramful (2001) in his study of the Mauritian banking sector found that interest rate spread was used not only to cover the cost of operating expenses and required reserves but also reflected the high degree of market power among banks and the poor quality of loans. General Banking business involves the mobilization of funds/deposits from excess or surplus units of the economy and giving out to deficit units as loans and advances. This is called financial intermediation. One of the biggest economic considerations in the 21st century is the maintenance of a profitable banking system. Bank profitability is the ability of a bank to generate revenue in excess of cost, in relation to the bank's capital and asset bases (Lartey, Antwi and Boadi, 2013). The determinants of bank profitability have attracted the interest of academic research. The majority of studies on bank profitability, such as Short (1979), Bourke (1989), Molyneux and Thornton (1992), Demirguc-Kunt and Huizinga (2000) and Goddard *et al.* (2004), used linear models to estimate the impact of various factors that may be important in explaining profits. Bank profitability is usually expressed as a function of internal and external determinants. The internal determinants originate from bank's accounts (balance sheets and/or profit and loss accounts) and therefore could be termed micro or bank-specific determinants of profitability. The external determinants are variables that are not related to bank management but reflect the economic and legal environment that affect the operation and performance of financial institutions (Athanasoglou, Brissimis & Delis, 2005).

The main sources of bank's profits include fees and commissions on financial services and advices to clients; and the interest spread on resources that are held in trust for clients who, in turn, pay interest on the asset. With regards to the interest spread, the main method is by charging interest on the amounts of money the bank lends out to customers. The bank profits from the difference between the level of interest it pays for deposits and other sources of funds, and the level of interest it charges in its lending activities. The more interest income generated relative to the interest expense, the more profit the bank eventually makes. This means one would expect a positive correlation between the net interest income and the bank profits. The question is to what extent does the net interest income contribute to the banks' profits?

This research therefore seeks to find out to what extent the Net Interest Income contributes to the profits of banks in Ghana, with specific reference to the banks listed on the Ghana Stock Exchange. The study also seeks to find out the relationship between the banks' ability to earn net interest income with their interest- earning assets (Net Interest Margin) and their ability to generate profit with their total assets (Return on Assets).

3.0 Methodology

3.1 Research Design

The study is descriptive in nature. In descriptive research, a researcher begins with a well-defined subject and conducts a study to describe it accurately and the outcome is a detailed picture of the subject (Neuman, 2007).

This study seeks to describe the relationship between the liquidity and the profitability of banks listed on the Ghana Stock Exchange.

3.2 Population and Sampling

3.2.1 Target Population

The population of this study was made up of all commercial banks listed on the Ghana Stock Exchange. These included CAL Bank Limited, Ecobank Ghana Limited, Ecobank Transnational Incorporated, Ghana Commercial Bank Ltd., HFC Bank Ltd, SG-SSB Ltd., Standard Chartered Bank Ltd., Trust Bank Ltd. and UT Bank Limited.

3.2.2Sampling

In this study, purposive sampling was used to select seven (7) out of the nine (9) banks listed on the Ghana Stock Exchange. The two banks excluded were Ecobank Transnational Incorporated and Trust Bank Ltd. These banks were excluded from the study because their financial statements were reported in currencies other than Ghana Cedis. Ecobank Transnational Incorporated reported in US Dollars while Trust Bank Ltd reported in Dalasi. Including the above two banks in the research would distort the analyses and comparison.

3.3 Instrumentation and Data Collection

Data was mainly collected from secondary sources. Data emanated from listed banks' financial reports, scholarly journals, business and financial news papers and other magazines and corporate journals. As the study needs historical financial data, which are from corporate reports, accessing publicly available data is assumed as the suitable method for the accuracy of the data. As public data is accessible to everyone; the study made use of the financial performance data which were of interest to the present research. Financial reports and other relevant information of the listed banks for the period 2005-2011 were retrieved from the internet, by search engines. The researchers are shareholders of some of the banks under consideration so some of the annual reports were readily available for use.

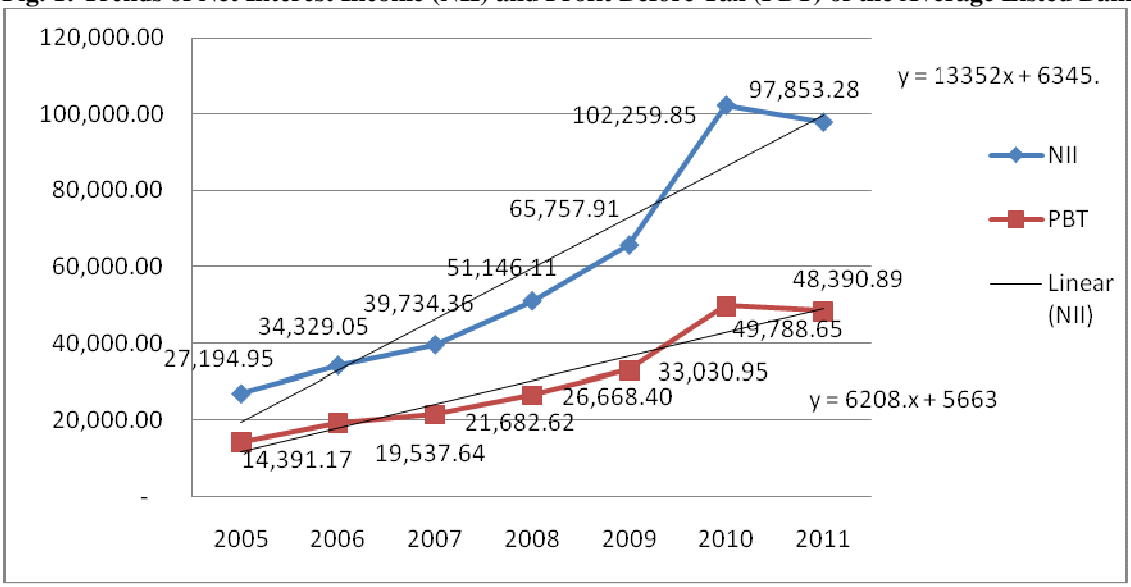
3.4 Analysis of Data

Quantitative analysis techniques were adopted for the study. The profitability was measured in terms of Return on Assets (ROA) – Profit before Tax over Total Assets. Net Interest Margin (NIM) was measured as Net Interest Income over Total Interest-Earning Assets. Time series was used to analyse the trends of the variables within the period 2005-2011. Regression and correlation analyses were used to find the relationship and the strength thereof between the net interest margin and the profitability. The dependent variable was profitability (ROA); while the independent variable was net interest margin (NIM).

The least squared regression line equation was in the form: $y = ax + b$; where y = profitability (dependent variable); x = net interest margin (independent variable); a = the gradient of the regression line; b = the y intercept

4.0 Empirical Results

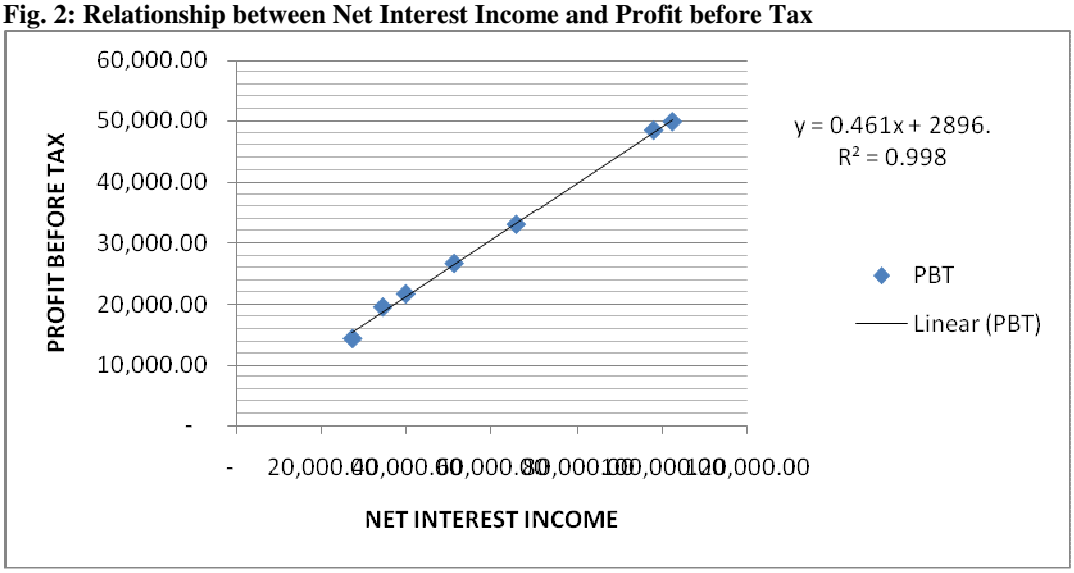
Fig. 1: Trends of Net Interest Income (NII) and Profit Before Tax (PBT) of the Average Listed Bank



(Source: Authors' Computation, 2013)

Figure 1 shows that both the net interest income and the before-tax profit of the listed banks in Ghana have been increasing within the period 2005-2010. Both variables declined within 2010-2011.

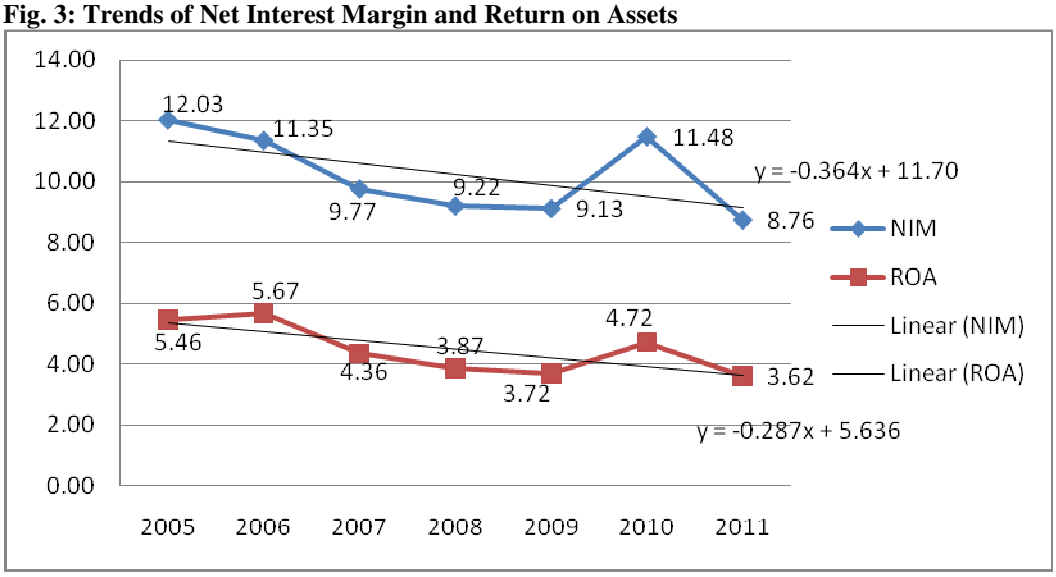
Fig. 2: Relationship between Net Interest Income and Profit before Tax



(Source: Authors' Computation, 2013)

As a confirmation of trend showed in figure 1, figure 2 shows a very strong positive relationship between the net interest income and profit before tax. About 99.8% of the profit before tax of the listed banks is explained by net interest income.

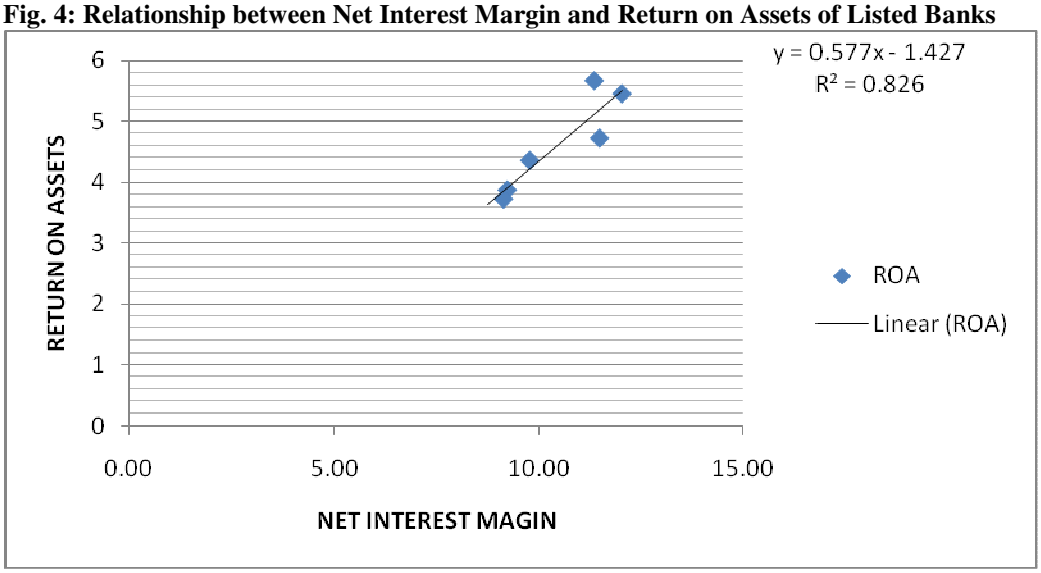
Fig. 3: Trends of Net Interest Margin and Return on Assets



(Source: Authors' Computation, 2013)

Figure 3 shows that between 2005 and 2006, net interest margin decreased while the return on assets increased. This means that the interest-earning assets did not perform very well. Between 2006 and 2009, both variables declined continuously. There was an increase in the variables between 2009 and 2010 and thereafter, decrease again.

Fig. 4: Relationship between Net Interest Margin and Return on Assets of Listed Banks



(Source: Authors' Computation, 2013)

Figure 4 shows that there is a strong positive correlation between the net interest margin an the return on assets of the listed banks in Ghana.

5.0 Discussions

The results show that within the period 2005 and 2011, the net interest income (NII) and the profit before tax (PBT) of the listed companies were increasing. The trend lines of NII and PBT are Y = 13352X + 6345 and Y = 6208X + 5663 respectively. There is therefore a strong positive correlation between the net interest income and the profit before tax of the listed banks. The regression equation between NII (X - Axis) and PBT (Y - Axis) is Y = 0.461X + 2896. The correlation co-efficient, R^2 is 0.998. This means that 99.8% of increase in profit before tax is explained by the net interest income. The results also shows that net interest margin (NIM) and return on assets on the average experienced more decrease than increase within the period 2005-2011. The trend lines of NIM and ROA are Y = -0.364X + 11.70 and Y = 0.287X + 5.636 respectively. There is a strong positive correlation between the NIM and the ROA (profitability) of the listed banks. The regression equation between NIM (X - Axis) and ROA (Y - Axis) is Y = 0.577X – 1.427. The correlation co-efficient, R^2 is 0.826. This means that 82.6% of ROA is explained by the NIM.

6.0 Conclusions

In conclusion, the study revealed that the trends of both the net interest income and the profit before tax were increasing within the period between 205-2013. There is a very strong positive correlation between the net interest income and the profit before tax. Unfortunately however, the study also reveals that the trends of net interest margin and return on asset were more decreasing than increasing within the period 2005-2011. This means that the banks' ability to earn net interest income with their interest-earning assets (Net Interest Margin) and their ability to generate profit with their total assets (Return on Assets) were both decreasing within the period 2005-2011. There is a strong positive correlation between the net interest margin and the return on assets.

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