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DETERMINANTS OF COMMERCIAL BANKS INTEREST RATE SPREADS UNDER THE MULTIPLE CURRENCY ENVIRONMENT IN ZIMBABWE

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APPROVAL LETTER

The undersigned certify that they have supervised the student PROSPER MAKOTORE's dissertation entitled, **Determinants of Commercial Banks Interest Rate Spreads in the Multiple Currency Environment In Zimbabwe**, submitted in partial fulfillment of the requirements of the Bachelor of Commerce (Honours) Degree in Banking And Finance at Midlands State University.

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To Makotore family, friends and the Chegutu Chess Club

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……..God bless you all…….

ABSTRACT

The study focused on the determinants of bank spreads in Zimbabwe's commercial banking sector in the multiple currency period (2009 to 2012). The study employed panel data techniques to analyze the impact of bank specific, industry specific and macroeconomic factors on bank spreads. Other objectives of the study involved the study of the contribution of foreign and local banks to widening bank spreads and to establish the relationship between the spread and its components the deposit rate and the lending rate. The main literature of the study comprised of theoretical and empirical literature from related studies that were done in developing nations.

A quantitative technique was adopted in carrying out this research where statistical secondary data was collected from financial statements, Reserve Bank of Zimbabwe and Zimstats. Pooled ordinary least squares was used to estimate the model using the econometric package e-views 5.1. The variables used to estimate the model were chosen from literature and they are overhead costs, non-interest income, non-performing loans, market share of deposits, capital adequacy and inflation.

Results obtained indicated that bank spreads are high in Zimbabwe and they are mostly driven by overhead costs, non-performing loans, and market share of deposits, capital adequacy, bank size, and inflation. There was no evidence to support the impact of non-interest income on bank spreads. Foreign banks charged lower spreads than local banks in the same period. Lending rates were highly volatile as compared to deposit rates. The study recommends policies to increase competition, operational efficiency, strengthening local banks, and adopting partial dollarization. Further studies were recommended in the areas of the impact of the monetary policy in explaining bank spreads

TABLE OF CONTENTS

LIST OF ACRONYMS

RBZ	: Reserve Bank of Zimbabwe
ZIMSTATS	: Zimbabwe National Statistics Agency
POLS	: Pooled Ordinary Least Squares Method
ADF	: Augmented Dickey Fuller Test
SADC	: Southern African Development Committee
MPS	: Monetary Policy Statement

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

CHAPTER ONE: INTRODUCTION

1.1 Introduction

This research is premised on analyzing the determinants of bank spreads in Zimbabwe in the commercial banking sector in the multiple currency period. It seeks to investigate the impact of various factors on bank spreads using quantitative methods. This chapter introduces the study, highlighting the background to the study and shall cover other aspects including the problem statement, objectives of the study, research questions and statement of hypothesis. The significance of the study, assumptions and delimitations of the study will also be looked into. The chapter will be concluded by defining terms and looking at the organization of the study.

1.2 Background to the Study

Sound economic growth and development is an artifact of efficient mobilization and allocation of resources in the economy. Interest rates facilitate the creation of bank credit which influences the level of capital intensive projects in the economy (Afzal and Mirza, 2010). Bank credit is largely provided by commercial banks in most countries and in Zimbabwe about 82.92% of the total market for loans is controlled by commercial banks (RBZ, 2012). Hence they play a pivotal role in stimulating economic activity which leads to improved national output.

It is widely believed that banking activities have a strong impact on economic performance. The RBZ made an assertion that structural and operational deficiencies in the Zimbabwean banking sector stimulated the decade long economic crisis which led to the use of multiple currencies on 29 January 2009 to reinstate economic stability (RBZ, 2012). This strategy was consistent with the International Monetary Fund's (IMF) currency option recommendations of 1973 which advocates for the adoption of dollarization in cases of economic instability involving a currency.

Under the patronage of the new regime, bank interest rates were decontrolled to acclimatize with the possible costs of dollarization which includes the absence of the lender of last resort, absence of reference instruments used in setting interest rates, the central banks' inability to issue currency and lack of an active interbank market (RBZ, 2013). Banks were free to come up with their own cost structures. Disparities in interest rates charged by commercial banks were observed across the industry.

In the absence of regulatory control, the RBZ as the monetary authority resorted to the use of moral suasion in encouraging banks to set interest rates within desirable parameters conducive to foster economic growth (RBZ, 2012). Afzal and Mirza (2010) noted that in the absence of restrictions on setting interest rates banks try to maximize profits by charging exorbitant lending rates against paying lower returns on deposits. In this regard, lending rates as high as 5% to 35% and deposit rates as low as 0.15% to 6% was recorded for this period (RBZ, 2012). These rates were not in line with regional benchmarks. Peer Southern African Development Committee (SADC) economies were charging lower spreads for example South Africa (3.5%) Botswana (7%), Lesotho (10%), Mozambique (7%), Namibia (5%) Swaziland (6%), Tanzania (8%).These rates were in the range of countries such as Malawi (21%), http:/www.worldbankorg.com.

Low savings were recorded for this period, evidence from the Finscope survey conducted in 2011 by the ZIMSTATS revealed that 40% of the adult population in Zimbabwe was financially excluded and about $2 billion was circulating in the informal sector. This clearly indicates that high lending rates coupled with low deposit rates and high bank charges were not promoting a savings culture. According to the FBC Securities Financial services sector analysis for June 2012, a high concentration of short-term deposits has been noted which suggest that the banking system was being used to facilitate salary payments rather than for deliberate savings which in turn results in bank credit which is biased towards individual loans for consumption rather than for capital intensive projects to productive sectors. For instance credit to individuals for private consumption increased from 8.6% to 18% for the period 2011-2012, at the expense of credit towards agriculture which declined from 18.6% to 15% for the same period (RBZ, 2012)

Furthermore, the Zimbabwean commercial sector credit market shows signs of concentration with five banks at the top. Basing on the MMC Capital bank survey report 2012, as of June 2012 the top five banks controlled 55.87% of the deposit market and 51.71% for loans and advances. Peria and Mody (2004) pointed out that markets that have a few participants with market power are able to transfer the costs of inefficiency to customers by increasing spreads. Since commercial banks are the main source of funding in the Zimbabwean economy lack of competition in this sector is likely to have a greater influence on bank spreads. The architecture of the commercial banking sector also changed with the conversion of Renaissance Merchant bank (Capital bank) and Premier Bank (EcoBank) and the unbundling of ZABG Bank on 1

September 2010 into ZABG (Allied Bank), Trust, Royal Bank and Barbican bank which never reopened for trading (RBZ, 2011) .The move was expected to increase competition which would help to bring bank spreads down. On the backdrop of constrained liquidity in the economy, the statutory reserve ratio which is a form of financial tax on deposits was scrapped off in 2011 to increase funds for lending purposes and reduce the cost of funds.

The case of high intermediation costs in the commercial banking sector in Zimbabwe has emerged to be a common public policy issue since the adoption of multiple currencies .Given the disproportionate allocation of resources in the economy, it become imperative to study factors influencing bank spreads such that appropriate policy recommendations will be developed.

1.3 Statement of the Problem

The case of high bank spreads in the credit marketshas become a key public issue in the economy ever since the adoption of multiple currencies in Zimbabwe. Banks are finding it difficult to mobilize savings from economic units and investors find it difficult to access credit for productive uses. Most bank credit is biased towards private consumption which does not aid economic growth. Given this disparity in resource allocation in the economy, it becomes imperative to study key economic fundamentals driving bank spreads to their present level for sustainable economic growth and development.

1.4 Objectives of the Study

The broad objective of the study is to ascertain the bank specific, industry specific and macroeconomic variables that determine bank spreads in Zimbabwe.

Other objectives are:

- To establish the relationships between the bank spread and its components the deposit rate and the lending rate.
- To compare the contribution of foreign and local banks to widening bank spreads.
- To suggest ways of reducing bank spreads

1.5 Statement of Hypothesis

The study was conducted under the following hypothesis:

H_0: Bank spreads are determined by bank specific, industry specific and macroeconomic variables.

H_1: Bank spreads are not determined by bank specific, industry specific and macroeconomic variables.

1.6 Significance of the Study

Interest rates are a key policy component in any economy, thus this research is particularly important to policy makers. That is the government and the Central bank can use the research to come up with robust policies that will help in promoting growth and development of the economy. Commercial banks will also use this research in strategic planning in terms of pricing their products, cost reduction and improving efficiency amongst other things. Generally there is shortage of studies of bank interest rates in African developing countries hence this research will also help academics with literature for further research. The study will also help the general public in understanding the dynamics of bank interest rates such that they can make well informed judgments when conducting business.

1.7 Assumptions of the Study

This research was conducted based on several assumptions regarding the main subject matter under study. The assumptions are as following.

- The financial statements prepared by the banks provide a true and fair view of the financial position and performance of the bank. The reason for making this assumption is because the study made use of interim financial statements which are unaudited.
- Markets are assumed to be imperfect, if credit markets are perfect it means zero intermediation costs therefore lending rates will equal deposit rates.

1.8 Delimitations of the Study

The study focus on bank specific, industry and macroeconomic variables affecting interest rate spreads in commercial banks in Zimbabwe. The study will make use of all the commercial banks operating in Zimbabwe. The study will mainly be conducted in Harare because of the location of

most bank headquarters and other data sources such as the RBZ and ZimStats. The study period is limited to (2009-2012) because of significant differences in operating environments prior to the period of the study.

1.9 Limitations of the Study

The researcher faced some challenges during the conduct of the study. The limitations are as following:

- Financial constraints-the researcher faced difficulties in meeting the costs of conducting the research especially transport costs. The researcher had to rely mostly on the internet to communicate with the various units that could provide him with the necessary information.

- Time constraints- meeting the time requirement of the research was difficult. The time allocated to conduct the research was limited. The researcher had to work over the holidays to meet deadlines.

1.10 Definition of Terms

Monetization – it is a process of converting something into legal tender, it mainly refers to the printing of bank notes or coining by the central authority.

Social intermediation – the process of creating and building human and social capital required for sustainable financial intermediation. This is an intervention strategy that helps marginalized clients connect and link up with formal financial institutions.

Net interest margin - a proxy for measuring intermediary efficiency computed as net interest income over total interest bearing assets.

Financial intermediation – refers to the provision of financial products and services, notably credit and savings.

Dollarization - the adoption of another country's currency as official currency.

1.11 Organization of the Study

The study consists of five chapters. Chapter one is the introductionof the study and it covers the background, problem statement, objectives, statement of hypothesis, assumptions of the study,

limitations, delimitations as well as the definition of terms. Chapter two reveals literature that is what other authors say about the present research under study. It constitute of the theoretical and empirical underpinnings of the study. Chapter three explains the methodology of the study and the research design will be identified as well as justification of the variables. The data collected will be analyzed and presented in chapter four. A summary of the study will be made in chapter five where conclusions stemming from the study will be highlighted and recommendations made.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter reviews the theoretical and empirical underpinnings of this study. Literature on various studies on bank spreads is examined to give lessons to the current study. Theoretical review analyses the theoretical premise of the study while empirical studies assesses past researches for developing economies that are relevant to the study.

2.2 An Overview of Bank Spreads

Banks spreads refers to the difference between the lending rate and the deposit rate. Lending rates refers to the price charged on bank loans and deposit rate refer to the reward for saving or entrusting one's funds with a deposit taking institution. A number of deposit and lending rates prevail at any given period because banks offer a portfolio of financial products which are priced differently. Bank spreads are used as a yardstick to measure the cost of intermediation. A wide spread shows that there are high lending rates and low deposit rates which discourages savings and investments in the economy. Thus bank spreads are regarded a good measure of banking efficiency (Perez, 2011).

Bank spreads can be categorized into two groups namely ex-ante spreads and ex-post spreads depending on the method and type of data that has been used to calculate them (Grenade, 2007). Felawawo and Tenant (1998) defined ex-ante spreads as spreads that show the difference between the actual interest rate paid on loans and the actual interest rate paid on deposits, that is they use the actual data or rates quoted on loan products or savings products when calculated. These are the rates that are clearly observable and are mostly used by the public for decision making when shopping around for financial products (Samuel and Valderama, 2006 and Grenade, 2007).

Ex-post spreads on the other hand calculates spreads as the difference between the interest revenues and interest expense paid on deposits and loans. Ex post spreads are calculated using financial statement data from banks hence they are not readily available to the public because of their complexity in computation. An additional distinction between the two is that ex ante spreads incorporate an unrealized default premium whilst ex post spreads takes account of the

actual default realized on loans (Samuel and Valderama, 2006). Hence the calculated values of ex ante spreads usually are greater than those of ex post spreads and the relationship can be written simply as:

Ex ante spread = ex post spread + interest revenue lost

The applicability of the two measures in measuring banking efficiency has been tested in various studies. It was found out that the ex post spread is mostly efficient when actual data on loan rates and deposit rates is not readily available, there is need to capture the realized default and the study sample is not too large. Ex ante spread on the other end could be used when actual data is readily available and the sample of the study is large like cross country analysis. However the ex post spread is the one that has been mainly employed used to measure banking efficiency in most empirical studies on bank spreads owing to its ability to capture default (Grenade ,2007).Some studies as those by (Dermigurc-Kunt et al, 2004 and Beck and Hesse ,2009) successfully adopted the use of both measures in the same study.

Various forms of ex post spreads exist, following Brock and Rojas-Suarez (2000) and Chirwa and Mlachila (2004) spreads can be categorized into narrow and wide definitions as following:

Narrow definitions

Spread (1) = (interest received on loans only/loans) minus (interest paid on deposits only/deposits)

Spread (2) = (interest received /loans) minus (interest paid/deposits)

Spread (3) = (interest plus commission received /loans) minus (interest plus commission paid/deposits)

Wide definitions

Spread (4) = (interest received minus interest paid) /Total assets

Spread (5) = (interest received/all interest-bearing assets) minus (interest paid/interest-earning liabilities)

Spread (6) = (interest plus commission received/ all interest-bearing assets) minus (interest plus commission paid/interest-earning liabilities)

Several definitions of bank spreads exist because banks charge a lot of lending and deposit rates depending on the type of client or the tenure of the loan amongst other things. In addition, banks

also charge fees and commission income instead of using interest income only in generating income and this reflect the full cost to the customers, Brock and Rojas-Suarez (2000). In order to accommodate the variations, several methods of measuring ex-post spreads exist.

2.3 Models of Interest Rate Determination

Several models that help in evaluating the dynamics of interest rates and challenge the wisdom of policy measures adopted exist. The study will look at four models of interest rate determination which are the loanable funds model, the liquidity preference model and the more advanced models namely the Monti-Klein model and the Ho and Saunders model.

2.3.1 Loanable Funds Model

The loanable funds model is based on the premise that the interest rate is determined by the interactions of the forces of demand and supply of loanable funds (Elwood, 2007). In a hypothetical loanable funds market, savers provide the funds needed for lending to borrowers who demand loans. Changes in demand and supply of funds are likely to shift interest rates up or down. For instance a rise in inflation expectations is expected to raise interest rates (Garry, 1999). In the loanable funds model, a rise in inflation expectations will result in suppliers of funds demanding a higher interest rate in order to preserve the expected real interest rate. As time move on, the demand for loanable funds will shift to offset the increase in the supply of loanable funds. In applying the model to a banking setting, it is assumed that a bank charges a single interest rate on any given day. This assumption is necessary since banks charge more than one type of interest rate on any given day.

Although the model is simple, it helps in explaining changes in interest rates, in identifying the factors that affect interest rates and also help in challenging the wisdom of the policy measures pertaining to interest rates that has been put in place. The inadequacy of the model lies on the fact that it is based on the assumption of a single interest rate whereas banks charge multiple interest rates.

2.3.2 Liquidity Preference Model

The liquidity preference theory was first forwarded by John Maynard Keynes in 1936 in his book the General theory of employment, interest and money. The term liquidity preference was used to explain the determination of interest rates by the supply and demand for money (Elwood

,2007). The model is based on the hypothesis that people value liquidity and that the economy is a monetary production function. That is the economy starts with financing or money and ends with monetary profits. The interest rate is determined by the equalization of the stock of cash and demand for cash. The implication of this is that the interest rate is determined by monetary factors. When there is excess money supply in the economy, economic agents try to part with liquidity by buying bonds therefore the price of bonds drop (Sargent and Wallace, 1974). When money supply reduces, people desire to hold stock of cash hence the price of bonds will increase. Elwood (2007) noted that the model is particularly useful in its predictions regarding the changes in money supply and money demand on interest. The model is therefore also highly applicable in a dollarized economy to find the reaction of interest rates to reductions in the flow of money supply. The theory also shows the role of banks as intermediates which facilitate the transfer of liquidity from one point to another.

2.3.3 Monti-Klein Model

This is an advanced model that was born from the works of Klein (1971) and Monti (1972). It is a derivative of the industrial organization approach to banking. The basic hypothesis of the model is that a banks' motive is to earn maximum profits in any given trading period. This motive is driven by shareholders who expect the highest possible rate of return on their investments hence would push the firm to earn maximum profits.

Secondly, banks are not complete price takers, that is, banks have some degree of control over the setting of prices in both the deposit and loan markets(Linda et al ,1999). Banks control over prices is limited by the existence of regulation or competition in the market. The power of banks to control prices is increased by market imperfections such as market power and information asymmetries.

The third assumption is that banks do not have control over the interbank money market rate and bonds interest rate, and the interbank market rate affects the rates on deposit and loans (Gropp et al, 2007).The bonds and interbank markets are there to finance liquidity gaps in the banks. Linda et al (1999) discovered that a rise in the interbank market rate is associated with a corresponding increase in lending rates and deposit rates. Hutchinson (1995) cited in Gropp et al (2007) articulated that the gap between the deposit rate and the market rate represents the opportunity cost of deposits by depositors and this represents profits to the bank.

The major thrust of the model is on the cost of funds as the major determinant of a banks' consideration in setting prices. The cost of funds is determined by the movement in the interbank market rate. A rise in the interbank market rate is expected to raise lending rates which in turn can raise spreads because banks are profit maximizers.

The Monti-klein gives a clear account of the relationship of the bank lending and deposit rates with other markets rates. However, the applicability of the model can be difficult in cases when the economy is dollarized. Quinspe-Agnoli and Whisler (2006) realized that full dollarization of the economy can result in an inactive interbank market therefore the rate will have little bearing on spreads charged by banks. An alternative model to the Monti-Klein model is the Ho and Sanders (1981) dealership model.

2.3.4 Ho and Saunders Dealership Model (1981)

The dealership model identifies the provision of liquidity to the market as the major role of banks in the financial system. This is done by matching the deposits with the loans. However banks fail to balance the two due to an irregular arrival of depositors and borrowers, Brock and Franken (2000). Therefore the bank has to determine the rate of return which can close the gap created by the asymmetrical arrival of loan demands and supply of funds (Gropp et al, 2007).

The theoretical construction of the model according to Brock and Franken (2000) begins with banks trying to balance deposits (D) and loans (L), but due to asymmetrical arrival of loans the original balanced position which is (D = L) is offset and the resulting position will be (F = L –D) ,where (F) is the difference between loans and deposits. Thus banks using the money market rate as the benchmark will try to determine the value (R) which will be enough to strike the balance or narrow (F) and also achieve wealth maximization for the bank.

In the model, banks use the money market rate as the reference rate which can cause problems in its applicability in the Zimbabwean economy because the Government has not been issuing out Treasury bills (TB) since 2009. However, the strength of the Ho and Saunders model should not be totally disregarded in the Zimbabwean scenario because it is able to show that banks take advantage of arbitrage opportunities caused by the asymmetrical arrivals of loan demands and deposits to set prices which clearly shows the function of a bank as a dealer.

2.4 Bank Specific Variables

The nature of the bank's internal environment has a bearing on the level of spreads that it charges. Each and every bank has its own policies and ways of operating which results in differences in the internal environment of banks. Factors that define the internal environment of a bank are discussed below.

2.4.1 Overhead Costs

Banks that incur high overhead costs are associated with wide bank spreads and higher costs indicate banking inefficiency. These banks tend to increase mark-up to cover for the corresponding increases in operational expenditure; thereby increasing spreads (Perez, 2011). The ease with which these costs are transferred to the customers through spreads is complimented by the existence of market imperfections such as the existence of an oligopolistic market structure where there are a few individual banks with market power that control the market (Chirwa and Mlachila, 2004). Beck and Dermigurc-Kunt (2009) noted that overhead costs are generally higher in developing poorer countries therefore they are of greater relevance in the Zimbabwean context since the country is still developing. A large number of studies subscribe to the fact that a positive relationship exist between bank spreads and overhead costs.

2.4.2 Non- interest Income

Non-interest income refers to income that is generated by banks through fee based activities such as levying bank charges. Banks employ a mix of non-interest income and interest income to generate profits. Banks that make use of non-interest income in greater quantities are expected to reduce spreads (Perez, 2011).The revenue generated by fee based activities is used to cover some of the costs that are incurred by the banks. Thus it reduces pressure on the need to levy high spreads in order to cover for costs. Therefore a negative relationship is expected between non-interest income and bank spreads.

2.4.3 Asset Quality

Banks generate the bulk of their income through the issue of loans at an interest; hence loans constitute the greater portion of its total assets. However, it is not always the case that the principal and interest will be repaid in full hence banks are exposed to credit risk. Possible causes of bad loans can be poor credit risk analysis, information asymmetries in the market or a general change in the macro economy which can be unfavorable to loan repayment. Banks

therefore make provisions for bad loans which represents a cost which can reduce profits. In order to preserve profits, banks will increase spreads in order to cover for the extra costs or to cushion themselves against the greater risks of default. The effect of a deteriorating portfolio of assets on spreads is most likely to produce a positive relationship.

Other studies have established a negative relationship between bank spreads and nonperforming loans. Younus and Mjeri (2009) noted that at times banks can fail to provision adequately for bad loans which can result in lower costs being passed to the spreads. When this occurs bank spreads will not increase proportionately with the rise in non-performing loans which can yield a negative relationship. Studies by Afzal and Mirza (2010) have offered an alternative explanation for the negative relationship. They articulated that increases in bad loans result in reduced interest revenues which reduce bank spreads.

2.4.4 Capital Adequacy

Banking is a risky business because it involves the issue of loans which can produce credit risk. The ability of a bank to absorb risk emanating from different business activities can be measured by the amount of capital that a bank has. Generally banks that have a large capital base are likely to absorb more risk than banks that are not adequately capitalized (Crowley, 2007).However it should be noted that there are costs that are incurred in maintaining capital. Banks that hold excess capital than required are likely to incur higher costs of maintaining capital which can cause them to increase spreads although they are able to adequately absorb risk.

Chirwa and Mlachila (2004) supported this view by suggesting that banks that keep in excess of the required regulatory capital to cover themselves from risks incur higher costs of maintaining the capital through differential taxation, these additional costs will be offset by increasing the spreads thereby yielding a positive relationship between the spread and the level of capital. Afzal and Mirza (2010) were of the opinion that banks that have low capital are exposed to greater risk, hence they are likely to increase spreads to cushion themselves against the risk. Their assertion is widely accepted because the need to absorb risk is a major priority in the banking business. Failure to do so can lead to the ultimate collapse of a bank. The Basel accord places greater emphasis on the issue of capitalization which shows its relevance in the smooth running of financial institutions.

2.4.5 Bank Size

Banks differ in size as measured by the amount of total assets that a bank holds. Banks that have a large asset base are considered to be big and are likely to charge higher spreads as compared to smaller banks (Beck and Hesse, 2006). The gains in efficiency falls as the size of the bank increases hence the large banks can charge higher spreads to compensate for inefficiency (Dimicic and Ridzak, 2012). Large banks are also likely to penetrate the market for loans and deposits which enables them to gain market power. This market power will in turn be used to sustain high spreads in the markets. Hence a positive relationship is expected between bank size and bank spreads (Dermigurc-Kunt and Huizinga, 1998).

However, some studies have established that large banks have the capacity to enjoy economies of scale which can enable them to enjoy lower costs of production which enables them to keep spreads at lower levels. Thus warrant a negative relationship between bank spreads and bank size.

2.5 Industry Specific Variables:

Other studies conducted by Brock and Franken (2002) and Chirwa and Mlachila (2004) were of the opinion that bank specific factors are not adequate in explaining variations in bank spreads stating that banks spreads are mostly determined at industry level. They identified factors such as the degree of competition in the industry, market structure and the prescribed reserve requirement as the factors that are relevant in explaining bank spreads.

2.5.1 Market Power

The ability to exercise power in the market has a bearing on the spreads that a bank charges. Banks that own a greater proportion of the market are expected to charge wide spreads. These banks can collude to artificially raise spreads so as to increase profits (Norris and Floerkemeier ,2007).These banks are also relatively inefficient because they have the power to push the costs of inefficiency to customers. The markets in which these banks operate provide little incentives to operate efficiently because of the lack of sufficient competition in the market which put pressure on the large banks to reduce spreads. The explanation above warrants for a positive relationship between bank spreads and market share of deposits or loans. Younus and Mjeri (2009) supported by Chirwa and Mlachila (2004) noted that foreign banks have a greater market

power and charge high spreads in most developing countries because of their financial flexibility, expertise and leading technology which enable them to gain a large share of the market.

2.5.2 Industry concentration

Credit markets can be concentrated whereby business activity is centered on a few banks that control the majority of the market. Highly concentrated banking industries are associated with wide spreads. The few banks that possess market power are likely to collude and raise spreads in order to earn higher returns (Afzal and Mirza, 2010). Generally the central banks try to increase the number of industry players to break the oligopolistic market structure and foster competition in the market which is likely to normalize the spreads that are charged by the banks. If the market structures are not changed, these high spreads will persist because the banks are not at a pressure to reduce spreads, Chirwa and Mlachila (2004). Therefore a positive relationship exists between bank spreads and industry concentration.

2.5.3 Prescribed reserve requirements

The reserve required requirements is a monetary policy variable. That is it is used by the monetary authority to control the expansion of credit in the economy. The holdings of reserves have an impact on the level of spreads that are charged by banks and a positive relationship is likely between the spreads and the required reserve ratio. Generally, a high reserve ratio is expected to raise spreads. This is because reserve requirement is a form of financial tax on the commercial banks because the reserves are normally remunerated at less than market values (Dermigurc-Kunt and Huizinga, 1998). That means there are costs that are associated with holdings of large reserves that are usually compensated by an increase in bank spreads (Samuel and Valderama, 2006).

2.6 Macroeconomic Variables

The level of stability in an economy has a bearing on the way banks set spreads. Generally high bank spreads have been associated with countries that have economic stability. The macro economy is made up of factors such as the inflation rate and business cycles as measured by the gross domestic product growth in the economy.

2.6.1 Inflation

Inflation refers to changes in the price level in an economy. Low inflation is expected to result in the normalization of prices in the economy which in turn result in low costs of doing business (Obeng, 2013).Lower costs are expected to result in lower spreads. Hyperinflation on the other hand results in higher spreads (Dermigurc-kunt and Huizinga, 1998). Hyperinflation increases the price of goods and services, these extra costs of operations are then passed on to the customers by increasing the margins on spreads to preserve purchasing power. Thus a positive relationship between the spread and inflation has been established especially in developing countries (Chirwa and Mlachila, 2004).

On the other hand, Obeng (2013) discovered that at times a fall in inflation in an economy can fail to reduce the prices of other goods and services. Thus banks will continue to suffer the financial burdens despite having low inflation in the economy. When this occurs, bank spreads will continue to increase even if inflation is decreasing. This phenomenon will yield a negative relationship between bank spreads and inflation. Countries that adopt dollarization to restore economic stability are expected to enjoy narrow spreads because of reductions in inflation and low inflation expectations. Crowley (2007) established that a negative relationship can also exist if there is high inflation but the Government will be putting pressure on the banks to keep bank spreads at low levels.

2.6.2 GDP Growth

Business cycles occur in the economy. At times the economy can experience a boom or a recession. These cycles alternate from time to time. Business cycles are measured by the changes in the growth of the gross domestic product of an economy. High GDP levels resemble a boom in the economy and low GDP show that the economy is experiencing difficulties at that time. Saunders and Schumacher (2000) cited in Afzal and Mirza (2010) articulated that business cycles have the tendency to alter the credit risk which might affect the willingness and ability of the borrower to repay the debt. Banks are therefore likely to increase spreads as a cushion against the changes in the business cycles. Thus a positive relationship is premised to exist between growth in GDP and bank spreads.

2.6.3 Treasury Bill Rate

A treasury bill is a short-term money market instrument that is guaranteed by the Government. Therefore it is a riskless form of investment because the Government does not default on repayment. The Treasury bill is used by the central bank to control liquidity in the economy. In cases where there is excess liquidity in the market, the central bank will issue treasury bills thereby reducing liquidity. Thus the Treasury bill rate can be used as a representation of the banks marginal cost of funds (Beck and Hesse, 2006). The Treasury bill rate is used by banks as a reference rate in making interest rate decisions hence it is likely to affect bank spreads.

A general rise in the TB rate is an indication of increases in the marginal cost of funds and it is likely to widen spreads to cover for the extra costs. However in a fully dollarized economy, the central banks have limited power to exercise seigniorage or the provision of liquidity to the markets because the printing of currency will no longer be feasible. Hence the central bank is less likely to involve itself in the active issue of TB Bills which can cause banks to adopt alternative reference rates such as the LIBOR. These rates are relatively higher than the TB rate which can drive interest rates up. Hence a positive relationship exists between the TB rate and bank spreads.

2.7 Ownership Classification and Bank Spreads

The architecture of most banking systems exhibit the presence of foreign banks amongst local banks. The dominance of these banks in the financial systems varies from one country to another. The ways in which the foreign banks operate usually differ from those of the local banks. This uniqueness has been sighted as the major reason for the differences in the bank spreads that foreign banks charge when compared to local banks. Generally these banks have been associated with lower spreads because they are very efficient. Crowley (2007) in his studies of bank spreads in English speaking African countries noted that foreign banks charge lower bank spreads as compared to those charged by local banks.

Foreign banks charge lower spreads than local banks because of being able to keep the costs of operations at lower levels. The reduction of costs is as a result of leads in the use of latest technology and use of expert human capital which is difficult to source locally. The foreign banks also have greater financial flexibility because they can easily leverage on the parent which is mostly an international company and hence had a large pool of financial resources. This also

suggests that foreign banks apply superior techniques in banking compared to local banks (Dermigurc-Kunt and Huizinga, 1998).

Other researchers are of the opinion that foreign banks located in developing countries are generally large and control the greater portion of the credit market which enables them to gain market control. This power can be used to sustain high spreads through collusion. Lack of sufficient competition can also enable them to sustain the high spreads.

2.8 Dollarization of the Economy and Bank Spreads.

Countries facing economic instability usually make use of dollarization as a strategy to restore economic stability. Full or official dollarization refers to the adoption of the other country's currency in place of the domestic currency. The currency adopted is usually stable and is generally acceptable in international trade. Partial dollarization refers to the use of other countries' currencies alongside the domestic currency. There are benefits and costs that are associated with the adoption of dollarization as a result of changes in the economic operating environment that can possibly affect bank spreads.

Generally dollarization is associated with lower inflation rates, low inflation expectations and improve remittance inflows which are the elements of economic stability in the economy (Quispe-Agnol and Whisler, 2006). Remittances are used as a source of funds. Improved inflows of remittances mean improvement in the liquidity of the economy which is likely to reduce the cost of funds. Reductions in costs of funds are in turn likely to result in low lending rates which reduce spreads. The benefits mentioned have an impact on the bank spreads that are charged by banks. For instance low inflation is associated with low spreads due to low costs of doing business (Calvo, 2002). If inflation expectations are low banks are likely to charge low premiums for changes in the purchasing power for money.

The major cost of dollarization is the loss in the central banks' role as the lender of last resort. The Central bank plays a prime role in supplying liquidity to banks when all the other institutions in the country have failed to do so. However, under full dollarization the Central bank has no power to print currency hence banks have to look for other sources of funding(Quispe-Agnol and Whisler, 2006). Calvo (2002) noted that these sources of funds are usually offshore credit lines from firms abroad. These sources of funds are relatively cheap as compared to internal sources of

funds and can take longer to process which can place a bank under extreme financial distress. Expensive sources of funds means that banks will also charge higher lending rates to compensate for the extra costs of funds.

Although full dollarization is likely to cause liquidity shortages and a general rise in the cost of funds, there can also be a benefit that can be realized as result of loss of the lender of resort. Full dollarization can compel banks to act in a morally hazardous way. Banks are compelled to reduce risk or improve on their efficiency because there will be no one to rescue them in case there is a crisis (Berg and Borensztein, 2000). Improvement in efficiency results in narrower spreads as compared when there is no efficiency which results in economic units carrying the burden of inefficiency. Gale and Vives (2002) noted that the adoption of full dollarization lessens the commitment of the central bank to help banks in trouble even though at times it would be necessary to do so.

2.9 The link between the Deposit Rate and Lending Rate relative to Bank Spreads.

The nature of the relationship and the degree of correlation between the deposit rate and the lending rate with the bank spreads is an important factor in the determination of bank spreads. The relationship can be used to predict the direction and magnitude of change in the spread in response to shocks in the operating environment. The prediction particularly make sense when bank interest rates are decontrolled and there is need to observe the degree to which the deposit or the lending rate is contributing to the widening bank spreads (Brock and Rojas-Suarez, 2000). When the interest rates are controlled by placing ceilings or floors the degree to which the changes can take place are easy to predict because there are controls in place. For instance ceilings on lending rates will only allow the lending rate to vary within certain bands; thereby the contribution of the lending rate to changes in the spread is easily quantified.

Generally, a tight correlation of the spread with the lending rate as compared to the deposit rate will result in very wide spreads. When this relationship exists, any shock that raises the spread will raise the lending rate rather than reduce the deposit rate. For instance a sudden rise in the TB rate is likely to raise lending rates more than the proportionate increase in the deposit rate which widens spreads. This relationship is particularly important in order to craft policies that will slow down or accelerate the interest rates such that they converge to desirable levels. Brock and

Rojas-Suarez (2000) noted that the deposit and lending rates are highly correlated with the spreads in countries where there is economic instability and deregulation of bank interest rates.

2.10 Empirical Literature

Developed nations have economic structures that are significantly different from those of developing nations. Hence empirical literature will focus on studies that were done in African developing nations and other developing states outside Africa.

2.11 Bank Spreads in Developing African States.

Crowley (2007) conducted a study of bank spreads in developing African states using a large set of countries in Africa. The study made use of a pool of 18 English speaking African nations and the sample period was 1974 to 2004. The study made use of a pooled estimation technique to run a regression on a large set of micro and macro-economic variables. The results of the study showed that higher spreads were attributable to factors such as high inflation rates, the concentration of publicly owned banks and finally the greater number of banks. Also other factors such as poor corporate governance, poor regulatory structures and higher financial taxes through increased reserve required ratios were identified as other drivers of spreads. The need to strengthen the regulatory framework was sighted as the best measure to drive the interest rates to lower levels that is necessary to foster economic growth.

Beck and Hesse (2006) conducted a similar study to the one conducted by Crowley (2007). Their study focused on the factors behind the consistently high interest rate spreads and margins in the Ugandan banking industry compared with peer African countries. The study adopted the use of the Ho and Saunders (1981) dealership model to model a panel dataset of 1390 banks from 86 countries over the period 1999 to 2005 .The Ho and Saunders model was used to enable cross country comparisons of bank spreads and variables. The results showed that there are high spreads in banks within countries and across countries. Both macroeconomic and bank specific variables were found to be of relevance in explaining variations in bank spreads. Bank size, high Treasury bill rates and institutional deficiencies explained a greater proportion of spreads in Ugandan banking industry. Although it was found that foreign banks charge low bank spreads, market structure and the presence of foreign banks had no significant relationship with interest rate spreads.

Brock and Rojas-Suarez (2000) made an assertion that a study of interest rates that makes economic sense is the one done in a decontrolled economy. Hence, Chirwa and Mlachila (2004) conducted a study of the causes of high spreads in a financially liberalized economy which is Malawi. The study made use of bank specific, industry level and macroeconomic variables. Net interest margin were employed as an alternative definition of spreads and monthly panel data regression on commercial banks over a period 1989-1999.The study results showed that bank spreads increased significantly after financial liberalization; high spreads were attributed to high monopoly power, high required reserves, high inflation and high central bank discount rate. They concluded that bank spreads in developing countries will continue to rise if financial liberalization fails to alter market structure such as increasing market competition as was the case in Malawi. This assertion was supported by Brock and Rojas-Suarez (2000) who realized that spreads in financially liberalized economies are generally higher as compared to the one which are controlled.

Ngugi (2001) conducted an empirical analysis on the determinants of interest rate spreads in Kenya. Two models were used to define spreads namely the accounting value of net interest margin and the firm maximization behavior. The researcher was of the view that narrowing spreads are a reflection of gains in efficiency. Results showed that when there is freedom to set interest rates , banks spreads will tend to rise and will not decrease from the high levels. The widening of bank spreads was associated with increased credit risk leading to growth in non-performing loans which puts pressure on the mark-up on loans. Inflationary pressure also resulted in wide spreads which were not reduced when inflation reduced. These results concurred with other studies who view continuous increases in spreads in case where the economy fails to adequately meet the prerequisite of financial reform and there are lags in policy implementation.

2.11 Bank Spreads in other Developing Countries.

Studies on bank spreads can be conducted at a country level and at times they can be extended beyond country boundaries. The main thrust will be on making inferences based on information that has been obtained from different economic structures.

2.11.1 Country Specific Studies on Bank Spreads

Perez (2011) used accounting data and employed a dynamic panel regression model to ascertain the factors affecting bank spreads in the developing nation of Belize. The results showed that

adversely classified loans and market share were the factors explaining a greater proportion of spreads. Increases in the level of non-performing loans were associated with increases in credit risk which is passed to the customers through spreads. Reduction of information asymmetries and increasing market competition were sighted as remedies to lowering spreads.

Younus and Mjeri (2009) conducted an analysis on bank spreads for the period 2004 to 2008 in Bangladesh by employing the use of the profit maximization model that is based on the industrial organization approach in an environment where lending and deposit rates are decontrolled. They begin the construction of their model by specifying the spread as a function of bank specific variables, bank industry variables and macroeconomic variables as follows:

$$IRS_{jt} = f(BSV_{jt}, BIV, RMV, u_t) \quad (1)$$

Where: IRS_{jt} is the interest spread of bank (j) at time (t); BSV is the vector of bank specific variables for bank (j), BIV is the vector of bank industry variables, RMV is the vector of regulatory and macroeconomic variables and finally u_t represents the error term. Alternative definitions of the spreads were used in modeling the dependent variable as defined below:

IRS (1) = (interest received –interest paid)/total assets

IRS (2) = (interest received / all interest bearing assets) – (interest paid/ all interest earning liabilities)

When the two definitions were used, a number of coefficients turned out to be insignificant meaning they were not proper definitions for calculating spreads in Bangladesh. An alternative was to use the narrower definition calculated as the difference between the lending rate for large and medium sized industries and the interest rate on deposits at the individual bank level.

The vector for bank specific variables contained 5 variables such as the adversely classified loan (CL) which measure the quality of assets, operating costs (OC), the market share of each bank in the deposit market (MS), a measure of power and bank size, the ratio of non-interest income (NII), and the deposit interest rate (DR). For bank industry variables the reserve required reserve requirements (SRR), National Savings Directorate (NSD) certificate rate were included. The vector for regulatory and macroeconomic variables comprised of the inflation rate (INF) and finally the ratio of taxes paid by the banks to net income before provision and tax (TAX).

Thus their final model turned out as follows:

$$IRS_{it} = \alpha + \alpha_1 CL_{jt} + \alpha_2 OCjt + \alpha_3 MS_{jt} + \alpha_4 Tax_t + \alpha_5 NII_{jt} + \alpha_6 DR_{jt} + \alpha_7 SRR_t + \alpha_8 NSD_t + \alpha_9 INF_t + \varepsilon_t \quad (2).$$

The results of the study showed that the level of bank spreads was affected by the level of non-interest income earned, market share of a bank, statutory reserves and NSD. The study concluded that profitability at the bank level was an essential tool in reducing spreads.

The State Bank of Pakistan used panel data regression analysis on commercial banks to ascertain the degree of efficiency of the Pakistan financial sector over a period of 1997 to 2007. They made use of bank level variables such as provision for loan losses, non-interest income, administration costs, foreign ownership, industry specific variable of bank concentration using the Herfindal index and macro-economic variables of interest-rate sensitivity and growth in real GDP. The study revealed that all the factors were significant in explaining the high interest spreads in Pakistan. Administration costs and foreign ownership had a high significance in comparison with other variables.

A follow up study from the one done by the State bank of Pakistan was done by Afzal and Mirza (2010) who explored the causes of high spreads in Pakistan for the period 2004 to 2009 using an exhaustive body of bank level and macro variables that explain intermediary efficiency.Net interest margins and spreads were used as proxies to measuring intermediary efficiency. They introduced two completely innovative variables namely the default likelihood indicator and the share of public sector deposits to total bank deposit in their research. The results showed that spreads are affected by bank size, asset quality, operational efficiency, liquidity, risk absorption capacity and GDP growth rate, evidence to support the impact of financial development indicators on bank spreads could not be established. Prudent credit risk policies to reduce non-performing loans and strengthening central authority surveillance forwarded as ways to reduce spreads and improve on efficiency.

2.11.2 Cross Country Studies of Bank Spreads

Brock and Rojas-Suarez (2000) made use of the Ho and Saunders model to run two stage regressions on variables that were premised to cause high spreads in a set of 7 developing countries in the Latin America in the 1990's. In the first stage, micro variables were regressed on

individual bank spreads and it was found out that non-performing loans, liquidity ratio and capital ratio were significant in explaining spreads.

Spreads = f (capital-assets ratio, liquidity ratio, cost ratios, non-performing loans ratio)

In the second regression macro variables were used to explain the pure spreads. Pure spreads to those spreads that cannot be explained by the microeconomic variables. The model specification is as follows:

Spreads=f (interest rate volatility, inflation rate, GDP growth rate)

These variables were able to explain spreads bank spreads in most countries. The two stage regression model was necessary in facilitating comparisons between countries. The study concluded that both micro and macro factors have an impact on bank spreads in most countries.

Dermigurc-Kunt and Huizinga (1998) employed a large set of data to study the factors that determine bank spreads and profitability in 80 countries and covering the period from 1988 to 1995. They found out that variations in interest margins reflect a number of determinants: bank characteristics, macroeconomic conditions, and the financial industry structure. Adjusting for differences in banking activity, leverage and the macroeconomic environment, it was found that banks with a large asset base and lowly concentrated industries are associated with lower margins. Foreign banks had higher spreads as compared to domestic banks in developing states and the opposite was observed in developed states and there was evidence of passing of the tax burden to customers by increasing spreads amongst banks. Reduction of spreads was linked to lowering of operating costs and lowering financial taxes. The results concurred with Barajas et al (1999) who asserted that Colombia's efforts in reducing operational costs, financial taxation and enhancing loan quality will determine whether it will be able reduce spreads.

2.12 Summary

The chapter focused on what different authors and scholars have written about the determinants of bank spreads in developing nations. Several authors believe that the factors that cause bank spreads to widen are relatively similar whether the country is an African country or not. Their area of difference was on the category of variables that has the greatest influence on bank spreads. Some authors believed that bank specific variables have the greatest influence on bank

spreads whilst others believe that they are mainly determined at the macro level. It can also be discerned that most of the studies conducted in developing states are cross country studies; hence much emphasis was placed on differences in economic structures and economic performance between countries. This research closes the gap by conducting a study for a Southern African country that is currently operating in a multiple currency environment. The proceeding chapter focuses on the methodology employed in the study.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter provides a detailed analysis of the main steps and methods that were taken in carrying out the study. It mainly focus on the research design, model specification and its justification, diagnostic tests, identification of key variables, the estimation procedure and the description of data sources and types. It also presents an analysis of the data presentation and analysis plan. A summary of the main points is provided at the end of the chapter.

3.2 Research Design

The study had its prime focus on establishing the causes of high spreads in Zimbabwe hence an explanatory research design was adopted for this study.Quantitative methods were used to analyze quantitative secondary data. The use of quantitative data is objective because it eliminates bias which arises from the use of judgments when a qualitative approach is employed. The study made use of 12 out of 16 commercial banks that were operational in Zimbabwe for the period 2009 to 2012. Following the criterion laid down by Afzal and Mirza (2010), the other banks were dropped from the study because of the following reasons:

i. Ecobank, Capital bank and Trust bank had insufficient number of observations because they had operated for a shorter period during the period of study.

ii. Interfin Bank was placed under curatorship. Banks placed under curatorship lack financial statements data and do not confirm to the Generally Accepted Accounting Practices (GAAP).

iii. Allied Bank suffered from a chronic financial distress as a result of the unbundling of ZABG hence its financial data was not suitable for analysis.

3.3 Model specification

The study made use of a pooled regression technique in estimating the regression equation. It adopted the model constructed by Younus and Mjeri (2009). The researchers used the model to explain the bank specific, industry specific and macroeconomic factors that affect bank spreads in Bangladesh for the period 2004 to 2008. Their model was specified as follows:

$$IRS_{it} = \alpha + \alpha_1 CL_{jt} + \alpha_2 OCjt + \alpha_3 MS_{jt} + \alpha_4 Tax_t + \alpha_5 NII_{jt} + \alpha_6 DR_{jt} + \alpha_7 SRR_t + \alpha_8 NSD_t + \alpha_9 INF_t + \varepsilon_t$$

Where, **CL_{jt}:** adversely classified loans for bank **j** at time **t**.

OC_{jt}: operating costs for bank **j** at time **t**.

MS_{jt}: market share of each bank in the deposit market at time **t**.

NII_{jt}: the ratio of non-interest income for bank j at time **t**.

DR_{jt}: the deposit interest rate for bank **j**at time **t**.

SRR_t: the reserve required reserve requirements at time **t**

NSD_t: National Savings Directorate certificate rate at time **t**.

INF_t: the inflation rate at time **t.**

TAX_t: the ratio of taxes paid by the banks to net income before provision and tax .

ε_t: is the error term.

In coming up with the model for this study the variables National savings directorate, deposit rate, required reserve ratio and tax variables were dropped from the original model to enable the research to suit the Zimbabwean environment. All the other variables in the original model were retained. The capital adequacy ratio variable was added into the model and the resulting model specification became:

$$SPREAD_{it} = \alpha_{it} + \beta_1 OVC_{it} + \beta_2 NII_{it} + \beta_3 CAR_{it} + \beta_4 NPL_{it} + \beta_5 \log(TA)_{it} + \beta_6 MSD_{it} + \beta_7 INF_{it} + \varepsilon_{it}$$

Where: **$SPREAD_{it}$**: is the spread for bank *i* at time *t.*

OVC_{it}:the ratio of operating expenses to total assets for bank *i* at time *t.*

NII_{it}:the ratio of non-funded income to total assets for banks *i* at time *t*.

CAR_{it}: the capital adequacy ratio of bank *i* at time *t.*

NPL_{it}: non-performing loans for bank *i* at time *t.*

INF_{it}: the inflation rate in the economy at time *t*.

MSD_{it}: deposit market share for bank *i* at time *t.*

t : period of study June 2009 to December 2012 (semiannual data)

ε_{it}: is the error term.

3.3.1 Ratio Analysis and Correlation Analysis

The study also made use of ratio analysis and correlation analysis to compliment the results from the regression analysis thereby enabling the full achievement of the laid down objectives. Correlation analysis involves the establishment of relationships and judging the degree of association between variablesto make inferences about a certain phenomenon. Following the work of Brock and Rojas-Suarez (2000), the study employed the correlation analysis to establish the degree of association of the bank spread with the lending and deposit rates. The econometric package E-views 5.0 was used to compute the statistics.

3.4 Justification of variables.

The study involved the selection of key variables that affect bank spreads in Zimbabwe in the multiple currency environments and the selection of these variables was influenced by previous studies done on bank spreads in other developing countries. The variables included measure the contribution of bank size, operational efficiency, asset quality, ability to absorb risk and stability in the macro economy in the widening of spreads.

3.4.1 Dependent Variable

Bank interest rate spread is the dependent variable. The spread is calculated as the difference between the lending rate and deposit rate at the bank level that the commercial banks in Zimbabwe were charging. Literature shows that the spread is a good measure of banking efficiency.

3.4.2 Independent Variables

The set of independent variables comprise of bank specific, industry specific and macroeconomic variables that are known to affect bank spreads.

3.4.2.1 Operating Costs to Total Assets (OVC)

The ratio of operating costs to total assets is used as a proxy to measure operational efficiency in the banks.Operating costs refers to staff costs, audit fees, administrative costs and rent expenses amongst other costs that are incurred by commercial banks in Zimbabwe. That is banks that incur higher costs are considered inefficient and are likely to increase margins on bank spreads to compensate for the extra costs incurred. Studies by (Grenade, 2007) showed that a positive relationship is expected between bank spreads and the ratio of overhead costs to total assets.

3.4.2.2 Non-interest Income to Total Assets (NII)

The ratio of non-interest income to total assets is used in the study to capture the contribution of non-core activities in the widening of spreads Non-interest income refers to the income that is generated by banks in Zimbabwe through fees or commission income. Banks that rely mostly on non-interest income for income generation rather than using interest income are associated with lower spreads. This is because the income from the non-core activities will be compensating for the interest revenues leading to the reduction of spreads. Perez (2011) used the ratio in his studies and found out that there is a negative relationship between non-interest income and interest rate spreads.

3.4.2.3 Bank Size (log of total assets)

It is a measure of the possibility of a bank to enjoy economies of large scale operations .banks that have greater scope for economies of scale incur lower costs of operations which entails greater financial flexibility. With financial flexibility it would be easy to penetrate markets which can give them power and hence increase spread. A positive relationship is therefore expected between bank spreads and bank size.

3.4.2.4 Capital Adequacy Ratio (CAP)

The capital adequacy ratio measures the ability of a bank to absorb risk emanating from different business activities. According to the Reserve Bank of Zimbabwe definition, it is calculated as:

$$CAR = (\text{Tier 1capital} + \text{Tier 2 capital} + \text{Tier 3 capital}) / \text{risk weighted assets}$$

Regulatory capital comprise of Tier 1 capital which comprise of paid up capital, statutory reserves, disclosed free reserves, and equity investments in a subsidiary. Tier 2 capital comprise of undisclosed reserves, general loss reserve, subordinated debts and hybrid debt capital instruments. Tier 3 capital is the sum of operational and market risk capital. Risk weighted assets refer to bank's asset or off balance sheet exposures weighted according to risk. A minimum capital ratio is usually stipulated by the central bank and in Zimbabwe it is currently pegged at 10%. Banks that have an extraordinarily high capital ratio are associated with high bank spreads because the costs of maintaining the capital will be high. Floerkemeier and Norris (2007) in his studies found out that stated that a strong capital base is likely to have a positive impact on bank spreads.

3.4.2.5 Non-performing Loans to Gross Loans (NPL)

The proxy of non-performing loans to total gross loans is used in the study to measure the contribution of asset quality to the widening of spreads.Non-performing loans refer to loans on which interest has been suspended or loans which have not been accruing interest for more than ninety days. Commercial banks are mainly involved in lending and the bulk of their assets are thus made up of loans and advances. Banks with a considerably high level of non-performing loans are likely to increase spreads to cater for the increased credit risk and compensate for the lost interest revenues emanating from the bad loans. Thus a positive relationship is expected between non-performing loans and bank spreads (Grenade, 2007).

3.4.2.6 Inflation (INF)

Inflation refers to the change in the price level in the economy as measured by the consumer price index compiled by the ZIMSTATS. Inflation is used in this study to measure stability in the macroeconomic environment. High inflation is considered a reflection of the high costs of doing business and can also indicate the riskiness of conducting business in the economy. When there is high inflation, borrowers are likely to default because the costs of borrowing will be high which makes it difficult to service the loans. Hence, banks are expected to increase spreads to cushion themselves against the adverse effects of possible loan defaults. Brock and Rojas-Suarez (2000) employed the use of inflation in his studies as a tool to measure economic stability and found a positive relationship between bank spreads and inflation.

3.4.2.7 Market Share of Deposits (MSD_{it})

Refers to the share of the market of deposits that a bank currently holds. The ratio is used to measures bank size and the extent to which a bank can exercise power in the market. Banks with a high degree of power can collude and artificially raise spreads to increase profits hence banks that have a high degree of market power is associated with increases in the bank spreads, (Afzal and Mirza, 2010), hence a positive relationship between market share and bank spreads is expected. The formula for calculating the ratio is:

$$\mathbf{MSD_{it}} = \frac{deposits}{\sum_{i=1}^{n}.(deposits)}$$

3.5 Data Types and Sources

The study utilized data obtained from interim and year-end financial reports found on commercial banks websites. Data for computing macroeconomic variables was obtained from the Reserve Bank of Zimbabwe and Zimbabwe National Statistics Agency databases. The study covers the period from Feb 2009 to December 2012. The study was restricted to this period because of significant differences in operating environments brought by use of different currency regimes prior to 2009 and the availability of latest data for investigation.

3.6 Estimation Procedure

The study adopted the use of pooled ordinary least squares in estimation. This method does not consider the differences between the individuals across the time period hence it can be taken as an ordinary least squares technique. The study pooled observations from twelve banks for the period 2009 to 2012. Although the method is criticized for failure to account for heterogeneity between individuals, the researcher assumed that the method would produce unbiased and consistent estimates.The econometric package E-Views 5.0 was used to estimate the equation.

3.7 Diagnostic Tests

Estimation using ordinary least squares methods is based on a set of assumptions. Violation of the laid down assumptions results in estimates that are biased and inconsistent. Thus this study will conduct diagnostic tests that are aimed at detecting situations where the assumptions have been violated so to produce robust regression results.

3.7.1 Multicollinearity tests

Multicollinearity exists if the explanatory variables are highly correlated with each other. These strong interrelationships make it difficult to disentangle the individual effects of independent variables on the dependent variable, Maddala (1977). The correlation matrix was used to detect the presence of severe multicollinearity. A zero order correlation coefficient is high if it is in excess of 0.8.

3.7.2 Panel Unit Root Tests

A number of time series show a trend overtime thus they do not conform to the specifications of weak stationery. If estimates are made using non-stationery series spurious regression estimates will be obtained whereby the coefficients look statistically significant while in actual fact a relationship does not exist. It has been found out that panel-based unit roots are comprehensive than unit root tests based on individual time series. The study will make use of the panel based Fisher-Augmented Dickey Fuller test which is based on a null of the presence of a unit root.

3.7.3 Cointegration Test

Cointegration is used to test for the existence of a long-run equilibrium relationship between the variables. The test is conducted by running a unit root test on the error term. If the variables are cointegrated, that is the error term is stationary, it means that there is a long run relationship between the variables and that the model is rendered fit for prediction. The study will conduct the test to establish the nature of the relationships between the variables in the long run.

3.7.4 Heteroscedasticity and Model Specification Test

Whites' test can be used to test for both the presence of heteroscedasticity and to check for model misspecification. The test is conducted under the null of homoscedasticity in the residuals, no omitted variables and that the linear model is correctly specified. The null assumes that the errors are homoscedastic and independent of the regressors and that the model is correctly specified hence it is applicable as a test for heteroscedasticity and model specification, (E-views 5.0 user guide).

3.8 Data presentation and analysis plan

Data presentation and analysis will be done in chapter four. The study will make use of tables in presenting the regression results. Graphs will also be used in presenting the results thus complimenting the tables. The interpretation of the research findings will also be done.

3.9 Summary

The chapter began by outlining the research design that was adopted for the study. It went on to discuss the model specification that was adopted in conducting the research. The model was specified and modifications were made to suit the requirements of this study. The chapter outlined the various sources of data that were utilized in the study. It also looked at the justification of the variables that were adopted from the literature and a discussion of the diagnostic tests that were going to be used was also done in this chapter. The next chapter will look at data analysis, presentation and interpretation.

CHAPTER FOUR: DATA ANALYSIS AND INTERPRETATION

4.1 Introduction

This chapter looks at the presentation and analysis of the results from the study of the determinants of bank interest spreads in Zimbabwe. The chapter covers the diagnostics test conducted on the model such as unit root tests, tests for autocorrelation and multicollinearity tests. The chapter also presents and discusses the study results. The chapter will also look at the consistency of the study results with economic theory. The chapter is concluded by a summary of the chapter**.**

4.2 Diagnostic Tests Results

The researcher conducted diagnostic tests to guard against the possibility of obtaining and interpreting spurious regression results .The results of the tests are presented in the tables that follow.

4.2.1 Multicollinearity Test Results

The results for the test for severe multicollinearity are presented in the correlation matrix in table 4.1.

Table 4.1 Correlation matrix

	BS	OVC	CAP	MSD	NPL	NII	TA	INFL
BS	1.0000							
OVC	0.2190	1.0000						
CAP	-0.1555	-0.0586	1.0000					
MSD	-0.0111	-0.4844	-0.1876	1.0000				
NPL	0.0279	0.0703	0.0329	-0.1825	1.0000			
NII	0.1383	0.1621	-00638	-0.1325	0.3285	1.0000		
TA	0.1122	-0.3919	-0.0618	0.7326	-0.1457	-0.0959	1.0000	
INFL	0.7590	0.1059	0.0400	-0.0453	-0.1279	0.0834	0.3153	1.0000

Source: Authors estimates

The results showed that the problem of multicollinearity did not exist because all the correlation coefficients were within the recommended range of no multicollinearity which is -0.8 to 0.8. Hence all the variables were retained for use in estimations.

4.2.2 Panel Unit Root Tests

The study made use of the panel based Augmented Dickey Fuller (ADF) test to test for the presence of unit roots. The test was done at 5% significance level and the hypothesis of the test is stated as follows:

H_0: unit root

H_1: no unit root

Table 4.2 Unit Root Test Results

Variable	ADF Statistic	Z-statistic	P-value	Order of integration
BS	104.8	-7.5876	0.0000	I(0)
NPL	42.7493	-2.61374	0.0051	I(0)
OVC	44.1087	-2.60306	0.0046	I(0)
NII	41.1087	-2.32799	0.0139	I(0)
CAP	44.4344	-2.74534	0.0068	I(0)
LOG(TA)	91.4514	-5.78158	0.0000	I(0)
MSD	79.2472	-2.96047	0.0000	I(0)
INFL	131.728	-9.14863	0.0000	I(0)
RESIDUAL	39.6010	-2.47427	0.0067	I(0)

Source: Authors' estimates

Interpretation of unit root test results

Unit root testing for the variables indicated that all the variables are stationary at the level. That is the problems of unit roots did not exist in the data. Stationarity using the ADF test occurs when the z-statistic value is greater than the critical value at the chosen significance level.

4.2.3 Cointegration Tests Results

Results in table 4.2 show that the residuals are stationary at the level. This implies that there is cointegration between the variables. When cointegration exists, then there is a long run relationship between the variables under study. Thus the forecast values obtained using the model are statistically and economically reliable for the longrun.

4.2.4 Heteroscedasticity Test Results

The Whites' test was used to check for the presence of heteroscedasticity in the residuals. According to E-views 5.0, the test can also be used to test for model misspecification since it is conducted under the null of homoskedastic errors and that the linear model is correctly specified. A significant test statistic shows the failure of any one of the assumptions:

H_0: homoscedasticity, no omitted variables, linear model correctly specified

H_1: heteroscedasticity, omitted variables, linear model incorrectly specified

Obs (R squared) = 16.55157

Probability = 0.167258

The test statistic is not significant hence the model is free from heteroscedasticity.The linear model is also correctly specified.

4.3 Regression Results

The model was estimated using pooled ordinary least squares and the results are presented in table 4.3 below

Table 4.3 Summary of the regression results

Variable	Coefficient	t-statistic	P-value
C	0.3403	3.409	0.0010
OVC	0.2277	2.5476	0.0126
NII	-0.0016	-0.0533	0.9576
LOG(TA)	-0.0156	-2.6136	0.0105
NPL	0.0660	2.1821	0.0318
CAP	-0.1698	-2.1254	0.0364
MSD	0.2147	2.8090	0.0061
INFL	2.1468	11.122	0.0000

Source: Raw data

R^2 = 0.674272 **F-statistics = 26.02345**

Adjusted R^2 = 0.648362 **Prob (F-statistics) = 0.00000**

Durbin-Watson statistics = 1.748669

Using the statistics in the table above to fit in the model specified in chapter three, the resulting model becomes:

SPREAD= 0.34 + 0.23**OVC** +0.002**NII** -0.02**LOG (TA)** – 0.17**CAR** + 0.07**NPL** + 0.24**MSD**+2.14**INFL**

4.3.1 Interpretation of R^2

An R^2 coefficient of 0.674272 obtained from the estimated model means that 67.43% of the independent variables used to estimate the model were able to explain the dependent variable. The result makes sense because there are other factors such as managerial input that were not included in the model but could help in explaining spreads. These factors were accounted for the in remaining 22.57%.

4.3.2 Interpretation of the Adjusted R^2

The adjusted R^2 measures the proportion of the dependent variable that explains the independent variables. An adjusted R^2 of 0.648362 shows that 64.8% of the dependent variable was able to explain the independent variables which makes it a good model

4.3.3 Interpretation of the F-statistic

The F-statistics tests the fitness of the model and a recommended F-statistics should be greater than 5 for it to be considered fit. The study obtained an F-statistic of 26.02345 which is greater than 5 hence the model was fit for estimation.

4.4 Interpretation of Regression Results

The regression estimates show that bank level, market level and macroeconomic variables determine bank spreads. Bank specific variables had the greatest influence on bank spreads. A detailed analysis of the results is done below.

4.4.1 Overhead Costs and Bank Spreads

Overheads costs were found to be significant in the determination of bank spreads in Zimbabwe. The findings are in line with economic theory which premises a positive relationship between bank spreads and overhead costs. The implication of this relationship is that bank spreads rise in response to rising overhead costs being incurred by banks .That is, banks that are not able to keep their overheads at low levels will raise the spreads to compensate for the extra costs of operations and can be considered operationally inefficient. The expansion of retail banking products, increasing retail branch networks and rising staff costs as a result of a salary increase award to bank workers contributed much to the rising costs of operations.

4.4.2 Non-interest Income and Bank spreads

Interestingly, non-interest income was found to be insignificant in explaining spreads in Zimbabwe. Generally, economic theory postulates that the increased use of non-interest income is supposed to compensate for use of interest income which lowers bank spreads. The insignificant relationship was least expected in the Zimbabwean economy where banks had not been lending aggressively because of liquidity constraints.

4.4.3 Capital Adequacy and Bank Spreads

Capital adequacy measures the ability of the bank to absorb the risks emanating from its different banking activities. The negative relationship established showed that increasing the level of capital adequacy results in a reduction in spreads. The relationship point to the fact that the costs of keeping high levels of bank capital is lower in Zimbabwe which makes banks to charge lower spreads. An alternative explanation to the relationship portrayed is that banks that were adequately capitalized could absorb greater risk than those than are not adequately capitalized hence they would charge lower spreads. This result concurs to the bulk of the research which associates banks with high capital levels to incur lower spreads.

4.4.4 Non-performing Loans and Bank Spreads

Non-performing loans were found to be significant in explaining bank spreads in Zimbabwe. A positive or negative relationship was expected from the regressions and the study produced a positive relationship. This relationship shows that the banks are passing on the costs of credit risk to customers by raising bank spreads. The costs of non-performing loans occur in the form of increases in the costs of provisioning which greatly reduce profitability. Crowley (2007) and Grenade (2007) found a positive relationship between non-performing loans and bank spreads citing the need for banks to cushion themselves form increased credit risk as the major reason for increasing spreads.

4.4.5 Market Share and Bank Spreads

The ability to exercise power in the market as measured by the share of the market of deposits that a bank holds was significant in explaining bank spreads in Zimbabwe. The positive relationship between the market share of deposits and bank spreads shows that large banks set higher spreads whilst smaller banks that own a smaller portion of the market charge lower spreads in order to attract customers. The ability of large banks to negotiate higher spreads shows that there is a lack of an incentive to improve on efficiency which causes them to raise spreads. This result was consistent with the rest of literature which postulates that a positive relationship exists between bank spreads and market share. Few studies such as the one conducted in Pakistan by Afzal and Mirza (2010) found a negative relationship between the spread and market share.

4.4.6 Bank Size and Bank Spreads

The natural logarithm of total assets was able to explain the rising bank spreads but had a negative sign. The negative relationship implies that in the economy with liquidity shortages, large banks are able to mobilize funds at lower costs through bank deposits hence can charge lower spreads. Smaller banks have to rely on other sources of funds such as offshore credit lines which can be expensive and therefore their prices reflects the high costs of funds.

4.4.7 Inflation and Bank Spreads

The impact of inflation was able to explain why bank spreads are widening in Zimbabwe. This result was most expected in Zimbabwe because the single digit inflation rate regime that was prevalent since the adoption of dollarization failed to normalize the prices of other goods and services in the economy. For instance, the financial statements of banks showed an increase in the salaries of bank personnel which raised staff costs despite a general stabilization in the prices of foodstuffs. Banks therefore continued to suffer from high costs of doing business although there were lower levels of inflation recorded in the economy. This being the case, banks was very sensitive to slight changes in the inflation rate. The result shows that lower inflation did not benefit much for the banking industry in terms of cost reduction during the period 2009 to 2012. These findings are in line with rest of the literature which premises that the spreads are likely to rise in the event that there are high costs of doing business.

4.5 The link between the Deposit and Lending Rate relative to the Bank Spreads

Table 4.5 below shows that a positive relationship exists between the bank spread, the deposit rate and the lending rate. It was also found that the lending rate is highly correlated with the bank spread as compared to the deposit rate. This result converges with findings that were obtained in Argentina, Bolivia and Chile by Brock and Rojas-Suarez (2000) during the mid-ninety's. An important implication of this relationship is that any shock that raises spreads in Zimbabwe tends to raise lending rates and increase bank spreads because the deposit rate will not be rising fast enough to offset the proportionate increase in the lending rate.

Table 4.4 Correlation of bank spreads with its components

Variable	Correlation coefficient	Strength of relationship
Deposit rate	+0.204934	Weak positive
Lending rate	+0.912633	Strong positive

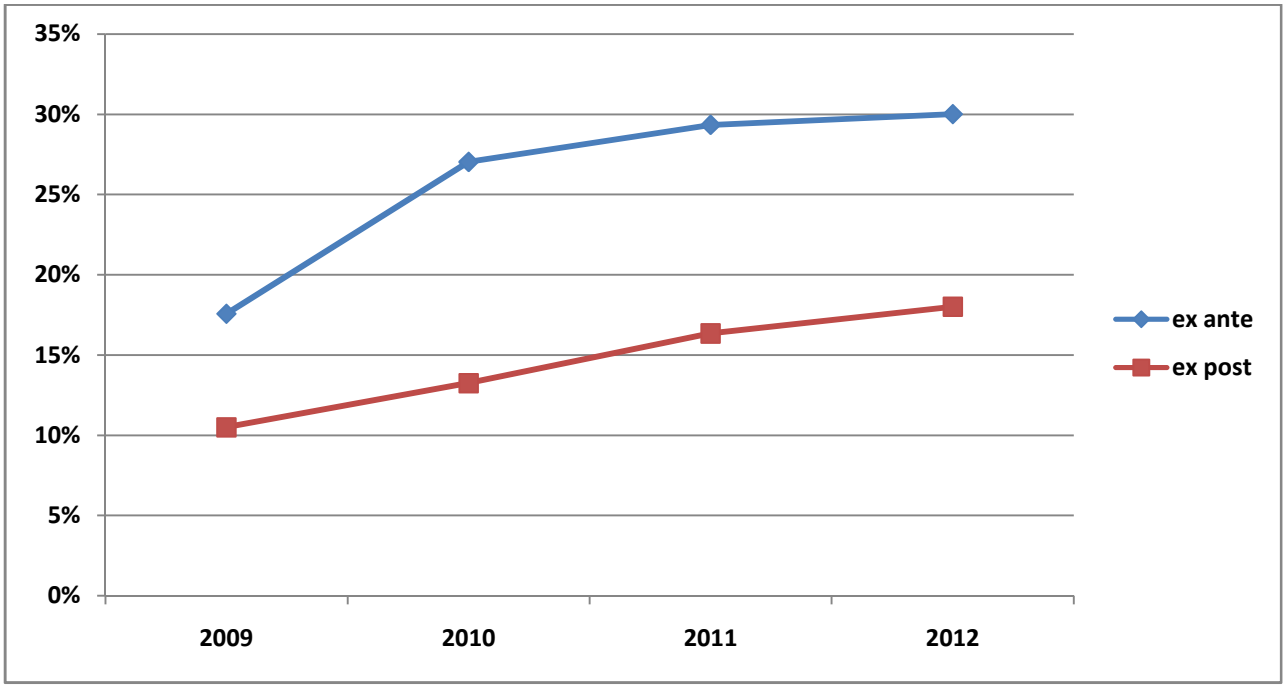
Source: Reserve Bank of Zimbabwe

The relationship also serves to explain the absence of regulation such as lending rate ceilings during the period 2009 to 2012 which help in slowing down the growth rate in the lending rates. Hence the increase in the lending rates contributed much to the widening of the bank spreads as compared to reductions in the deposit rate.

4.5.1 Growth in Bank Spreads from 2009 to 2012

The study established that bank spreads have been on the rise since the adoption of multiple currencies and they were showing no signs of converging to lower levels. The difference between the ex-ante and ex-post spreads show the extent to which banks were realizing the revenues on loans made. The results show that banks were facing difficulties in recovering debts which resulted in them realizing less interest revenues on loans than what was expected. Figure 4.1 show the growth of bank spreads since 2009 to 2012.

Figure 4.1 Growth in bank spreads 2009 to 2012



Source: ZIMSTATS and financial statements

4.6 Comparison of Bank Spreads between Foreign Banks and Local Banks

The study sought to compare the contribution of foreign and local banks to widening bank spreads in Zimbabwe from 2009 to 2012. It is found that local banks charge higher spreads as compared to foreign banks, this result converges to the findings of Crowley (2007) and Dermigurc-kunt and Huizinga (1998). Table 4.6 below shows the calculated average ratios for both local and foreign banks.

During the period 2009 to 2012 local banks charged higher spreads than foreign banks as a result of incurring higher costs of approximately 13% compared to 10%. During the same period, local banks had a high holding of bad assets of 7% compared to 5%. This phenomenon can be attributed to a cautious lending approach that was being taken by foreign banks which enabled them to have a good loan book. Since local banks control a smaller portion of the market, they resorted to the use of non-interest income to generate income which was supposed to lower their spreads. Foreign banks are generally large and their average size is US$244 million which is twice that of an average local bank. This large size enables them to gain a competitive urge over local banks in terms of mobilizing resources or capturing customers which allows them to

operate cheaply. However this result should be treated with caution since large institutions can incur diseconomies of scale.

Table 4.5 Foreign and local banks average statistics (2009 to 2012)

Ownership Class	**Local**	**Foreign**
Spreads (%) (financial statements calculated)	13	10
Overhead costs to total assets (%)	13.2	9.4
Non-interest income to total assets (%)	9.6	6.4
Non-performing loans to total loans (%)	7	5
Bank size (millions US$)	111	244
Capital adequacy (%)	15.8	18.65
Market share of deposit (%)	3	7.8

Source: Financial Statements

Foreign banks also had higher capital adequacy ratios which imply that they might have been incurring higher costs of maintaining capital but were likely to absorb greater risk. During the study period two local banks were placed under curatorship and several of them were operating under distressed conditions. All the foreign banks were generally stable which suggest that they are able to absorb risk. From the analysis it can be clearly observed that local banks could have contributed greatly to widening bank spreads.

4.7 The costs of adopting full dollarization

From the monetary policy statements published by the RBZ, the study established that the adoption of full dollarization managed to bring stability in the economy by eliminating exchange risk and reducing inflation, inflation closed the year 2012 at 2.91% .Increases in the Gross domestic product from US$5,482,647,593 in 2009 to US$ 7,953,787,246 in 2011 after a decade of economic stagnation. However, the regime came along with its own costs such as the shortage of liquidity in the economy. The inability of the Central bank to print currency technically means that it cannot influence liquidity in the economy. The financial statements of most banks show

large off shore credit lines which suggest that banks were resorting to alternative sources of liquidity to finance funding gaps.

The RBZ also failed to assume the role of the lender of last resort, RBZ (2012). The lender of last resort provides liquidity to a bank when all the other institutions had failed. Failure to do so would place the banks at risk of failure. These observations auger with the findings of Quise-Agnoli and Whisler (2006),who asserted that under full dollarization, printing money will no longer be a feasible way and banks have to look for alternative financing to end episodes of financial distress. This situation raises the banks costs of funds which are in turn passed on to the customers through increasing margins on spreads.

4.8 Summary

The chapter looked at the results of the study. It was found that bank spreads in Zimbabwe were on the rise since 2009 and they were mainly driven by overhead costs, non-interest income, capital adequacy and inflation. During the same period, lending rates were highly volatile as compared to deposit rates and local banks were found to have contributed immensely to the growth in bank spreads. The next chapter will look at the summary, conclusions and recommendations to the study.

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introductions

The study established the factors that determine bank interest rate spreads in Zimbabwe during the multiple currency period. Findings indicated that bank spreads are influenced by overheads, non-performing loans, market share, capital adequacy, bank size and inflation. This chapter outlines the conclusions of the study in accordance with the study results. It also gives an insight on the policy recommendations as well as suggestions for future studies. The rest of the chapter will discuss the conclusions of the study, recommendations, and then suggestions for future research.

5.2 Summary of the study

The thrust of the study was on identifying the determinants of bank spreads in commercial banks operating in Zimbabwe. The hypothesis of the study was that bank spreads are influenced by bank specific, industry specific and macroeconomic factors. Literature discussed the models for the determination of bank spreads such as the Monti-Klein Model and the Dealership model. These models premised that the role of banks is to provide liquidity to the economy and that the bank spread act as an incentive to perform this role. Banks major objective will be to earn maximum profits due to shareholder interests who desire returns for the funds invested in the banks.

Literature also identified lack of efficiency, lack of competition in credit markets, poor risk absorption capability and macroeconomic instability as the major drivers of bank spreads in developing countries. The major factors identified from literature as causes of wide spreads were overhead costs, non-interest income, capital adequacy, non-performing loans, and market share of deposits, bank size and inflation. The authors could not readily agree on the category of factors that had the greatest influence on bank spreads. Some believed that bank specific variables had much influence on bank spreads whilst others such as Chirwa and Mlachila (2004) believed that they were mainly determined at the macro level.

An explanatory research design was adopted to explain the casual relationships between the variables. The study employed quantitative methods on secondary data sourced from financial statements and RBZ publications and ZIMSTATS publications. A model was specified based on

literature to analyze the effects of micro and macro factors on bank spreads. Results from the regression analysis estimated by POLS showed that overhead costs, non-performing loans, non-interest income, capital adequacy, market share of deposits and inflation had an effect on the determination of bank spreads. The impact of non-interest income on bank spreads could not be established. These findings were in line with literature which postulates that bank specific variables have the greatest impact on bank spreads. Local banks were found to have the greatest influence on the widening bank spreads when compared to foreign banks owing to their greater financial flexibility. Also the lending rate was found to be highly volatile when measured against the deposit rate.

5.3 Conclusions

Basing on the findings the study reached at the following conclusions.

- The study revealed that bank spreads in Zimbabwe are very wide and they are not showing any signs of narrowing.

- The rise is attributable to bank specific, industry specific and macroeconomic factors. This led to the acceptance of the null hypothesis that stated that bank spreads are determined by bank specific, industry specific and macroeconomic variables. The firm specific variables have the greatest influence on bank spreads as shown by the number of variables that were statistically significant in the model estimation. These variables are the level of non-performing loans, overheads, bank size and capital adequacy. The degree of market power that a bank possess as measured by the share of market deposits is the industry variable that affect bank spreads. Stability in the economy as measured by bank spreads also determine spreads. This result auger well with past research such as that of Dermigurc-Kunt and Huizinga (1998) and Younus and Mjeri (2009).

- Evidence from the research also shows that foreign banks are more efficient when compared to local banks. A high degree of inefficiency and lack of competitiveness was recorded in local banks when compared to foreign owned bank. Therefore local banks were the major contributor to widening bank spreads in the multiple currency regimes.

- Lending rates are very volatile in Zimbabwe as compared with the deposit rate. This was shown by a strong correlation between the lending rate and bank interest rate spreads.

- Although the multiple currency regimes managed to bring economic stability, its adoption came with its own costs such as the loss of the lender of last resort and chronic shortage of liquidity in the financial sector which leads to rising costs of funds. Thus increasing financial burdens on banks which were compensated by rising costs of funds.

- The study was successful in identifying the main causes of widening bank spreads in Zimbabwe. However, it can be difficult to make future predictions using the study because the economic, political and the legal environment changes rapidly from time to time. The period 2009 to 2012 was generally de-regularized but by the beginning of 2013 the Central bank was moving towards regulation of interest rates.

5.4 Recommendations

The empirical findings of this study lead to the formulation of important policy implications that are discussed below:

5.4.1 Improving on bank efficiency

Commercial banks need to improve on their operational efficiency for bank spreads to lower. Improved efficiency in terms of costs reduction and improvement in asset quality will help to bring bank spreads down. This can be done by encouraging customers to use mobile banking facilities rather than the conventional banking methods which are expensive to run. It can be viewed that almost all the banks in Zimbabwe have a mobile money transmission service in place, what is needed is to place greater emphasis on the use of these products for their increased use. Econet Wireless engaged in a vigorous campaign of the use of Ecocash and the product has many users. The banks can use the same strategy to market their mobile services.

5.4.2 Improving on competition

The study established that banks that possess a greater market share charge high spread. Hence,there is need for the RBZ to instill competition in the commercial banking sector in order to reduce spreads. Usually if there are many players in the industry competition is likely to increase. However in Zimbabwe the commercial banking sector has many players but the industry still lacks competition. Generally it can be viewed that banks in Zimbabwe prosper on customer's lack of information to make choices which enables them to continue hiking spreads even if there are other cheap products in the market. Hence there is need to change focus on

measures to instill competition like putting in place measures that require banks to display in the banking halls the effective interest rates that they charge. Display of charges increases customer knowledge of prices which increase comparisons between banks thereby fostering competition.

5.4.3 Strengthening of local banks

Local banks are generally weak when viewed against foreign banks. Although the gap on the use of latest technology between foreign banks and local banks has closed in over the years, it can be seen that foreign banks are generally large in size and are adequately capitalized than local banks. These attributes create a competitive advantage for foreign banks which enables them to capture the large market share and possibly enjoy the economies of large scale production which enables them to charge lower spreads. Hence,local banks should increase the financial flexibility through adequate capitalization to enable them to compete effectively with the foreign owned banks.

5.4.4 Introduction of interest rate controls

The high degree of correlation between the bank spread and the lending rate shows that the pursuit of a market determined interest rate policy regime by the RBZ was not effective in bringing spreads down. The higher volatility of the lending rate shows that it is easy to transfer the costs of inefficiency to the customers by raising lending rates and lowering the deposit rate. When market forces fails to instill efficiency as in this case, there is need for the RBZ to reintroduce interest rate ceilings to limit the growth in the lending rates. This strategy should be approached with caution since the country is operating under extreme liquidity shortages and imposition of tight controls can harm the industry.

5.4.5 Adoption of partial dollarization

Faced with chronic liquidity challenges in the economy as a result of using full dollarization, an alternative for the RBZ will be to adopt partial dollarization. Under this system the domestic currency will be used alongside a foreign currency. This restores the central banks' control over money supply and at the same time maintains stability in the economy. The use of a bi-currency system will improve liquidity in the economy which will lower the costs of funds and ultimately lower spreads.

5.5 Suggestions for Future Studies

The prime focus of this research was on finding the micro and macro factors that affect bank spreads in Zimbabwe in the multiple currency environments. This study can further be extended by exploring the impact of the monetary policy on explaining bank spreads in Zimbabwe. With the adoption of full dollarization it would be interesting to note how this development has impacted on the role of the monetary policy in explaining bank spreads in Zimbabwe.

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APPENDICES

APPENDIX 1: DATA SET

Obs	?OVC	?NII	?MSD	?CAP	?BS	?SP	?TA	?INFL	?NPL	?RES
CBZ-2009S1	0.0273	0.0318	0.28	0.12	0.097	0.029	2.47E+08	0.005	0.141	-0.01235
CBZ-2009S2	0.047	0.0583	0.2649	0.111	0.2735	0.048	4.05E+08	0.056	0.035	0.044199
CBZ-2010S1	0.0304	0.0382	0.2588	0.111	0.2555	0.0483	5.40E+08	0.065	0.02	0.014042
CBZ-2010S2	0.0632	0.0441	0.2223	0.1142	0.276	0.067	6.50E+08	0.07	0.0041	0.025208
CBZ-2011S1	0.027	0.0158	0.26	0.1281	0.268	0.0378	8.16E+08	0.086	0.04	-0.00943
CBZ-2011S2	0.0598	0.0358	0.2275	0.1114	0.205	0.096	9.82E+08	0.075	0.06	-0.04094
CBZ-2012S1	0.03	0.04	0.2397	0.1142	0.215	0.1067	1.08E+09	0.065	0.06	-0.00436
CBZ-2012S2	0.064	0.0285	0.2281	0.129	0.21	0.292	1.12E+09	0.08	0.0512	-0.04847
SCB-2009S1	0.09	0.05	0.1277	0.19	0.097	0.04	1.43E+08	0.005	0.00013	-0.02643
SCB-2009S2	0.1018	0.0602	0.166	0.2059	0.2735	0.0401	2.70E+08	0.056	0.0002	0.037376
SCB-2010S1	0.1018	0.0602	0.166	0.2059	0.2555	0.0401	2.86E+08	0.065	0.034	0.006715
SCB-2010S2	0.1093	0.1027	0.0854	0.2215	0.276	0.085	2.82E+08	0.07	0.0234	0.031435
SCB-2011S1	0.10555	0.08145	0.1257	0.2137	0.268	0.06255	3.73E+08	0.086	0.017	-0.01616
SCB-2011S2	0.1096	0.1156	0.0756	0.2348	0.205	0.1241	3.25E+08	0.075	0.0186	-0.04743
SCB-2012S1	0.1093	0.1027	0.0854	0.2215	0.215	0.085	3.57E+08	0.065	0.023	-0.01522
SCB-2012S2	0.098	0.1071	0.0678	0.2003	0.21	0.0928	3.89E+08	0.08	0.0218	-0.04301
STANB-2009S1	0.05	0.036	0.198	0.001	0.097	0.03	1.72E+08	0.005	0.001	-0.01906
STANB-2009S2	0.0608	0.1078	0.1286	0.201	0.2735	0.0327	2.01E+08	0.056	0.024	0.055735
STANB-2010S1	0.0608	0.1078	0.1286	0.001	0.2555	0.0327	2.68E+08	0.065	0.018	0.035033
STANB-2010S2	0.0855	0.0735	0.1161	0.1784	0.276	0.065	3.40E+08	0.07	0.0194	0.034402
STANB-2011S1	0.073	0.091	0.122	0.0102	0.268	0.04885	3.54E+08	0.086	0.0102	0.003665
STANB-2011S2	0.0968	0.0859	0.0934	0.1716	0.205	0.0901	3.61E+08	0.075	0.0249	-0.04201
STANB-2012S1	0.0855	0.0735	0.1161	0.0194	0.215	0.065	4.21E+08	0.065	0.0194	-0.00205
STANB-2012S2	0.1	0.09	0.09	0.169	0.21	0.1	4.71E+08	0.08	0.03	-0.04248
FBC-2009S1	0.0501	0.0347	0.0411	0.34	0.097	0.1356	82789939	0.005	0.01	-0.01296
FBC-2009S2	0.14	0.04	0.07	0.35	0.2555	0.25	1.67E+08	0.056	0.0347	0.022957
FBC-2010S1	0.1385	0.0271	0.03	0.35	0.276	0.1224	1.39E+08	0.065	0.0347	0.031431
FBC-2010S2	0.14	0.05	0.04	0.14	0.268	0.15	2.36E+08	0.07	0.06	0.03631
FBC-2011S1	0.0754	0.0421	0.04	0.33	0.205	0.1226	18599734	0.086	0.0149	-0.10604
FBC-2011S2	0.13	0.07	0.05	0.14	0.215	0.14	2.80E+08	0.075	0.06	-0.02494
FBC-2012S1	0.1412	0.0325	0.0453	0.14	0.21	0.1596	2.40E+08	0.065	0.06	-0.01231
FBC-2012S2	0.11	0.05	0.06	0.17	0.272	0.13	3.92E+08	0.08	0.1014	0.033706
BAR-2009S1	0.0428	0.0454	0.0065	0.44	0.097	0.1695	1.17E+08	0.005	0.22	0.031546
BAR-2009S2	0.1018	0.0967	0.0906	0.43	0.2735	0.104	1.69E+08	0.056	0.07	0.045615
BAR-2010S1	0.1108	0.0944	0.0676	0.37	0.2555	0.104	1.74E+08	0.065	0.06	0.01456

BAR-2010S2	0.1485	0.91	0.07	0.45	0.276	0.0933	2.29E+08	0.07	0.04	0.012033
BAR-2011S1	0.094	0.9	0.0587	0.34	0.268	0.1024	2.37E+08	0.086	0.03	-0.00903
BAR-2011S2	0.1445	0.0991	0.0638	0.019	0.205	0.139	2.60E+08	0.075	0.1	-0.02791
BAR-2012S1	0.0663	0.0538	0.0507	0.038	0.215	0.0195	2.51E+08	0.065	0.1	0.022707
BAR-2012S2	0.1209	0.1065	0.0511	0.018	0.21	0.0979	2.82E+08	0.08	0.106	-0.02284
MET-2009S1	0.0584	0.1389	0.01	0.43	0.097	0.0314	4629381	0.005	0.067	-0.04816
MET-2009S2	0.1101	0.1781	0.01	0.562	0.2735	0.0312	30087941	0.056	0.056	0.02563
MET-2010S1	0.1101	0.1781	0.01	0.562	0.2555	0.0312	57150454	0.065	0.089	0.003879
MET-2010S2	0.1198	0.1207	0.0169	0.313	0.276	0.1117	65309523	0.07	0.1	0.030051
MET-2011S1	0.0637	0.0845	0.0155	0.227	0.268	0.098	70970174	0.086	0.08	0.004336
MET-2011S2	0.1118	0.068	0.023	0.251	0.205	0.173	1.05E+08	0.075	0.086	-0.04238
MET-2012S1	0.1198	0.1207	0.0169	0.313	0.215	0.1117	1.84E+08	0.065	0.14	0.00269
MET-2012S2	0.0899	0.0632	0.0335	0.27	0.21	0.1364	1.97E+08	0.08	0.1423	-0.02755
MBCA-2009S1	0.0523	0.061	0.1121	0.05	0.097	0.0202	1.08E+08	0.005	0.0835	0.005017
MBCA-2009S2	0.1308	0.0323	0.1121	0.152	0.2735	0.1964	91099133	0.056	0.0994	0.047426
MBCA-2010S1	0.1308	0.0323	0.1121	0.152	0.2555	0.1964	1.44E+08	0.065	0.0994	0.017253
MBCA-2010S2	0.0758	0.0467	0.05	0.15	0.276	0.1047	1.60E+08	0.07	0.043	0.046871
MBCA-2011S1	0.0527	0.0152	0.0397	0.1583	0.268	0.0511	1.64E+08	0.086	0.0738	0.017303
MBCA-2011S2	0.084	0.0605	0.0447	0.15	0.205	0.1138	1.81E+08	0.075	0.015	-0.03828
MBCA-2012S1	0.0758	0.0467	0.05	0.15	0.215	0.1047	1.92E+08	0.065	0.043	-0.00055
MBCA-2012S2	0.0835	0.0413	0.0319	0.2	0.21	0.1425	1.79E+08	0.08	0.017	-0.04388
KING-2009S1	0.12	0.05	0.09	0.18	0.097	0.11	55527802	0.005	0.02	-0.03473
KING-2009S2	0.1721	0.0691	0.0264	0.17	0.2735	0.111	88848083	0.056	0.02	0.043939
KING-2010S1	0.1721	0.0691	0.0654	0.17	0.2555	0.111	99695546	0.065	0.02	-0.00111
KING-2010S2	0.1576	0.0815	0.0204	0.07	0.276	0.1451	1.55E+08	0.07	0.02	0.036408
KING-2011S1	0.1176	0.0585	0.0516	-0.05	0.268	0.0797	1.69E+08	0.086	0.01	0.003054
KING-2011S2	0.1973	0.0974	0.0275	0.07	0.205	0.1064	1.34E+08	0.075	0.07	-0.04987
KING-2012S1	0.1576	0.0815	0.047	0.07	0.215	0.1451	1.63E+08	0.065	0.02	-0.01952
KING-2012S2	0.1568	0.1009	0.0314	0.1	0.21	0.0845	1.95E+08	0.08	0.1	-0.03833
NMB-2009S1	0.186	0.1823	0.02	0.2603	0.097	0.0868	23871826	0.005	0.0083	-0.05065
NMB-2009S2	0.19	0.18	0.016	0.2624	0.2735	0.08	39433027	0.056	0.008	0.024768
NMB-2010S1	0.186	0.1823	0.02	0.2603	0.2555	0.0868	71245513	0.065	0.0083	-0.00587
NMB-2010S2	0.15	0.09	0.03	0.1749	0.276	0.12	1.03E+08	0.07	0.03	0.032377
NMB-2011S1	0.1223	0.0541	0.0248	0.1066	0.268	0.1042	1.30E+08	0.086	0.0037	0.008134
NMB-2011S2	0.1	0.06	0.04	0.1437	0.205	0.13	1.67E+08	0.075	0.08	-0.01043
NMB-2012S1	0.1494	0.091	0.0366	0.1749	0.215	0.1184	1.81E+08	0.065	0.0666	-0.00590
NMB-2012S2	0.09	0.07	0.05	0.155	0.21	0.14	2.27E+08	0.08	0.16	0.005905
BANC-2009S1	0.0726	0.04	0.0298	0.15	0.097	0.09	42587999	0.005	0.045	-0.00715
BANC-2009S2	0.1293	0.06	0.0282	0.2	0.2735	0.1552	72392550	0.056	0.063	0.05537
BANC-2010S1	0.1293	0.06	0.0282	0.2	0.2555	0.1552	1.30E+08	0.065	0.063	0.027084

BANC-2010S2	0.0701	0.0439	0.063	0.19	0.276	0.1395	2.36E+08	0.07	0.043	0.048381
BANC-2011S1	0.0402	0.0237	0.044	0.195	0.268	0.0914	3.81E+08	0.086	0.0537	0.026379
BANC-2011S2	0.0622	0.0568	0.0941	0.19	0.205	0.0873	3.50E+08	0.075	0.058	-0.03043
BANC-2012S1	0.0701	0.0439	0.063	0.19	0.215	0.1395	4.37E+08	0.065	0.043	0.007688
BANC-2012S2	0.0637	0.05	0.103	0.18	0.21	0.1287	5.58E+08	0.08	0.142	-0.01654
ZB-2009S1	0.17	0.02	0.0001	0.14	0.097	0.07	29474468	0.005	0.0355	-0.02878
ZB-2009S2	0.2401	0.0243	0.039	0.12	0.2735	0.08	77708466	0.056	0.05	0.031627
ZB-2010S1	0.182	0.056	0.045	0.123	0.2555	0.1123	1.27E+08	0.065	0.04	0.011864
ZB-2010S2	0.1707	0.0927	0.0391	0.13	0.276	0.1371	1.54E+08	0.07	0.055	0.03075
ZB-2011S1	0.167	0.0945	0.04	0.14	0.268	0.165	1.87E+08	0.086	0.07	-0.00602
ZB-2011S2	0.1479	0.1125	0.0436	0.148	0.205	0.1867	2.05E+08	0.075	0.0802	-0.03927
ZB-2012S1	0.1567	0.1234	0.05	0.14	0.215	0.17	2.31E+08	0.065	0.15	0.002826
ZB-2012S2	0.1644	0.1164	0.046	0.1409	0.21	0.1808	2.56E+08	0.08	0.184	-0.02784
TN-2009S1	0.0584	0.1389	0.01	0.0000	0.097	0.097	5726751	0.005	0.0643	-0.01691
TN-2009S2	0.1101	0.1781	0.01	0.0000	0.2735	0.17	22131736	0.056	0.084	0.062738
TN-2010S1	0.0637	0.0845	0.0155	0.0000	0.2555	0.178	36119219	0.065	0.0679	0.039367
TN-2010S2	0.1198	0.1207	0.0169	0.0000	0.276	0.194	52697733	0.07	0.0271	0.035013
TN-2011S1	0.0744	0.0488	0.015	0.0000	0.268	0.176	65745569	0.086	0.0783	0.015484
TN-2011S2	0.1118	0.068	0.0234	0.0000	0.205	0.172	70765317	0.075	0.079	-0.03318
TN-2012S1	0.0411	0.0271	0.0334	0.0000	0.215	0.1426	93493301	0.065	0.0702	0.014718
TN-2012S2	0.0899	0.0632	0.0335	0.0000	0.21	0.1139	98787677	0.08	0.18	-0.01406

SOURCE :Financial statements,Zimstats, RBZ

APPENDIX 2: CORRELATION MATRIX

	BS	CAP	INFL	MSD	NII	NPL	OVC	TA
BS	1.000000	-0.155534	0.759033	-0.011064	0.138275	0.027852	0.219012	0.112190
CAP	-0.155534	1.000000	0.040001	-0.187627	-0.063777	0.032892	-0.058633	-0.061764
INFL	0.759033	0.040001	1.000000	-0.045306	0.083433	-0.127922	0.105868	0.315312
MSD	-0.011064	-0.187627	-0.045306	1.000000	-0.132499	-0.182486	-0.484409	0.732695
NII	0.138275	-0.063777	0.083433	-0.132499	1.000000	0.328547	0.162108	-0.095939
NPL	0.027852	0.032892	-0.127922	-0.182486	0.328547	1.000000	0.070255	-0.145654
OVC	0.219012	-0.058633	0.105868	-0.484409	0.162108	0.070255	1.000000	-0.391934
TA	0.112190	-0.061764	0.315312	0.732695	-0.095939	-0.145654	-0.391934	1.000000

APPENDIX 3: PANEL UNIT ROOT TESTS

UNIT ROOT TEST FOR OVERHEADS (OVC)

Null Hypothesis: Unit root (individual unit root process)
Date: 05/08/13 Time: 11:13
Sample: 2009S1 2012S2
Series: CBZOVC, SCBOVC, STANBOVC, FBCOVC, BAROVC, METOVC, MBCAOVC, KINGOVC, NMBOVC, BANCOVC, ZBOVC, TNOVC
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic selection of lags based on SIC: 0 to 1
Total number of observations: 76
Cross-sections included: 12

Method	Statistic	Prob.**
ADF - Fisher Chi-square	44.1087	0.0074
ADF - Choi Z-stat	-2.60306	0.0046

** Probabilities for Fisher tests are computed using an asympotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results ?OVC

Series	Prob.	Lag	Max Lag	Obs
CBZOVC	0.3963	1	1	6
SCBOVC	0.0811	0	1	7
STANBOVC	0.5520	1	1	6
FBCOVC	0.1208	1	1	6
BAROVC	0.0224	0	1	7
METOVC	0.0964	1	1	6
MBCAOVC	0.0464	1	1	6
KINGOVC	0.0952	1	1	6
NMBOVC	0.7282	0	1	7
BANCOVC	0.0571	1	1	6
ZBOVC	0.3405	0	1	7
TNOVC	0.9141	1	1	6

UNIT ROOT TESTS FOR NON INTEREST INCOME (NII)

Null Hypothesis: Unit root (individual unit root process)
Date: 05/08/13 Time: 11:17
Sample: 2009S1 2012S2
Series: CBZNII, SCBNII, STANBNII, FBCNII, BARNII, METNII, MBCANII, KINGNII, NMBNII, BANCNII, ZBNII, TNNII
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic selection of lags based on SIC: 0 to 1
Total number of observations: 79
Cross-sections included: 12

Method	Statistic	Prob.**
ADF - Fisher Chi-square	41.7012	0.0139
ADF - Choi Z-stat	-2.32799	0.0100

** Probabilities for Fisher tests are computed using an asympotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results ?NII

Series	Prob.	Lag	Max Lag	Obs
CBZNII	0.1096	0	1	7
SCBNII	0.5928	1	1	6
STANBNII	0.0304	1	1	6
FBCNII	0.0600	0	1	7
BARNII	0.2337	1	1	6
METNII	0.7134	0	1	7
MBCANII	0.0217	0	1	7
KINGNII	0.7820	1	1	6
NMBNII	0.6399	0	1	7
BANCNII	0.1240	0	1	7
ZBNII	0.5428	0	1	7
TNNII	0.0608	1	1	6

UNIT ROOT TESTS FOR CAPITAL ADEQUACY (CAP)

Null Hypothesis: Unit root (individual unit root process)
Date: 05/08/13 Time: 11:35
Sample: 2009S1 2012S2
Series: CBZCAP, SCBCAP, STANBCAP, FBCCAP, BARCAP, METCAP, MBCACAP, KINGCAP, NMBCAP, BANCCAP, ZBCAP, TNCAP
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic selection of lags based on SIC: 0 to 1
Total number of observations: 77
Cross-sections included: 12

Method	Statistic	Prob.**
ADF - Fisher Chi-square	44.4344	0.0068
ADF - Choi Z-stat	-2.74534	0.0045

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results ?CAP

Series	Prob.	Lag	Max Lag	Obs
CBZCAP	0.4959	1	1	6
SCBCAP	0.0000	1	1	6
STANBCAP	0.0223	0	1	7
FBCCAP	0.9293	1	1	6
BARCAP	0.0168	0	1	7
METCAP	0.8020	0	1	7
MBCACAP	0.8271	1	1	6
KINGCAP	0.9441	1	1	6
NMBCAP	0.9987	1	1	6
BANCCAP	0.2460	0	1	7
ZBCAP	0.9993	1	1	6
TNCAP	0.7155	0	1	7

UNIT ROOT TEST FOR BANK SPREAD (BS)

Null Hypothesis: Unit root (individual unit root process)
Date: 05/08/13 Time: 11:20
Sample: 2009S1 2012S2
Series: CBZBS, SCBBS, STANBBS, FBCBS, BARBS, METBS, MBCABS, KINGBS, NMBBS, BANCBS, ZBBS, TNBS
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic selection of lags based on SIC: 0 to 1
Total number of observations: 83
Cross-sections included: 12

Method	Statistic	Prob.**
ADF - Fisher Chi-square	104.800	0.0000
ADF - Choi Z-stat	-7.58764	0.0000

** Probabilities for Fisher tests are computed using an asympotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results ?BS

Series	Prob.	Lag	Max Lag	Obs
CBZBS	0.0095	0	1	7
SCBBS	0.0095	0	1	7
STANBBS	0.0095	0	1	7
FBCBS	0.3193	1	1	6
BARBS	0.0095	0	1	7
METBS	0.0095	0	1	7
MBCABS	0.0095	0	1	7
KINGBS	0.0095	0	1	7
NMBBS	0.0095	0	1	7
BANCBS	0.0095	0	1	7
ZBBS	0.0095	0	1	7
TNBS	0.0095	0	1	7

UNIT ROOT TESTS FOR NON-PERFORMING LOANS (NPL)

Null Hypothesis: Unit root (individual unit root process)
Date: 05/08/13 Time: 11:25
Sample: 2009S1 2012S2
Series: CBZNPL, SCBNPL, STANBNPL, FBCNPL, BARNPL, METNPL, MBCANPL, KINGNPL, NMBNPL, BANCNPL, ZBNPL, TNNPL
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic selection of lags based on SIC: 0 to 1
Total number of observations: 73
Cross-sections included: 11 (1 dropped)

Method	Statistic	Prob.**
ADF - Fisher Chi-square	42.7493	0.0051
ADF - Choi Z-stat	-2.61374	0.0045

** Probabilities for Fisher tests are computed using an asympotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results ?NPL

Series	Prob.	Lag	Max Lag	Obs
CBZNPL	0.2128	1	1	6
SCBNPL	0.2136	0	1	7
STANBNPL	0.1208	1	1	6
FBCNPL	0.3005	0	1	7
BARNPL	0.8263	0	1	7
METNPL	0.2420	1	1	6
MBCANPL	0.0148	0	1	7
KINGNPL	0.4325	0	1	7
NMBNPL	0.6102	0	1	7
BANCNPL	0.0014	0	1	7
ZBNPL	0.2821	1	1	6
TNNPL		Dropped from Test		

UNIT ROOT TESTS FOR TOTAL ASSETS [LOG(TA)]

Null Hypothesis: Unit root (individual unit root process)
Date: 05/08/13 Time: 11:42
Sample: 2009S1 2012S2
Series: LOG(CBZTA), LOG(SCBTA), LOG(STANBTA), LOG(FBCTA), LOG(BARTA), LOG(METTA), LOG(MBCATA), LOG(KINGTA), LOG(NMBTA), LOG(BANCTA), LOG(ZBTA), LOG(TNTA)
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic selection of lags based on SIC: 0 to 1
Total number of observations: 81
Cross-sections included: 12

Method	Statistic	Prob.**
ADF - Fisher Chi-square	91.4514	0.0000
ADF - Choi Z-stat	-5.78158	0.0000

** Probabilities for Fisher tests are computed using an asympotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results LOG(?TA)

Series	Prob.	Lag	Max Lag	Obs
LOG(CBZTA)	0.0008	0	1	7
LOG(SCBTA)	0.4997	1	1	6
LOG(STANBTA)	0.3788	0	1	7
LOG(FBCTA)	0.1047	0	1	7
LOG(BARTA)	0.0539	1	1	6
LOG(METTA)	0.0115	0	1	7
LOG(MBCATA)	0.6131	0	1	7
LOG(KINGTA)	0.1942	0	1	7
LOG(NMBTA)	0.0102	1	1	6
LOG(BANCTA)	0.1442	0	1	7
LOG(ZBTA)	0.0000	0	1	7
LOG(TNTA)	0.0003	0	1	7

UNIT ROOT TESTS FOR INFLATION (INFL)

Null Hypothesis: Unit root (individual unit root process)
Date: 05/08/13 Time: 11:45
Sample: 2009S1 2012S2
Series: CBZINFL, SCBINFL, STANBINFL, FBCINFL, BARINFL, METINFL, MBCAINFL, KINGINFL, NMBINFL, BANCINFL, ZBINFL, TNINFL
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic selection of lags based on SIC: 0
Total (balanced) observations: 84
Cross-sections included: 12

Method	Statistic	Prob.**
ADF - Fisher Chi-square	131.728	0.0000
ADF - Choi Z-stat	-9.14863	0.0000

** Probabilities for Fisher tests are computed using an asympotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results ?INFL

Series	Prob.	Lag	Max Lag	Obs
CBZINFL	0.0041	0	1	7
SCBINFL	0.0041	0	1	7
STANBINFL	0.0041	0	1	7
FBCINFL	0.0041	0	1	7
BARINFL	0.0041	0	1	7
METINFL	0.0041	0	1	7
MBCAINFL	0.0041	0	1	7
KINGINFL	0.0041	0	1	7
NMBINFL	0.0041	0	1	7
BANCINFL	0.0041	0	1	7
ZBINFL	0.0041	0	1	7
TNINFL	0.0041	0	1	7

UNIT ROOT TESTS FOR MARKET SHARE OF DEPOSITS (MSD)

Null Hypothesis: Unit root (individual unit root process)
Date: 05/08/13 Time: 23:08
Sample: 2009S1 2012S2
Series: CBZMSD, SCBMSD, STANBMSD, FBCMSD, BARMSD, METMSD, MBCAMSD, KINGMSD, NMBMSD, BANCMSD, ZBMSD, TNMSD
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic selection of lags based on SIC: 0 to 1
Total number of observations: 78
Cross-sections included: 12

Method	Statistic	Prob.**
ADF - Fisher Chi-square	79.2472	0.0000
ADF - Choi Z-stat	-2.96047	0.0015

** Probabilities for Fisher tests are computed using an asympotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results ?MSD

Series	Prob.	Lag	Max Lag	Obs
CBZMSD	0.0030	1	1	6
SCBMSD	0.5850	0	1	7
STANBMSD	0.0006	0	1	7
FBCMSD	0.0015	0	1	7
BARMSD	0.0013	1	1	6
METMSD	0.9729	1	1	6
MBCAMSD	0.7065	0	1	7
KINGMSD	0.0257	1	1	6
NMBMSD	0.9716	1	1	6
BANCMSD	0.8916	1	1	6
ZBMSD	0.0002	0	1	7
TNMSD	0.9129	0	1	7

UNIT ROOT TESTS FOR THE RESIDUAL

Null Hypothesis: Unit root (individual unit root process)
Date: 05/15/13 Time: 19:49
Sample: 2009S1 2012S2
Series: CBZRES, SCBRES, STANBRES, FBCRES, BARRES, METRES, MBCARES, KINGRES, NMBRES, BANCRES, ZBRES, TNRES
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic selection of lags based on SIC: 0
Total (balanced) observations: 84
Cross-sections included: 12

Method	Statistic	Prob.**
ADF - Fisher Chi-square	39.6010	0.0236
ADF - Choi Z-stat	-2.47427	0.0067

** Probabilities for Fisher tests are computed using an asympotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results ?RES

Series	Prob.	Lag	Max Lag	Obs
CBZRES	0.4881	0	1	7
SCBRES	0.3671	0	1	7
STANBRES	0.4689	0	1	7
FBCRES	0.2441	0	1	7
BARRES	0.4047	0	1	7
METRES	0.0561	0	1	7
MBCARES	0.5480	0	1	7
KINGRES	0.2191	0	1	7
NMBRES	0.0044	0	1	7
BANCRES	0.2831	0	1	7
ZBRES	0.1698	0	1	7
TNRES	0.2121	0	1	7

APPENDIX 3: POOLED REGRESSION RESULTS

Dependent Variable: ?BS
Method: Pooled Least Squares
Date: 05/08/13 Time: 11:46
Sample: 2009S1 2012S2
Included observations: 8
Cross-sections included: 12
Total pool (balanced) observations: 96

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.340288	0.099809	3.409384	0.0010
?OVC	0.227693	0.089376	2.547591	0.0126
?NII	-0.001564	0.029349	-0.053303	0.9576
?CAP	-0.169829	0.079902	-2.125461	0.0364
?MSD	0.244124	0.086909	2.808968	0.0061
LOG(?TA)	-0.015534	0.005943	-2.613619	0.0105
?NPL	0.066056	0.030272	2.182081	0.0318
INFL	2.146821	0.193033	11.12154	0.0000

R-squared	0.674272	Mean dependent var	0.224984
Adjusted R-squared	0.648362	S.D. dependent var	0.056003
S.E. of regression	0.033209	Akaike info criterion	-3.892311
Sum squared resid	0.097052	Schwarz criterion	-3.678615
Log likelihood	194.8309	F-statistic	26.02345
Durbin-Watson stat	1.748669	Prob(F-statistic)	0.000000

APPENDIX 4: HETEROSCEDASTICITY TEST RESULTS

White Heteroskedasticity Test:

F-statistic	7.555184	Probability	0.156345
Obs*R-squared	16.55157	Probability	0.167258

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 05/08/13 Time: 17:18
Sample: 1 96
Included observations: 96

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.060468	0.032906	1.837592	0.0698
CAP	-0.012421	0.008931	-1.390786	0.1681
CAP^2	0.067159	0.049836	1.347607	0.1815
INFL	0.041153	0.025391	1.620801	0.1089
INFL^2	-0.130264	0.274271	-0.474947	0.6361
MSD	0.017529	0.009500	1.845162	0.0687
MSD^2	-0.037461	0.032085	-1.167543	0.2464
NII	-0.004751	0.005164	-0.919960	0.3603
NII^2	0.003577	0.005382	0.664605	0.5082
NPL	0.007409	0.002983	2.483670	0.0151
NPL^2	-0.013019	0.006568	-1.982292	0.0508
OVC	0.006763	0.015991	0.422928	0.6735
OVC^2	-0.034763	0.063488	-0.547549	0.5855
LOG(TA)	-0.005488	0.003608	-1.521109	0.1321
(LOG(TA))^2	0.000115	9.89E-05	1.159406	0.2497

R-squared	0.306344	Mean dependent var	0.001011
Adjusted R-squared	0.186453	S.D. dependent var	0.001368
S.E. of regression	0.001234	Akaike info criterion	-10.41518
Sum squared resid	0.000123	Schwarz criterion	-10.01450
Log likelihood	514.9286	F-statistic	2.555184
Durbin-Watson stat	2.169583	Prob(F-statistic)	0.004386