THE DETERMINANTS OF BANKING SECTOR INTEREST RATE SPREADS IN ZAMBIA

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DECLARATION

I CHARLES MASILI BANDA declare that this dissertation is my own work and that it has not been submitted for the degree at this or any other university.

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CERTIFICATE OF APPROVAL

This dissertation of CHARLES MASILI BANDA is approved as partial fulfilling the requirements for the award of the Master of Arts Degree in Economics by the University of Zambia.

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ABSTRACT

Financial intermediation is essential for economic development. The consensus is that Zambia needs a stable and efficient banking system in order to finance both private and public investment and expenditures. The effectiveness of the banking system in channelling funds from surplus to deficit actors is often gauged by examining the spread between lending and deposit rates and by assessing the degree of operational efficiency of the banking industry. Although Zambia has made some progress since the deregulation of its banking system, interest rate spreads remain absolutely high. When the spread between lending and deposit interest rates is too large, it is generally regarded as a considerable impediment to the expansion and development of financial intermediation, as it discourages potential savers with low returns on deposits and limits financing for potential borrowers, thus reducing feasible investment opportunities and therefore the growth potential of the economy. However, Zambia's experience indicates a widening spread in the post-liberalization period. This research will therefore contribute to fill the knowledge gap by examining why interest rate spreads are still persistently high in Zambia despite successful financial reforms.

The aim of this study has been to investigate the levels and trends in interest rate spreads, to document the key macroeconomic and market determinants of interest rate spreads and to provide policy options that would help to narrow the interest rate spreads so as to enhance the efficiency of the Banking Sector and hence economic growth and development of Zambia. In particular, the study investigates the effects of inflation, exchange rate volatility, reserve requirements and discount rates on interest rate spreads. The study uses Ordinary Least Squares to estimate the Log-Linear regression model to explain the main determinants of interest rate spreads in Zambia. Quarterly time series data is used from 1995 to 2008 and it was collected from the Bank of Zambia. The Dickey-Fuller and Augmented Dickey- Fuller Tests were performed to determine if the variables were stationary and to determine their order of integration. To avoid spurious results, a cointegration analysis using the Johansen Maximum Likelihood ratio test was done to determine whether the variables are cointegrating. The log- linear empirical model was estimated by Ordinary Least Squares using EViews econometric Package. To ensure that the model was adequate and that consistent and unbiased parameter estimates were obtained, various diagnostic tests were conducted. The study checked and corrected for violations of the standard assumptions of the regression analysis. The Ramsey RESET test was also conducted to ensure that model was correctly specified.

The study found exchange rate volatility and inflation rate to be statistically insignificant. Hence the government should not use them in an attempt to influence interest rate spreads as such policies are bound to fail. However, the study found the lag of the interest rate spread, the discount rate and reserve requirements to be positive and statistically significant. Hence policies targeting these are likely to be more effective at reducing the persistently high interest rate spreads.

DEDICATION

TO MY LATE MUM AND DAD

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LIST OF ABBREVIATIONS

ABC	- African Banking Corporation
ADF	- Augmented Dickey Fuller
ALR	- Average Lending Rate
AR	- Autoregression
ARCH	- Autoregressive Conditional Heteroscedasticity
ASR	- Average Savings Rate
BFSA	- Banking and Financial Services Act
BNKDEV	- Bank Development
BoZ	- Bank of Zambia
CPI	- Consumer Price Index
CROWD	- Government borrowing
DBZ	- Development Bank of Zambia
DISRATE	- Discount Rate
DF	- Dickey Fuller
E-Views	- Econometric Views
GDP	- Gross Domestic Product
GDPpc	- Per Capita Gross Domestic Product
INFL	- Inflation
IMF	- International Monetary Fund
IRS	- Interest Rate Spreads
JB	- Jarque- Bera
LUSE	- Lusaka Stock Exchange
Ltd	- Limited
Plc	- Private Limited Company
NATSAVE	- National Savings and Credit Bank

NBFIs	- Non- Bank Financial Institutions
OLS	- Ordinary Least Squares
PIA	- Pensions and Insurance Authority
RES	- Reserve Requirements
RESET	- Regression Specification Error Test
SEC	- Securities and Exchange Commission
TBILL	- Treasury Bill
VAR	- Vector Autoregression
WALBR	- Weighted Average Lending Base Rate
XRATVOL	- Exchange Rate Volatility
Z	- Zambia
ZNCB	- Zambia National Commercial Bank

CHAPTER ONE

INTRODUCTION

1.0 Background to the Study

Financial intermediation is essential for economic development. Some authors have provided evidence of a causal link between the degree of financial intermediation and economic growth. The consensus is that Zambia needs a stable and efficient banking system, next to the gradual development of financial markets, in order to finance both private and public investment and expenditures. The effectiveness of the banking system in channelling funds from surplus to deficit actors is often gauged by examining the spread between lending and deposit rates and by assessing the degree of operational efficiency of the banking industry. Although Zambia has made some progress since the deregulation of its banking system, interest margins remain absolutely high.

However, the interpretation of relatively high interest margins involves a trade-off. On the one hand, high margins are associated with a low degree of efficiency and non-competitive market conditions. On the other hand, high margins may be a reflection of an inadequate regulatory banking environment and a high degree of information asymmetry. In such circumstances, high margins would be indicative of high risk premia. If, in this type of environment, competition increases, it might induce gambling behavior by banks, causing financial instability. Beck, Demirguc-Kunt and Levine (2003), for example, conclude that highly concentrated banking systems are less likely to suffer from crises. Therefore, in less developed economies relatively high bank margins may be necessary, at least temporarily, to sustain bank franchise value and avoid financial instability.

The margin between average lending and average deposit interest rate in the banking system in any economy is not unusual. In fact, such a margin constitutes an incentive for a bank to continue to

remain in the industry. Magnitude of the spread, however, varies across the world. It is actually inverse to the degree of efficiency of the financial sector, which is an offshoot of a competitive environment. The nature and efficiency of the financial sectors have been found to be the major reasons behind differences in interest rate spreads in countries across the world. In economies with weak financial sectors, the intermediation costs, which are involved in deposit mobilization and channelling them into productive uses are much larger. They have been found to be responsible for high spreads.

Quaden (2004), for example, argues that a more efficient banking system benefits the real economy by allowing "higher expected returns for savers with a financial surplus, and lower borrowing costs for investing in new projects that need external finance." Therefore, if the banking sector's interest rate spread is large, it discourages potential savers due to low returns on deposits and thus limits financing for potential borrowers. Valverde et al (2004) elucidate by noting that because of the costs of intermediating between savers and borrowers, only a fraction of the savings mobilized by banks can be finally channelled into investments.

It is now widely recognised that a developed and efficient system of financial intermediation is an important precondition for successful long-term economic growth. In Zambia, the role played by commercial banks in efficiently allocating resources is particularly important as funds are often scarce and nascent enterprises usually have few other sources of capital. The interest rates on deposits and loans offered by the commercial banks, and the interest rate spread (IRS) that captures the difference between income from assets and the costs of liabilities, are particularly important because they reflect the costs and therefore efficiency of financial intermediation. Moreover, since

high interest rates on loans discourage potential investors and limit feasible investment opportunities, interest rates and the interest rate spread (IRS) have important implications for economic growth and development for Zambia.

In 2006 following lower inflation and yield rates on government securities, commercial banks nominal lending interest rates in Zambia declined. The weighted average lending base rate (WALBR) and the average lending rate (ALR) each declined by 6.0 percentage points to 21.6% and 27.9% respectively. However, the average savings rate (ASR) for amounts more than K100, 000 and the 30- day deposit rate for amounts over K20 million remained unchanged at 6.1% and 8.4% respectively. Interest rate spreads narrowed during the year, implying improved financial intermediation (Bank of Zambia Annual Report, 2006).

Commercial bank lending and time deposit interest rates increased marginally while the savings rate remained unchanged during the period January to June 2008. The average lending rate (ALR) increased by 0.2 percentage points to 24.6% from 24.4% in December 2007. The 30- day deposit rate for amounts above K20 million edged up to 5.0% from 4.8% while the average savings rate (ASR) for amounts above K100, 000 was unchanged at 4.8% in the first half of 2008. In line with these developments, the spread between ALR and ASR increased to 19.8 percentage points in the first half of 2008 from 19.6 percentage points in December 2007 (Bank of Zambia Monetary Policy Statement July- December 2008).

With a successful financial reform, the interest rate spread should narrow to reflect gained efficiency in the intermediation process and reduced costs of transactions with improved market

competitiveness. The widening spread in the Zambian market in the post-liberalization period may indicate a combination of market inefficiency and increased costs of intermediation. The spread represents the failure to meet prerequisites for successful financial liberalization including lack of fiscal discipline, financial instability and macroeconomic instability. It also shows poor sequencing in the shift to monetary policy tools where reserve requirements continued to take priority in curbing inflationary pressure.

1.1 Statement of the Problem

A key variable in the financial system is the spread between lending and deposit interest rates. When it is too large, it is generally regarded as a considerable impediment to the expansion and development of financial intermediation, as it discourages potential savers with low returns on deposits and limits financing for potential borrowers, thus reducing feasible investment opportunities and therefore the growth potential of the economy. Financial systems in developing countries have been shown to exhibit significantly and persistently larger intermediation spreads on average than those in developed countries (Hanson and de Rezende Rocha, 1986). These high spreads have frequently been attributed to such factors as high operating costs, financial taxation or repression, lack of competition, and high inflation rates. Banks, in their role as financial intermediaries, face substantial uncertainty which can add to spreads. This uncertainty is due to the indeterminate timing of loan demand and the supply of deposits. Uncertainty can be exacerbated by macroeconomic instability, owing to the limited contractual redress available to banks in the event of default. Consequently, even in a world of highly competitive banking markets, positive spreads (above and beyond what is needed to generate normal profits) would still exist as long as transaction uncertainty is present.

Prior to Zambia's economic reforms of the 1990's, the financial sector was heavily controlled. Under this regime of administrative controls, the financial system remained under-developed and repressed. Since 1992, following the financial reforms in Zambia, interest rate controls were removed. Although lending rates have become positive in real terms, virtually all real savings rates are still negative, thereby discouraging savings in the banking system and giving rise to large interest rate spreads in the banking sector.

During the post-liberalization period, we expect the spread to narrow to reflect efficiency gains and reduced transaction costs with the removal of distortionary policies and strengthening of the institutional arrangements. However, Zambia's experience indicates a widening spread in the post-liberalization period. This has important implications for the growth and development of Zambia, as numerous authors suggest a critical link between the efficiency of bank intermediation and economic growth.

1.2 Objectives of the Study

The overall objective of this study is to analyze the level and trends in interest rates spreads and to document the key macroeconomic and market determinants of interest rate spreads in Zambia over the 1995 - 2008 period. The study has three (3) specific objectives as outlined below:

i) To determine the macroeconomic and market determinants of interest rate spreads in Zambia

ii) To analyze the levels and trend in interest rate spreads in Zambia from 1995 to 2008

iii) To provide policy options that would help to narrow the interest rate spreads in Zambia so as to enhance the efficiency of the Banking Sector and hence economic growth and development.

1.3 Significance of the Study

So far, there has been no definitive study in Zambia on actual causes or determinants of persistently high interest rate spreads. This paper attempted to fill this research gap. There is limited number of empirical studies on interest rate spreads in Zambia despite realizing that interest rate spreads are persistently high. Higher interest rate spreads is indicative of inefficiency in the banking sector. This has important implications for the growth and development of Zambia as numerous authors suggest a critical link between the efficiency of bank intermediation and economic growth. Therefore, if the banking sector's interest rate spread is large, it discourages potential savers due to low returns on deposits and thus limits financing for potential borrowers. Because of the costs of intermediating between savers and borrowers, only a fraction of the savings mobilized by banks can be finally channelled into investments. This ultimately reduces lending, investment and economic growth.

These implications of banking sector inefficiency have spurred numerous debates in developing countries about the determinants of banking sector interest rate spreads. Studies have shown that there is a pervasive view amongst some stakeholders that high interest rate spreads are caused by the internal characteristics of the banks themselves, such as their tendency to maximize profits in an oligopolistic market, while many others argue that the spreads are imposed by the macroeconomic, regulatory and institutional environment in which banks operate. These debates can only be resolved through an objective and quantitative analysis of the determinants of the banking sector interest rate spreads in developing countries and in this case Zambia in particular.

Deposit-lending rate spreads are closely related to the banking sector's ability to channel savings into productive uses. Several studies have looked at the causes and implications of high spreads, but in some regions, particularly Africa, spreads have received less attention. The purpose of this study

was to address part of this gap by examining interest rate spreads in Zambia. The study will be of great relevance to policy makers because it will examine the determinants of interest rate spreads in Zambia.

1.4 Scope of the Study

This study is confined to the period from 1995 - 2008 which covers the Post-liberalization period. This period is chosen because it represents the period in which distortionary policies such as ceilings on interest rates were removed and the market institutional arrangements have been strengthened.

1.5 Organisation of the Study

This study is divided into six chapters. The first chapter introduces the study. Chapter two looks at the review of literature. The third chapter looks at the overview of the Banking Sector in Zambia. This chapter also looks at the structure of the financial sector, financial policies, interest rate controls before liberalization, financial liberalization and the Banking Sector reforms among others. Chapter four outlines the methodology and estimation techniques. In chapter five, the analysis of the results are presented while chapter six concludes with a summary and policy options are provided.

CHAPTER TWO

LITERATURE REVIEW

The spread or margin between lending and deposit interest rates is a key variable in the financial system. It reflects the additional cost of borrowing related to intermediation activities performed by banks in linking borrowers with the ultimate fund lenders. When it is too large, it can contribute to financial disintermediation as it discourages potential savers with too low returns on deposits and limits financing for potential borrowers, thus reducing feasible investment opportunities and therefore the growth potential of the economy.

In a study of the monetary policy regime and interest rate spreads in Barbados, Wendell and Valderrama (2006) found that the factors advanced in the literature on the determinants of bank spreads are the macroeconomic environment, the banking sector's market structure, bank-specific factors, and financial regulation. With respect to the first determinant, macroeconomic imbalances are generally associated with high bank spreads. Instability in the macroeconomy is likely to increase the probability of default by bank debtors. Exchange rate instability and high and variable inflation can constrain corporations' and households' ability to meet their loan obligations, if it adversely affects their balance sheets. This is supported by empirical studies for developing countries, which find a positive relationship between inflation and spreads (Brock and Rojas-Suarez, 2000; Demirguc-Kunt and Huizinga, 1999).

Brock and Rojas-Suarez (2000) apply the two-step procedure for a sample of five Latin American countries (Argentina, Bolivia, Colombia, Chile, and Peru). For each country, the first stage regressions for the bank interest spread include variables controlling for non-performing loans, capital ratio, operating costs, a measure of liquidity (the ratio of short term assets to total deposits)

and time dummies. The coefficients on the time dummies are estimates of the spread. Their results show positive coefficients for capital ratio (statistically significant for Bolivia and Colombia), cost ratio (statistically significant for Argentina and Bolivia), and the liquidity ratio (statistically significant for Bolivia, Colombia, and Peru). As for the effects of non-performing loans, the evidence is mixed. Apart from Colombia, where the coefficient for non-performing loans is positive and statistically significant, for the other countries the coefficient is negative (statistically significant for Argentina and Peru). The authors explain these findings as "a result of inadequate provisioning for loan losses: higher non-performing loans would reduce banks' income, thereby lowering the spread in the absence of adequate loan loss reserves". The result for Argentina is striking given the opposite findings reported by Catão (1998). In the second stage, Brock and Rojas-Suarez (2000) run a regression for the measure of "pure" bank spreads on macroeconomic variables reflecting interest rate volatility, inflation rate and GDP growth rate. Their results show that interest rate volatility increases bank spread in Bolivia and Chile; the same happens with inflation in Colombia, Chile and Peru. For the other cases, the coefficients are not statistically significant. On balance, bank spreads in Bolivia are explained by micro variables, while bank spreads in Chile and Colombia are accounted for by both macro and micro factors. As for Argentina and Peru, there is still a large fraction of the spread that cannot be explained by any of the above factors.

Macroeconomic instability may increase bank spreads through its impact on financial market volatility. According to this view, bank spreads are regarded as a hedging tool against the reinvestment and refinancing risks arising from fluctuations in interest rates, owing to the endemic maturity mismatch between banks' assets and liabilities.

In the Caribbean context, Craigwell and Moore (2002), based on aggregate banking data for 10 Caribbean countries over 1990–99, argue that market power plays a significant role in explaining relatively high spreads, which in turn are sustained by the limited competition posed by nonbank financial institutions and by an underdeveloped local capital market. There is a wealth of empirical evidence suggesting that net interest margins are strongly related to the efficiency of the banking sector. The efficiency hypothesis suggests that smaller banks are likely to have higher overhead costs than larger banks. This prediction is borne out in the empirical work of Demirguc-Kunt and Huizinga (1999), Barajas, Steiner, and Salazar (1999), and Brock and Rojas-Suarez (2000). The small size of the markets in the Caribbean would imply that banks are operating well below their minimum efficiency scale, and hence cannot reap economies of scale. These banks tend to have much higher operating costs, especially for labor, than banks in larger developed markets (Randall, 1998, and Robinson, 2002). Technology considerations also add to the higher cost of banks in the Caribbean, because their adoption of new technology lags behind their counterparts in more developed economies (Robinson, 2002). Separately, Barajas, Steiner, and Salazar (1999) argue that the extent of nonperforming loans is positively associated with spreads.

The capital structure of the banking sector and informational asymmetries may also contribute to spreads. The level of capital that banks hold to cushion themselves against risks could result in higher spreads (Saunders and Schumacher, 2000). In particular, holding capital in excess of the regulatory minimum for insuring against additional credit risk turns out to be relatively more expensive than debt because of differential taxation (Chirwa and Mlachila, 2004). This cost may be offset by increasing spreads, leading to a positive relationship between the actual capital ratio and spreads. For instance, in Trinidad and Tobago, banks have a tendency to hold capital far in excess of

the regulatory minimum. The extent of asymmetric information between the bank and its borrowers may also have an impact on spreads. In this vein, Craigwell and Moore (2003) find that local banks endowed with better information on the creditworthiness of borrowers tend to discriminate in their lending rates across borrowers, whereas foreign banks tend to set a uniform interest rate.

Institutional constraints related to financial regulation also tend to influence bank profit margins and, therefore, interest rate spreads. These constraints include liquidity requirements, statutory government securities holding requirements, and capital controls. Less than fully remunerated reserves act as a tax on banks. Banks often attempt to pass on the cost of this tax to their customers by raising lending rates or reducing deposit rates. Thus, higher reserve requirements will typically result in a widening of commercial banks' margins. Barajas, Steiner, and Salazar (1999) and Saunders and Schumacher (2000) find evidence of a positive relationship between reserve requirements and interest rate spreads in Latin America. Similarly, Gelos (2006) highlights reserve requirements, together with overhead costs and the extent of banking competition measured by the degree of market concentration, as the key factors driving spreads in Latin America.

Gelos (2006) found that Latin American banks had high spreads because of higher lending rates, less efficient banks and larger reserve requirements than banks in other regions. Brock and Rojas-Suarez (2000) found that higher operating costs and higher nonperforming loans (NPLs) were related to higher spreads. Randall (1998) found that the share of loans going to the public sector in the Caribbean was negatively correlated with spreads (one possible explanation for this was that greater government involvement resulted in larger transactions that were more efficient to manage).

Chirwa and Mlachila (2004) found that spreads in Malawi increased after financial liberalization because of increases in reserve requirements and provisioning. Barajas, Steiner, and Salazar (1999) found that in Columbia spreads widened in the 1990s as a result of high non-performing loans of the public banks and private banks' greater responsiveness to credit quality and more careful approach to risks. Banco Central do Brasil (1999) identified credit risk, taxes, and overhead costs as the main determinants of the high ex-ante spread in Brazil (more important even than the high level of required reserves, which were nevertheless significant). Higher costs would logically require banks to charge higher spreads in order to remain profitable (Randall 1998, Gelos 2006).

Higher spreads may be a result of higher costs, or they could be a result of factors that allow banks to become more profitable, such as a reduction in competition. Some studies have indicated that higher concentration in the banking sector leads to higher spreads by reducing competition (Demirguc-Kunt and Huizinga 1999). Berger and Hannon (1989) suggested that greater concentration could lead to higher profits, but possibly not to higher lending rates since higher concentration can be associated with greater efficiency. Claessens and Laeven (2004) suggested that concentration does not reduce competition. Competition could also be affected by the size of the banking sector or the size of the economy. In a smaller economy, the concentration of the banking sector would be greater and the number of banks smaller. However, in some small countries a very few large local companies represent the only reputable borrowers and banks compete fiercely to lend to them. The effect of reducing the size of the economy or the size of the banking sector on spreads could be negative if the small size results in a greater reduction in the number of reputable borrowers than in the number of banks.

Uncertainty could be another source of higher spreads since banks would require a risk premium to compensate for the added volatility. Higher inflation or higher interest rates would be sources of uncertainty, and several studies have found this relationship (Demirguc-Kunt and Huizinga 1999 and Banco Central do Brasil 1999 for inflation, and Demirguc-Kunt, and Huizinga 1999 for interest rates). Changes in inflation or interest rates would seem more directly related to uncertainty. Ho and Saunders (1981) found that interest rate volatility leads to larger spreads. Variability of the exchange rate could also be a source of uncertainty.

The analysis of bank spread determination in the Caribbean shows that monetary policy variables are most significant. Along with the control variables (inflation and the corporate tax rate), they account for 79 percent of the variability of spreads in 1989–2004. By contrast, banking concentration, proxied by the Herfindahl index, proves to be statistically insignificant—suggesting that the level of concentration is not the key determinant of spreads. Likewise, bank-specific variables, including bank size and provisions for nonperforming loans, do not have an important role in explaining variations in bank spreads.

Independent studies (Chand 2002, Asian Development Bank 2001) as well as reports of government committees set up by the Government of Fiji in 1999 found that lack of adequate competition, scale diseconomies due to small size of markets, high fixed and operating costs , high transportation costs of funds due to expensive telecommunications, existence of regulatory controls and perceived market risks lead to high intermediation costs, which result in high spreads. Specifically, these studies have identified one of the most obvious costs, which is associated with the ability to enforce debt contracts. Small borrowers with no property rights have no collateral to offer and they are perceived high risks. Because of high transaction costs involved, such borrowers are charged

punitive rates of interest. Further, Chand (2002) singles out the governance issues. The latter encompasses maintenance of law and order and provision of basic transport and social infrastructure, all impinging on security, lack of which has been found to be causes for high transaction costs resulting in large intermediation costs.

Information asymmetry and transaction costs between agents are part of the reasons why financial intermediaries arise. The intermediaries serve to minimize the problems created by information and transaction frictions. They facilitate mobilization of savings, diversification and pooling of risks, and allocation of resources. However, since the receipts for deposits and loans are not synchronized, intermediaries like banks incur certain costs. They charge a price for the intermediation services offered under uncertainty, and set the interest rate levels for deposits and loans. The difference between the gross costs of borrowing and the net return on lending defines the intermediary costs. The wedge between the lending and deposit rates also proxies efficiency of the intermediation process. For example, under perfect competition the wedge is narrower, composed only of the transaction cost, while in an imperfect market, the wedge is wider, reflecting inefficiency in market operation. Inefficiency in the intermediation process may be a characteristic of a repressed financial system. This is because in a control policy regime, selective credit policies involve substantial administrative costs, and interest rates with set ceilings fail to reflect the true cost of capital. Such a policy regime constrains the growth of the financial system in terms of diversity of institutions and financial assets and encourages non-price competition.

The market fails to develop direct debt and equity to complement the banking institutions. Risk reduction acts as a catalyst in promoting the intermediation process as savings and investment

become attractive. Inefficiency also stems from information asymmetry that is enhanced by a weak legal framework, which creates a disincentive for banks to invest in information capital. A weak legal system constrains the enforcement of financial contracts, exposing banks to legal and credit risk. This arises because of the inability to make agreements that restrict the ability of borrowers to divert funds away from the intended purpose, the lack of disclosure of accurate information on borrowers and the inability to write easily enforceable legal contracts. A weak legal system (without clearly spelled out property rights) also restricts diversification of institutions and therefore denies institutions a chance to diversify the asset portfolio. As a result, the premium charged on credit is high, keeping lending rates high while widening the interest rate spread. Kenya's experience with the financial reform process shows a widening interest rate spread following interest rate liberalization. This period is characterized by high implicit costs with tight monetary policy achieved through increased reserve and cash ratios (Ngugi, 2001).

Market structure encompasses the degree of competition, which reflects the number of market players and the diversity of financial assets, the market share of individual participants, ownership structure and control, policy regime (controlled vs uncontrolled), and the adequacy of the legal and regulatory framework (Fry, 1995). In a market where the government sets interest rates and credit ceilings, allocation of resources is inefficient because of uneven credit rationing criteria and the lack of incentive by banks to compete for public deposits. In addition, the allocation of funds to poor performing sectors increases the credit risk for commercial banks. With interest ceilings, however, banks are constrained in charging the appropriate interest rate on loans, and the only option is to offer the minimum possible interest rate on deposits. Further, the presence of government owned and controlled banks creates an uncompetitive environment and to some extent makes it difficult to

enforce the set regulatory framework, weakening the stability of the banking sector. Financial reform emphasizes the abolition of interest rate and credit ceilings and the promotion of a competitive environment with reduced government control and ownership. (Ngugi, 2001)

Although achieving competitiveness does not imply nonexistence of an interest rate spread, Ho and Saunders (1981) note that the size of the spread is much higher in a non-competitive market, which also calls for strengthening the regulatory and legal framework to enhance the stability of the market. Caprio (1996) notes that a weak legal system, where the courts are not oriented towards prompt enforcement of contracts and property rights are ill defined, increases credit riskiness and banks have no incentive to charge lower rates. Cho (1988), in addition, observes that the liberalization theory overlooks endogenous constraints to efficient allocation of resources by the banking sector, where, in the absence of a well functioning equities market, efficient allocation of capital is not realized even with financial liberalization. Fry (1995) explains that in the absence of direct financial markets and an equity and bonds market, financial institutions absorb too much risk, as business enterprises rely excessively on debt finance. Thus, conclude Demirguc-Kunt and Huizinga (1997), the interest spread fluctuates, reflecting the substitution between debt and equity financing. As the equity market expands, offering competitive returns, banks increase their deposit rates to compete for funds from the public. The expanded market also reduces the risk absorbed by the banking sector and banks charge competitive lower lending rates, reducing the interest rate margin. Thus, remarks Fry (1995), even in an oligopolistic banking system, there is need for competition from the direct financial market.

Empirical results show that market imperfections widen the interest rate spread. Ho and Saunders (1981), approximating market power with bank size, found a significant difference in spread between large and small banks, where smaller banks had higher spreads than the large banks. Barajas et al. (1996) also show a significant influence of loan market power on the interest spread. Elkayam (1996) observes that in a competitive banking system, the interest rate spread derives solely from central bank variables (including the discount window loans, reserve requirement and interest on liquid assets on deposit with the central bank), while under a monopolistic (or oligopolistic) structure, the interest rate spread is in addition affected by elasticities of demand for credit and deposits. He also found that there was more market power in the credit market than the deposit market. In addition, considering monetary policy, Elkayam (1996) found that an increase in money supply under elastic demand reduces the spread more in a monopolistic than in a competitive market.

Sandi (2009) in his study of the Price- Concentration relationship in the Commercial Bank deposit markets in Zambia found that there exists an equilibrium relationship among consumer weighted deposit interest rates (i.e. prices) and concentration ratio, per capita income and deposits held by commercial banks. He found that per capita income, market share, concentration ratio and the growth of deposits play a significant role in determining changes in deposit interest rates in Zambia. The low per capita income of Zambia compared to other Sub- Saharan countries was found to be the reason as to why few people hold bank accounts with commercial banks. Zambian commercial banks therefore have a tendency of offering low interest on deposit accounts as opposed to the interest rate they charge on loans in order to make profits. Commercial banks concentration was also found to be the major contributor to low deposit interest rates. This was attributed to the banking system collapse in the 1990s and the dominance of the sector by a few banks which were Barclays

Bank, ZANACO and Standard Bank. These banks were leading in all portfolios included in the study such as loans and advances, deposits and total assets among others. It was concluded that Zambia's highly concentrated banking market is "bad" for depositors. The study however looked at the determination of deposit rates but this study investigates the determinants of banking sector interest rate spreads in Zambia.

CHAPTER THREE

OVERVIEW OF THE BANKING SYSTEM IN ZAMBIA

3.0 Structure of the Financial Sector

The financial sector in Zambia comprises banks and non-bank financial institutions (NBFIs) and are regulated and supervised by three agencies. The largest regulatory body is the Bank of Zambia (BoZ) which supervises commercial banks and non bank financial institutions which are licenced by the BoZ. The other two are the Pensions and Insurance Authority (PIA) which supervises Insurance companies, and the Securities and exchange Commission (SEC) which regulates the Capital Market which consists of the Lusaka Sock Exchange (LUSE), Brokers, Dealers and Investment Banks. However, there are two financial institutions that were created by an Act of parliament and they operate outside the financial system regulatory framework. These are the Development Bank of Zambia (DBZ) and the National Savings and Credit Bank (NATSAVE).

The Bank of Zambia regulates and supervises eighteen (18) Commercial Banks and numerous non bank financial institutions, that include eleven (11) Leasing Companies, three (3) building societies and twenty five (25) Microfinance Institutions. Others include fourty- four (44) Bureaux De Change, and those institutions established by Acts of parliament which include one (1) Development Bank (the Development Bank of Zambia) and one Savings and Credit Institution (the National Savings and Credit Bank). There is also the Credit Reference Bureau (Credit Reference Bureau Africa Limited). The legal framework for the banking sector primarily consists of the Companies Act, the BoZ Act and the BFSA. Further, banks, which operate as public companies, are required to comply with the provisions of the Securities Act.

The Pensions and Insurance Authority (PIA) is the supervisory and regulatory institution for the pensions and Insurance industry. The insurance industry is supervised through the Insurance Act. Therefore, Pensions & Insurance Authority's role in the social security sector borders around the aspects of social insurance, which deals with measures to protect income earners and their families against a reduction or loss of income as a result of exposure to risks that impair one's capacity to earn the income. This is done through establishment of occupational pension schemes, whether private or public. The Pensions and Insurance Authority thus regulates and supervises the overall operations of these institutions to ensure protection of the rights of the contributors. This is done through ensuring that the aspects of the Pension Scheme Regulation dealing with compliance are adhered to.

The SEC was established in 1993 and is responsible for the supervision and the development of the capital market as well as the licensing, registration and authorisations for financial intermediaries, issuers of debt and equity instruments and collective investment schemes, respectively. The SEC mostly conducts off-site supervision. On-site inspections are divided into ad-hoc and statutory. Its aim is to promote and maintain a strong and facilitative regulatory framework that ensures the orderly development of an innovative and competitive capital market for the secure, fair, efficient and transparent issuance and trading of securities.

3.1 Financial Policies

The course of Zambia's post independence economic strategy was shaped by the 1968 Mulungushi declaration. The strategy, motivated by economic nationalism and the desire to redress political and economic inequalities, entailed state led import substituting industrialization and extensive government controls over resource allocation. Some of the foreign companies operating in Zambia

were nationalised, a large parastatal sector was created and administrative controls were imposed over foreign exchange, imports, prices and interest rates. Economic performance however was very poor as the economy was severely affected by the steep fall in the price of copper from the mid 1970s, while the interventionist policies led to inefficiencies and structural rigidities which impeded adjustment to external shocks. A series of IMF stabilisation programmes were implemented, beginning in 1976, in an attempt to tackle the economic crisis, but, apart from a short period during 1985-87, the government persisted with the main components of the interventionist strategy until the late 1980s/early 1990s.

The financial system in the mid 1960s was dominated by foreign commercial banks mainly serving the credit needs of foreign and expatriate businesses. The general thrust of financial policies after 1968 was to enable government to exert greater control over the financial system and to ensure that credit allocation was more supportive of the government's overall economic strategy. Financial policies consisted of three main strands: nationalisation of foreign financial institutions, establishment of government owned banks and development finance institutions, and administrative controls over interest rates and, to a limited extent, loan allocation. However, the nationalization of financial institutions was not implemented in Zambia as these institutions threatened to pull out. As a result, the government established its own commercial bank (ZANACO) and an insurance company the Zambia State Insurance Company (Brownbridge, 1996).

3.2 Interest Rate Controls before Liberalisation

Beginning in the mid 1960s, the deposit and lending rates of the commercial banks were controlled by the BOZ which maintained a policy of low interest rates in order to minimize borrowing costs.

Until 1984 commercial bank deposit rates were held within a range of 3.5 per cent and 8.5 per cent and lending rates between 7 per cent and 13 per cent. In addition a preferential rate was stipulated for agricultural lending from 1978. Nominal rates were generally held below the rate of inflation, which averaged 10 per cent during the 1970s and 20 per cent during 1980-84. There was an increase in both inflation and nominal interest rates from the mid 1980s onwards. The implementation of a stabilisation programme led to a small rise in administered interest rates in 1984 and the decontrol of interest rates and introduction of a treasury bill auction in September of the following year. Lending rates rose sharply thereafter to around 30 per cent in 1986. However, this was accompanied by an acceleration of inflation and hence real interest rates remained negative. Interest rate controls were reimposed in May 1987 following the breakdown of an IMF supported adjustment programme, and held below 20 per cent for the remainder of the decade. The government adopted a new IMF supported adjustment programme in 1989 under which interest rates were again raised, although they remained far below prevailing inflation rates which had by this time reached levels in excess of 100 per cent per annum. During the 1990s interest rates were again raised and then liberalized (Brownbridge, 1996).

3.3 Financial Liberalisation

For over 20 years until the early 1990s, Zambia pursued predominantly interventionist economic policies which entailed extensive government ownership and administrative controls over markets, including financial and banking markets. Interventionist policies, combined with a steep fall in the external terms of trade, led to economic decline, and a major programme of market oriented economic reforms was adopted in the early 1990s which included financial sector reforms. The financial system in the mid 1960s was dominated by foreign commercial banks mainly serving the

credit needs of foreign and expatriate businesses. The general thrust of financial policies after 1968 was to enable government to exert greater control over the financial system and to ensure that credit allocation was more supportive of the government's overall economic strategy (Brownbridge, 1996).

However, financial sector reforms had two main components. The first component included the liberalisation of interest rates and foreign exchange markets in 1992 and 1993. The second component involved reforms to the system of prudential regulation and supervision of financial institutions, and included the enactment of new banking laws in 1994 (ibid).

3.4.0 Banking Sector

The Banking Sector in Zambia has commercial banks which can be distinguished into three types according to the type of ownership. The first type are those commercial banks which are subsidiaries of foreign banks. These are locally incorporated subsidiaries of foreign banks. The second type are banks which are partly owned by the government of the republic of Zambia. The third type are local banks. These banks are incorporated locally which are neither subsidiaries of foreign banks nor partly owned by the Government.

3.4.1 Banking Sector Reforms

The changes that were occurring in the financial sector as a result of liberalization led to the regulatory framework governing the banking sector to undergo extensive review. A new banking law was enacted to replace the 1972 Banking Act which had become outdated then. The primary law governing the financial sector is the Banking and Financial Services Act (BFSA) of 1994. The BFSA gives the BoZ power to supervise banks and non-bank financial institutions. It also gives the BoZ

power to prescribe, issue regulations and guidelines and to enforce them. The power to licence banks lies with the Registrar of Banks and Financial Institutions (Financial Sector Development Plan, 2004). The Act was amended in 2000 to cover all institutions that provided financial services as defined in the Act, strengthen the Bank of Zambia's regulatory and supervisory powers, incorporate best practices and internationally accepted standards for licensing and prudential regulation and supervision into the law, and establish higher standards of responsibility, accountability and professional competence and integrity for directors and senior officers of financial institutions.

Provisions contained in the Statutory Instrument were promulgated to cover the disclosure requirements of banks, capital adequacy, foreign exchange risk management and exposure, the classification and provisioning of loans, and exposure limits to single entities and parties connected to the financial institution in line with internationally accepted best practice in relation to bank supervision (Chiumya, 2004).

3.4.2 Market Share and Perfomance Indicators by Bank

The banking industry's market share, based on the proportion of assets, loans and deposits held of the industry's totals as at 31st December 2008 was dominated by Barclays Bank, Zambia National Commercial Bank, Standard Chartered Bank, Stanbic Bank and Finance Bank. These were the largest banks in terms of asset size which together accounted for 76.4% of the industry's total assets (see Table 3.1).

Table 3.1: Commercial Bank's Market Share and Performance Indicators- 2008

Bank	% of assets	% of loans	% of deposits	% of profit before tax	Return on Assets(%)	Return on Equity
Barclays	24.8	36.6	18.5	15.7	2.2	14.1
ZNCB	16.4	12.1	18.9	12.5	3.1	28.3
Stanchart	14.3	13.5	16.6	9.7	2.4	13.7
Stanbic	11.8	13.5	13.3	7.1	1.9	14.3
Citibank	6.1	3.6	5.4	17.8	9.3	27.6
Indo Zambia	6.7	3.4	7.2	7.8	4.8	14.6
Finance Bank	9.1	8.6	10.0	20.3	7.8	43.5
Bank of China	3.0	0.2	3.1	3.2	4.1	29.5
First Alliance Bank	1.3	1.1	1.3	4.6	13.1	24.4
ABC	1.9	3.2	1.1	(0.8)	(1.8)	(12.3)
Investrust	2.7	3.5	2.8	3.5	4.4	34.8
Cavmont Capital	1.0	0.3	1.1	1.1	3.8	20.8
Intermarket	0.6	0.5	0.6	(1.1)	(14.4)	(79.5)
Access	0.3	0.0	0.3	(1.4)	(62.7)	(175.4)
Total/ Weighted average	100.0	100.0	100.0	100.0	3.6	20.8

Source: Bank of Zambia annual report, 2008

In terms of the proportion of loans held, Barclays Bank dominated the banking sector with 36.6% followed by Standard Chartered and Stanbic each with 13.5%. This was followed by Finance Bank with 8.6%. However, Access Bank did not have a share of the total loans as it was opened towards the end of 2008 even though it was registered in Zambia on 13th May, 2008. Of the total banking sector profits before tax, Finance bank had the largest proportion with 20.3% followed by Citibank with 17.8%. This was followed by Barclays bank with 15.7% and then followed by ZANACO with 12.5%. These four banks dominated in terms of the proportion of profits of the banking sector and they accounted for 66.3%.

In terms of Return on Assets, First Alliance Bank had the largest return on assets of 13.1% followed by Citibank with 9.3%. Finance bank was third with a return on assets of 7.8% and was followed by

Indo- Zambia bank with 4.8%. As regards to the Return on Equity, Finance bank had the highest return on equity of 43.5% followed by Investrust with 34.8%. This was followed by Bank of China with the return on equity of 29.5% followed by ZANACO with a return on equity of 28.3%.

3.4.3 Market Share: assets, loans and deposits by ownership

Subsidiaries of foreign banks dominate the banking industry in terms of assets, loans and deposits. As at December, 2008, they owned 63.8%, 65.2% and 60.2% of the banking industry's total assets, total loans and total deposits respectively compared to 62.8%, 71.1% and 58.8% in 2007. Government owned banks on the other hand accounted for 20.6%, 16.5% and 23.8% of the industry's total assets, total loans and total deposits respectively compared with 23.1%, 15.5% and 26.0% respectively. Local banks accounted for 15.5%, 18.4% and 16.0% of the total banking sector's total assets, loans and deposits respectively compared with 14.1%, 13.4% and 15.2% respectively in the previous year (see Table 3.2).

Table 3.2: Assets, Loans and Deposits by Type of Ownership, 2006- 2008 (%)

	2006			2007			2008		
	Assets	Loans	Deposits	Assets	Loans	Deposits	Assets	Loans	Deposits
Subsidiaries of foreign banks	63.6	67.4	61.1	62.8	71.1	58.8	63.8	65.2	60.2
Banks with Government stake	21.7	16.0	24.5	23.1	15.5	26.0	20.6	16.5	23.8
Local Banks	14.8	16.6	14.4	14.1	13.4	15.2	15.5	18.4	16.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Bank of Zambia annual report, 2008

The proportion of assets of subsidiaries of foreign banks increased marginally by 0.2% from 63.6% in 2006 to 63.8% in 2008 while the proportion of assets of banks with a government stake decreased by 1.1% from 21.7% in 2006 to 20.6% in 2008. As for local banks, the proportion of assets increased by 0.7% from 14.8% in 2006 to 15.5% in 2008. As for the proportion of loans, they decreased for subsidiaries of foreign banks by 2.2% from 67.4% in 2006 to 65.2% in 2008. The proportion of loans for banks with a government stake increased by 0.5% from 16.0% in 2006 to 16.5% in 2008.

The proportion of loans for local banks increased by 1.8% in the same period from 16.6% to 18.4%. The proportion of deposits of subsidiaries of foreign banks decreased by 0.9% from 61.1% in 2006 to 60.2% in 2008. As for banks with a government stake, they decreased by 0.7% from 24.5% to 23.8% while for local banks increased by 1.6% from 14.4% to 16.0% in the same period.

3.4.4 Market Share: Profit before tax by ownership

The distribution of profit before tax by type of ownership indicated that subsidiaries of foreign banks accounted for 50.2% of the industry's total earnings in 2008 down from 69.8% in 2007. Local banks accounted for 29.6% in 2008 compared to 22.3% in 2007 while Government owned banks had 20.3% in 2008 compared with 8.0% the previous year (see Table 3.3 below).

Table 3.3: Profit- before Tax by Type of Ownership, 2006- 2008 (%)

	2006	2007	2008
	Profit before tax	Profit before tax	Profit before tax
Subsidiaries of foreign banks	68.7	69.8	50.2
Banks with Government stake	11.2	8.0	20.3
Local Banks	20.2	22.3	29.6
Total	100.0	100.0	100.0

Source: Bank of Zambia annual, 2008

The five banks that accounted for the largest portion of the industry's total profit before tax, in order of significance, were Finance bank, Citibank, Barclays Bank, Zambia National Commercial Bank and Standard Chartered Bank (BoZ, 2008).

3.4.5 Bank Branch Network and Agencies

A bank agency falls under a branch and does not offer the full range of products and services which are provided at the branch. Further, depending on the bank, an agency may not open on all the working days of the week (BoZ, 2008). From table 3.4 below, Barclays bank has made some

dramatic increase in the number of branch network and agencies from 21 in 2006 to 52 in 2008. It increased its network by more than double. Access bank started operating in 2008 and hence it did not have any branch network before 2008. African Banking Corporation, Bank of China, First Alliance Bank, Intermarket Banking Corporation and Stanbic Bank have not increased their branch network and agencies since 2006 and the number of branch network has remained the same as shown in the table below. The number of commercial bank's branch network and agencies is shown in the table below;

Table 3.4: Commercial Bank's Network and Agencies, 2006- 2008

Bank Name	2006	2007	2008
Access Bank Zambia Limited*	n/a	n/a	1
African Banking Corporation(Z) Ltd	2	2	2
Bank of China	1	1	1
Barclays Bank Zambia Plc	21	39	52
Cavmont Capital Bank Ltd	11	12	12
Citibank Zambia Limited	2	2	2
Finance Bank Zambia Limited	40	42	44
First Alliance Bank (Z) Limited	3	3	3
Indo- Zambia Bank Limited	9	9	12
Intermarket Banking Corporation (Z) Limited	3	3	3
Investrust Bank Plc	7	8	9
Stanbic Bank Zambia Limited	12	12	12
Standard Chartered Bank Zambia Plc	15	16	17
Zambia National Commercial Bank Plc	52	53	54
Total	178	202	224

Source: Bank of Zambia annual report, 2008

*Access Bank started operating in 2008. n/a= not applicable

3.4.6 Local Banks

According to Brownbridge (1996), the Zambian private sector first entered the banking industry in 1984 when Meridien Bank was founded. Four more banks were set up in the second half of the

1980s, including Finance Bank in 1987 and Capital Bank in 1989. By mid 1995, there were around 13 banks owned by local private sector investors in operation in Zambia. Most of these banks began operating during the first half of the 1990s. At a time when most sectors of the economy were suffering from recession, the banking sector experienced remarkable growth. The first local banks in Zambia were established during a period when financial policies were not particularly conducive to private sector investment in banking. Interest rates were tightly controlled, which together with high reserve requirements, depressed profit margins, and bank licenses were very difficult to obtain, apparently because of political considerations rather than any stringency in the legal requirements of the Banking Act. However, some local banks failed in the 1990s while others opened up in the same period.

3.4.7 Bank Failures

The Zambian financial system experienced episodes of bank failures between 1995 and 2002. These failures had several adverse effects on the confidence in the financial system. Unfortunately, Zambia has experienced financial sector distress resulting in the closure of ten (10) banks since 1995. The bank closures led to a loss of confidence and what has been termed “a flight to quality”. There was a shift of deposits from the smaller, indigenous, locally owned institutions to foreign owned banks which were perceived to be “safer”. This was because all the banks which have failed to date, with one exception, have been locally owned. The effect of the bank closures has also served to discourage people from placing deposits in financial institutions for fear of loss in the event of their failure (Chiumya, 2004).

Table 3.5 Failed Banks

Number	Name of Bank	Liquidation Date
1	Meridian BIAO Bank	September 1995
2	Zambia Export Import Bank Limited	May 1996
3	African Commercial Bank Limited	February 1998
4	Prudence Bank Limited	February 1998
5	Credit Africa Bank Limited	March 1998
6	Manifold Investment Bank Limited	March 1998
7	First Merchant Bank Zambia Limited	March 1999
8	Commerce Bank Limited	January 2001
9	Union Bank Zambia Limited	March 2001
10	United Bank of Zambia	May 2006

Source: Author's own field research

As can be seen from the above table, the bank failures were happening within a short a short space of time. The closure of Meridien BIAO was the first since 1995 and it occurred in September 1995. This was followed by the closure of African Commercial Bank in February 1996 and later on Zambia Export Import Bank in the same year. This was followed by the closure of four (4) more banks in 1998. The first bank to close in 1998 was Prudence Bank in February and two more banks failed in March of the same year while the fourth closure in that year occurred in May. These were Credit Africa bank, Manifold Investment Bank and Zambia Export Import Bank respectively. The year 2001 experienced the closure of two banks and these were Commerce Bank and Union Bank respectively. The most recent bank failure occurred in 2006 and this was the failure of the United Bank of Zambia.

3.5 Structure of Interest Rates in Zambia

According to Sandi (2009), the interest rates over the years in Zambia have been very low. The lending and borrowing rates had been negative in real terms, though nominal rates shot- up immediately after the financial sector liberalization. In a move to attain positive real interest rates

that would promote savings in the country, the government decided to move away from a policy of controlling interest rates. However, despite this policy move, the ratio of domestic savings to gross domestic product (GDP) has been declining since 1998. In 1997, it stood at 8.1% and by 2000, it was recorded at 4.8%. In 2001, it further went down to 4.2% (Sandi, 2009).

During 2008, all annual real interest rates declined, largely due to the increase in inflation. The real 30- day deposit rate for amounts above K20 million and the real ASR for amounts above K100, 000.00 both declined to negative 11.6% and negative 11.8% respectively from the negative 4.1% (for both) recorded at end- December 2007. In addition, the real ALR and the WALBR fell to 10.3% and 2.5% respectively from the 15.7% and 9.4%, recorded at end- December 2007 (BoZ, 2008).

Table 3.6: Monthly Average Interest and Yield Rates, 2006- 2008 (in percent)

Description	Nominal			Real		
	2006	2007	2008	2006	2007	2008
91- day Treasury bill	8.7	10.7	12.2	0.5	1.8	-4.4
182- day Treasury bill	8.7	11.3	13.5	0.5	2.4	-3.1
273- day Treasury bill	9.6	11.3	13.8	1.4	2.4	-2.8
364- day Treasury bill	9.9	11.2	14.9	1.7	2.3	-1.7
WATR	9.2	11.1	14.0	1.0	2.2	-2.6
24- month Bond	10.6	14.1	15.2	2.4	5.2	-1.4
3- year Bond	12.1	14.3	15.6	3.9	5.4	-1.0
5- year Bond*	13.5	14.9	16.5	5.3	6.0	-0.1
7- year Bond*		17.7	17.3		8.8	0.7
10- year Bond*		19.0	18.5		10.1	1.9
15- year Bond*		2 0.0	19.3		11.1	2.7
Composite Yield Rate on Bonds		14.8	16.3		5.9	-0.3
Commercial Bank's WALBR	21.6	18.3	19.1	13.4	9.4	2.5
Commercial Bank's ALR	27.9	27.9	26.9	19.7	15.7	10.3
Commercial Bank's ASR	6.1	4.8	4.8	-2.1	-4.1	-11.8
Deposit > 20 million (30 days)	8.4	4.8	5.0	0.2	-4.1	-11.6

Source: Bank of Zambia annual report, 2008

*these bonds were introduced in 2007.

CHAPTER FOUR

METHODOLOGY AND ANALYTICAL FRAMEWORK

4.0 Theoretical Framework

4.0.1 Market Determinants of Banking Sector Interest Rate Spreads

The market or industry-specific determinants of spreads that account for the impacts of the structure and development of the banking sector among others are prescribed reserve requirements, and economies/diseconomies of scale, as determined by market size. The structure and development of the banking sector is usually captured using two proxies which are the Bank/GDP ratio and Real Per Capita GDP. As in Demirguc-Kunt and Huizinga (1998) the bank/GDP ratio *(BNKDEV)* is calculated as the total assets of commercial banks divided by current GDP. This ratio reflects the overall level of development of the banking sector, and the level of inter-bank competition in well-developed banking sectors. This ratio is expected to have a negative correlation with the dependent variable (interest rate spread), as an improvement in the level of banking sector development and competition should force down banking sector interest rate spreads (IRS).

Real per capita GDP *(GDPpc)* should have a similar effect on IRS, as it is included as a general index of economic development, and should therefore reflect "differences in banking technology and the mix of banking opportunities" (Demirguc-Kunt and Huizinga 1998). However, this may not apply for Zambia because the economy is underbanked (FinScope Zambia, 2006).

Prescribed reserve requirements are included as a market determinant of banking sector IRS, as such reserves reflect a burden associated with operating in the banking sector. A positive correlation between such reserves and IRS is expected, as high liquidity reserve requirements act as an implicit financial tax by keeping interest rates high. Chirwa and Mlachila (2004) explain by noting that, "the opportunity cost of holding reserves at the central bank, where they earn no or little interest, increases the economic cost of funds above the recorded interest expenses that banks tend to shift to customers." They further argue that the large pool of resources created by high reserve requirements allow for the financing of high fiscal deficits, and thereby creates an environment of high inflation and persistently high intermediation margins. The variable to be used *(RES)* is the ratio of required

reserves to deposits, and is calculated as the banking sector's required reserves divided by its total deposits.

Market size has an impact on banking sector IRS, as studies on small island developing states suggest that diseconomies of scale may increase per unit costs in commercial banks, thus keeping spreads high according to Tennant and Folawewo (2007). This variable *(SCALE)* is expected to be negatively correlated with IRS, as banking sectors in countries with larger markets are more likely to benefit from economies of scale, thereby enabling them to keep their costs and spreads down. Ideally, the measure of economies of scale should reflect the market size of individual banks and not the entire economy. As a result of this problem, this variable will not be included in this study because we do not use individual bank data.

4.0.2 Macroeconomic Determinants of Banking Sector Interest Rate Spreads

The macroeconomic determinants of spreads included in this paper account for the impacts of macroeconomic instability and the macro-policy environment on banking sector IRS. Similar to most studies in this area, the inflation rate for Zambia is included, and is calculated as the percentage change in the consumer price index(CPI). This variable *(INFL)* is an indicator of the cost of doing business in an economy, and it is expected to be positively correlated with IRS (Chirwa and Mlachila2004).

Macroeconomic instability is proxied by the variable exchange rate volatility *(XRATVOL)*. This variable reflects the changes in interest and inflation rates in countries with freely-floating exchange rates. Exchange rate volatility for each quarter is calculated as the standard deviation of the percentage change in the real US$ exchange rate for the three preceding quarters. Because increased macroeconomic instability increases the risk faced by commercial banks, *XRATVOL* is expected to be positively correlated with IRS, as the banking sector increases its spreads to protect against the increased risk.

The macro-policy environment is captured in our model through the use of three variables. The first proxies the extent of government dependence on the domestic banking sector for the financing of its fiscal deficit. This variable *(CROWD)* measures for the entire banking sector, public sector

borrowing as a percentage of total loans. Robinson (2002) notes that "the level of government borrowing and its influence on money and credit markets is an element of macroeconomic policy that imposes constraints on the flexibility on interest rates." CROWD is therefore expected to be positively correlated with IRS, as governments' heavy reliance on domestic banking sectors for deficit financing increases competition for funds and causes interest rates to rise.

The second macro-policy indicator, the discount rate *(DISRATE)*, is defined as the cost faced by commercial banks when borrowing from the central bank. Although declining in popularity, the discount rate is still used as a monetary policy instrument. Even more importantly, it is expected to be positively correlated with IRS, as it increases the commercial banks' cost of funds, which may be passed on to customers through higher spreads.

Finally, the Treasury Bill rate *(TBILL)* is included. It is generally regarded as an indicator of the interest rate policy being pursued by the government, and a benchmark for the rates charged by commercial banks. This variable is therefore also expected to be positively correlated with IRS, because lower Treasury Bill rates would lead to lower interest rate spreads and vice versa.

The relationship between the banking sector IRS and its market and macroeconomic determinants is therefore specified as follows:

$$IRS = f(BNKDEV, GDPpc, RES, SCALE, INFL, XRATVOL, CROWD, DISRATE, TBILL) \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

4.1 Hypotheses

i) Unfavorable macroeconomic environment such as inflation, exchange rate volatility and discount rates positively affect interest rate spreads in Zambia.

ii) Market or industry- specific characteristics such as reserve requirements positively affect interest rate spreads in Zambia.

4.2 Unit Root Test for Stationarity

A major problem associated with time-series data is that they often exhibit time characteristics (i.e. non-stationarity of variables/series) that may lead to spurious regression results and therefore, make statistical inference invalid. Spurious results imply obtaining a spurious or 'nonsense' correlation among series. That is, the variables do not lend support to any theory that ties them together (i.e. variables are not cointegrated). Non-stationarity of series, given that these series are not cointegrated, implies that any regression involving them would yield spurious results. Spurious results suggest that the mean and variance computed from non-stationary variables (in levels) would be biased estimates of the unknown population mean and variance. This is because, firstly, there is no long-run mean to which non-stationary series revert and secondly the variance is time-dependent and goes to infinity as time approaches infinity. Therefore, there is no long-run economic relationship among variables. Hence, the argument is upheld that using one or more non-stationary series in a regression produces biased estimates (spurious results), thereby leading to invalid statistical inference when the series are estimated in levels, except in the case of a cointegrating relationship.

Testing for stationarity and determining the order of integration will involve the use of the Dickey-Fuller (DF) and the Augmented Dickey-Fuller (ADF) tests. The DF and ADF procedures involve testing whether variables/series in a model are stationary or testing the order of integration through unit root tests. The null hypothesis of these tests is that of a unit root test(I(1)). A significant test statistic would reject that hypothesis and suggest that the data series is is I(0). The strategy followed in selecting lag length in the ADF test is to select the highest lag length with no serial correlation.

The actual procedure of implementing the DF test involves several decisions. This is because a random walk process may have no drift, or it may have a drift or it may have both deterministic and stochastic trends. To allow for the various possibilities, the DF test is estimated in three different forms. These forms are as outlined below;

$\Delta Y_t = \rho Y_{t-1} + \mu_t$ ……..….(2)

In this form, Y_t is a random walk without a drift and no trend. If Y_t is a random walk with a drift, the test equation will take the following form;

$\Delta Y_t = \beta_1 + \rho Y_{t-1} + \mu_t$ …… (3)

If the time series (Y_t) is a random walk with drift around a stochastic trend, then the DF test equation is of the form:

$\Delta Y_t = \beta_1 + \beta_2 t + \rho Y_{t-1} + \mu_t$…… (4)

Where;

t = the time or trend variable,

Δ= is the difference operator,

ΔY_t= is the first difference of variable Y at time t

β_1, β_2, ρ = coefficients to be estimated and

μ_t= error term

In conducting the DF test in the above four (4) equations, it is assumed that the error term, μ_t, is uncorrelated. But in the case the μ_t are correlated, Dickey and Fuller developed a test known as the augmented Dickey- Fuller (ADF) test. This test is conducted by "augmenting" the preceeding three equations by adding the lagged values of the dependent variable ΔY_t. To be specific, suppose we use equation three (3) which this study shall adopt. The ADF test here shall consist of estimating the following regression;

$\Delta Y_t = \beta_1 + \beta_2 t + \rho Y_{t-1} + \sum_{i=1}^{m} \propto_i \Delta Y_{t-1} + \varepsilon_t$…….. (5)

Where ε_t is a pure white noise error term and where $\Delta Y_{t-1} = (Y_{t-1} - Y_{t-2})$, $\Delta Y_{t-2} = (Y_{t-2} - Y_{t-3})$ and so on. The number of lagged difference terms to include will be determined empirically, the idea being to include enough terms so that the error term in the above equation is serially uncorrelated (Gujarati, 2007).

4.3 Testing for Cointegration

Regression of non-stationary time series on another non-stationary time series may produce a spurious regression. Although economic variables may be individually non-stationary, they may be cointegrated. Non-stationary variables are said to be cointegrated if a linear combination of these variables assumes a lower order of integration, rendering the linear combination stationary or I(0). The existence of a cointegrating relationship implies that the regression of nonstationary series in their levels will yield meaningful, not spurious results. However, for integration to exist the non-stationary series must be integrated of the same (higher) order. Economically speaking, two variables will be cointegrated if they have a long-term, or equilibrium, relationship between them. In short, provided we check that the residuals from regressions are I(0) or stationary, the traditional regression methodology (including the t and F tests) is applicable to data involving (nonstationary) time series. As Granger notes, "A test for cointegration can be thought of as a pre- test to avoid 'spurious regression' situations (Gujarati,2007).

There are various ways of testing the existence of cointegration between variables of interest. One of the methods used is the Engel-Granger two-stage approach. This approach begins by testing whether the variables of interest are stationary or not. If variables contemplated in the model are integrated of

order one, *I(1)*, then in the first stage, estimates of the long-run equilibrium equation using OLS is made. The residuals are then obtained of the estimated equation and then an ADF test on the residuals of the long-run equation will then be conducted. This is to determine whether the variables in question are cointegrated (whether the error term follows a stationary process). If the error term is stationary (taken as proof of cointegration) in the second stage, we could combine the error term with the first difference of the variables (short-run indicators) to estimate the final model. However, this approach has a number of shortcomings, particularly when there are more than two variables in an equation. This has led to the popularity of Johansen's approach which is better at handling multivariate systems (Johansen, 1988).

When the variables in the VAR are integrated of order one, I(1), or more, unrestricted estimations is subject to the hazards of regressions involving nonstationary variables. However, the presence of nonstationary variables raises the posibility of cointegrating relations as stated above. The relevant procedure then consists of three stages. The first stage is to determine the cointegration rank, that is, the number of cointegrating relations. The second stage is to estimate the matrix of cointegrating vectors, $\boldsymbol{\beta}$, and the associated weighting matrix, $\boldsymbol{\alpha}$. This step amounts to determining the factorization;

$\Pi = \alpha\beta$ ……...(6)

The third stage involves estimation of a VAR, incoperating the cointegration relations from the previous step (Johnston and Dinardo, 2004).

There are several methods of tackling these problems but the Johansen maximum likelihood approach will be used in this paper. The Johansen multivariate cointegration analysis gives a more

general method to counter these limitations. It starts from the unrestricted vector AR (VAR) process as;

$X_t = \Pi_1 X_{t-1} + \Pi_2 X_{t-2} + \ldots + \Pi_k X_{t-k} + \Phi D_t + \varepsilon_t$, t= 1,…,T ……..(7)

Where X_t is a vector of all possibly endogenous variables integrated of order one, D_t is the deterministic terms (constant, trend, dummies and other regressors that are considered fixed and non-stochastic), ε_t are vector error terms assumed to be independent Gaussian with zero mean and variance Ω, the initial values $X_{t+k}\ldots,X_0$ are fixed and the parameters to be estimated are ($\Pi_1, \Pi_2,\ldots, \Pi_k, \Phi, \Omega$) (see Johansen and Juselius, 1990).

This unrestricted VAR can be transformed into a vector error correction model (VECM) as;

$\Delta X_{t=} \Pi X_{t-1} + \sum_{i=1}^{k-1} \Gamma_i \Delta X_{t-i} + \Phi D_t + \varepsilon_t ; t = 1, \ldots, T$…… (8)

Where, $\Pi = \sum_{i-1}^{k-1} \Pi_i - I$ and $\Gamma_i = -\sum_{j=i+1}^{k} \Pi_j$; I is an identity matrix

Testing for cointegration in the Johansen procedure requires analyzing the rank of the matrix Π (for details see Johansen and Juselius, 1990).

A modification is made to equation (8) and rewriting we have;

$\Delta X_t = \alpha\beta' X_{t-1} + \sum_{i=1}^{k-1} \Gamma_i \Delta X_{t-i} + \Phi D_t + \varepsilon_t$…….. (9)

The cointegrating vectors β have the property that $\beta' X_t$ is stationary even though X_t itself is non-stationary.

Testing the null hypothesis that there are at most r cointegrating vectors amounts to testing whether the last (n-r) eigen values of the matrix Π are zero.

4.4 Model Specification

The determinants of banking sector interest rate spreads in Zambia is analysed by the model derived from Tennant and Folawewo (2007). We used the determinants from previous studies to guide our choice of independent variables but instead of focusing on the customary spreads or margins of individual banks, we examined the spreads for the banking sector as a whole. This allowed us to use actual interest rate data in the calculation of spreads and gives a better understanding of the broad state of efficiency of financial intermediation in Zambia thereby more effectively highlighting the macro- implications of such. We focused only on market (or industry- specific) and macroeconomic determinants of spreads. We used an *ex ante* approach in calculating the interest rate spread. This approach uses the rates quoted on loans and on deposits and draws inferences from the difference between them. Our dependent variable, bank interest rate spread, is therefore defined as the difference between bank lending and deposit rates. Ideally, it is measured as the difference between the average interest rate earned on loans and the average interest rate paid on deposits for individual commercial banks (Sologoub,2006). However, due to the unavailability of such bank-level data on interest rates in Zambia, and in order to better understand the broad state of efficiency of financial intermediation in an economy, banking sector spreads were instead examined. This was done by using the average commercial bank lending and deposit rates for Zambia. The banking sector interest rate spreads (IRS) are therefore calculated as:

IRS = Average Commercial Bank Lending Rate – Average Commercial Bank Deposit Rate…(10)

The relationship between the banking sector interest rate spreads and its market and macroeconomic determinants to be estimated in this study is the one used by Tennant and Folawayo (2007) after making adjustments to it to suit the available data. It is therefore specified as follows:

$IRS_t = \alpha_0 + \alpha_1 RES_t + \alpha_2 INFL_t + \alpha_3 XRAVOL_t + \alpha_4 CROWDt + \alpha_5 DISRATE_t + \varepsilon_t$……. (11)

where t= is the time period from 1995 to 2008 on a quarterly basis

IRS_t= Interest rate spread at time t

RES_t = Statutory Reserve Requirements at time t

$INFL_t$ = Inflation rate at time t

$XRAVOL_t$ = Exchange rate volatility at time t

$CROWD_t$ = Government dependence on the domestic banking sector at time t.

$DISRATE_t$ = Discount rate at time t

4.5 Measurement of Variables and expected Signs

Interest Rate Spread (IRS)

The dependent variable is the bank interest rate spread (IRS). It is measured as the difference between bank lending and deposit rates.

Statutory reserve requirements (RES)

Prescribed reserve requirements are a market determinant of banking sector IRS, as such reserves reflect a burden associated with operating in the banking sector. A positive correlation between such reserves and IRS is expected, as high liquidity reserve requirements act as an implicit financial tax by keeping interest rates high.

Inflation (INFL)

The inflation rate for Zambia is included, and is calculated as the percentage change in the consumer price index (CPI). This variable *(INFL)* is an indicator of the cost of doing business in an economy, and it is expected to be positively correlated with IRS.

Exchange Rate Volatility (XRATVOL)

Exchange rate volatility for each quarter is calculated as the standard deviation of the percentage change in the real US$ exchange rate for the three preceding quarters. Because increased macroeconomic instability increases the risk faced by commercial banks, *XRATVOL* is expected to be positively correlated with IRS, as the banking sector increases its spreads to protect against the increased risk.

Government Borrowing from the Banking Sector (CROWD)

This variable captures the extent of government dependence on the domestic banking sector for the financing of its fiscal deficit. The variable measures for the entire banking sector, public sector borrowing as a percentage of total loans. The level of government borrowing and its influence on money and credit markets is an element of macroeconomic policy that imposes constraints on the flexibility on interest rates. CROWD is therefore expected to be positively correlated with IRS, as governments' heavy reliance on domestic banking sectors for deficit financing increases competition for funds and causes interest rates to rise.

Discount Rate (DISRATE)

The discount rate *(DISRATE)* is defined as the cost faced by commercial banks when borrowing from the central bank. The discount rate is used as a monetary policy instrument. It is expected to be positively correlated with IRS, as it increases the commercial banks' cost of funds, which may be passed on to customers through higher spreads.

4.6 Estimation Procedure

This study makes use of ordinary least squares (OLS) method of estimation and the statistical package used is E-Views. The time series characteristics of the data are examined before actual estimation of the model. We start with testing the data for unit root using the DF and ADF tests. Co-integration tests are carried out using the Johansen Maximum Likelihood Cointegration methodology. Co-integration analysis is essential in determining if the variables posses a long run relationship. In addition, diagnostic tests are conducted to establish the models' adequacy. In particular, the Breusch- Godfrey serial correlation LM test is also employed because the study uses quarterly time series data where autocorrelation is a frequent OLS violation. Also, the Ramsey RESET test is carried out to see if there is any misspecification in the model. One advantage of the RESET is that it is easy to apply, for it does not require one to specify what the alternative model is.

4.7 Data Type and Sources

This study uses quarterly time series data for the period 1995 to 2008. The period chosen has been necessitated by the availability of data. The study makes use of secondary data collected from the Bank of Zambia (BoZ).

CHAPTER FIVE

EMPIRICAL ANALYSIS

5.0 Descriptive Statistics

The table below shows the descriptive statistics of the variables used in the model

Table 5.1: Descriptive statistics of the data

	IRS	CROWD	DISRATE	XRATVOL	INFL	RES
Mean	20.189	49.759	32.854	4.904	22.439	9.471
Median	20.300	44.000	33.950	4.150	20.900	8.550
Maximum	29.100	114.300	68.400	18.500	49.000	16.500
Minimum	10.400	11.000	8.400	0.400	8.100	1.900
Std. Dev	5.162	25.516	17.105	3.875	9.602	4.082
Skewness	-0.076	0.616	0.168	1.227	0.844	-0.191
Kurtosis	1.855	2.924	1.778	4.929	3.710	1.892
Jarque- Bera	3.115	3.560	3.744	22.740	7.830	3.208
Probability	0.211	0.169	0.154	0.000	0.020	0.201
Observations	56	56	56	56	56	56

Notes; IRS= Interest Rate Spread, CROWD= Government Borrowing from the Banking Sector, DISRATE= Discount Rate, INFL= Inflation Rate, RES= Required Reserves as percentage of Deposits, XRATVOL= Exchange rate volatility

The Jarque- Bera (JB) test for normality for the variables was used because it is the large sample test unlike the Anderson- Darling test (or A^2 Statistic). The null hypothesis is that the variables are normally distributed. The JB follows the Chi- Square (X^2) distribution with 2 degrees of freedom. The JB test statistic is calculated as;

$$JB = n\left[\frac{s^2}{6} + \frac{(K-3)^2}{24}\right] \quad \text{.....(12)}$$

Where;

n= sample size

S=skewness coefficient

K=kurtosis coefficient

The critical value for the X^2 at 1% level of significance for 2 degrees of freedom is 9.2103. Therefore, Table 5.1 shows that all the variables are normally distributed because the JB test statistics are all less than the critical value at the 1% level except for the XRATVOL which has a test statistic of 22.740 which is greater than the critical value of 9.2103 at the 1% level and hence we reject the null hypothesis of normality in XRATVOL. The probabilities also confirm that the null hypothesis of the variables being normally distributed is not rejected except for the XRATVOL variable which rejects the null hypothesis. However, the descriptive statistics gave a broad picture that the residuals from the regression using these variables were expected to follow a normal distribution for efficient and unbiased estimators.

5.1 Unit Root Tests for Stationarity

Since economic time series data are often nonstationary, the data series were checked for the order of integration. A nonstationary series has the mean and variance that changes overtime. This means that the nonstationary data series have a different mean (or variance) at different points in time. If a series must be differenced *d* times before it becomes integrated of order zero, then it is said to be integrated of order *d*, denoted I(*d*).

Testing for stationarity involved the use of the Dickey-Fuller (DF) and the Augmented Dickey-Fuller (ADF) tests. The DF and ADF procedures involve testing whether variables/series in a model are stationary or testing the order of integration through unit root tests. All the variables included in the model were subjected to the DF and ADF unit root tests to establish whether they are stationary or not. This is because theoretical literature and other empirical studies suggest that time series data are usually associated with the problem of non stationarity. This problem, if not corrected for can lead to spurious regression or nonsense regression results in OLS estimations whereby no inference can be made since the standard statistical tests such as the "F" distribution and the student "t"

distribution are invalid. A spurious relationship arises were there is no economic long-run relationship. Table 5.2 and 5.3 give the results of the unit root tests in levels and in first differences respectively.

Table 5.2: Results for Unit Root Tests for variables in levels

Variable	DF statistic	ADF Statistic	No. of lags in ADF	Order of Integration
IRS	-1.3591	-1.6525	1	I(d)
CROWD	-1.1231	-1.6070	1	I(d)
DISRATE	-2.9957	-3.2388	1	I(d)
INFL	-2.7895	-3.8243	1	I(d)
RES	-1.5746	-0.7109	1	I(d)
XRATVOL	-2.8705	-3.6173	3	I(d)

Notes; (1) MacKinnon critical values for the rejection of a unit root
(2) Critical values for the DF statistics are -4.1314, -3.4919 and -3.1744 for 1%, 5% and 10% respectively.
(3) Critical values for the ADF statistics are -4.1348, -3.4935 and -3.1753 for 1%, 5% and 10% respectively

Table 5.2 gives us a summary of the DF and ADF unit root tests of the variables in levels with a constant and trend added in the DF and ADF equations. The null hypothesis is that there is a unit root in the series. The results in Table 5.3 above shows that there is a unit root in all the variables at their levels thus confirming that they are non-stationary and are integrated of order *d* I(*d*). Therefore, the first difference of the variables are taken and then tested for unit roots. The results are shown in Table 5.3 below.

Table 5.3: Unit Root test for variables in first difference

Variable	DF statistic	ADF Statistic	No. of lags in ADF	Order of Integration
ΔIRS	-6.0746	-4.4919	2	I(1)
ΔCROWD	-4.8711	-4.8711	0	I(1)
ΔDISRATE	-5.8230	-5.3942	1	I(1)
ΔINFL	-6.3970	-4.5607	1	I(1)
ΔRES	-9.3505	-5.9358	1	I(1)
ΔXRATVOL	-6.7908	-4.4833	4	I(1)

Notes; MacKinnon critical values for the rejection of a unit root

(1)Critical values for the DF statistics are -4.1348, -3.4935 and -3.1753 for 1%, 5% and 10% respectively.

(2) Critical values for the ADF statistics are -4.1420, -3.4969 and -3.1772 for 1%, 5% and 10% respectively

The results in the Table above reveal that the variables become stationary after the first difference and hence they are integrated of order one, I(1). The strategy followed in selecting the lag length in the ADF test was to select the highest lag length with no serial correlation. A constant and trend was included in the estimations.

5.2 Cointegration Test / Analysis

Since our time series are non-stationary and they are integrated of the same order, *I*(1), a cointegration test is carried out. Co-integration analysis is essential in determining if the variables posses a long run relationship and we use the Johansen Maximum Likelihood Cointegration because we have more than two variables in our study. The results are shown in the table below;

Table 5.4: Johansen Cointegration Test

Eigenvalue	Likelihood Ratio	5% Critical Value	1% Critical Value	Hypothesized No. of CE (s)
0.715877	121.6128	94.15	103.18	None**
0.357895	52.40376	68.52	76.07	At most 1
0.251048	28.03855	47.21	54.46	At most 2
0.126999	12.13910	29.68	35.65	At most 3
0.058277	4.669094	15.41	20.04	At most 4
0.024543	1.366681	3.76	6.65	At most 5

*(**) denotes rejection of the hypothesis at 5% (1%) significance level
L.R. Test indicates 1cointegrating equation(s) at 5% significance level
Test assumption : Linear deterministic trend in the data.

The above test results indicate that there is at most 1 cointegrating vector at 5% significance level as shown by the likelihood ratio of 121.6128 which is above the critical value of 94.15 and 103.18 at 1% Hence we reject the null of no cointegration in the variables at the 5% level of significance. The results in the above table show that the null hypothesis of at most 1, at most 2, at most 3, at most 4 and at most 5 cointegrating equations are not rejected at the 5% level of significance. Only the hypothesis of no cointegrating equation is rejected at the 5% level while the others are accepted. The results suggest the presence of cointegration, implying that there is a long-run relationship between the series. We therefore conclude that there is only one cointegration relationship involving the six(6) variables : IRS, DISRATE, INFL, RES, XRATVOL and CROWD. The likelihood ratio test statistic reject the null hypothesis of no cointegrating equation at 5% level of significance and suggest that there is a unique cointegration vector. Our quarterly data from 1995 to 2008 therefore appear to support the proposition that in Zambia's Banking sector, there exist a stable long- run relationship between interest rate spreads and the above mentioned variables.

5.3 Estimation of the Model

The results for the unit root tests and the cointegration analysis allows us to proceed to estimate the relationship between the IRS and its determinants. The log-linear regression model was estimated and the estimation results are shown in the Table below;

Table 5.5 : Estimation results

Dependent Variable: LOG(IRS)				
Method: Least Squares				
Date: 03/ 24/ 10				
Sample(adjusted): 1995:2 2008:4				
Included observations: 55 after adjusting endpoints				
Variable	Coefficient	Std. Error	t- Statistic	Prob.
C	0.077655	0.189699	0.409360	0.6841
LOG(IRS(-1))	0.784814	0.077648	10.10727*	0.0000
LOG(RES)	0.086504	0.042154	2.052070**	0.0455
LOG(DISRATE)	0.092036	0.049834	1.846859***	0.0708
LOG(INFL)	0.021988	0.067496	0.325765	0.7460
LOG(XRATVOL)	0.001269	0.014893	0.085187	0.9325
R- squared	0.873366			
Adjusted R- squared	0.860444	F-statistic		67.58823
Durbin- Watson stat	1.599744	Prob(F-statistic)		0.000000

Notes: The asterisk *,**,*** indicates significance at 1%,5% and 10% respectively

Before we interpreted the results, we carried out the various diagnostic tests to ensure that our estimated model is adequate in explaining the determinants of Interest rate spreads in Zambia between 1995 to 2008. The various diagnostic tests carried out are explained below before we interpreted our regression results.

5.4 Model Evaluation and Diagnostic Tests

This section presents the results of a number of tests which were performed on the model to determine its adequacy before any interpretation of the empirical results was undertaken. This is done in order to discover the weakness of the model in terms of reliability and forecasting power as well as to

determine if there is any misspecification in the model. Table 5.6 below gives the various diagnostic tests that were undertaken on the model to determine its adequacy.

Table 5.6: Model Diagnostic Test Results

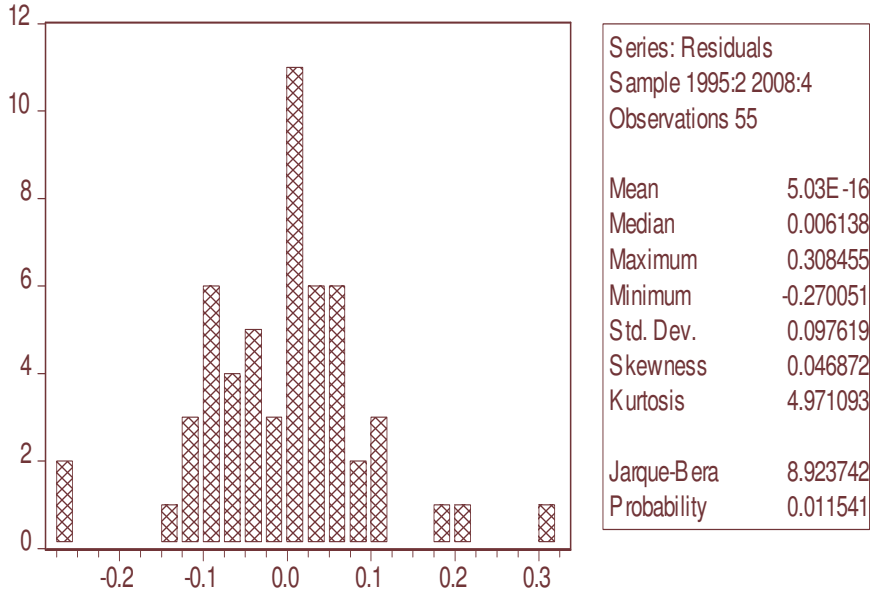
Type of Test	F- Statistic	Probability
Ramsey RESET Test	0.261468	0.611457
White Heteroskedasticity Test	0.741460	0.681994
Breusch- Godfrey Serial Correlation LM Test	1.313480	0.278570
ARCH LM Test	0.053851	0.817404

Source: author's own computation

Ramsey RESET Test. This is a general test of specification error called RESET (regression specification error test). This test is concerned with the specification errors, which include omitting relevant variables, including an unnecessary or irrelevant variable, incorrect functional form and correlation between explanatory variables and residuals. The null hypothesis is that the model is correctly specified against the alternative that it is mis-specified. The Ramsey Reset test for misspecification gives an F-statistic of 0.2615 with a probability of 0.6115. This result indicates that the model is correctly specified because we fail to reject the hypothesis of no misspecification at all conventional significance levels.

Histogram -Normality Test. If we are to conduct hypothesis testing, first we have to establish the normality of the error term. If the error term is not normally distributed, then so will be the estimators which will render us unable to derive the values of estimators.

Figure 1: Residual Normality Test for the Model



From Figure 1, the Jarque-Bera statistic for testing the normality of the residuals is 8.9237 with a probability of 0.0115. Thus, the normality assumption is not rejected because the critical value is 9.2103. The result indicates that the error term is normally distributed as we fail to reject the null hypothesis at the 1% level of significance. The residual normality test is shown in the figure below;

Breusch-Godfrey Serial Correlation LM Test. This is another test for heteroscedasticity in residuals. Table 12 shows that the Breush-Godfrey serial correlation test gives an F-statistic of 1.3135 with a probability of 0.2786. Hence, we fail to reject the hypothesis of no autocorrelation in the residuals. The Breush-Godfrey test is used because the Durbin Watson test is not reliable when lagged values are used in the model. The Breusch- Godfrey test is much more general in that it allows for both AR and MA error structures as well as the presence of lagged regressand as an explanatory variable (Gujarati, 2007). The null hypothesis is that there is no serial correlation.

The ARCH LM Test. This is a test for autoregressive conditional heteroscedasticity in the residuals. The null hypothesis is that there is no ARCH up to the order q in the residuals. The result indicates the absence of ARCH at all conventional significance levels because the probability is 0.817404 and the F-statistic is 0.053851. Hence, we fail to reject the null hypothesis.

Multicollinearity. The pair-wise correlations are not quite high except that between the Treasury bill rate (TBILL) and the Discount rate (DISRATE) which is 97.8% suggesting that there may be a severe collinearity problem between the two variables. However, we dropped the TBILL variable and chose to include the DISRATE variable because it is the policy used by the central bank to discourage commercial banks from borrowing by increasing their cost on borrowing from the central bank in which they later transfer this cost to their customers and hence increasing the interest rate spreads. Otherwise, the correlation matrix does not indicate that there is serious multicollinearity between variables in the model. This is so because a rule of thumb is that if pair-wise or zero-order correlation coefficient between two regressors is high when it is in excess of 0.8 which is not the case (except between TBILL and DISRATE). The correlation matrix is shown below;

Table 5.7: Correlation Matrix

	IRS	TBILL	INFL	DISRATE	XRATVOL	RES	CROWD
IRS	1.000	0.426	0.147	0.417	-0.143	0.196	0.087
TBILL	0.426	1.000	0.771	0.978	0.105	-0.523	-0.200
INFL	0.147	0.771	1.000	0.811	0.011	-0.649	-0.187
DISRATE	0.417	0.978	0.811	1.000	0.075	-0.587	-0.304
XRATVOL	-0.143	0.105	0.011	0.075	1.000	-0.100	-0.230
RES	0.196	-0.523	-0.649	-0.587	-0.100	1.000	0.586
CROWD	0.087	-0.120	-0.187	-0.304	-0.230	0.586	1.000

Source: Author's own computation

5.5 Interpretation of Results

The model is a good fit since the regressors (logarithm of the first lag of interest rate spread, logarithm of inflation, logarithm of the discount rate, logarithm of reserve requirements and logarithm of exchange rate volatility) in the model explain about 87 percent of variation in interest rate spreads.

The first lag of the interest rate spread appears to be important in explaining the variation in the interest rate spread which may suggest the importance of the inertial interest rate spread or expectations about the interest rate spreads. This variable has a positive effect on the dependent variable implying that an increase in the last quarter's interest rate spread will contribute to the increase in interest rate spread in the current quarter. Ceteris paribus, a percent change in interest rate spread in the previous quarter will lead to about 0.78 percent increase in interest rate spread in the current period on average.

Reserve Requirements: the coefficient of logarithm of reserves is positive and statistically significant at 5% level. On average, a percent increase in the reserve requirement leads to about 0.9% increase in the interest rate spread. The minimum reserve requirement influences the interest rate spread positively. The findings are in line with the study's expectations as an increase in the minimum reserve requirements by the central bank will lead commercial banks to shift the cost of non- interest earning reserves to their customers, thus increasing the interest rate spread. The findings of this study are similar with those found by Barajas and others (2000) who found evidence of a positive and significant relationship between spreads and liquidity reserves in the Colombian banking system. Brock and Rojas-Suarez (2000) and Saunders and Schumacher (2000) also found evidence suggesting that reserve requirements act as a tax on banks that translates into higher spreads in a number of Latin

American and developed countries, respectively. Chirwa and Mlachila (2004) also found that spreads in Malawi increased after financial liberalization because of increases in reserve requirements.

Inflation: The results show that inflation is positively associated with interest rate spread and statistically insignificant at all conventional significance levels. This suggests that inflation does not affect the levels of interest rate spreads in Zambia. This result is similar with that found by Crowley (2007) in his study of Interest Rate Spreads in English-Speaking African countries. In regressions of unadjusted spreads (spreads unadjusted for inflation), inflation was not found to be significant. This could suggest that banks do not take the erosion of their profits into account when determining how to adjust interest rates to compensate for inflation.

Exchange rate volatility: The results show that the exchange rate volatility is positively associated with interest rate spread and statistically insignificant at all conventional significance levels. This suggests that the exchange rate volatility also does not affect the levels of interest rate spreads in Zambia. The implication of this result is that the exchange rate volatility may not be a critical determinant of the interest rate spread in Zambia as commonly perceived. Whilst macroeconomic stability has been long held to be a critical cause of high interest rate spreads, our results have shown that the volatility of the exchange rate does not have a significant impact on the banking sector interest rate spreads in Zambia.

Discount rate: The study has found the coefficient of the discount rate to be positive and statistically significant at 10% level of significance. All things equal, a percent increase in the discount rate will lead to about 0.5 % increase in the interest rate spread.

CHAPTER SIX

CONCLUSION AND POLICY IMPLICATIONS

6.0 Main findings of the Study, conclusion and policy implications

The main aim of this study is intended to give more insight on the factors that determine interest rate spreads in Zambia. In general, the study found exchange rate volatility and inflation rate to be statistically insignificant hence the government should not use them in an attempt to influence interest rate spreads as such policies are bound to fail. The insignificance of these variables suggests that they have less of an impact on interest rate spreads than that perceived in much of the literature. The clear implication is that measures by the central bank such as moral suasion, will have little, if any, impact on interest rate spreads in environments where there are persistent factors causing spreads to be high. The variability of exchange rate and inflation was not found to have any significance, a surprising result since such variability would seem likely to lead to higher risk premiums.

The other implication of our results is the fact that many of the factors commonly believed to be critical determinants of interest rate spreads may not be as relevant as perceived. For example, whilst macroeconomic stability has been long held to be a critical cause of high interest rate spreads, our results have shown that one of the most common indicators of such instability, the volatility of the exchange rate, does not have a significant impact on the banking sector interest rate spreads in Zambia. This suggests that much of the debate on exchange rate policies and management may not be highly relevant to banking spreads, but exchange rate volatility may impact on a country's exports and balance of payments. There is no evidence of a transmission mechanism by which this effect is translated into a widening of banking sector spreads.

The study found the lag of the interest rate spread to be positive and statistically significant. This provides the basis for the need for government through the central bank to pursue policies that will reduce the spread because the higher spread in the previous period will affect the spread in the current period positively. Increase in the current spread will lead to more increases in the spread in the following period and hence this has a negative impact on the growth prospects of Zambia because there is a negative relationship between the spread and the growth prospects of a country. In order to reduce the interest rate spreads, there is need to increase the current low deposit rates (to positive as they are currently negative in real terms) through enhancing competition in the banking sector. This increase in deposit rates will not only reduce the spread but will also encourage savings. The increase in savings will lead to the availability of more resources. This will have positive effects in the economy such as high investments and consequently high economic growth.

The discount rate plays an important role in determining the interest rate spread in Zambia's Banking Sector. It has a positive and statistically significant coefficient. This points to the need for the Central Bank to endeavour to reduce the discount rate as a way of reducing the spread as commercial Banks tend to transfer the cost of borrowing from the central bank to its customers and hence an increase in the spreads. The commercial banks alternatively borrow amongst themselves at commercial rates to avoid going to the central bank. The rate commercial banks charge for borrowing amongst themselves is called the interbank rate. This is usually short- term borrowing and the rates charged are high and hence commercial banks tend to pass on that cost to customers through high lending rates and low deposit rates and hence leading to high interest rate spreads.

The reserve requirement is a significant determinant of interest rate spread. High reserve requirements act as an implicit financial tax by keeping interest rates high. Zambia does not have a bank deposit insurance and hence banks are still subjected to high liquidity reserve requirements even after

financial liberalization. While reserve requirements may be designed with the aim of protecting depositors, the opportunity cost of holding reserves at the central bank, where they earn no interest, increases the economic cost of funds above the recorded interest expenses that banks tend to shift to customers. There is therefore need to create a deposit insurance in Zambia so as to protect depositors instead of using reserve requirements as a mechanism to protect depositors.

6.1 Limitations of the Study and recommendations for future research

This study only focuses on the market and macroeconomic determinants of Banking Sector interest rate spreads. This is just one side of the determinants of interest rate spreads. There are other determinants whose data is not available in the public domain and hence there is need to investigate such determinants. There is need for further investigation of the influence of bank specific characteristics as these can influence interest rate spreads.

Further investigations could be conducted on this topic in a country specific case but perhaps using a different methodology. VAR methodology could be applied to this topic to even carry out the impulse response and variance decomposition of the influence of various variables on interest rate spreads.

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APPENDICES

Appendix 1

Log-Linear Regression Model Output

Dependent Variable: LOG(IRS)
Method: Least Squares
Date: 04/03/10 Time: 04:33
Sample(adjusted): 1995:2 2008:4
Included observations: 55 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.077655	0.189699	0.409360	0.6841
LOG(IRS(-1))	0.784814	0.077648	10.10727	0.0000
LOG(RES)	0.086504	0.042154	2.052070	0.0455
LOG(INFL)	0.021988	0.067496	0.325765	0.7460
LOG(XRATVOL)	0.001269	0.014893	0.085187	0.9325
LOG(DISRATE)	0.092036	0.049834	1.846859	0.0708

R-squared	0.873366	Mean dependent var	2.969159
Adjusted R-squared	0.860444	S.D. dependent var	0.274320
S.E. of regression	0.102478	Akaike info criterion	-1.615663
Sum squared resid	0.514588	Schwarz criterion	-1.396681
Log likelihood	50.43074	F-statistic	67.58823
Durbin-Watson stat	1.599744	Prob(F-statistic)	0.000000

Appendix 2

Model Diagnostic Tests' Outputs

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.313480	Probability	0.278570
Obs*R-squared	2.911378	Probability	0.233240

ARCH Test:

F-statistic	0.053851	Probability	0.817404
Obs*R-squared	0.055864	Probability	0.813156

White Heteroskedasticity Test:

F-statistic	0.741460	Probability	0.681994
Obs*R-squared	7.931657	Probability	0.635513

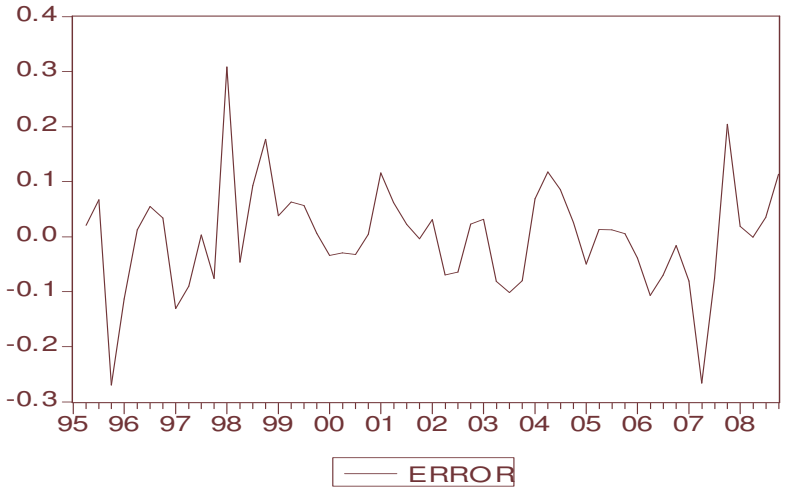
Ramsey RESET Test:			
F-statistic	0.261468	Probability	0.611457
Log likelihood ratio	0.298786	Probability	0.584644

ADF (Unit root) Test of Error Term

ADF Test Statistic	-4.922625	1% Critical Value*	-4.1383
		5% Critical Value	-3.4952
		10% Critical Value	-3.1762

*MacKinnon critical values for rejection of hypothesis of a unit root.

Figure 2: Residuals from Log- Linear Regression Model Plot



Correlogram of Residuals

Date: 04/03/10 Time: 12:43
Sample: 1995:2 2008:4
Included observations: 55

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
. | .	. | .	1	-0.032	-0.032	0.0599	0.807
. | .	. | .	2	-0.009	-0.010	0.0642	0.968
. | .	. | .	3	0.064	0.063	0.3081	0.959
. | .	. | .	4	-0.006	-0.002	0.3105	0.989
. | .	. | .	5	-0.054	-0.053	0.4919	0.992
. | .	. | .	6	-0.026	-0.034	0.5358	0.997
.*| .	.*| .	7	-0.108	-0.111	1.2987	0.988
. | .	. | .	8	-0.044	-0.046	1.4291	0.994
. |**	. |**	9	0.268	0.273	6.3408	0.705
.*| .	. | .	10	-0.080	-0.056	6.7854	0.746
. | .	. | .	11	-0.047	-0.056	6.9427	0.804
. |*.	. |*.	12	0.144	0.107	8.4581	0.748
. | .	. | .	13	-0.027	-0.030	8.5112	0.809
. | .	. | .	14	-0.026	-0.014	8.5632	0.858
. | .	. | .	15	-0.024	-0.032	8.6102	0.897
. | .	. | .	16	-0.040	0.005	8.7386	0.924
. | .	. | .	17	-0.042	-0.027	8.8838	0.944
. | .	.*| .	18	-0.046	-0.138	9.0627	0.958
.*| .	. | .	19	-0.059	-0.002	9.3708	0.967
. | .	. | .	20	-0.051	-0.025	9.6045	0.975
. | .	.*| .	21	0.019	-0.065	9.6394	0.983
. | .	. | .	22	0.004	0.032	9.6408	0.989
. | .	. | .	23	-0.053	-0.052	9.9175	0.992
.*| .	.*| .	24	-0.060	-0.097	10.277	0.993