UNIVERSITY OF CAPE COAST

NON-PERFORMING LOANS AND PROFITABILITY - A CASE OF SOME

LISTED BANKS ON GHANA STOCK EXCHANGE

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LISTED BANKS ON GHANA STOCK EXCHANGE

BY

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DECLARATION

Candidate's Declaration

I hereby declare that this dissertation is the result of my own original work and that no part of it has been presented for another degree in this University or elsewhere.

Signature: …………………………..   Date: ……………………………

Candidate's Name: Appietu Henrietta

Supervisor's Declaration

I hereby declare that the preparation and presentation of the dissertation were supervised in accordance with the guidelines of supervision of dissertation laid down by the University of Cape Coast.

Signature:……………………   Date:………………………

Supervisor's Name: Dr. Anokye M. Adam

ABSTRACT

The importance of loans to the banks' profitability and for developing the economy cannot be ignored. The default of the loan repayment however, results in the banks losing profits and affecting the countries development. The aim of this research work is to examine the relationship between Non-Performing Loans and Profitability-A Case of Some Banks Listed on Ghanaian Stock Exchange. To achieve this aim, this research covered the trend of non-performing loans (NPL) and profitability of the banks and the determinants of non-performing loans, which specifically included factors related to the bank and macro-economic factors. Most importantly, how the banks' profitability is impacted by non-performing loans were examined. To this end, the researcher selected seven listed banks found on the Ghanaian Stock Exchange. This current research employed secondary data which is in panel form covering the periods from 2006-2017. The financial report of the banks and the Bank of Ghana website served as the sources of the secondary data. Regression analysis was employed to assess the determinants and how it impacts on the banks' profitability. The results revealed a downward trend for NPLs for the selected banks. Loan to Deposit ratio (LTD), Capital adequacy ratio (CAR), return on equity (ROE), inflation rate (INF) and gross domestic product (GDP) are significant determinants of nonperforming loan (NPL). ROA was impacted negatively and insignificantly by NPL, whilst NPL has significant and negative effect on ROE. The research concluded that for the banks to decrease their exposure to NPL there in the need to increase their ROE and ROA. The study recommended the use of moderate lending rates in order to decrease their nonperforming loan.

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DEDICATION

To my family, to my supervisor and to my department staffs who through

support helped me to complete this work.

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LIST OF ABBREVIATIONS

AvLR	Average Lending Rate
BoG	Bank of Ghana
CAR	Capital Adequacy Ratio
GDP	Gross Domestic Product
IMF	International Monetary Fund
LTD	Loan to Deposit Ratio
NPL	Non-Performing Loan
OLS	Ordinary Least square
ROA	Return on Asset
ROE	Return on Equity
SPSS	Statistical Package for Social Sciences
VIF	Variance Inflation Factor

CHAPTER ONE

INTRODUCTION

Banks perform significant role in the country by granting loans to individuals, companies and other sectors. Banks face the risk of high loan provisioning which results in nonperforming loans (NPLs). Currently, the issue of NPLs in Ghana is of great interest to policy makers and researchers. High rate of NPLs in the banks reduces the confidence of investors and if its determinants are not rectified and not resolved would result in malaise in the financial sector and driving out investors from the country. What determines these nonperforming loans is not well dealt with by banks in Ghana and has caused many banks to be closed down by the Central Bank.

The purpose of this paper is to examine the impact of NPLs on the profitability of listed banks in Ghana. This study will review literature on what determines NPL and how the banks' profitability is impacted by NPL and other related issues to nonperforming loans and profitability.

Background of the study

The Ghanaian banking system is regulated and monitored by the central bank (BoG)) with the Banking Act made by the parliament of Ghana. The Acts has regulations which guide the activities and operations of all banks and some other financial institutions found in the country. Unfortunately, records show that profits in the sector fell sharply in the years 2005 to 2007 to numerous reasons amongst the NPL in the books of most banks but however saw a better liquidity and profitability performance at the close of 2009 (BoG, 2012). Hamisu (2011) added that many banks in Ghana today are making huge losses due to the problem NPLs indicated in their books.

From the year, 2010 banking survey conducted in Ghana by PricewaterhouseCoopers, revealed a downward for the banking sector's profitability level irrespective of the increase in branch networks and rise in deposits. For example, Standard Chartered Bank Ltd., and Ecobank Ghana Ltd show a steady level in raising more income for their shareholders. However, Standard Chartered Bank Ltd. in the year 2015 witnessed a decline in return on equity from 22% to 12.1% in 2016, whilst Ecobank Ghana Ltd profitability dropped from 16.3% to 11.5% (Kutsienyo, 2011).

In 2017 February, the central bank reports indicated that the ratio of NPLs in the banking industry rose by 36.17% and this represents an increase of 4.7 to 6.4 billion cedis within the 12 months' period. As a result of NPLs some banks have experienced low profitability leading to their collapse. This is witnessed from the collapse of UT and Capital bank as a result of a takeover bid by GCB Bank evidenced the weak nature of loan portfolio with decreasing trend in their profitability. Some concerns raised as a result of the takeover were on the poor performance of banks loans given out and a high rate of loan default.

With low profitability of banks, government tax collection from the banks are reduced. This has some consequences on the country's GDP by reducing it. With this effect, investors' confidence is brought down and if left unresolved might prevent investors from the country, hence having deteriorating effects on the economy of the country.

There has been some heated competition among the banks due to the deregulation process in the previous couple of decades (Nkegbe & Yazidu 2015). The banks' credit risk increased as a consequence from the

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competition. This affects their portfolios in terms of loans issuing processes and poor criteria for borrowing (Manove, Padilla, & Pagano, 2001); Bolt & Tieman 2004; Jeong & Jung 2013). As a result, there has been a rise in the NPLs, which impacted bitterly on the banks' profitability and also the financial viability of the financial sector.

According to Jeong and Jung (2013), banks should find it necessary to minimize NPL. Aiyar and Bergthaler, (2015) opined that, for NPL to be reduced, there should be credit policies designed to guide and control the direction and activities of the banks in lending money to borrowers. This will help to prevent as far as possible potentially problematic lending. Other factors to minimize NPL include; proper loan structuring, not embarking on an inadequate or excessive loan amount, adequately monitor a loan, proper statement analysis, sufficient collateral from borrowers, and proper documentation (Barongo, 2013).

Two sets of factors were identified in literature to describe the growth of NPLs over the years (Aiyar & Bergthaler, 2015). According to the authors, one group focuses on factors which are external and these consists of macro-economic related factors that impacts on the borrowers' credibility to pay off loans, whilst the other group paid attention to the internal factors of the banks themselves. According to Nyarko-Baasi (2018), most banks in Ghana and other countries like Indonesia, Thailland, Mexico, Japan and Malaysia witnessed high NPLs and important decrease in their profitability during the year 2008, banking and financial crunches. This lead to the closure of most Thailand and Indonesian banks.

According to Majumder (2014), there is a depletion of capital among banks when there is high percentage of NPLs. Adverse effects of non-performing loans such as low capital base and low profitability are seen in the banking sector of Ghana. While Boahene, Dasah and Agyei (2012), investigating how NPL relates to the profitability in banks in Ghana, they used regression technique to analyze their data. They found that NPLs significantly reduces the banks performance in terms of finances. Ongore and Kusa (2013) on financial performance determinants of banks in Kenya, established that the most important determinants were capital adequacy (CAR), liquidity ratio and NPLs.

Numerous studies have been undertaken on NPLs in the banking sectors. For example, Blanco and Gimeno (2010) undertook a research on banks in South African and Kolapo et al., (2012) considered Nigerian banks. The authors witnessed the profitability of the banks being effected by the NPLs. This calls for the need for serious attention in assessing the factors that determes of NPL, since it was indicated by Blanco and Gimeno (2010) and Kolapo et al., (2012) that NPL has adverse consequence on the banking sector's profitability. The determinants of NPLs are different for different economies countries. This is as a result from factors that relates to the bank activities and the level of economic conditions the banking industry is operating.

Given how NPLs are detrimental to banks' profitability, the rapid expansion of the banking institutions found in Ghana and the marketing environment by which the banking industry operate, motivated the researcher

to conduct a research on the effect of NPLs on the banks' profitability of listed Ghanaian banks on the Stock Exchange of Ghana.

Problem Statement

There have been persistent challenges among Ghanaian banks to reduce NPLs which is considered to affect the banks' profitability. Irrespective of the various actions such as empowering the Credit Reference Bureaus to minimize nonperforming loans, NPLs still continue to be on the rise in Ghanaian banks. For instance, the banks' profitability found in the Ghana Stock Exchange such as Agricultural Development Bank; EcoBank; GCB; and Societe Generale Ghana as at 2016 recorded a profit of GH¢26.0 million, GHC 457,186 GHC 446,782 and GHS 63.8 million respectively. Irrespective of this profit margins, the average non-performing loan ratio stands at 20%.

BoG (2017), reported that there has been a rise in nonperforming loans from 18.8% in June 2016 to 21.1% in June 2017. At the same year, the NPLs reach GHC 8 billion, the pre-tax return on asset from 4.9% during the month of June in 2016 reduced to 3.7% during the month of June in 2017, whereas return on equity over the same period reduced from 22.9 percent to 17.7 percent.

Different studies on the relationship between NPL and profitability were done in U.S.A (Saba et al. (2012), Western Europe (Louzis et al. 2010); Badar et al. (2013) and East African countries (Moti et al. 2012). The research embarked on by Saba et al. (2012) used OLS regression model, but did not employ other robust analysis like random effect or fixed effect model to verify the results. Louzis et al. (2010) employed correlation in their analysis and did not consider macro-economic factors like inflation and GDP in their analysis.

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The few studies done in the context of Ghana by Nyarko-Baasi (2018) used only ROE as a proxy for profitability. Also, in a research by Addae, (2017), considered inflation as the only macroeconomic factor in his study. This research work tries to fill this gaps by considering factors related to the banks and macro-economic indicators like inflation and GDP in determining how NPLs affects the profitability of banks.

Purpose of the study

The main purpose of this research is to examine the association between nonperforming loans and the banks' profitability.

Specific Objectives

The following specific objectives are generated to in order to achieve the general objective of the study.

1. To examine the trend of NPLs and profitability of the banks

2. To analyze the determinants of NPLs of the banks

3. To analyze the impact of NPLs on profitability of the banks in Ghana

Research Questions

The following research questions are proposed for achieving the objectives of the research;

1. What is the trend of nonperforming loans and profitability of banks in Ghana?

2. What are the determinants of NPLs of the banks in Ghana?

3. How does NPLs affects on the banks' profitability in Ghana?

Research Hypothesis

By basing on the research questions, the following research hypothesis would be tested;

1. Ho: LTD has no positive association with NPL.

    H1: LTD has positive association with NPL.

2. Ho: ROA has no negative association with NPL.

    H1: ROA has negative association with NPL.

3. Ho: ROE has no negative association with NPL.

    H1: ROE has negative association with NPL.

4. Ho: CAR) has no negative association with NPL.

    H1: CAR has negative association with NPL.

5. Ho: INF has no negative association with NPL.

    H1: INF has negative association with NPL.

6. Ho: LR has no positive association with NPL

    H1: LR has positive association with NPL.

7. Ho: GDP has no positive association with NPL

    H1: GDP has positive association with NPL

8. Ho: NPL has no negative association with ROA

    H1: NPL has negative association with ROA

9. Ho: NPL has no negative association with ROE

    H1: NPL has negative association with ROE

Significance of the study

The results of the research which deals with how NPLs impacts on the banks' profitability is of great significance to the banking institutions, other researchers and the government. Bank of Ghana will use the finding of the study to develop macroeconomic policy implications that would help to minimize non-performing loans. By assessing the specific factors that relates to the bank in determining nonperforming loans, management of banks would

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be alerted on the areas of internal banking activities which adds to the occurrence of NPLs. This would help them to focus on quality of loans but not quantity of loans to be granted. Also, in assessing the trend of the banks' profitability, would reveal to the banks whether their profit margins are on the rise or not. In the academic field, this study serves as benchmark data for further studies and contributes to the literature that relates to non-performing loans of banks.

Scope of the study

The research dealt with on the impact of NPLs on the banks' profitability in Ghana. Listed banks found on the Ghanaian stock exchange would be selected for the research work, however those banks found in Kumasi would be the focus of information. The scope of the research is narrowed to the NPLs determinants and profitability of the banks.

Limitations of the study

Research works are bound with limitations by which this current research work is not an exemption. The limitations of this research are that, since this research work quantitatively measured the variables regarding nonperforming loans and profitability research; degree of subjectivity might be inherent to the data collected, since some of the banks might not be providing the accurate data to the researcher. Furthermore, there was the potential for not receiving data on all the variables under study. Finally, the research method cannot account for all of the increasing complexities of NPLs and the banks' profitability that may need to be addressed. This research work was only restricted to listed banks in the Ghanaian stock exchange in Kumasi.

Organization of the study

This research work is segregated into five different chapters which are interrelated. The first chapter introduces the research. It consists of the research background, the problem of the research, research objectives, research questions, method and analysis, significances of the research work, study coverage and how the research is organized. Chapter two is the review of literature, which looks at briefly work done by other researchers on the topic. The research methods are covered in the third chapter. The fourth chapter contains the data analysis and discussions. The fifth chapter looks at summary of the research work, conclusions, and recommendations of the analyzed data.

CHAPTER TWO

LITERATURE REVIEW

Introduction

This chapter consists of a review of past research works that relates to this current research. It has been categorized into theoretical review (that is theories that relates to the study), empirical review, and conceptual framework. The empirical review documented the findings from previous research works which are directly or indirectly related to this study. Last, but not the least, the conceptual framework showed how the research variables and the objectives was explored.

Definitions of Non-Performing Loans

Many and varied definitions of nonperforming loans as a proxy can be extracted from literature, but these definitions virtually mean the same thing. For instance, Petersson and Wadman (2004) considered non-performing loans as credit facilities that banks do not profit from because they have been in default. Nonperforming loans are loans which financial institutions cannot recoup within a specified period as governed by the rules and regulations in a country. It is considered as the loan for which the interest to be paid and the principal exceeds 90 days overdue (IMF, 2009). According to Fofack, (2009), NPLs are defined as loans that for a long time period does not create any income; this means that for the past 90 days, interest rate on such loans have not be paid. NPLs are loans for which its cash stream is not certain and is not considered by the bank as being able to generate income until profit is generated from the loan, and there is lowering of the interest rate because of the borrowers' problem (Machiraju, 2008).

Machiraju (2008), is of the opinion that NPL is a major predictor determining the quality of credit. From the perspective of NBE (2010), NPLs are loans that is experiencing a deteriorating credit quality for which the principal collection and/or loan interest or advances is in question. The specific borrowers act such as the circumstances of placing the loan at risk and petitioning for bankruptcy provides the grounds for classifying loan as doubtful or bad. Taylor et al, (1993), expounded on this by saying that one or more of the terms and conditions of the loan may be defaulted by the borrower or part of its asset may be in a country which is experiencing recession in the economy. Barongo (2013), provided a definition of NPL as a loan which is not income generating or generating interest on the principal for the past 90 days or more.

Theoretical Review of Nonperforming Loan

Different theories exist in determining and explaining NPLs. The theories underpinning NPLs have important implications for evaluating NPLs, therefore it is of great importance to explain how some of the theories relates to NPLs. Theories like asymmetric information theory and deflation theory have been applied by some researchers to have linkage with NPLs. These theories are presented in detailed below:

Theory of Asymmetric Information

According to Richard (2011), the asymmetric information theory informs that distinguishing between good and bad borrowers might be difficult particularly in a country with poor information on the credit viability of the borrower. This usually leads to difficulty in selecting the right borrower and problems of moral hazard. The asymmetric information theory can be

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explained in the financial market perspective as the party that have accurate information about a certain product that has to be marketed (which on this situation represented by the borrower) who is merited to negotiate the terms and conditions of the product more than the second party (which in this situation the lender). Either wrong or right assessment and decision can be made by the other party who have little information about the product to be marketed.

This links to financial institutions who might have little or less information about the borrower and permits the granting of loan to the borrower. This left the financial institution either receiving the loan repayment from the borrower or not. If wrong assessment and decision is made based on the little information available, the financial institution stands the risk of losing the loan granted to the customer resulting in non-performing loan. Further, this theory emphasized that moral hazard and wrong select leads to non-performing loans being accumulated by banks (Bofondi & Gobbi, 2003).

Deflation Theory

Deflation theory can be traced to the work of Fisher (1933). This theory posits that financial institutions with high debt may experience the following; liquidation of debt which leads to deposited money contraction, and selling of assets in a distressed manner. The deposit contraction leads to a decrease in the price levels, which causes a massive decline in the net worth of the business. This conceived situation results bankruptcies being precipitated, hence the concerned financial institutions operating at a loss by reducing their output due to reducing their labor employment and in trade.

As a result from these cycles, complex disturbances in the form of decline in the value of money and interest rates are witnessed. As discussed above, the complex disturbances can be grouped into both factors that are internal (micro and macro factors) external factors affecting the rate of indebtedness between, creditors or debtors or both which can aggregate into defaults in the loan granted to the clients.

Link between the theories and the objectives

Both the theory of asymmetric information and deflation theory are adopted for the research to measure the NPLs determinants and how NPLs impacts on the banks' profitability. From the asymmetric information theory, financial institutions find it hard to make distinction between bad and good borrowers. This is as a consequence from the absence of the accuracy of the borrower's information. The bank in a position to generate profit from the loan, make wrong decision by granting the loan to the borrowers. The borrowers refusing to settle the loan brings down the banks' capital and increasing the NPLs of such bank which leads to high LTD ratio of the banks. A high LTD indicates that the banks may not possess much deposit to cover such loan defaulters, and that the banks may not be earning as much as it could be which results in reducing the banks' profitability.

For the deflation theory, when the debt escalates as a consequence from borrowers not settling their loans, then NPLs begins to increase. As a result, debt liquidation sets in. This results in selling in a distressed manner and shrinking of the deposits currency sets in. This results in low CAR. The low CAR means that the banks are likely not to absorb losses from non-performing loans which affects the banks' profitability negatively. This makes

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the asymmetric information theory and deflation theory compliance to this study.

Determinants of non-performing loans

Numerous factors are responsible for the existence of nonperforming loans. This section presents a brief look at these factors. Consideration is given to factors related to the bank and factors related to the macroeconomic.

Bank Specific Factors

In South-Eastern Europe, Eastern and Central, Klein (2013) investigated NPLs during the years 1998–2011. He reached out with findings that macro-economic factors and factors related to the banks are key determinants of NPLs. Nonetheless, there was a low explanatory power for bank specific factors like CAR, lending rate, and loan to deposit ratio.

Djiogap and Ngomsi (2012) found a significant but relationship which is positive between CAR and non-performing loans. Moreover, Ranjan & Chandra (2003), mentioned that a rise in the LTD ratio leads to higher risk for the banks by raising the level of non-performing loans. Quagliariello (2007) reported from their research that ROA and ROE significantly affects non-performing loans.

Makri, et al (2014), assessed some factors which affect NPLs during the years 2000-2008 in the European zones banking systems. The authors found that ROE and ROA negatively determines NPLs of the banks. However, ROA and LTD ratio revealed insignificant effect on NPL.

In a research by Ali and Eva (2013) in Albania on how some specific factors impacts on NPLs identified ROA, CAR and LTD as the determinants of NPLs. After applying regression analysis, they further witnessed an

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association which is negative between GDP and NPLs but, inflation had insignificant association with non-performing loans.

Macroeconomic factors

Beck, Jakubik and Piloiu (2013) by using a secondary data analysed the factors that determines NPLs in about 75 nations from the years 2000 to 2010, and conclude that GDP, exchange rate and interest rate significantly determines NPL ratios.

A study conducted on savings and commercial banks in Spain by Salas and Saurina (2002) using a data set during the periods 1985-1997, revealed that GDP, and CAR significantly explain the variation of NPLs. In a research undertaken by Louzis, Vouldis, and Metaxas, (2012) on what determines nonperforming loans in the financial sector in Greek during 2003-2009 period. The study used dynamic panel regression method. The study concluded that lending rate and GDP strongly determines NPLs.

Castro (2013) assessed the relationship that developments of macroeconomic have on credit risk of banking industry among some countries (Portugal, Italy, and Spain). Specifically, GDP growth was a significant and negatively determines banks NPLs. Tomak (2013) embarked on a research in Turkey for a sample of 18 from 25 banks. The finding reveals inflation rate as a significant and positive determinant of NPLs but, GDP was not significant.

Jusoff, Ahemed, Muhamad, and Asari (2011) investigated the association between inflation rate, interest rate and NPLs, in Malaysian banking sector for the period January 2006- December 2009. According to the authors, the rate of inflation was insignificant determinant of NPL.

Non-Performing Loan and Profitability - Empirical Review

How NPLs affects the banks' profitability do not occur in a vacuum. Gizaw, Kebede and Selvaraj, (2015) underwent a research in Ethiopia to determine how performance in terms of profitability has been impacted by credit risk. The authors collected data from between the years of 2003 and 2014 from eight different banks. The findings from the researcher indicated that variables like NPLs, provisions for bad loans and CAR which were used to represent credit risk were found to positively impact on the Ethiopian banks' profitability. This impact was observed by the authors to be significant.

Chimkono et al (2016) examined the association that exists among some factors, banks' profitability level and NPLs ratio in Malawian banks. Their study covered the periods from 2008 to 2014 making a seven-year period. In their study, the measure for financial performance was the ROA whereas NPLs ratio was used to represent nonperforming loans. It was discovered that efficiency ratio in terms of cast, NPL ratio, and lending rate impacted on the banks' profitability significantly. In the context of Ghana, Bentum (2012), embarked on an empirical research on the profitability determinants Ghanaian banks. ROE was used to represent the profitability of the selected banks. The study reported that factors related to the bank which affected the banks' profitabillity, from the researcher's findings were reserves on total assets and capital. Inflation, the growth rate of GDP, and money supply were the macro-economic variables that impacted on the banks profit level at the time of the research.

In the Jordanian banking sector, a research was embarked on by Alshatti (2015), into how NPLs affects the banks profit level for the year span

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of 2005 -2013. ROE and ROA were used to represent the banks' profitability. His research findings indicated that NPLs has positive association with profitability and an inverse association was noted between loss to net facilities of the banks and the financial performance of the banks. Nevertheless, there was no evidence of CAR impacting on the performance of the concerned banks.

In a research by Nkegbe and Yazidu (2015) in Ghana on the banks performance determinants and the trends of the banks' profitability, used net interest margin, ROE, ROA to represent the banks' profitability. Bank size, NPL, liquidity and operational efficiency were employed as the explanatory variables for their research. The results from their research indicated that the performance of the banks showed a downward trend. However, the relationship between the banks' performance represented by ROA and market of loan were observed to be positive. Broad money supply, CPI and GDP were the reported macro-economic variables which served as profitability drivers. ROA and ROE both have a negative association with NPL.

Asantey and Tengey (2014) embarked on a research to determine how bad loans impacts on the financial viability and lending ability of banks. Their research employed secondary data which were fetched from the financial statements of the concerned banks. The data collected were from the year 2008 to 2013 making a five-year period. The findings from their research indicated that, at the 0.05 alpha level, there was a negatively high association between profitability of the banks and bad loans.

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Conceptual Framework

The primary aim of this study is to assess the effects of nonperforming loans on the bank's profitability in Ghana. Per the review from the literature, bank related factors and macroeconomic factors determines NPLs of banks. Factors related to the bank which determines NPLs include CAR, ROE and ROA (for measuring profitability), loan to deposit ratio. Macro-economic variables included GDP, rate of inflation, lending rate, rate of exchange, and rate of money supply (Farhan, Sattar, Chaudhry & Khalil, 2012), Sakiru, Solarin, Yussof, Muamalat and Dahalance (2011), Shingjergji (2013), Swamy (2012), Louzis et al. (2012), Wondimagegnehu (2012), and Badar, Javid, Zulfiquar (2013).

The figure below displays the framework designed for the study. The conceptual framework is of two parts. The first concentrated on the determinants of NPL and the second is on the effect of NPL on profitability.
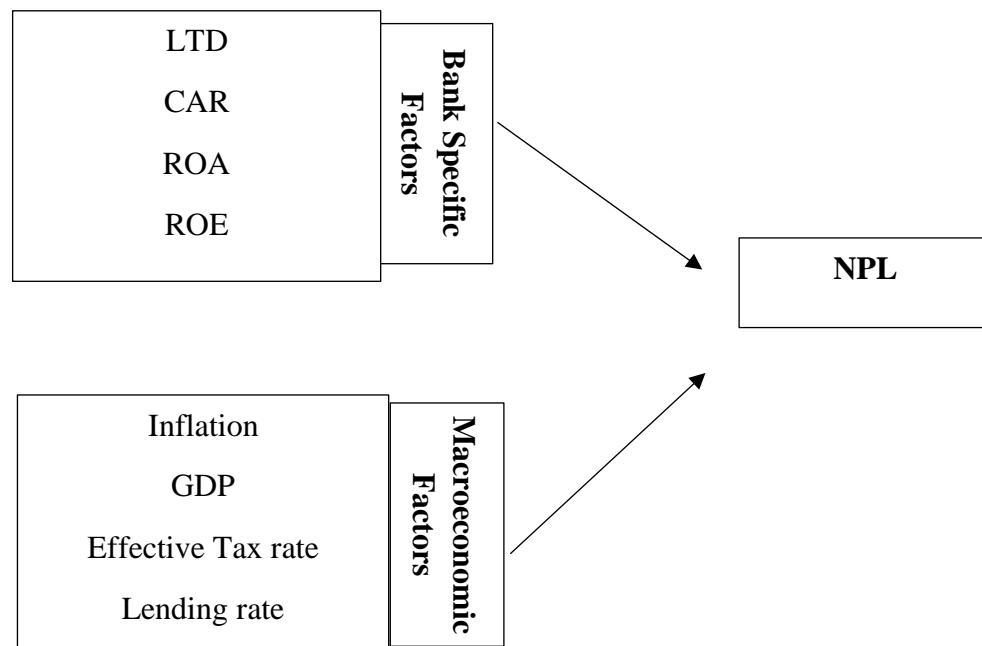
Figure 1: Conceptual framework on Determinants of NPL

Source: Appietu, (2019)

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| NPL | → | Profitability |

Figure 2: Conceptual framework on NPL and profitability

Source: Appietu, (2019)

CHAPTER THREE

RESEARCH METHODS

Introduction

This chapter encompasses the presentation of the methods applied to meet the research objectives. The method illustrates the steps that have been followed in embarking on the research and the steps involved are described in detail. The chapter is divided into seven main parts namely the study design, research approach, data type and sources, data analysis and presentation, study variables, model specification and ethical consideration.

Study Design

The design of a study is the guided procedures to be followed in order to acquire the needed data and information which is in relation to the objectives set for the research. According to Saunders, Thornhill, and Lewis (2012), every research is generally found within the confinement of three different research designs. These consists of Exploratory, Descriptive, and Explanatory research design.

Explanatory research finds out if the effect of a variable influences another variable. It also shows the relationship between variables of study (McDaniel & Gates, 2008). Since, explanatory research is compliance with the primary aim and the objectives of this current research, then this research design type was considered feasible for this study.

Descriptive research have the opportunity to give descriptions and details about the variables in the research. It is mostly of quantitative in nature. Since this study will describe the determinants of NPLs, then it is partly considered in this study.

Data type

Choosing the best research approach helps in answering the research questions. According to Saunders et al. (2009), there are two approaches to research. These includes deductive approach and inductive approach. In deductive approach, the theoretical hypotheses are examined. It begins by adopting a theory that relates to the research and deducts research hypothesis by indicating the association that exist among two or more variables. The hypothesis is then narrowed down and data is collected for addressing the research hypothesis. This helps to examine the hypothesis with the data for denying the theory or confirming it (Saunders et al., 2009). This makes deductive research approach appropriate for this research as hypothesis were suggested and also to explain the association among the variables.

Data Sources

Panel data was employed for the research. This stem from the fact that panel data is robust to heterogeneity to different units. One feature of panel data is the combination of both cross-section data and data which is in time series to give data which is very informative. Gujarati (2007), indicated that, data in panel form has the ability to measure and detect effects that is difficult to identify in time series data.

The data source employed for the research was secondary source of data which is panel in nature. According to Belay (2012), secondary data source is preferred since, it is prepared already and not expensive in terms of time and monetary aspect in collecting such data. To Kothari (2004), secondary data may be obtained from either unpublished or published documents. The secondary data source was obtained from the BoG website

and the banks' statements on their finances that are well audited. These data include macroeconomic variables and some factors related to the bank. The data collected are from the periods of 2006 to 2017 making a time period of 11 years interval.

The data on the bank specific factors alone looks more of a time series data, since it focused on a single situation (bank specific factors) at multiple time intervals. They are usually collected at fixed intervals, such as annually or yearly. After adding the macroeconomic variables to the factors related to the bank, then the study now focused on multiple situations (macroeconomic variables and bank specific factors) at multiple time intervals, which is on this case yearly. Hence the structure of the data for the study is more or less a panel data.

Data Analysis and Presentation

Kothari (2004), proposed that research data have to be processed and analyzed in accordance with the objectives of the research. All data obtained from the two banks were analyzed to assess their adequacy, suitability, accuracy and reliability. Descriptive and econometric models were employed on the panel data obtained from the years 2006-2017 to determine how nonperforming loans affects the banks financial performance.

The data taken from the concerned banks indicated on the Ghanaian Stock Exchange were keyed into Microsoft Excel to prepare the data obtained for analysis. After that, STATA version 15 software package and Statistical Package for Social Science (SPSS) were employed for analyzing the data. Tools such as, mean, maximum and minimum values were employed to present and provide description about the characteristics of the study variables.

To meet the expectations of the classical linear regression model, multicollinearity and heteroscedasticity test were employed as diagnostic tests on the data to determine their robustness. In determining the collinearity among the variables, correlation analysis and variance inflation factor (VIF) were employed. In tabular form, the results from the regression analysis were presented and explanation on each parameter were provided in accordance with the findings from previous studies.

Research Variables

In this study, both ROA, and ROE which were employed to measure the banks' profitability maintained the position of dependent variable. Besides, the explanatory variables included in this current study were the measures or NPL determinants. These variables were LTD, CAR, INF (inflation), AvLR (average lending rate), and GDP.

Brooks (2008) maintained that using not less than one explanatory variable in a regression analysis does reduce the chance of omitted variables in the regression analysis. Hence, in an attempt to minimize the consequences of omitted variables in the research work, a disturbance term was introduced in this study.

Dependent variable

Bank Profitability

Offering of high risky credits by banks can be minimized when such banks have good profitability level in such a way that such banks are less compelled to create more revenue by granting more loans which is of less quality. The authors, Boudriga, Boulila, & Jellouli (2009), are in position that banks which are inefficient stands at a high chance of witnessing more loan

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problems because such banks are only interested in granting large quantity loans rather than quality. This leaves the banks engaging in more uncertain loans to buttress their profit level so as to reach the required threshold set by the central bank. In this study, both ROE and ROA were used to represent the bank's profitability.

Return on Asset (ROA): This reveals the effectiveness in the employment of assets. It reveals the amount of net income obtained from the assets of the concerned banks. It measures the capability of the authorities of the banks to make more profits for the banks by engaging the banks' assets. Accordingly, high ratio of ROA means the bank is in better position for generating more profit.

$$ROA = \frac{\text{Net Profit}}{\text{Total Asset}}$$

Return on Equity (ROE): This indicates that return rate of equity being invested in business. It measures the rate of net income expressed in a percentage of shareholders' equity. In simple terms, it indicates the amount of profit generated by the banks with investment from shareholders in the bank. Hence, ROE provides a value for the amount the bank is gaining from their investment in equity.

$$ROE = \frac{\text{Net Profit}}{\text{Total Equity}}$$

Independent Variables

These are the variables that have ability to explain or impacts on the dependent variables. Independent variables included in the research were, nonperforming loans, LTD, CAR, inflation rate (IFR) and lending rate (LR). The choice of these variables was based on the notion that most previous

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research works based on these variables due to their extent of their effectiveness on profitability and NPLs.

Nonperforming Loan

NPLs can be considered as loans in which for a long time period usually 90 days or more, its interest and principal are outstanding and conflicts the conditions and terms of the loan requirements. Tseganesh (2012), opined that the asset quality of the banks is represented by how much of NPL the banks are experiencing.

$$\text{NPL ratio} = \frac{\text{NPLs}}{\text{Gross Loans}}$$

Capital Adequacy Ratio (CAR)

This provides a measure to the financial viability of the banks as it provides the capacity of the banks to tolerate or absorb losses which are abnormal. According to Habtamu (2012), CAR further shows the capability of the banks to undertake more businesses.

$$\text{CAR} = \frac{\text{Total Equity}}{\text{Total Asset}}$$

Loan to deposit (LTD) Ratio

LTD determines the liquidity of the banks by assessing the amount of money from the collected deposits that has been used for granting loans by the bank. It indicates the association between deposits and loans. Makri et al. (2014), made it clear that, LTD determines the income sources and the bank's liquidity in terms of its asset which is related to loan.

$$\text{LTD} = \frac{\text{Total Credit}}{\text{Total Deposit}}$$

Interest Rate/Lending Rate

Lending rates serves as part of the macroeconomic indicators which determines NPLs. It is associated with the cost of funds borrowed. Interest rate measures the profit level between short term borrowing cost and the income on lending in the long term. According to Joseph (2011), interest rate spread escalates the loan costs charged on the borrower, hence affecting performing of bank's assets.

Inflation Rate

This is the rate of change in the prices of services and goods. It occurs when the prices of services and goods are rising. Based on a more similar opinion, inflation is about persistent rise of the price aggregate of services and goods leading to a decrease in the purchasing power of currency. An unexpected and high inflation rate can affect the economy and makes it difficult for peoples to raise money for investment. In similar vein, with the existence of inflation, resources are transferred from savers and lenders to borrowers, because loans can be repaid by borrowers with Ghana cedis which might be worthless. Inflation can be regarded as the change in percentage of the consumer index price. This suggest that, a rise in inflation results in the rise of borrowing cost and makes the repayment of loan difficult to the borrowers.

Measures of Profitability

In recent years, attention of researchers has been geared towards the profitability of banks and the need for resource management in determining the profitability of the banking system. Sanni, (2006), is of the view that profitability occurs when the expenses are exceeded by income for a particular

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time period. By adopting the Matching Concept, the expenses and income needs to occur at equal time and income have to be direct effect from the expenses. This forms the fundamental requirements for profitability as proposed by (Sanni, 2006).

Sabo (2007), is in position that, the time period for the profitability can be in a week, a month or three or a year. Receiving either income in cash or paying expenses in cash can be materialized, and it is not always compulsory for such payments to be made in cash. Profits generated by businesses serves as the life blood for organizations that are profit orientated. Because such organizations expect to generate profits, they remain in operations. When such expectations are confirmed not reachable, the organization make decisions to close down their operations.

A lot of variables are employed to represent banks' profitability. Some of these indicators include; ROE, ROA and Net Interest Margin (NIM). There are divisions among researchers about the choice of the measures of profitability over the other indicators as the best proxy for banks' profitability. An instance of this is noted from, Goudreau and Whitehead (1989); and Uchendu (1995) who were of the opinion that ROE, ROA, and NIM are all good for measuring profitability, but recommended the use of ROA and ROE as good indicators of profitability.

Hancock (1989), in his research adopted only ROE as an indicator of profitability, whilst Odufulu (1994) employed gross profit margin as a proxy for profitability. Furthermore, Ogunleye (1995) used ROE and ROA as indicators of banks' profitability since he did not believe that NIM could be of better indicator of profitability, whilst Uchendu (1995) opined that ROE,

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ROA, and NIM are good proxies for profitability of banks. According to Ahmed (2003), ROE, ROA, and NIM are good indicators of profitability used in most literatures. From the views of Akinola (2008), indicators of banks' profitability include Profit After Tax (PAT), Rate of Return on Capital (ROC), Profit Before Tax (PBT), ROA and ROE.

Model Specification

This study seeks to assess how nonperforming loans impacts on the Ghanaian bank's profitability. Based on this, profitability was used to represent the dependent variable whereas nonperforming loan is the explanatory variable. To achieve the objective two of the research which looks at the determinants of NPLs, the non-performing loans serve as the dependent variable and its determinants its determinants (LTD, CAR, ROA, ROE, AvLR, INF and GDP) would be the independent variables. The reason for the choice of these variables is as a result from these variables being available in the banks considered for the study. The equation below shows the general model of the regression model employed in this research.

$Y_{it} = \beta o + \beta X_{it} + \varepsilon_{it}$

Where: - Y_{it} represents the dependent variable for a specific bank 'i' at specific year 't', $\beta 0$ represents the constant term, β represents the coefficient of the explanatory variables, X it is the explanatory variable for bank 'i' in year 't' and εit the error term. A modification of the estimated models employed in this study are presented below;

Model 1: $NPL_{it} = \beta 0 + \beta_1(LTD)_{it} + \beta_2(CAR)_{it} + \beta_3(ROA)_{it} + \beta_4(ROE)_{it} + \beta_5(ALR)_{it} + \beta_6(INF)_{it} + \beta_7(GDP)_{it} + \beta_8(UEMP)_{it} + \varepsilon_{it}$

In the second model, the bank's profitability represented by ROE and ROA are used as the dependent variable whereas, the determinants of nonperforming loan were the explanatory variables. The estimated model used here is as follows;

Model 2: $ROA_{it} = \beta0 + \beta_1(NPL)_{it} + \beta_2(LTD)_{it} + \beta_3(CAR)_{it} + \beta_4(ALR)_{it} + \beta_5(INF)_{it} + \beta_6(GDP)_{it} + \beta_7(UEMP)_{it} + \varepsilon_{it}$

Model 3: $ROE_{it} = \beta0 + \beta_1(NPL)_{it} + \beta_2(LTD)_{it} + \beta_3(CAR)_{it} + \beta_4(ALR)_{it} + \beta_5(INF)_{it} + \beta_6(GDP)_{it} + \beta_7(UEMP)_{it} + \varepsilon_{it}$

Where;

$\beta0$ is an intercept $\beta1$, $\beta2$, $\beta3$, $\beta4$, $\beta5$, $\beta6$, and $\beta7$ are the respective explanatory coefficients for a particular bank i and at a particular time period t. NPL, CAR, ROE, LTD, ROA, INF, ALR, UEMP and GDP represent nonperforming loan, capital adequacy, return on equity, loan to deposit ratio, return on asset, inflation rate, Average lending rate, unemployment and gross domestic product, respectively. ε_{it} represents error term which checks for omitted variables. The error term has non- auto correlated, constant variance, and zero mean.

The coefficients of independent variables were determined by employing the technique of ordinary least square (OLS). The reason behind the choice of the OLS was that, it meets the requirements of the Classical Linear Regression Model (CLRM) which holds true (Brooks 2008). More to the point, Petra (2007), points out that the OLS performs better than other estimators. This can be true when there is a short time dimension and when the cross section is less. Hence, as the facts above remain in congruence with this study, it is necessary to adopt the OLS. 9

Other tests such as the random and fixed effect models were performed on the variables. The fixed effects model provides the opportunity to have varied intercept for different cross sectional unit and it is also time invariant, implying that it doesn't alternate over time. Random effect model on the other hand, employs varied intercepts for different cross sectional unit and invariant to time. This makes it look like fixed effects model. But Brooks (2014), differentiated fixed effect model from random effect model by indicating that there is a common mean for random effect model for the different units of the intercepts that they arise from.

The Hausman-Test is employed for determining whether to adopt the fixed effect model or the random effect model. According to Brooks (2014), the Hausman- Test, is considered in order to determine the effectiveness of the random effects model, hence indicating whether embarking on the fixed effects model instead of the random effect model is the best choice. If the p-value for the Hausman- Test is significant, then the fixed effects model would be employed, if not then the random- effects model would be adopted.

Diagnostic Tests

Diagnostic tests such as multicollinearity, and heteroscedasticity tests were performed on the variables. Multicollinearity which indicates the strength of the association between the explanatory/independent variables was performed using both correlation and variance inflation factor (VIF). When variables are highly collinear by having correlation coefficient of 0.8, then one of such variables is removed from the regression analysis. After using correlation for testing multicollineariry, VIF was used to confirm collinearity

in the variables. Variables with VIF of 10 and above are removed from the analysis.

Heteroscedasticity test was employed to test if the disturbance terms don't have the equal variance. Breusch-Pagan test was utilized to determine the existence of heteroscedasticity. According to this test if the p-value is significant (p-value below 0.05) at 95% confidence level, then there is the problem of heteroscedasticity among the data set, however if the p-value is insignificant then there is no problem of heteroscedasticity.

Ethical Consideration

The management of the various banks would be served with letters demanding for their audited financial reports. The letters would be sent to the banks two weeks before the data would be collected. This would give the management ample time to prepare the data for collection. Upon acceptance by the management of the banks, the data would be collected for academic purposes only.

CHAPTER FOUR

RESULTS AND DISCUSSION

Introduction

This chapter is written with the aim of presenting the findings of the research. This in turn is followed by discussions of the findings from the research in the light of comments made on NPLs and the banks' profitability - a case of some listed banks found on the Ghanaian stock exchange. The research used panel data from 2006 – 2017 from seven banks that were found on the Stock Exchange of Ghana. This chapter is organized into different sections for easy organization of the analysis of the results. Basically, of follows the orders of descriptive statistics, data validity test and regression analysis. The analysis, interpretation and discussion of the data obtained for estimating how NPL affects the banks' profitability was made by employing panel data.

Descriptive Statistics of the study variables

Table 1 presents the descriptive analysis of the variables considered in the research. It is in the orders of mean scores, standard deviation values, minimum and maximum score of all the variables of the study over the sample period.

Table 1: Descriptive Statistics of the study variables

Variable	Obs	Mean	Std. Dev.	Min	Max
NPL	84	14.538	12.889	2.51	62.22
LTD	84	70.348	19.911	23.41	123.35
ROE	84	26.72	12.788	.76	72.18
ROA	84	4.695	1.384	2	13.8
CAR	84	12.83	3.812	6.18	30.21
AvLR	84	13.171	1.493	9.18	14.48
INF	84	13.295	3.496	8.73	19.25
GDP	84	35.647	9.106	20.41	47.81
UNEMP	84	11.783	1.166	9.95	13.64

NPL-Non-Performing Loan; LTD-Loan to Deposit Ratio; ROE-Return on Equity; ROA-Return on Asset; CAR-Capital Adequacy Ratio; AvLR-Average Lending Rate; INF-Inflation; GDP-Gross Domestic Product; UNEMP-Unemployment
Source: Appietu, (2019)

The minimum and the maximum nonperforming (NPLs) by the seven listed banks under study in Ghana are 2.51% and 62.22% respectively, with the mean NPL being 14.54%. It has a deviation value of 12.89 which is close to the mean value indicating high differences in the NPLs of the listed banks under study. This is an implication that out of the total amount loans granted by the banks in Ghana, the banks incurred 14.53% NPLs on the average. As one of the requirements of BoG (2008), banking institutions working in the country are require to have and maintain a NPLs ratio of not more than 5%. Per the presentation on Table 1, the NPLs of the Ghanaian banks are above the required threshold. This makes NPLs being persistent problem for the banks selected for the research.

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With regards to Loan to Deposit (LTD) ratio, its average value is 70.35%, with the least and high values being 23.41% and 123.35% respectively. It has a small deviation value of 19.91%. Since the ratio (70.35%) is high (more than half), and this suggests that the banks would not have much deposit to cater for any unforeseen credit demands, and that the banks may not be earning as much as it could be. Return on Equity (ROE) recorded an average value of 26.72% with the highest and lowest values of 72.18% and 0.76% respectively. This picture suggests a bit good financial healthiness of the banks as at the years under study was embarked on. Moreover, Return on Assets (ROA) revealed a mean value of 4.70%, with 1.38% being the standard deviation from the mean and having minimum and maximum values to be 2% and 13.8% respectively. This indicates that an average profit of 4.70% was made by the banks on assets, indicating a low performance on their return on assets under the periods of the study. This provides the evidence that the banks in Ghana shows better performance in their ROE than that of ROA. Thus, banks in Ghana was able to make good profit from their equity than their assets.

Capital adequacy ratio (CAR) showed an average value of 12.83%, with minimum and maximum values shown by 6.18%, and 30.21% respectively and standard deviation value of 3.81%. As the banks have low value of 12.83% as their capital adequacy ratio, the banks are likely not to absorb losses and meet capital requirements. Therefore, the banks under study with low CAR are more likely to be insolvent and hence, not being able to repay their debts as a consequence from the losses that are not expected. The average lending rate (AvLR) showed mean value of 13.17% with its minimum and

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maximum values reported to be 9.18% and 14.48% respectively and with minimal standard deviation value of 1.49%. Moreover, the least and the highest inflation rate during the study period were 8.37% and 19.25% respectively. A high inflation rate is likely to affect NPLs of the banks as borrowers might find it challenging to settle their loans. The average GDP of the country was $35.647 billion with a deviation of $9.106 billion from the mean. The minimum and the maximum values are $20.41 billion and $47.81 billion respectively. A better GDP of a country means less possibility of NPL.

Trend of nonperforming loans and profitability of the banks

As part of the research objectives, it was necessary to assess how the trend of NPL and profitability of the banks look like. This helps to establish the trend for NPLs of the banks operating in Ghana during the years under which the study was conducted, which is from the years 2006-2017. Figure 3 displays the pictorial view for NPLs and the banks' profitability.
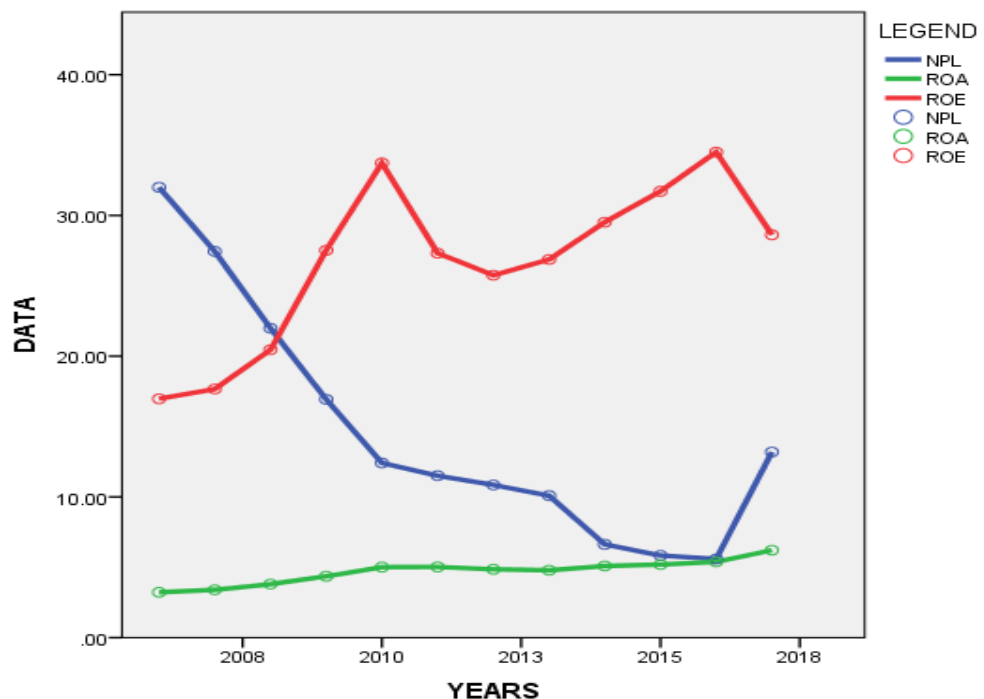

Figure 3: Trend of nonperforming loans and profitability of the banks
Source: Appietu, (2019)

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From the figure above, there is a steady decline in the NPLs of the banks from the periods of 2006 to 2016, until it increased in the year 2017. This substantial reduction in the NPLs might result from either there is an improvement in the requirements for issuing loan thereby improving quality of loan or the banks being in a position to avoid granting bad loans in large quantity and advances. Even though, the level of NPLs revealed a downward pattern from the years 2006-2016, but the problem of the banks' with reference to NPLs in Ghana was still beyond the average threshold as indicates by the descriptive result shown earlier. Thus, a downward sloping trend of NPL is suggested by this study.

In assessing the trend of the Ghanaian banks profitability, both ROE and ROA were considered. The years 2006 to 2010 witnessed a rising pattern in the ROE of the banks. However, a declining trend was observed from the years 2010 till 2012 before it rose again till the year 2016. A reduction of ROE was further noted in the year 2017. With respect to ROA, a fairly increment was identified from the years 2006 to 2017.

Validity and robustness of the data

The CLRM assumptions have to be met so as to maintain the robustness and validity of the regression results. As proposed by Brooks (2008), all the necessary information can be used in the regression model only if the assumptions of the CLRM are met. Nonetheless, some of the data may be omitted from the regression analysis when the assumptions of CLRM are not duly satisfied. In order to maintain the research quality, robustness checks such as heteroscedasticity and multicollinearity were performed before employing the regression model to test the results. This helps to eliminate or

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mitigate any misspecification of the data in order to have quality regression model.

Multicollinearity

Multicollinearity is used to determine if there is any strong or exact relationship between all or some of the independent (explanatory) variables. When there is strong relationship (multi collinear) between the explanatory variables, then such variables might be possessing similar predictive power. When such situation occurs then one of the variables needs to be removed from the proposed regression model. It also cause a significant increase in the p-value and makes variables which are significant insignificant. In testing for multicollinearity, the correlation analysis and the variance inflation factor (VIF) was used.

In testing for the relationship among the study variables, the correlation analysis was employed. Correlation analysis provides coefficient value which determines the strength and direction of the association between the variables. Berk and Devore (2007) suggested that coefficients below 0.5 shows a weak association, coefficients above 0.5, but below 0.8, indicates an association which is moderate and coefficients above 0.8 suggests a strong association. The p-value indicate the possibility of the association being insignificant or significant. P-value below 0.05 is considered significant if not, otherwise. If the correlation between two variables are strong, then there is multicollinearity between those variables. Table 2 proclaims the correlation results found between the explanatory variables.

Table 2: Correlation between variables

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) LnLTD	1.000							
(2) LnROE	-0.241*	1.000						
(3) LnROA	-0.359*	0.541*	1.000					
(4) LnCAR	0.324*	-0.386*	0.164	1.000				
(5) LnAvLR	-0.387*	0.477*	0.611*	0.036	1.000			
(6) LnINF	-0.253*	0.165	0.072	-0.132	0.177	1.000		
(7) LnGDP	-0.337*	0.381*	0.607*	0.155	0.793*	-0.086	1.000	
(8) LnUNEMP	-0.450*	0.390*	0.634*	0.123	0.782*	0.206	0.898*	1.000

Source: Appietu, (2019)

From Table 2, there is a moderate and weak association between the explanatory variables, with the exception of unemployment and GDP that has a high (0.898) and significant relationship between them. This is an indication that the possibility of multicollinearity affecting the regression results does not exist among the explanatory variables, but multicollinearity is exhibited between unemployment and GDP. Therefore, unemployment will be excluded from the regression model. VIF was tested on the remaining variables. When the VIF value is high for a particular variable, then such variable exhibits multi collinear with some other variables. According Bedru and Seid (2005), and from the rule of thumb, if the VIF value for a specific variable is more than 10, then such variable is attributed to demonstrate high collinearity. Table 3 presents the VIF of the explanatory/independent variables.

Table 3: Variance inflation factor

	VIF	1/VIF
LnGDP	3.537	.283
LnAvLR	3.516	.284
LnROA	2.628	.38
LnROE	2.464	.406
LnCAR	2.103	.475
LnLTD	1.721	.581
LnINF	1.304	.767
Mean VIF	**2.468**	

Source: Appietu, (2019)

After dropping unemployment from the data set, none of the variables has VIF to be more than 10 and the average VIF is 2.468 which is far below

the threshold value of 10. This makes the remaining variables in the table above passing the multicollinearity test. This is an indication that the independent variables to be used in the research model are not in high relationship with one another.

Heteroscedasticity Test

One of the key requirements of the CLRM is for the data passing the Homoskedasticity test. The assumption is that, the disturbance term (Ui) with its according probability distribution should be the same for all the study variables or observations. That is the independent variables should have equal variance for each disturbance term. According to Bedru and Seid (2005), heteroscedasticity exists between variables when there is varied values for Ui. To determine the problem of heteroscedasticity, the Breusch-Pagan test was applied in this research. A significant p-value (p-value below 0.05) at the 95 confidence level indicates the presence of heteroscedasticity problem, if not then otherwise.

Table 4: Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Chi-Square	3.22
Prob.	0.073

Source: Appietu, (2019)

Per the presentation on Table 4, the p-value of 0.073 (7.3%) is more than 0.05 (5%), indicating the absence of heteroscedasticity problem in the variables of the study.

Determinants of nonperforming loans

As part of the research objectives, it was found necessary to critically find out the significant determinants of NPLs of the banks considered in the

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research. To find out how significant the determinants predict the NPLs of the banks, regression analysis is used.

To Saunders et al., (2007), regression analysis is one of the statistical models employed to describe how one or more explanatory variables impacts on dependent variable. It can show the most important factor that in this case determines NPLs. A regression coefficient close to +1 shows that the explanatory variables impacted high on the dependent variable, whereas regression coefficients close to 0 shows that the dependent variable is being weakly impacted by the independent variable. The explanatory or independent variables in this case were; CAR, LTD, ROE, ROA, inflation rate (INF), average lending rate (AvLR), and GDP, whilst NPL is the explanatory variable.

Model selection

To confirm the OLS estimation, either fixed effects or random effects model needs to be employed. In determining the choice of either random effects or fixed effects model the Hausman test was applied. The rule governing the Hausman Specification test is that, if p-value is below 0.05 then the fixed effect model is considered for the analysis. Hence, as depicted at the Appendix, there is a p-value of 0.00 for the regression model after the Hausman specification test was applied. This is an indication that the p-value is statistically significant buttressing the point that the fixed effect model is required for determining the determinants of NPLs. The regression results pertaining to fixed effect model is presented on Table 5.

Table 5: Fixed effect regression model on the determinants of NPL

LnNPL	Coef.	St.Err.	t-value	p-value	Sig
LnLTD	-0.802	0.285	-2.82	0.006	***
LnCAR	-0.795	0.288	-2.76	0.007	***
LnROA	0.489	0.278	1.76	0.083	
LnROE	-0.350	0.119	-2.94	0.004	***
LnAvLR	0.743	0.642	1.16	0.251	
LnINF	-1.037	0.208	-5.00	0.000	***
LnGDP	-2.257	0.325	-6.95	0.000	***
Constant	63.602	7.557	8.42	0.000	***

Mean dependent var		2.379	SD dependent var	0.750
R-squared		**0.721**	Number of obs	84.000
F-test		25.796	**Prob > F**	**0.000**
Akaike crit. (AIC)		79.093	Bayesian crit. (BIC)	98.540

*** $p<0.01$, ** $p<0.05$, * $p<0.1$
Source: Appietu, (2019)

From Table 5, the model revealed an R-Square value of 0.721. This indicates that the independent variables jointly explain 72.1% of the differences in the NPLs faced by the banks under study. Because the explanatory variables have the power to explain above half (72.1%) of the variations in the dependent variable, then the model can be considered to have a high predictive power. With significant value of 0.00, justifies that the regression analysis is highly significant.

About the NPLs determinants, it is noted from the table that, LTD, CAR, ROE, INF and GDP are significant determinants of NPL. This is indicated by the p-values of these variables being below 0.05. On the other hand, ROA and AvLR are insignificant determinants since its p-values are more than 0.05. From the table and based on the coefficients, the regression model below can be deduced;

LnNPLs = 63.60 − 0.80(LnLTD) − 0.79(LnCAR) + 0.50(LnROA) − 0.35

(LnROE) + 0.74(LnAvLR) − 1.04(LnINF) − 2.26(LnGDP) + ε

According to the equation above, LnROA and LnAvLR are positive determinants of NPLs by revealing coefficient values of 0.5 and 0.74 respectively. Therefore, a 1% increase in ROA and AvLR would lead to an insignificant (p-values more than 0.05) increase in NPL by 0.5% and 0.74% respectively with all the other determinants being held constant. Conversely, LTD, CAR, and ROE have respective coefficients of -0.8, -0.79 and -0.35 with their p-values being significant. This suggests that LTD, CAR and ROE are significant and negative determinants of NPL. Moreover, 1% increase in LTD, CAR and ROE would lead to a significant decline in NPL by 0.8%, 0.79%, and 0.35% respectively with the other variables held constant. Both the macroeconomic (INF and GDP) determinants provided coefficients of -1.04 and -2.26 with significant p-values implying that both INF and GDP are negative and significant determinants of NPL. A 1% increase in INF and GDP would lead to a significant reduction in NPL by 1.04% and 2.26% respectively.

Impact of nonperforming loans (NPL) on profitability

In determining how NPLs impact on the banks' profitability, two measures of profitability which are ROE and ROA were considered. Other determinants of NPL are included in the model. Regression analysis is employed in this case.

Impact of nonperforming loans (NPL) on ROA

Under this section the dependent variable is ROA and the independent variables are NPL, LTD, CAR, AvLR, INF, and GDP. The hypothesis below is tested;

Ho: NPLs has no negative association with ROA

H1: NPLs has negative association with ROA

The Hauseman test is first conducted to determine the choice of either fixed effect model or random effect model. The Hauseman specification test for the choice of the model is presented in the appendix. An insignificant P-value of 0.99 was recorded against the Hausman specification test for the model. This is an indication that the p-value is insignificant meaning the random effect model is appropriate for determining the impact of NPLs on ROA.

Table 6: Random effect regression model on the impact of NPL on ROA

LnROA	Coef.	St.Err.	t-value	p-value	Sig
LnNPL	-0.041	0.050	-0.73	0.625	
LnLTD	-0.138	0.118	-1.17	0.243	
LnCAR	0.131	0.113	1.16	0.246	
LnAvLR	0.687	0.299	2.30	0.022	**
LnINF	0.017	0.109	0.16	0.872	
LnGDP	0.274	0.187	1.46	0.143	
Constant	-6.700	4.619	-1.45	0.147	
Mean dependent var		1.511	SD dependent var		0.265
Overall r-squared		**0.453**	Number of obs		84.000
Chi-square		71.124	**Prob > chi2**		**0.000**
R-squared within		0.487	R-squared between		0.259

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Source: Appietu, (2019)

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The R-square reported a value of 0.453, this justifies that the explanatory variables explain 45.3% of variations in ROA being representing the banks' profitability. The probability value of 0.00 which is below the compared alpha value of 0.05 testifies that the regression results is statistically significant. Both NPL and LTD had coefficients of -0.04 and -0.14, with p-values of 0.62 0.24 implying that NPL and LTD impacted negatively on ROA, but its impact was insignificant. With CAR and AvLR showing coefficients of 0.13 and 0.69 respectively suggests that both of them impacted positively on ROA. Nevertheless, AvLR has significant impact on ROA by having p-value of 0.02. Both the macroeconomic variables; INF and GDP have positive and insignificant impact on ROA by reporting respective coefficients of 0.02 and 0.27 and with p-values of 0.14 and 0.15 respectively. From the table the regression model below is formulated;

LnROA = -6.70 − 0.041(LnNPL) − 0.138(LnLTD) + 0.131(LnCAR) + 0.687(LnAvLR) + 0.017(LnINF) + 0.274(LnGDP) + ε

Per the above regression model, a percentage rise in NPL would result in insignificant decline in ROA by 0.041%. Since, NPL has negative impact on ROA, the study failed to reject the alternative hypothesis (H1) and maintains that NPL has negative impact on ROA.

Impact of nonperforming loans (NPL) on ROE

With the choice of either the fixed effect or the random effect model, the Hauseman test was first conducted. The findings from the Hauseman specification test is presented in the appendix. The Hausman specification test for the model revealed an insignificant p-value of 0.85, meaning the random

effect model is appropriate for determining the impact of NPLs on ROE. The results are presented on Table 7.

Table 7: Random effect regression model on the impact of NPL on ROE

LnROE	Coef.	St.Err.	t-value	p-value	Sig
LnNPL	-0.373	0.111	-3.35	0.001	***
LnLTD	0.466	0.262	1.78	0.035	*
LnCAR	-1.160	0.250	-4.64	0.000	***
LnAvLR	1.753	0.682	2.57	0.010	**
LnINF	0.029	0.244	0.12	0.905	
LnGDP	0.004	0.421	0.01	0.993	
Constant	0.297	10.326	0.03	0.977	
Mean dependent var		3.134	SD dependent var		0.656
Overall r-squared		**0.534**	Number of obs		84.000
Chi-square		76.294	**Prob > chi2**		**0.000**
R-squared within		0.485	R-squared between		0.716

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Source: Appietu, (2019)

Per the presentation on Table 7, with p-value being 0.00 for the model and the R-square value of 0.534 suggests that the regression results is of high significant and the independent variables are able to explain over half (53.4%) of the variations in ROE. With coefficients of -0.373 and -1.160 computed against NPL and CAR respectively indicates that both of these variables have significant (p-value = 0.00) and negative impact on ROE. Moreover, LTD and AvLR have positive coefficients signaling their positive impact on ROE. Their impact is significant with their p-values being less than 0.05. INF and GDP which are the macroeconomic variables have positive but insignificant impact on ROE. From the table, the model below is developed;

LnROE = 0.297 – 0.373(LnNPL) + 0.466(LnLTD) – 1.160(LnCAR) + 1.753(LnAvLR) + 0.029(LnINF) + 0.004(LnGDP) + ε

From the model above, a 1% decline in NPL would result in a significant rise in ROE by 0.373%. The hypothesis below is tested;

Ho: NPLs has no negative association with ROE

H1: NPLs has negative association with ROE

The study failed to reject H1, and conclude that NPLs has negative association or impact with ROE.

Discussion of findings

The discussion of the results from the previous chapters are presented in this section. The discussions are made in relation to the previous research findings from other researchers reviewed from the literature. The findings from each independent variables consisting of the non-performing loans determinants and how they impact on the banks' profitability of the selected banks in Ghana is discussed together. The discussions are based on previous theoretical and empirical evidences from other researchers.

The results on CAR revealed that it impacted negatively on NPLs and this impact was significant. This was in line with the hypothesis formulated for this research. The hypothesis for this research was that a negative association exists between NPLs and CAR of the banks. The negative coefficient suggests an inverse association between CAR and NPLs. This supports the arguments that banks that are strong in terms of capital are financially viable to avoid high risk level. This proves that Ghanaian banks found on the Stock Exchange of Ghana have small capabilities to embark on loans that are very risky, since the financial institutions are well regulated in the country. Hence, due to this regulatory measure by the central bank in Ghana which is effective, resulted in CAR having negative impact on NPLs.

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This suggests that the selected banks for the research were able to pass the CAR requirements by the Bank of Ghana and also, the managers of the banks were able to efficiently absorb non-performing loans from their capital. This finding is in agreement with the study embarked on by Hyun and Zhang (2012); Boudriga et al. (2009); Djiogap and Ngomsi (2012); Shingjerji (2013); and Makri et al. (2014) where they used the countries aggregate data.

An insignificant but positive association between NPLs and ROA was noted. This is due to the fact that, the management of the banks being ineffective in terms of utilization of asset and issuing fewer quality loans in the Ghanaian banking institutions. This led to the ROA having a positive association with NPLs. This result is a suggestion that banks in Ghana are less sensitive to profits generated from assets and provision of loans. This confirms the findings of Ahmad and Bashir (2013); Boudriga et al. (2009); Selma and Jouini (2013); Makri et al. (2014); and Swamy (2012).

ROE showed a statistically significant but impacted negatively on NPLs. Having coefficient value of -0.647, the finding indicates a high effect of ROE as a representative of the banks' profitability on non-performing loans. Nonetheless, a decline in ROE as a representative for the banks' profitability lead to high levels of NPLs. The significant and negative association between ROE and NPL is an indication of the existence of good fund management which the shareholders invested in order to gain profits from the banks in Ghana. This result is at par with the finding of Hyun and Zhang (2012); Klein (2013); Makri et al. (2014); Boudriga et al. (2009) and Shingjerji (2013) but refutes the research results of Louzis et al. (2012).

Lending rate (AvLR) was indicated to exhibit no significant but positive association with NPL. Higher lending rate places restrictions on the number of borrowers who are willing to borrow, this limits the total loan amount to be granted thereby reducing NPLs, but this is not the case observed here. This is consistent with the study by Daniel and Wandera (2013); Tomak (2013); Ranjan and Chandra (2003); Louzis et al. (2010); Farhan, Sattar, Chaudhry, and Khalil (2012), and Konfi (2012) who found statistically significant positive impact of AvLR on NPLs. However, it disagrees with the findings from Ahmad and Bashir (2013); Ali and Eva (2013); Hyun and Zhang (2012); and Saba et al. (2012)

For the macroeconomic determinants, INF was discovered to demonstrate a significant and negative association with NPL. This means as INF increases NPL decreases. The higherr the rate of inflation, the higher the individuals' volatility of and the profitability of business which makes them default their loans. According to Rasiah (2010), central banks in an attempt to regulate inflation rate raises the borrowing cost which reduces the banks capacity to issue loans. As a consequence from this, there is a higher borrowing cost which results in a lot of borrowers not being able to settle their loans, hence the dare consequences is the occurrence of NPLs.

GDP was noted to exhibit a significant and impacted negatively on nonperforming loans. This means that GDP have inverse association with non-performing loans and that as GDP decreases NPL increases. According to Vong and Chan (2006) there is the believe that in situations were economic growth is favorable, there is minimal defaults on loans. Hence, increasing the level of GDP would lead to NPL declining as identified in the study. This is in

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accordance with Salas and Saurina (2002), who observed negative and significant effect of GDP on NPL. From the perspective of researchers such as Fisher (1933); Kiyotaki and Moore (1997); and Minsky (1986), a continuous growth of GDP of a country leads to the banks extending loans to debtors who have low credit worthiness and when the economy experiences recession, non-performing loans begins to rise.

By engaging ROA as a dependent variable, it was noted that NPL has an insignificant and impacted negatively on ROA. This is at par with the findings from a research conducted by Olawale, Oluwafemi, Israel, and Simeon (2014) in Nigeria, who noticed a negative but an insignificant relationship between NPL and ROA. This is further buttressed by Wangai, Bosire and Gathogo (2014) in Kenya, Gizaw et. al. (2015) in Ethiopia, and Kolade et al. (2012).

NPL was noted to exhibit a significant and a negative impact on ROE. This is an implication that as NPL increases ROE decreases. This contradicts what is identified by Alshatti (2015). He noted that NPL is positively related to ROE. However, it supports the findings of Nkegbe & Yazidu (2015); and Asantey & Tengey (2014) who identified similar impact. This is explained by Khemraj and Pasha (2012). These authors asserted that maximum percentage levels of NPLs are usually in connection to the banks' profitability problems which occurs in both developed and developing countries.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

This section summarizes the major findings from this research, conclusion and followed by recommendations made as a result from the research findings. This study assesses nonperforming loans (NPL) and banks profitability - a case of some listed banks on the Ghanaian Stock Exchange. Panel data which ranges from the years 2006 to 2017 was adopted for the research. The data comprises factors related to the bank and macroeconomic factors.

Summary of Findings

This sub-section summarises the results in perspective of empirical findings from the study. In effect, this section will give the synopsis of each finding according to the objectives enumerated in the chapter one. This research covered panel data on Non-Performing Loan (NPL), LTD, Return on Asset (ROA), Return on Equity (ROE), CAR, Average Lending Rate (AvLR), Inflation (INF), and GDP from the periods of 2006 to 2017. Descriptive statistics, robustness test, and OLS regression such as random and fixed effect model were performed on the study variables.

The results revealed that, the minimum and the maximum nonperforming (NPLs) by the listed banks in Ghana are 2.51% and 62.22% respectively, with the mean NPL being 14.54%. Loan to Deposit (LTD) ratio, had a mean value of 70.35%, with the maximum and minimum values being 123.35% and 23.41% respectively. ROA and ROE recorded a mean value 4.70% and 26.72% respectively. Capital adequacy ratio (CAR) showed an

average value of 12.83% and that the banks likely not to absorb losses and meet capital requirements. The average (AvLR) showed mean value of 13.17%. Moreover, the minimum and the maximum rate of inflation for the years the data was gathered for the research were observed to be 8.37% and 19.25% respectively. The average GDP of the country was $356.43 million. In testing for the robustness of the study variables, no evidence of multicollinearity and heteroscedasticity was identified.

When regression analysis was performed to examine the banks' NPLs determinants considered in the study, it was noted that, LTD, CAR, ROE, INF and GDP were significant determinants of NPL. On how NPL impacts on the banks' profitability, where ROE and ROA were employed as a measure for profitability, it was identified that NPL has insignificant but negatively impacted on ROA. After using ROA as a dependent variable, NPL impacted negatively on ROE. Moreover, the impact was identified to be significant.

Conclusion

This research mainly focused on the impact of non-performing loans on the profitability of banks in Ghana. Secondary data were collected from 7 banks which were found on the Ghanaian Stock Exchange on the study variables from the years 2006 to 2017. Descriptive and regression analysis were performed to determine how nonperforming loans impacts on the bank's profitability. The results indicate that LTD, CAR, ROE, INF and GDP are significant determinants of NPL. When ROA was employed as a dependent variable, NPL was noted to show evidence of negative with no significant effect on ROA. Nevertheless, NPL had a significant but negative impact on ROE. The study therefore conclude that the banks have to respectively

increase their ROA and ROE so as to minimize the banks being exposed to NPL. The banks should give much attention to other significant determinants such as LTD, CAR, ROE, INF and GDP before granting loans.

Recommendations

The following recommendations were made following from the research findings from the previous chapters;

From the findings, increasing CAR reduces NPLs. Hence, it is recommended to the banks to consider prudent measures for mobilizing more deposits. This would improve their capital adequacy ratio thereby improving their financial strength. This would give the banks the capacity to tolerate or withstand with abnormal or operational losses due to NPLs.

Since LTD negatively impacts NPL, it is recommended to the banks to minimize the amount of money used for loans from the deposits collected. Hence, the banks should not issue more loans at the expense of their total deposit.

For quality of loan to be improved, the loan officers and managers of the bank should have to give much attention to the quality of asset of the banks with regards to the performance of loans so as to avoid loss of loans is highly recommended. Therefore, it is worthy for the managers of the banks to effectively adapt to using current assets and loans rather than using fixed assets to mitigate NPLs levels observed by the banks.

Government has to team up with the central bank to control the macroeconomic variables such us inflation since it also impacts on the banks' nonperforming loans.

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APPENDIX

Hausman specification test on the determinants of NPL

	(b) fe	(B) re	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
LLTD	-.8018955	.0460648	-.8479603	.1720606
LCAR	-.7945481	-1.289514	.4949661	.1278474
LROA	.4891621	.6726885	-.1835264	.
LROE	-.3501675	-.6465222	.2963548	.
LAvLR	.7430042	.9531161	-.2101119	.
LINFL	-1.037445	-.7284075	-.309037	.
LGDP	-2.256608	-1.737743	-.5188654	.

```
                  b = consistent under Ho and Ha; obtained from xtreg
       B = inconsistent under Ha, efficient under Ho; obtained from xtreg


 Test:  Ho:  difference in coefficients not systematic

            chi2(7) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                    =         36.01
         Prob>chi2 =       0.0000
         (V_b-V_B is not positive definite)
```

Hauseman specification test for the impact of nonperforming loans (NPL) on ROA

	(b) fe	(B) re	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
LNPL	.0159558	-.0000147	.0159705	.0257003
LLTD	-.1030994	-.1378026	.0347032	.0732376
LCAR	.1250674	.1307309	-.0056635	.0683293
LAvLR	.6794883	.6874315	-.0079432	.0718621
LINFL	.0400735	.0174993	.0225743	.0505494
LGDP	.3211226	.2741457	.0469769	.0860219

```
                  b = consistent under Ho and Ha; obtained from xtreg
       B = inconsistent under Ha, efficient under Ho; obtained from xtreg


 Test:  Ho:  difference in coefficients not systematic

            chi2(6) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                    =          0.45
         Prob>chi2 =       0.9984
```

Hauseman specification test for the impact of nonperforming loans (NPL) on ROE

	(b) fe	(B) re	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
LNPL	-.2947322	-.3730652	.078333	.0588968
LLTD	.7267307	.4661041	.2606266	.1703516
LCAR	-.993002	-1.160422	.1674198	.1587854
LAvLR	1.615449	1.752932	-.1374831	.1189541
LINFL	.2065548	.0291784	.1773764	.1133208
LGDP	.2779978	.0038782	.2741196	.1932075

```
                  b = consistent under Ho and Ha; obtained from xtreg
       B = inconsistent under Ha, efficient under Ho; obtained from xtreg

   Test:  Ho:  difference in coefficients not systematic

          chi2(6) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                  =        2.65
          Prob>chi2 =      0.8515
```