

**THE RELATIONSHIP BETWEEN THE LEVEL OF NON-
PERFORMING LOANS AND THE FINANCIAL PERFORMANCE
OF COMMERCIAL BANKS IN KENYA**

BY:

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DECLARATION

This research project is my original work and has not been presented in any other university for any purpose of examination.

James Nene Macharia Date.....

D61/60362/2011

This research project has been submitted for examination with my approval as the university supervisor.

Mr. Nga'nga' James Mburu Date.....

DEDICATION

I dedicate this study to my mum Joyce Mwhaki Macharia and daddy Stanley Macharia for the support, understanding and encouragement that they have provided during all the years of my studies and as I prepared and worked on this project. **I LOVE YOU.**

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ABSTRACT

This research project sought to establish the relationship between the non-performing loans issued by commercial banks in Kenya and the financial performance of all commercial banks in Kenya. Non- Performing loans (NPLs) are the portfolio loans issued by banks but they are not paid up and not written off either. The population of the study was all the 43 commercial in Kenya at the period of the study. The period of study was 2005 to 2011. The data used was secondary from financial statements of the commercial banks for years of the study. Data was also obtained from Central Bank of Kenya.

The measure financial performance was ROA. The non performing loans were regressed against the returns on the assets of the commercial banks to show the influence of the former on the latter. In the early years of the study, the levels of nonperforming loans were very high with the financial performance in terms of ROA being very low. With time however, the levels of nonperforming loans significantly reduced with the profitability levels increasing significantly. Banks should therefore put emphasis on borrower analysis before issuing any loan.

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CHAPTER ONE

INTRODUCTION

1.1 Introduction

This study aimed at investigating the relationship between non-performing loans issued by commercial Banks in Kenya and the effect of such loans on the financial performance of commercial banks. This chapter aimed at giving a complete overview of the study. It comprises of seven sections; section 1.2 expound on the background of the study, section 1.2.1 examines non-performing loans, 1.2.2 explains origins and structure Credit Referencing Bureau, 1.2.3 examines the meaning of earnings per share, 1.3 examines statement of the problem, 1.4 explains the objectives of the study and section 1.5 discusses significance of the study.

1.2 Background of the study

Today's banks seek to earn income by lending money out at a higher interest rate than they pay depositors for use of their money. Banks usually make loans up to the point where they can no longer do so because of the reserve requirement restriction. Their amount of reserves is equal to the required reserve ratio times the total deposits in the bank (Case and Fair, 2007). The banking industry considers lending as their most important function for utilization of funds. Since the major portion of gross profit of the industry is earned from loans; the administration of loan portfolios seriously affects the profitability of banks (Wei-shong and Kuo-chung, 2006).

In the process of providing credit assistance to the investment activities and projects in the economy, financial institutions face inherent risks in the form of default risk which results in build-up of Non-Performing loans that have a negative effect on the profitability of the financial institutions. Typically a credit transaction involves a contract between two parties: the borrower and the creditor (bank in this context) are subject to a mutual agreement on the 'terms of credit'. Optimizing decision pertaining to the terms of credit could differ from the borrower to that of the creditor. As such, the mutual agreement between the borrower and the creditor may not necessarily imply an optimal configuration for both.

One reason for default could be mismatch between borrower's terms of credit and creditor's terms of credit. However, a common perspective is that both the cases of defaulter and nonperformer imply similar financial implications, that is, financial loss to banks. Moreover, regulatory and supervisory process does not focus on such a distinction between defaulter and non-performer as far as prudential norms are concerned. The aggregate rate of non-performing loans is commonly used by international regulatory and supervisory bodies (IMF, World Bank and BIS) to assess the strength of the banking industry in each country. According to the Global Financial System Report (IMF, 2007), the aggregate rate of nonperforming loans varies considerably amongst countries.

However, a limited number of studies have investigated problem loans as an endogenous variable (Sinkey and Greenwalt, 1991, Kwan and Eisenbeis, 1997, Salas and Saurina, 2002). In these studies NPLs is explained either by bank specific or macroeconomic

factors. Recently, the interest on the determinants of nonperforming loans has been reconsidered by various authors, as data on problem loans became available. For instance, Breuer (2006), using Bank scope data, analyses the impact of legal, political, sociological, economic, and banking institutions on problem bank loans.

Therefore, any problem in lending like restricting or reducing loan as well as default is likely to have great impact on the performance of banks. MacDonald and Koch (2006) shows that lending represents the heart of the banking industry. Loans are the dominant asset and represent 50-75 percent of the total amount at most banks assets. Loans also generate the largest share of operating income. Popa et al. (2009) explains that popular measures of bank performances are return on assets (ROA), return on equity (ROE), net banking income and the efficiency ratio. A high performing bank is the one that gives an exceptional return to share holders. Many previous studies focus on the calculation of earnings per share (Mac Donald and Koch, 2006). Banks have therefore resulted into using credit reference bureaus as a way of borrowers' authentication. In this regard, it may be synthesized that Credit Reference Agencies (here in after CRAs) collect a variety of both positive and negative financial information on individuals.

1.2.1 Non-performing loans

Non-performing loans (NPLs) are a worldwide issue that affects the stability of financial markets in general and the viability of the banking industry in particular. Crockett (2003) argues that initially NPLs may not seem to have a serious negative effect. Banks remain liquid and depositors retain their confidence in the system. Over time, however, the size

of the problem grows, especially if banks are allowed to accrue interest on their non-performing loans.

According to Oxford Dictionary in Finance and Banking (3rd Edition), NPLs is a loan on which the interest or payment are overdue. In the USA, NPLs is defined by regulators as a category of loan which is more than 90 days in arrears. Based on Oxford Business English Dictionary, it is a loan in which the borrower has not made a payment for a particular period of time. Researchers have found that most of the banks were merged or were closed in order to avoid bankruptcy and main reason which was disclosed was high NPLs and their high cost. According to IMF, a loan is non-performing when payment of interest and principal are post due by 90 days or more. It may also be that at least 90 days of interest payment have been capitalized, refinanced or delayed by agreement, or payment are less than 90 days overdue, but there are other good reasons to doubt that payment will be made in full.

Therefore the bank runs into trouble with non-performing loans. NPLs are a loan that is in default or close to being in default. Many loans become non-performing after being in default for three months, but this can depend on the contract term between the lender and the borrower. Banks with high profitability are less pressured to revenue creation and thus less constrained to engage in risky credit offerings. At the same time, inefficient banks are more likely to experience high levels of problem loans. Poor management can imply weak monitoring for both operating costs and credit quality of customers, which

will induce high levels of capital losses. Under this bad management hypothesis advanced by Berger and Young (1997), managers lack competencies to effectively assess and control risks incurred when lending to new customers. Godlewski (2004) uses the adjusted ROA as a proxy for performance. He shows that banks profitability negatively impacts the level of non- performing loans ratio.

1.2.2 Credit Referencing Bureau

This subsection explores consumer credit information systems as a tool used by lenders to manage credit risk. Lenders access credit reference databases managed by third party providers the commonly referred to as Credit Reference Agencies. This enables them to evaluate a consumer's credit application and his or her creditworthiness. With the robust growth of the financial sector globally, there is hardly a country that does not have a credit information sharing system in place. International organizations such as the World Bank are working to implement at least one in those few emerging economies that still do not have CRAs.

Akelof (1970) pioneered an economic model of the used car market as an example. This is often cited as the first economic study to recognize the issue of quality uncertainty, the importance of trust and the role of asymmetric information in financial relationships. Jaffee and Russell (1976) showed that there exists a link between the issue of asymmetric information and the problem of credit rationing. Jappelli and Pagano (1993) analyzed the factors that lead to endogenous communication between lenders in a credit

market and firstly introduced the use of information sharing among creditors via credit registries into economic models. They emphasized that information sharing is more likely to occur when the mobility of households is high, borrowers are heterogeneous, the underlying credit market is large, and the cost of exchanging information is low.

The rapid development and sophistication of information systems and highly technological statistical models, coupled with the increasing competition between lenders and issues of borrowers' indebtedness, have made data sharing mechanisms in the credit market a topic of recent interest. In economic theory, CRAs have evolved as organizations providing information sharing devices in the financial system in order to meet the problem of asymmetrical information between borrowers and lenders. As CRAs rely on the voluntary provision of data by their client members, they also rely on the reporting lending institutions to voluntary review and correct erroneous data. It is difficult to identify 'good borrowers' and to do so requires the bank to use a variety of screening devices such as the interest rate an individual is willing to pay.

1.2.3 Commercial Banks in Kenya and Their Financial Performance

Banking sector in Kenya is guided by the companies act, banking act, the Central Bank act and other prudential guidelines. The Central bank is the chief controller of these commercial banks and falls in the Ministry of Finance. It formulates the monetary policies and controls aspects such as liquidity, solvency and proper functioning of the financial system. These commercial banks have however come together to form the

Kenya Bankers Association which serves to foresee aspects such as the interests of the banks and other issues that affect its members (Kenya Bankers Association Annual Report 2008). There are 43 commercial banks in Kenya with some being locally owned while others are foreign. Of these banks, 7 are listed at NSE. These banks offer both retail and corporate services while a few of them also offer other services such as investment banking.

Since these are financial institutions, they are exposed to a variety of risks among them; interest rate risk, foreign exchange risk, political risk, market risk, liquidity risk, operational risk and credit risk (Yusuf, 2003; Cooperman, Gardener and Mills, 2000). In Kenya, the level of competition is very high. This is characterized by most of the banks adopting high technology in customer satisfaction. Majority of these banks have mobile phone enabled facilities to maximize on customer retention. Others have facilitated mobile banking for ease of customer reach. In the recent times some of the banks have floated shares in the Nairobi Stock Exchange to enable expansion. Such include the Cooperative Bank of Kenya and Equity Bank. The offer of rights issue by banks such as Kenya commercial Bank, and the upcoming issue by Nic Bank is an indication of good performance.

1.3 Statement of the Problem

The non-performing loans problem is cited as one of the potential risks that may cause economic and financial instability. NPLs brought some banks in Asia to bankruptcy

during the crises in 1990s. According to the Financial Stability Institute, addressing the problems of NPLs is a continuing challenge. Crockett (2003) argues that initially NPLs may not seem to have a serious negative effect. Banks remain liquid, and depositors retain their confidence in the system. Over time, however, the size of the problem grows, especially if banks are allowed to accrue interest on their NPLs. These loans usually rise as deteriorating finances of distressed borrowers and soaring interest rates impair borrowers' ability to service loans.

The financial institutions' capital base is therefore affected by increased losses from loan defaults, requiring them to seek recapitalization. The rising of NPLs has great effects on the financial institutions: they tighten their lending and switch their attention to rehabilitating the NPLs in their books. This prevents viable businesses from obtaining funds to generate economic activities. Micco et al. (2004) explains that state-owned banks tend to have higher levels of NPLs, due to their weak credit recovery capacity compared to privately owned banks. It is possible to identify which economic sector contributes to the highest fraction of NPLs and also its impact towards the financial performance to the financial institutions. The collapse of financial and property asset values substantially reduce the value of the collateral for many bank loans. As a result, most financial institutions experience erosion in profits and hence are bound to seeking for borrower credibility.

Murugu (1998) explains that most of the crises experienced by commercial banks are associated to NPLs. Mullei (2003) sites an example of Daima bank that went into bankruptcy due to high levels of NPLs and was placed under statutory management due to poor management of the loan portfolios. Other local studies have focused on the credit risk management and its impact on lending. Mutwiri (2003) studied the use of the 6c's credit risk appraisal model and its relationship with the level of NPLs in Kenya. Chemjor (2007) studied the significance of factors contributing to NPLs in commercial banks in Kenyan setup. Lucy (2010) studied the relationship between NPLs management practices and financial performance of commercial banks in Kenya.

Laurin and Majnon (2003) studied the effect of NPLs on the tax payable. From accounting perspective, these loans are recognized as impaired and therefore the necessary provisions should be made. The bank eventually will not collect the whole amount of the principal, and interest if any, receivable. Loan loss provision is a method that banks use to recognize a reduction in the net realizable value of their loans. As a result, banks are expected to evaluate the credit losses on the loan portfolios. This requires a great deal of judgement with many opposing incentives (Lucy 2010). In Kenya, these provisions are tax deductible. Commercial banks therefore have an incentive to overstate the loans provisions to increase their profits by reducing the tax payable. This raises the question; what level of NPLs achieves the highest financial performance?

There is no known study that relates the NPLs to the financial performance of commercial banks in Kenya. This study will therefore fill this gap of knowledge by establishing a relationship between various levels of NPLs and their effect on financial performance of these commercial banks in Kenya. The study will seek to answer the following question: What is the impact of non-performing loans (NPLs) towards the financial performance of commercial banks in Kenya?

1.4 Objective of the Study

The objective of this study is to determine the effect of non-performing loans and the financial performance of commercial banks in Kenya.

1.5 Significance of the Study

This study will be of great importance to different individual groups as discussed below:

a) The investors

The study is to enable them to crystal gaze and understand the dividend policies expected from commercial by use of information about their levels of non-performing loans. It would be possible to estimate the dividend decision expected from the reported bad and doubtful debts due to their effect on the EPS.

b) To the commercial banks

The study was to be of much assistance to them in assisting them assess the credibility of the borrowers to assist in elimination of the buildup of bad and doubtful debts.

c) New entrants into the banking sector

New banks and micro financial institutions would also benefit since it is possible to classify borrowers into clusters using the information available.

d) The Researcher

The study was to assist the researcher qualify for an award of MBA (Finance) and thus put him on a competitive edge in the business world. The study was also to elicit more interest in the study of the subject and expose areas that need more research and exploration. Future research, students may fill up the gap in the areas not covered and thereby contribute to the frontier of knowledge in this area of issuance of loans by financial institutions.

e) Policymakers

The study will help them in formulating and implementing policy in the objective of monitoring and reducing the NPLs in order to protect its various publics by posing restrictions to the borrow.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This study was an investigation into the relationship between non-performing loans and the financial performance commercial banks in Kenya. Chapter two aimed at reviewing past studies on the subject with an analysis on the relevant literature in this area. It took the form of a theoretical and empirical study, which critiques the fundamentals of NPLs. This chapter has the following sections; section 2.1 causes of NPLs, section 2.2 problems of NPLs, 2.3 explains the agency theory , 2.4 and it's subsections examines the empirical review of both the NPLs and EPS., section 2.5 outlines the summary of summary literature review which seeks to find out any gap in the subject which the theories have not addressed.

2.2 Causes of Non-performing Loans

Non- performing loans are a result of the compromise of the objectivity of credit appraisal and assessment. The problem is aggravated by the weakness in the accounting, disclosure and grant of additional loans. In the assessment of the status of current loans, the borrower's credit worthiness and the market value of collateral are not taken into account thereby rendering it difficult to spot them. The causes for loan default vary in different countries. It extends from borrower's specific act to bank's weak regulatory mechanism in advancing loans and monitoring procedures. In Kenya, a developing

country, the reasons for default have a multidimensional aspect as discussed below:

2.2.1 Reduced Attention to Borrowers

Few of the loan defaults that make trouble for banks can be blamed on reduced attention to borrowers. Borrowers give better attention to the loans that they borrowed when they have the perception that better attention is given to them. Banks rarely lose money solely because the initial decision to lend was wrong. Even where there are greater risks that the banks recognize, they only cause a loss after giving a warning sign. More banks lose money because they do not monitor their borrower's property, and fail to recognize warning signs early enough. When banks fail to give due attention to the borrowers and what they are doing with the money, then they will fail to see the risk of loss. The objective of supervising a loan is to verify, first, whether the basis on which the lending decision was taken continues to hold good. Secondly, whether the loan funds are being properly utilized for the purpose they were granted.

A bank can use different ways to monitor the borrower. First, it can follow up the financial stability of a borrower by periodically scrutinizing the operations of the accounts, verifying the value of security and examining the stock statements. Secondly, bank officials can personally visit the borrower periodically to determine the progress of the borrower company's business activity and where necessary giving advice to resolve any problems. A bank official may be appointed to the board of directors of a company that has been granted a loan. Banks however, eschew this practice, either

because they do not have adequate officials who are capable of undertaking the task, or because they may be held legally responsible in the event of a borrower becoming insolvent.

2.2.2 Macroeconomic Instability

Macroeconomic stability and banking soundness are inexorably linked. Both economic theory and empirical evidence strongly indicate that instability in the macro-economy is associated with instability in banking and financial markets and instability in these sectors is associated with instability in the macro economy. Most problems of poor loan quality faced by banks were compounded by macroeconomic instability. This is mostly manifested by high inflationary rate and makes loan appraisal more difficult for the bank, because the viability of potential borrowers depends upon unpredictable development in the overall rate of inflation, its individual components, exchange rates and interest rates.

Moreover, asset prices are also likely to be highly volatile under such conditions. Hence, the future real value of loan security is also very uncertain. Banks do poorly both when product and asset price inflation accelerate unexpectedly and when inflation decelerates unexpectedly, unemployment increases, and/or aggregate output and income decline unexpectedly.

Macroeconomic instability would have consequences for the loan quality of banks in any country. High inflation increases the volatility of business profits because of its

unpredictability, and because it normally entails a high degree of variability in the rates of increase of price of the particular goods and services which make up the overall price index. The probability that firms will make losses rise; as does the probability that they will earn windfall profits. Generally looking, the effect of macroeconomic instability on the financial sector and banking in particular makes it a cause for non- performing loans. Because financial institutions basically deal in forward contracts, whose profitability hinges greatly on the ability to predict future prices, they do not do well in volatile environments that increase uncertainty and make forecasting more difficult. To reduce their risk exposure, the banks collateralize their loans with either the borrowers' estimated future income and/or the estimated future value of specified assets. If either the realized income or realized asset prices fall sufficiently short of the projected values, the borrower may default and generate losses for the bank.

2.2.3 Unsound assessment mechanism and weak risk consciousness

Risks can be quantified and minimized for a bank's management and its auditors when considering the need to provide for bad and doubtful loans. No loan is entirely without risk. Every loan, no matter how well it is secured, and no matter who is the borrower, has the potential to generate loss for the lender. It is the degree of risk to which a loan is susceptible and the probability of loss that vary; these should normally be reflected in the interest margin and other terms set at the inception of the loan. There are situations under which setting performance indicators ignored risk adjusted revenues.

However, little emphasis is given on risk control and exit management. Heavily relying on the materials provided by managers and only reviewing the written reports and financial reports do not make risk review mechanism conscious. A bank should conduct due diligence by making every possible examination available. A bank, in considering whether to lend or not, takes into account the quality of a borrower which is reflected in, inter alia, its past and projected profit performance, the strength of its balance sheet and the nature of the market for its product, economic and political conditions in the country in which it is based, the quality and stability of its management and its general reputation and standing.

The borrower's ability to repay a loan is of paramount importance. Ideally, the loan will be self-financing in that it will be repaid from the cash flow that the borrower is able to generate from employing the proceeds of the loan. A bank will often require security for a loan in the form, say, of a guarantee or mortgage, in which case it will be concerned about the value and title of that security. The decision to grant loan, however, should be based on the prospects and solvency of the borrower and a careful analysis of how the funds to repay the loan will be generated. Constant monitoring increases the chance that the company will respond to a bank's concern and provide information more willingly. A bank which always closely follows a company's standing can often point out danger or opportunities to the company, as well as quick agreement to request for credit.

2.2.4 Lack of strict admittance policies and no active exit

Under the influence of idea of pursuing market share excessively, banks do not establish detailed and strict market admittance policies, which undermine the first risk to prevent gate and weaken the orientation effect of admittance policies to market. During pre-loan investigation, some relationship managers put little emphasis on authenticity and integrality review on related materials. They have not clarified the true intended usage of the loan and the review is too optimistic, which does not analyze the potential influence of changes in related factors. There is also no deep review on the market, no enough understanding on enterprises' operation management situation, no thorough risk revaluation; inaccurate assessment, the risk of loans is not fully covered and the risk on group customers and affiliated enterprises are not identified effectively. The factors above damage the loans at the early stage.

Some extends credit against the rules, i.e. exceeding authority to offer loans, splitting one big number into several small pieces to avoid the authority constraint, issuing bank acceptance to fund enterprises on a rolling basis, or discount without actual trade background. Most problems in this case relates with accepting guaranty from unqualified institutions such as governments and agencies, high loan-to-value ratio, providing loans without property registration and transfer of collateral, guaranty for each other between enterprises and legally flawed credit procedures. There are also problems in which the conditions of the loans are not satisfied and the contracts of loans are not completed.

2.3 Problems Associated with NPLs

2.3.1 Credit crunch

According to the United States Council of Economic Advisors (1991), credit crunch is a situation in which the supply of credit is restricted below the range usually identified with prevailing market interest rates and the profitability of investment projects. A credit crunch is a disequilibrium phenomenon. It is present when banks are unwilling to lend especially when a firm with a profitable projects cannot obtain credit in spite of low interest rates (lower than the expected marginal products). Credit crunch results in excess demand for credit and hence credit rationing, where loans are allocated via non price mechanism. Eventually, it imposes additional pressure on the performance of the monetary policy.

2.3.2 Cost inefficiency

Berger, Young, (1997) analyzed the relationship between cost efficiency and NpLs in an ambivalent way. They have used Granger-causality techniques in order to test which were the four hypothesis (bad luck, bad management, skimping and moral hazard) are consistent with data. The dependent variables in this study were NPLs estimated cost efficiency which measures the short-term X-efficiency of bank relative to its peers in year of how close the bank is to estimate industry-wide-best practice cost frontier in that year and the lost dependent variable is the ratio of equity capital to assets which measures the bank's financial cushion for absorbing loan losses. From the studies they have suggested

that the inter-temporal relationships between loan quality and cost efficiency run in both direction. The higher the NPLs volume, the lower the cost efficiency.

2.3.3 Economic instability

Inaba, Koza, & Sekine (2003), researched on how the increase in NPLs affected real economy activity in Japan. They examined the respective roles played by the firms' and banks' balance sheet condition in determining firm investment and bank lending. From the study, they have summarized that from the firms' balance sheet condition, debt/asset ratio is negative and significant for both bond-issuing and non-bond issuing firms while from the banks' balance sheet condition, capital adequacy ratio which takes into account NPLs, capital gains/losses and deferred tax assets is positive and significant only for non-bond-issuing firms.

This implies that, after the collapse of the asset-price bubble, firms restrained their investment in order to reduce the burden of existing debts. Moreover, it indicates that forced with erosion of their capital adequacy, banks restrain their lending and hence hamper the investment of firms without access to the capital market. This finding is consistent with the story of a "credit crunch".

2.4 Theoretical Framework

2.4.1 Agency theory

The agency theory views the organizations as a links of contracts among self-interested individuals rather than a unified, profit-maximizing entity. Agents need constant supervision and management, which raises agency costs or coordination costs. Information technology, by reducing the costs of acquiring and analyzing information, permits organizations to reduce overall management costs, and allows them to grow in revenues while shrinking the numbers of middle management and clerical workers (Laudon & Laudon, 1996).

Although this definition of agency theory views their associated costs as costs the company incurs, the customer also incurs agency costs in dealing with a company. For example, the interaction with sales people, dealing with employees in problem situations, or just looking for an employee to ask for assistance, involve agency costs for the customer. Agency costs do not necessarily have to constitute monetary costs, as the definition might assume.

2.5 Empirical Literature Review

This is concerned with studies done by other scholars in determining the relationship between NPLs and the financial performance of commercial banks. ROA is relevant since it influences the future earning capacity of the firm and the financial investment decisions in any firm.

2.5.1 Financial Performance of Commercial Banks

Financial performance of banks has been measured using several approaches. These include financial ratios, benchmarking comparison against budget or a mix of the above (Arkiran 1995). The performance of these banks has been studied by different scholars either by use of return on total assets (ROTA), return on equity (ROE) the earnings per share (EPS) or the issue of stock splits. In most cases, the performance ratios used to demonstrate the performance of banks are the dividend per share and the earnings per share. These are required to be disclosed by international accounting standards.

Mac Donald and Koch (2006) explain that a high performing bank is the one that gives an exceptional return to share holders while maintaining an acceptable level of risk. Mostly the aggregate bank profitability is measured and compared in terms of ROE and ROA. Kithinji (2011), notes that the major cause of serious financial problems by commercial banks in Kenya continues to be directly related to credit standards for borrowers, poor portfolio risk management or lack of attention to changes in the economic circumstances and competitive climate (Central Bank Annual Supervision Report, 2000). The credit decision should be based on a thorough evaluation of the risk conditions of the lending and the characteristics of the borrower.

Clausen (2009), analyses Profitability Ratio Analysis of the Income Statement and the Balance Sheet. Ratio analysis of the income statement and balance sheet are used to measure company profitability level as well as the future stability of the firm.

These two important reports show the profit and net worth of the company. They report the affairs of a firm in terms of profits compared to sales as well as how the assets are performing in terms of generating revenue.

2.5.2 Non-Performing Loans

The first NPLs issue was raised in America when very serious financial crisis jolt American Stock Exchange (Stanley, 2004). To overcome this crisis American Government introduced the corporation known as Federal Saving and Loans Insurance Cooperation to work for the primary reasons of defaulted loans. However due to the high cost and cash problems, this cooperation itself went into huge loss. It is evident therefore that NPLs are one of the major issues all over the world.

Pakistani Financial Sector had also faced the same problem with the government and different financial companies trying to overcome this major problem. Banking Nationalization Act and Pakistan Banking Council were stood as responsible for all this, but without having strong evidence one cannot blame them. NPLs have compelled many countries to establish Asset Management to companies that fix the problems of NPLs.

Hou, & Dickinson, (2007), examined the non-performing loans on microeconomics, specifically of the bank level. They empirically evaluated how NPLs affect commercial banks' lending behavior. In particular they illustrated some consequences of NPLs on economics. They have used empirical methodology for testing the effect of NPLs

using data taken from individual bank's balance sheet to assess whether NPLs will negatively affect bank's lending behavior.

Regulatory and supervisory bodies emphasize the positive role of capital stringency as a buffer against losses and hence failures (Dewatripont and Tirole, 1994). Empirical evidence suggests that this is not always the case. Barth et al. (2004) study the relationship between specific regulatory and supervisory practices and banking-sector development, efficiency and fragility. They find that stringent capital requirements are associated with fewer nonperforming loans but are not robustly linked with other banking outcomes.

Pasiouras (2008) reports a positive association between technical efficiency and capital requirements, albeit not statistically significant in all cases. Other studies indicate that capital requirements increase, on the contrary, risk-taking behavior (e.g. Besanko and Kanatas, 1996; Blum, 1999). Godlewski (2004), reports that capital regulation in the banking industry is positively related to excess risk taking. The increased credit risk leads to an increase in the ratio of NPLs. He explains that stringent constraints on capital imply additional pressure on assets returns, which could be done through higher risk taking. Pasiouras et al. (2006) find a negative relationship between capital requirements and banks' soundness as measured by Fitch ratings. Delis et al. (2008) examining a panel of transition countries, argue that capital requirements does not appear to have a statistically significant impact on productivity

2.6 Local Studies

Muasya (2009)) analyses the impact of NPLs on the performance of banking sector in Kenya. She outlines that majority of such factors include under staffing, under qualified staff among others for years 2004-2008. In the study, a sample of 13 banks is used to show how these factors affect the performance of these banks where the performance is represented by the profit before tax of the 13 sampled banks. The study however assumes that the factors that affect each bank can be assumed to be harmonious to other banks. She concludes that the agility of the employees to collect the loans issued affects the performance of the banks.

Wasonga (2008) analyses the challenges faced by banks when issuing loans to SMEs. He explains that most banks are faced with the challenge of lack of credit history for customers leading to high levels of bad loans. The period of study was 2003- 2007. While the commercial banks have faced difficulties over the years for a multitude of reasons, this study notes that the major cause of serious financial problems by commercial banks in Kenya continues to be directly related to credit standards for borrowers, poor portfolio risk management or lack of attention to changes in the economic circumstances and competitive climate (Central Bank Annual Supervision Report, 2000).

Ochola (2009) studies the relationship between credit risk management and non-performing loans for commercial banks in Kenya for the years 2004-2008. In her study, she uses primary data from credit officers to and secondary data from journals and

publications with a sample of four banks. The study shows that poor risk management practices lead to build up of high provisions of bad and doubtful debts which in turn negatively affects the stability and profitability of the banks. The study concludes that the build up of nonperforming loans is as a result of poor credit risk management and this eventually affects the performance of the commercial banks. The study however measures performance in terms of the amount of bad and doubtful debts accumulated every year.

Okeyo (2010) researched on the global financial crisis and its effect on the performance of Kenya banks. The variables used in this study were the ROTA and ROE. T-tests were carried out to show any difference in performance before and after the global crisis. The data collected between the years 2004 to 2006 indicated no effect of the global crisis on the listed banks in Kenya. However in the years 2007-2009, the smaller banks in terms of capital were affected by the global financial crisis. This study however did not pay attention to the shareholders wealth by analyzing the dividends per share and the earnings per share. The emphasis was on the ROE and the ROTA.

Kithinji (2011) conducted a research on credit risk management and profitability of commercial banks in Kenya. In this study credit was measured by loan and advances to customers divided by total assets. Non-performing loans was measured using nonperforming loans/ total loans, and profits were measured using ROTA (Return on Total assets). The trend of level of credit, nonperforming loans and profits were

established during the period 2004 to 2008. A regression model was used to establish the relationship between amount of credit, non-performing loans and profits during the period of study. R² and t-test at 95% confidence level were estimated. The results indicated that there is no relationship between profits, amount of credit and the level of nonperforming loans. The research did not take into account the investment by the shareholders or the return in terms of dividends to the investors.

2.7 Chapter Summary

From the studies above, it is evident there exists studies to determine how the NPLs affect the financial performance of commercial banks in Kenya. Researches done however revolve around how these loans come to exist as well as how to avoid the accumulation of such loans. Researches also revolve around how these loans affect ROE and ROTA. No studies show how the financial performance is affected in terms of the return on the total assets of the commercial bank. This study aims to contribute to gap on the performance of the commercial banks in Kenya in reference to the ROA.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter outlines the method used for the research. The study outlined the commercial banks in Kenya. The chapter therefore outlines: selection of the sample, data collection instruments and data collection procedures as well as data analysis. Additionally, the chapter explains how the researcher carried out the study to achieve the study objectives. It consist five sections, section 3.0 introduction, section 3.1 research design, section 3.2 population and study sample, section 3.3 data collection methods and section 3.4 data analysis.

3.2 Research Design

The research study used a cross-sectional research design. A specific point in time was used for determining the level of NPLs and their effect on the ROA. The study was intended to determine the effect of different levels of NPLs and its effect on the ROA on commercial banks in Kenya. This design was adopted to ensure proper representation of all commercial banks since most of the studies done previously were sector specific or panel based. The commercial banks in Kenya are either multinational or are limited within the boundaries of Kenya. This research design was determined by the research questions, categories of data needed, the source of the data and the availability of the data.

3.3 Population and Study Sample

Mugenda and Mugenda (2003) defined the population as the number which the researcher wishes to generalize the results on. The research population represents the elements that will be studied in the research. These consist of all the 43 commercial banks in Kenya as information for these banks is likely to be easily available (Central Bank Annual Report 2007). The researcher carried out a census survey of all the commercial banks therefore no need for sampling the firms. At the period under study there were 43 commercial banks in Kenya. This was be the population of the study.

3.4 Data Collection Methods

The data used in this study was quantitative in nature. It is secondary data obtained from annual publications by both the Central Bank of Kenya as well as financial statements of the commercial banks for the period 2005- 2011. These include, Statement of income, Statement of financial position and Directors reports. Emphasis is on the ROA of the respective financial periods. The data collected related to NPLs and the ROA of the same year, mainly quantitative. The data was be obtained mainly from CBK and the annual publications of the companies. The data being secondary prompted the researcher to organize, tabulate, summarize and carry out the necessary analysis.

3.5 Data Analysis

After the collection of data, tabulations, graphs and pie-charts were used to explain the

outcomes. This was then used to determine the relationship between the NPLs and the financial performance of commercial banks. The relationship between these ‘‘bad loans’’ and the financial performance represented by ROA was regressed as follows:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2$$

Where;

Y -is the financial performance level indicated by ROA

X₁-is the amount of credit as measured by Loans and Advances

X₂ .is level of Nonperforming Loans as measured using the formula Non-performing Loans/Total Loans

β₁ and β₂ are coefficients while α is the constant term

After determining the level of NPLs across the banks and the total outstanding shares, the relationship between these variables was obtained. This involved regressing the NPLs with the ROA of the firm for entire period of the study. NPLs were the independent variable in the regression equation while ROA was the dependent variable. The regression equation was expected to assume the following expression:

$$ROA = K + NPLs + \epsilon$$

In the above equation, ROA represents the returns on assets of a commercial bank, K represents the intercept or constant, NPLs represents the non-performing loans of the bank and ε represents the error term or the rate of ROA that could not be explained by the level of NPLs accumulated by the commercial bank. The regression equation above was obtained from the scatter graph that was used to achieve the above objective 1.

ROA was determined by use of the total loans issued by the commercial banks studied in

this case. This was from the annual financial statements of the commercial banks. The generation of the regression equation was done by use of the Statistical Package for Social Sciences (SPSS) version 17. The significance level was determined by the use of tests so as to achieve the above objective 1. Tests of validity or reliability were not done on the data as the data is secondary. Valid or reliable data were not likely to be collected by the researcher.

CHAPTER FOUR

DATA ANALYSIS AND PRESENTATION

4.1 Introduction

This chapter presents analysis of the data found on the effect of level of non-performing loans and performance of commercial banks. The study collected secondary data on the financial performance and lending and deposit interest rate from the data (CBK) for a 6 year period, 2005 to 2011. The two variables were then regressed to show the influence on the later on the former.

4.2 Amount of Credit and Level of Nonperforming Loans

Credit risk which refers to identification, analysis and assessment, monitoring and control of credit has direct implications on the amount of loans and advances extended to customers as well as on the level of nonperforming loans. Amount of credit as measured by loan and advances extended to customers and nonperforming loans are used as proxies for credit risk. Amount of credit was expressed as a proportion of total assets to control for the size of the banks. Nonperforming loans was expressed as a proportion of the total loans extended by the commercial banks. Analysis focused on the banking sector as well as banks categorized in their groups. Commercial banks in Kenya are categorized in three tier groups on the basis of the value of bank assets. Tier group one are banks with an asset base of more than Ksh40 billion, tier group two are commercial banks with asset base between Ksh40 billion and Ksh10 billion while tier group three are banks with asset

base of less than Ksh10 billion. According to the 2009 Banking Survey, there are eleven commercial banks in tier group one, eleven commercial banks in tier group two and twenty on commercial banks in tier group three comprising to a total of forty three commercial banks.

Table 4.1: Tier Groups of Commercial Banks

Tier Group	Total Assets (billions)	Percentage of Total Assets
One	948.814	78%
Two	172.616	14%
Three	93	8%
Total Assets	1214.43	100%

Source: Author (2012)

In terms of total assets in the banking sector, commercial banks in tier group one constitutes 78% of total commercial banks, tier group two constitutes 14% of the total banking sector while tier three commercial banks constitutes 8% of the total commercial banks.

Table 4.2: Average Assets by Tier Groups for 2008

Tier Group	Average Assets in billions
One	86.25582
Two	15.69236
Three	4.411667
Average For All Banks	49.37933

Source: Author (2012)

The average value of assets in tier one category averaged Ksh86.25582, tier group two averaged Ksh15.69236 billion while banks in tier group three averaged Ksh4.411667 billion in 2008. The average assets for all commercial banks was Ksh49.37933 in 2008, Ksh22.22574 billion in 2007, Ksh16.95755 billion in 2006, Ksh15.19133 billion in 2005 and Ksh13.5056 billion in 2004.

Credit extended by commercial banks averaged Ksh16.2087 in 2008, Ksh15.44379 in 2007, Ksh14.76513 in 2006, Ksh12.93275 in 2005 and Ksh10.5044 in 2004. Total loans and advances to total assets, which is a measure of level of credit averaged 64% for all commercial banks, 67.4% in 2007, 144.2% in 2006, 129.7% in 2005 and 115% in 2004. The observation is that the level of credit was high in the early years of the implementation of Basle II but decreased significantly in 2007 and 2008, probably when the Basle II was implemented by commercial banks. Notably Basle II came into being in

2004 but the impact of this Accord was not immediate explaining why there was a time lag in reduction of the amount of credit. When the amount of credit exceeds the level a bank assets as in the case of 2004, 2005 and 2006, banks are exposed to more risk of the credit ending up being nonperforming.

The nonperforming loans as a proportion of total loans which is another proxy for credit risk averaged 5.08% in 2008, 13.5% in 2007, stood at 14.3% in 2006 and further averaged 16.07% in 2005 and 19.64% in 2004. Notably, the level of nonperforming loans given by nonperforming loans to total loans decreased during the period 2004 to 2008. The requirement by the Basle II might have enabled commercial banks to control their level of nonperforming loans thus reducing banks credit risk.

4.3 Profitability of the Banks

Table 4.3 Profitability of the Banks

Year	No. of banks operational	Average annual profits (billions)	R.O.A
2005	40	46.5.75	0.0182
2006	40	644.3	0.02444
2007	42	566.43	0.02434
2008	42	1027.628	0.0225
2009	43	1071.613	0.0226
2010	43	1161.48	0.2236
2011	43	1182.431	0.02271

Source: Author (2012)

Profitability of the 43 commercial banks that were in operations in 2008 averaged Ksh1027.628 billion, while of the 42 banks in 2007 averaged Ksh.818.19 billion as the First Community Bank started its operations in 2008. The operations of the 40 commercial banks that were in operation in 2006 and 2005 resulted to average profits of Ksh.644.3 billion and Ksh.465.75 billion respectively . Net profits as a proportion of total assets for the banks averaged 0.02271 in 2011, 0.02263 in 2010 , 0.0226 in 2009 0.0225 in 2008, 0.02434 in 2007, 0.02444 in 2006 and 0.0182 in 2005 Thus on average the profits of the banking industry increased during the period 2005 to 2011. Notably Gulf Africa Bank started its operations in 2007 while Family Bank converted to a commercial bank in 2007. The average figures for each year take into account the number of institutions that were in operation in each of the years.

4.4 Profitability, Level of Credit and Nonperforming Loans

Table 4.5: Average Assets, Average Amount of Credit, Average Nonperforming Loans and Average Profits for the Banks

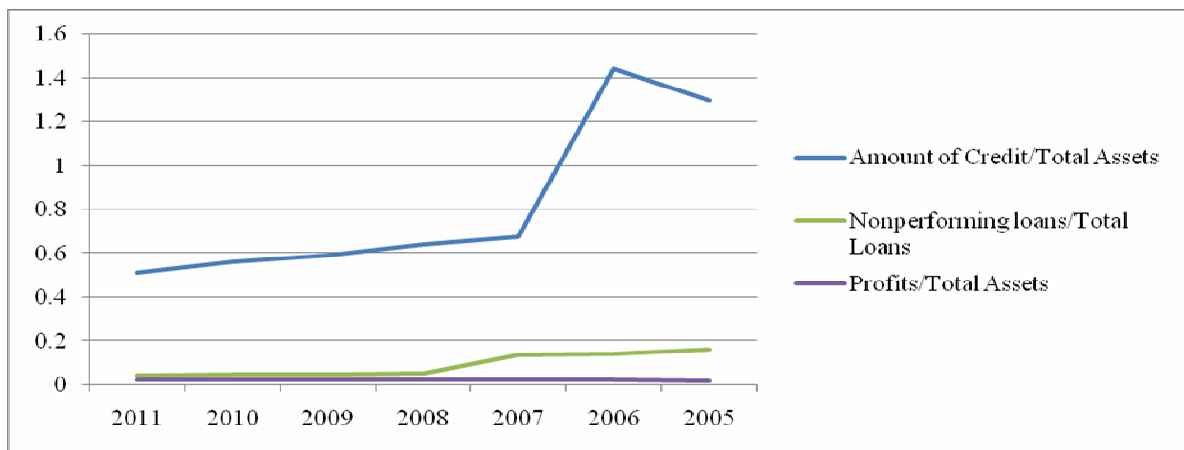
Average for All Banks	2011	2010	2009	2008	2007	2006	2005
Amount of C/TA	0.51	0.56	0.59	0.64	0.674	1.442	1.297
NPL/TL	0.043	0.047	0.0502	0.0508	0.135	0.143	0.1607
Profits/Total Assets	0.02271	0.02263	0.0226	0.0225	0.02434	0.02444	0.0182

Source: Author (2012)

From the table above, the level of credit extended decreased during the period and so did the level of nonperforming loans. However profitability of the commercial banks fluctuated during the period but on average increased marginally during the period 2005 to 2011.

4.5 The Relationship between Profits, Amount of Credit and Nonperforming Loans

Figure 4.1: The Relationship between Profits, Amount of Credit and Nonperforming Loans



Source: Author (2012)

The Figure 4.1 above shows that profits/total ratio of the banks were generally low during the period 2005 to 2011 while the level of nonperforming loans decreased. The amount of credit extended to customers was relatively high but assumed a downward trend during the period. Whereas the level of credit and profits were relatively low and stable, the amount of credit was high and relatively volatile.

4.6 The Regression Model

The regression equation was of the form $Y = \alpha + \beta_1 X_1 + \beta_2 X_2$

Where;

Y = the profits as measured by Net Profits/Total Assets (ROTA)

X1= the amount of credit as measured by Loans and Advances/Total assets

X2= level of Nonperforming Loans as measured using

Nonperforming Loans/Total Loans β_1 and β_2 are coefficients while α is the constant term.

Table 4.6: Variables Entered/Removed (b)

Model 1	Variable entered	Variables Removed	Method
	NPLNs, credit(a)	.	Enter

a- All requested variables entered.

b- Dependent Variable: profits

Source: Author (2012)

Table 4.7: Coefficients (a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.776	.831		3.219	.084
	Credit	.004	.009	.192	.266	.815
	NPLNs	-.069	.064	-.727	-1.009	.419

a Dependent Variable: profits

Source: Author (2012)

The regression model arising from the above data is of the form; $Y = 2.776 + 0.004X_1 - 0.069X_2$. The model means that profits that are not dependent on the amount of credit and nonperforming loans amounts to Ksh. 2.776 billion. Thus even if no credit is extended commercial banks will still make some profits. The coefficient of credit extended is 0.003 indicating that the amount of credit extended contributes positively to profits but marginally. Additionally, as the level of nonperforming loans increase, profits decrease. There is therefore a positive relationship between the amount of credit extended and the amount of profits while there is a negative relationship between the level of nonperforming loans and profits. The t-test indicates that the profits that do not depend on credit and nonperforming loans is significant. The test of significance indicates that the coefficient of 0.003 in the case of credit and the coefficient of -0.65 in the case of nonperforming loans are due to chance. This means that there is no association between profits, amount of credit and the level of nonperforming loans.

Table 4.8: Model Summary

Model 1	R	R Square	Adjusted R Square	Std. Error of the Estimate
	.622(a)	.387	-.226	.53078

a Predictors: (Constant), NPLNs, credit

Source: Author (2012)

The R-Square indicates that only 38.7% of the profits are explained by amount of credit and the level of nonperforming loans. The adjusted R-Square of -0.226 however indicates that amount of credit and nonperforming loans do not explain the level of profits made by commercial banks. This means that there is no relationship between the amount of credit, nonperforming loans and the amount of profits.

Table 4.9: Relationship Determination

ANOVA (b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.356	2	.178	.631	.613(a)
	Residua	.563	2	.282		
	Total	.919	4			

a Predictors: (Constant), NPLNs, credit

b Dependent Variable: profits

Source: Author (2012)

ANOVA $F_{2,2}$ statistic of 0.631 is significant with a P-value > 0.05 . The model does not establish a relationship between profits, amount of credit and the level of nonperforming loans.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATION

5.1 Introduction

This chapter presents discussions of the key findings presented in chapter four, conclusions drawn based on such findings and recommendations there-to. This chapter will thus be structured into discussions, conclusion, recommendations and areas for further research.

5.2 Summary

The findings reveal that the level of credit was high in the early years of the implementation of Basle II but decreased significantly in 2007 and 2008, probably when the Basle II was implemented by commercial banks. Notably, the level of nonperforming loans given by nonperforming loans to total loans decreased during the period 2005 to 2011. The requirement by the Basle II might have enabled commercial banks to control their level of nonperforming loans thus reducing banks credit risk. Thus on average the profits of the banking industry increased during the period 2005 to 2011.

However profitability of the commercial banks fluctuated during the period but on average increased marginally during the period 2005 to 2011. The profits were generally low during the period of study. The amount of credit extended to customers was

relatively high but assumed a downward trend during the period. Whereas the level of credit and profits were relatively low and stable, the amount of credit was high and relatively volatile.

The regression results indicate that there is no relationship between profits, amount of credit and the level of nonperforming loans. The R-Square indicates that only 38.7% of the profits are explained by amount of credit and the level of nonperforming loans. The adjusted R-Square of -0.226 however indicates that amount of credit and nonperforming loans do not explain the level of profits made by commercial banks. This means that there is no relationship between the amount of credit, nonperforming loans and the amount of profits. ANOVA $F_{2, 2}$ statistic of 0.631 is significant with a P-value > 0.05 . The model does not establish a relationship between profits, amount of credit and the level of nonperforming loans.

The findings reveal that the bulk of the profits of commercial banks is not influenced by the amount of credit and nonperforming loans suggesting that other variables other than credit and nonperforming loans impact on profits. Commercial banks that are keen on making high profits should concentrate on other factors other than focusing more on amount of credit and nonperforming loans.

5.3 Conclusions

Based on the findings, the study concludes that amount of the non-performing loans decreased significantly from the year 2005 to 2011 while the profits of the banks increased in the same period and this can be contributed to the new measures put forth by the banks.

5.4 Recommendations

Since non-performing loans does influence financial performance and position of the banks, the study recommends that commercial banks and mortgage firms in Kenya should assess their clients and advance their loans to them according to the creditworthy of their clients, as non-performing loans can decrease the level of interest rates and consequently financial performance. The various commercial banks in the country should review the procedures in which the non-performing loans are advanced to the clients and reduce their occurrences. Commercial banks should also apply rigorous policies on loan advances so as loans are awarded to those with ability to repay and mitigate moral hazards such as insider lending and information asymmetry.

Banks should apply efficient and effective credit risk management that will ensure that loans are matched with ability to repay, no or minimal insider lending, loan defaults are projected accordingly and relevant measures taken to minimize the same. The banks should also enhance periodic/regular credit risk monitoring of their loan portfolios to reduce the performance financial.

5.5 Limitations of the Study

The researcher faced a problem with accessing financial data from the Central Bank of Kenya. Most of the data in their archives seem secured. Secondly the limitation of time was much pronounced since the sources of the data operate on working days and the researcher is equivalently an employee. The numbers of years of the study were also posing a challenge especially the year 2011 where most of the banks had not submitted their financial information in full.

5.6 Suggestions for Further Studies

The scope of the current study was limited to the secondary data obtained the relationship between the level of non-performing loans and the financial performance of commercial banks in Kenya for the last seven years. Future research could expand this scope to include other parameters that might affect the performance of these financial institutions such as the interest rates charged on the loans and how they relate to the overall performance of the commercial banks. The same study should be done on the Micro Finance Institutions and find out if the same results would be achieved.

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APPENDICES

Appendix I

List of Commercial Banks in Kenya

1. African Banking Corporation
2. Bank of Africa Ltd
3. Bank of Baroda
4. Bank of India
5. Barclays Bank of Kenya Ltd
6. CFC Stanbic Bank Limited
7. Charterhouse Bank Limited
8. Chase Bank Limited
9. Citibank N.A.
10. City Finance Bank
11. Commercial Bank of Africa
12. Consolidated Bank of Kenya
13. Co-operative Bank of Kenya
14. Credit Bank Limited
15. Development Bank of Kenya
16. Diamond Trust Bank Kenya
17. Dubai Bank Limited
18. Ecobank
19. Equatorial Commercial Bank
20. Equity Bank Limited
21. Family Bank Ltd
22. Fidelity Commercial Bank
23. Fina Bank Limited
24. First community bank
25. Giro Commercial Bank
26. Gulf African bank
27. Guardian Bank
28. Habib AG Zurich
29. Habib Bank Limited
30. Imperial Bank Limited
31. Investment & Mortgages Bank
32. Kenya Commercial Bank Ltd
33. K-REP BANK
34. Middle East Bank of Kenya
35. National Bank of Kenya Ltd
36. National Industrial Credit Bank
37. Oriental Commercial Bank
38. Paramount-Universal Bank
39. Prime Bank Limited
40. Southern Credit Banking Corp.
41. Standard Chartered Bank Ltd
42. Transnational Bank Limited
43. Victoria Commercial Bank Ltd

Appendix II:

Computations for Non Performing Loans and Return on Assets

Represent the nonperforming loans for bank i in year t , $t-1$, and $t-2$ respectively; and $\varepsilon_{i,t}$ is the error term which should be normally distributed with zero mean and constant variance. In the model β_{0i} is fixed.

Table – 1

Variables	Coefficient	Std. error ¹⁾	t-statistics	Prob.
Bank specific factors				
LnNPL_A _{i,t-1}	0.231329	0.091067	2.540206	0.0171
lnL_A _{i,t}	0.933447	0.608620	1.533711	0.1367
lnSIZE _{i,t}	0.157875	0.383693	0.411462	0.6840
ΔLOANS	-0.010862	0.002624	-4.138843	0.0003
ΔLOANS _{i,t-1}	-0.012695	0.002079	-6.106473	0.0000
ΔLOANS _{i,t-2}	-0.008616	0.002497	-3.450496	0.0019
RIR _{i,t}	0.806953	0.502583	1.605612	0.1200
RIR _{i,t-1}	0.381330	0.426080	0.894975	0.3787
Macro-factors				
INF _t	-0.002097	0.086632	-0.024211	0.9809
INF _{t-1}	0.070132	0.128910	0.544040	0.5909
ΔGDP _t	-0.049554	0.036561	-1.355406	0.1865
ΔGDP _{t-1}	-0.006514	0.034384	-0.189455	0.8512
REER	1.591487	1.046019	1.521471	0.1398
REER _{t-1}	2.689959	0.840546	3.200254	0.0035
Fixed Effects				
Bank 1	-9.781574			
Bank 2	-9.920805			
Bank 3	-9.678762			
Bank 4	-12.54788			
Bank 5	-9.963629			
Bank 6	-10.88915			
Diagnostic test				
R-squared	0.956505			

¹⁾ Represent White's robust standard errors.

Represent the for bank i in year t , $t-1$, and $t-2$ respectively; and $\varepsilon_{i,t}$ is the error term which should be normally distributed with zero mean and constant variance. In the model β_{0i} is fixed.

Variables	Coefficient	Std. error ¹⁾	t-statistics	Prob.
Bank specific factors				
LnNPL_A _{i,t-1}	0.253678	0.084641	2.997096	0.0052
lnL_A _{i,t}	-0.927715	0.411203	-2.256099	0.0310
lnSIZE _{i,t}	-	-	-	-
ΔLOANS	-0.010817	0.002462	-4.394326	0.0001
ΔLOANS _{i,t-1}	-0.012556	0.001892	-6.636234	0.0000
ΔLOANS _{i,t-2}	-0.008432	0.002234	-3.774699	0.0007
RIR _{i,t}	0.592864	0.389024	1.523979	0.1373
RIR _{i,t-1}	-	-	-	-
Macro-factors				
INF _t	-	-	-	-
INF _{t-1}	-	-	-	-
ΔGDP _t	-0.051873	0.029788	-1.741394	0.0912
ΔGDP _{t-1}	-	-	-	-
REER	1.413999	0.790145	1.789542	0.0830
REER _{t-1}	2.583651	0.747548	3.456166	0.0016
Fixed Effects				
Bank 1	-7.507684			
Bank 2	-7.574109			
Bank 3	-7.542794			
Bank 4	-10.57218			
Bank 5	-7.730316			
Bank 6	-8.824282			
Diagnostic test				
R-squared	0.9565052			

¹⁾ Represent White's robust standard errors.

Table – 3: Test again confirms the fixed effects model:

	(b) ran	(B) fix	(b-B) Difference	Sqrt (diag (V_b – V_B))
OEAGR(t)	-0.1719	-0.3845	0.2126	0.3172
EGR(t)	0.5296	0.0388	0.4907	4.2952
DGR(t)	2.6980	-3.5885	6.2865	15.1077
NPLGR(t-1)	-0.0469	0.0485	-0.0954	0.1280

Test: H0: difference in coefficients not systematic
 $\text{Chi2 (4)} = (\mathbf{b} - \mathbf{B})'[(\mathbf{V}_b - \mathbf{V}_B)^{-1}](\mathbf{b} - \mathbf{B}) = 0.80$
 Prob > chi2 = 0.9383

Hausman Test for Bank variables sample

The threshold for the Bank variables sample is 4.3% of the NPL rate and the effective capital ratio is 9.2%. The results are:

Table – 3

Dependent Variable: LGR (t)				
Variable	NPL Rate >= 5.6%		NPL rate < 5.6%	
	Coefficient	Std. Error	Coefficient	Std. Error
Constant	13.4676**	6.8930	-31.0899*	18.3848
DGR(t)	0.1012	0.1179	-0.1454	0.1630
OEAGR(t)	-0.3474***	0.0277	-0.1172*	0.0715
EGR(t)	0.1033***	0.0256	0.1483**	0.0736
NPLGR(t-1)	0.0595	0.0996	0.4909*	0.2553
Dm	-8.3046	7.0490	39.7979**	18.3526
Dm*NPLGR(t-1)	-0.0799	0.1003	-0.4761*	0.2553
No. of Obs.	435		265	
No. of groups	165		112	
R-sq:	Within = 0.4105		Within = 0.2022	
	Between = 0.1871		Between = 0.1036	
	Overall = 0.3061		Overall = 0.1356	
Wald chi2	50.11		51.17	
Prob > Chi2	0.0000		0.0000	

Results for Bank variables sample