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**THE PRICE-CONCENTRATION RELATIONSHIP IN THE COMMERCIAL
BANK DEPOSIT MARKETS IN ZAMBIA**

BY

SAMUEL SANDI

**A dissertation submitted to the University of Zambia in partial fulfillment
of the requirements of the Degree of Master of Arts in Economics**



The University of Zambia

June 2010

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JUNE 2010

I, Samuel Sandi, declare that this dissertation:

- (a) Represents my work;
- (b) Has not previously been submitted for a degree at this or any other University; and
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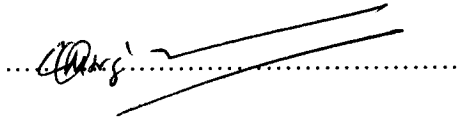
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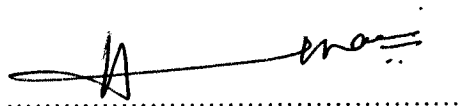
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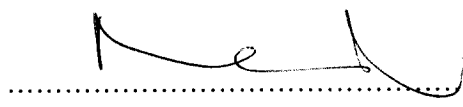
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ABSTRACT

Economic theory states that in situations of few well established enterprises, competition and consumer welfare is usually affected. The reduction in competition among other things results into consumers facing poorer service, and higher prices of goods and services. A number of studies in the banking sector in the USA, Europe and lately in the Southern African Monetary Area have been carried out and most of the results indicate that in a highly concentrated banking industry i.e few well established commercial banks, there are negative effects on the efficiency of banks and pricing of retail banking products.

The Zambian banking sector has been and remains oligopolistic. Before independence in 1964, two foreign commercial banks dominated the banking sector namely Standard Bank and Barclays Banks with the Grindlays Bank providing fringe competition. In 1965, the Zambia National Commercial Bank (ZANACO) was established and followed by the Non-Bank Financial Institutions such as the Post Office, the Zambia National Building Society (which was a merge of building societies), the Zambia National Provident Fund and the Zambia State Insurance Corporation (another merge of insurance companies). Years later more private banks entered the market. Despite the entry of local banks, the banking industry still remains uncompetitive. Most of the banks with the notable exception of ZANACO are predominantly urban-based. The foreign banks continue dominating in terms of market share, loans and advances, deposits and total assets. Such type of structure indicates that the banking industry in Zambia is concentrated. This structure does not favour the welfare of customers. As a result high banking costs are being borne by the depositors due to inadequate competition prevailing in the country.

Under this study “the Price-Concentration Relationship in the Commercial Bank Deposit Markets in Zambia”, we explore the level of bank concentration in the country and the relationship between bank concentration and the pricing of retail banking deposit rates (i.e prices). In our analysis we uses quarterly data spanning the period 1997 to 2007 from the Bank of Zambia annual reports and bulletins; Commercial Banks annual reports; data from various thesis kept by the University of Zambia library; the Central Statistics reports; data on commercial banks from the World Bank’s World Development indicators; and Ministry of Finance and National Planning economic reports.

In analysing the data collected under this study, the time series of co-integration and error correction modelling approaches have been used. Empirical results suggests that there exists a unique long-run or equilibrium relationship among consumer weighted deposit interest rates (i.e., prices) and concentration ratio, per capita income and deposits held by commercial banks. This relationship implies that Zambia’s highly concentrated banking markets are “bad” for depositors.

To my family.

ACKNOWLEDGEMENTS

The results of this study owe a great deal to many people and organizations, too numerous to mention. However, I would like to extend my sincere gratitude to the Ministry of Communications and Transport for sponsoring me to undertake this study.

Many thanks also go to the University of Zambia, Department of Economics staff for having made my studies pleasant. I wish to specifically acknowledge my supervisor Dr. C. Ng'andwe for his guidance. Special thanks also go to Dr. S. Bwalya and Prof. Manenga Ndulo for their contributions.

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ABBREVIATIONS

ACB	African Commercial Bank
ADF	Augmented Dickey-Fuller
AFC	Agricultural Finance Company Limited
BOZ	Bank of Zambia
COZ	Credit Organisation of Zambia
CSO	Central Statistics
CR	Concentration Ratio
ECM	Error-Correction Model
FRBSE	Federal Reserve Bank of San Francisco
GDP	Gross Domestic Product
HHI	Herfindahl-Hirschman Index
HIV/AIDS	Human Immunodeficiency Virus/ Acquired Immune Deficiency Syndrome
NBFIs	Non-Bank Financial Institutions
NSCB	National Savings and Credit Bank
IO	Industrial Organisation
RDC	Rural Development Corporation
SCP	Structure Conduct Performance
SIDO	Small Industries Development Organization
SSA	Sub-Saharan Africa
USA	United States of America
VECM	Vector Error Correction Model
ZADB	Zambia Agricultural Development Bank
ZANACO	Zambia National Commerce Bank
ZCCM	Zambia Consolidated Copper Mines
ZNBS	Zambia National Building Society
ZNPF	Zambia National Provident Fund

CHAPTER ONE

INTRODUCTION

Background

There are a number of problems facing the banking industry in developing countries including Zambia. The banking industry is characterised by high operating costs and the dominance of few and relatively large foreign banks. Due to this fact, most of the developing countries have high bank concentration¹ ratios. High bank concentration ratios could influence many aspects of the banking industry. A particular question of interest for policymakers and researchers alike might be the impact of these factors on bank spreads -the difference between the rate charged to borrowers and the rate paid by depositors. High spreads can hinder the growth of savings and investments and imply that the cost of using the financial system may become prohibitive for certain borrowers.

Despite the financial sector reforms undertaken by most developing countries in recent years to stimulate competition in the banking sector, bank interest spreads, fees and other charges have remained high, undermining intermediation and accessibility to banking services. Banks have continued to ration credit at high interest rates in many developing and transition economies thereby resulting in wide margins and non-competitive conduct (Musonda, 2008).

¹ The principle of concentration, measures the degree to which a market is dominated by a few firms

In order to understand the high bank concentration ratios in the early banking markets of Sub-Saharan African (SSA) countries and what is pertaining in recent years, a brief background during the 1970s and early 1980s is given. During this period the banking industry in SSA was dominated by oligopolistic foreign-and government-owned banks (Brownbridge, 1998). The foreign banks owned over 70% share of assets and basically served the interests of the foreign companies. The locally owned private banks and non-bank financial institutions (NBFIs) which were established during the 1970s could have provided important intermediation to the SSA economies. This could have resulted into enhanced competition and improvements in services to customers. However the banking sector was heavily regulated by the monetary authorities. Such regulations led to financial markets in most developing countries to be characterized by financial repression²/distress. A substantial number of local banks had failed, mainly due to non-performing loans leaving only a few operating with the dominance of foreign banks in terms of market share (Brownbridge, 1998).

Until recently, the Zambian banking sector has also been oligopolistic. Before independence, two foreign commercial banks dominated the banking sector namely Standard Chartered Bank and Barclays Bank with the Grindlays Bank providing fringe competition (Kalima, 2001). After the Mulungushi reforms of 1968, government embarked on establishing financial institutions rather than nationalizing the existing ones. In addition to ZANACO which was established in 1965, the government also established Non-Bank Financial Institutions such as

² Financial repression is a mechanism by which governments buy foreign bonds in an effort to sterilise currency.

the Zambia National Building Society, the Zambia National Provident Fund and the Zambia State Insurance Corporation.

By 1990 more local and international banks were established by the private sector. However, despite the entry of these private sector banks in the 1990s, a number of them were liquidated in the same period leaving the banking industry still uncompetitive. The foreign banks continue to dominate in terms of market share. For instance foreign banks in Zambia account for approximately 73% in terms of market share of depositors while the local banks which are in majority but thinly spread across the country only account for 27%, (Lune, 2006).

In this study we explore the level of bank concentration in Zambia and the relationship between bank concentration and the pricing of retail banking deposit rates. We analyze whether there exist a long-run relationship between price and concentration in the commercial bank deposit. We use quarterly data for the period 1990-2007 in our analysis. First, the hypothesis of the existence of a co-integrated relationship between price and concentration of banks is tested. If the hypothesis of no co-integration is rejected, then a stable long-run relationship between price and concentration exist. Secondly, we estimate an error-correction model (ECM) to integrate the dynamics of short-run (changes) with long run (levels) adjustments processes.

The method used in this study is similar to that used in the price concentration studies in the USA (Berger and Hannan 1989) and in Africa (Okeahalam, 2002).

Research Problem Statement

The successive liberalization of the economy in 1991 and the advent deregulation of the financial market eased the barriers to entry for new banks in the banking sector. This is evidenced by an increase in banks from eight (8) in 1990 to nineteen (19) banks by end of 1994. The number of banks has since reduced to 16 as at December 2009

However, deterioration of the financial situation of some banks resulted from risky lending to attract new customers, lower revenue from foreign exchange operations, lower treasury-bill yields, periodic shortages of liquidity, limitations to raise capital and additional competition from small banks and from emerging non-bank financial institutions led to many banks to collapse between 1994 and 2000. During this period of turmoil, nine commercial banks were closed down.

The liquidation of commercial banks in Zambia, closure of bank branches and the type of market structure, which is dominated by a few banks with only a few branches spread across the country, raises the possibility that competition may be diminished through increases in concentration. As a result high banking costs are being borne by depositors due to inadequate competition prevailing in the country. For instance, interest rates on deposits are very low and often negative in real terms compared to lending rates by commercial banks in the country.

Objectives of the Study

The study has three (3) specific objectives as outlined below:

- 1) To examine the level of bank concentration in Zambia;
- 2) To examine the relationship between bank concentration and the pricing of retail banking products; and
- 3) To raise possible policy implications.

Hypothesis

Theory states that liberalization of financial sector which eliminates direct government intervention in the financial system is expected to lead to financial deepening, increase in flow of funds and improved efficiency of the financial system. With the liberalization policy, several policy variables are expected to change such as interest rates, cost structure and investment decisions by banks. However, some of these policy variables can be influenced by the degree of competition in the banking sector. Scholars of competition policy have used the SCP framework to test whether structural and behavioural characteristics of banks have some influence on bank profitability. The SCP hypothesis predicts that market concentration lowers the cost of collusion between firms and results in higher than normal profits for all markets participants. Therefore the specific hypotheses are:

- 1) the banking sector in Zambia is highly concentrated; and
- 2) the pricing of retail banking deposit in Zambia is related to bank concentration.

Significance of the Study

The analysis of price-concentration relationship in the Zambian retail bank deposit industry is important and timely because the study will contribute to the investigation on why interest rates spread between deposits and loans is wide and real interest on deposits is negative even when the inflation has been declining in the country in recent years. Its findings will greatly be useful and assist in understanding of the price-concentration relationship in the commercial bank deposit market of Zambia.

Structure of the thesis

This study is divided into six chapters. The first chapter is the introduction of the study. The second chapter covers the literature review on price-concentration relationship in the retail banking sector. The third chapter outlines the structure of the banking sector in Zambia. Chapter four outlines the methodology and estimation techniques. Chapter five presents the analysis of the regression results while chapter six concludes with a summary and policy implications.

CHAPTER TWO

LITERATURE REVIEW

In the recent past empirical studies such as Chirwa (2001) and Okeahalam (2001) provides empirical evidence on the positive role of the banking sector in Africa in enhancing economic growth through a more efficient resource allocation. However less emphasis has been put on the effect of competition in the banking sector, its market structure, conduct and performance in promoting economic growth and the welfare of depositors. The present section reviews the literature by focusing on both theoretical and empirical research on competition in the banking industry.

A number of studies in industrial economics and other fields of economics indicate that if there is an increase in concentration in an industry, competition tends to be reduced (Neuberger, 2001). The reduction in competition among other things results into consumers facing poorer service, and higher prices for goods and services. Therefore, whenever there is high industrial concentration, there usually follows some debate and enquiry into the effect that this might have on competition and consumer welfare (Lloyd-Williams and Molyneux, 1994). Theory also states that in highly concentrated markets, huge firms tend to increase their profits by engaging in strategic behaviour such as price leadership (Steven, 1992).

In 1967 Cameron³ had argued that concentration in industrial business is related to competition in banking and this was supported by Cetorelli (2003) in recent years. Based on Cameron (1967) historical analysis, a number of studies in banking have adopted this methodology to analyze competition in the banking industry. The methodology may be broadly divided into the Structure Conduct Performance (SCP) paradigm and Price-Concentration Relationship approaches, (Ashton, 1999) as outlined below.

MARKET STRUCTURE-CONDUCT-PERFORMANCE

According to the SCP hypothesis, market structure influences conduct (behaviour) of firms through for instance pricing and investment policies, and this in turn translates into performance. The SCP studies have used a range of proxies to represent market structure and market performance. Market structure has been represented by the relationship between buyer and seller costs, the degree of product differentiation, the degree of concentration within a market place, the degree of market share, and the entry conditions for potential new firms (Goldberg and Rai 1996). Other factors, including risk, leverage, buyer and seller concentration and foreign competition and macro-economic factors, have all been considered in various SCP studies.

³ "...Competition in banking is related to the question of competition in industry. In general the two flourish – and decline – together. Whether this phenomenon is a joint by-product of other circumstances, or whether it results from the decline or restriction of competition among banks, is a matter worthy of further research. It is a striking coincidence, in any case, that industrial structure – competitive, oligopolistic, or monopolistic – tends to mirror financial structure."

Principal findings of SCP studies include the rejection of the concept of long-term equilibrium, a link between the performance of the firm and the concentration of the market and the connection between performance and the market power of individual firms, (Goldberg and Rai 1996). According to Ashton (1999), the SCP paradigm also considers how the observable characteristics of a market or industry may affect the conduct and performance of participants within the market.

One of the first studies using the SCP was conducted in the USA immediately after the financial sector was liberalized in the 1980s (Spiegel, 2001). The deregulation of the sector in the US saw a number of banks merging leaving only a few of them operating, a situation which resulted into bank concentration.

In another study Molyneux and Forbes (1995) considered the SCP paradigm for 18 banks in Europe. The sample was taken between 1986 and 1989 and it included banks operating in a broad range of regulatory environments. The study provided empirical support for the traditional SCP paradigm. It concluded that the degree of concentration has an effect on the level of competition within the industry.

Other scholars have also recommended the use of this framework. For instance, Okeahalam (2002) argued that the SCP framework is the most commonly used empirical approach to evaluate competition in banking. He further stated that under this framework, an assumption is made that measurements of market

structure and concentration can provide reliable inference as to the extent of competition or conduct in an industry. The extent of competition affects the price which consumers pay for banking services which influences the level of profits and other measures of financial returns.

The SCP model is shown as equation 1.

$$\pi=f(C,B,D) \quad (1)$$

Where; π is the index of performance (profitability); C= is a vector of variables denoting ease of collusion; B= is the vector of variables representing barriers to entry D= is the vector of demand variables

This model has been tested by many studies such as Berger and Hannan (1989) and Okeahalam (2002). These studies found evidence in favour of a positive and significant relationship between concentration and profitability in various sectors they have studied (Bain, 1951).

PRICE-CONCENTRATION RELATIONSHIP IN BANKING

Apart from the Structure-Conduct-Performance tool, other studies have adopted the Price-Concentration Relationship tool to analyze the relationship between price and concentration in banking. In a study of Commercial Banking Sector of South Africa, Okeahalam (2001) used the following reduced-form equation to measure the relationship between price and bank concentration in South Africa;

$$Y_{ijt} = \alpha + \alpha \text{CONC}_{jt} + \beta X_{ijt} + \alpha_{ijt} \quad (2)$$

Where;

Y_{ijt}	=	is the rate of interest paid at time t
CONC_{jt}	=	represents a concentration ratio level in market j at time t
X_{ijt}	=	is a vector of control variables
i	=	country
j	=	market
t	=	time

the results typically found a significant and negative relationship between consumers deposit rates and market concentration. The relationship implied that highly concentrated banking markets were not good for depositors.

In another study on Price concentration relationship, Berger and Hannan (1998), used a panel of U.S banks in different markets, for the period September 1983 to December 1985. The results gave evidence that supports the fact that more concentrated markets imply lower deposit rates than less concentrated ones.

Some theoretical arguments suggest that a less concentrated banking sector with many small banks is more prone to financial crises than a concentrated banking sector with a few large banks (Allen and Gale (2002)). The proponents of the "concentration-stability" view hold that large banks can diversify better so that banking systems characterized by a few large banks will be less fragile than banking systems with many small banks. Furthermore, concentrated

banking systems may enhance profits and therefore lower bank fragility. High profits provide a “buffer” against adverse shocks and increase the franchise value of the bank, reducing incentives for bank owners to take excessive risk (Helmann and Stiglitz, 2000). Third, some hold that a few large banks are easier to monitor than many small banks, so that corporate control of banks will be more effective and the risks of contagion less pronounced in a concentrated banking system (Helmann and Stiglitz, 2000). The U.S., with its large number of small banks, supports this “concentration-stability” view since it has had a history of much greater financial instability than the U.K or Canada, where the banking sector is dominated by a few large banks.

An opposing view is that a more concentrated banking structure enhances bank fragility. First, advocates of the “concentration-fragility” view note that large banks frequently receive greater net subsidies than small banks through implicit “too big to fail” policies. This greater subsidy for large banks may in turn intensify risk-taking incentives, increasing the fragility of concentrated banking systems (Boyd and Runkle 1993). Second, proponents of the concentration-fragility view would disagree with the proposition that a few large banks are easier to monitor than many small banks. If size is positively correlated with complexity, then large banks may be more opaque than small banks, which would tend to produce a positive relationship between concentration and fragility. Boyd, and D’Nicolò (2003) stress that banks with greater market power tend to charge higher interest rates to firms, which induces firms to assume greater risk.

Berger and Hannan (1989) also found that, after controlling for other factors that might affect the results, deposit interest rates tended to be lower in metropolitan areas where the banking industry was relatively concentrated. Using data on loan rates from 20 cities in the US during 1987 and 1988, Rhoades (1982) similarly found that mortgage interest rates tended to be higher in cities in UK where concentration was relatively high. Based on data from 1975 to 1998, Pilloff and Rhodes (2002) found that local market concentration is positively and significantly related to bank profitability. These studies show that where the banking industry is concentrated, the depositors suffer low rates on their deposits whereas the banks on the other hand charge relatively higher lending interest rates on the loans they give out to their clients.

Research also indicates that the effect of bank concentration on firms can be modified by the country's institutional and regulatory framework and on who owns the banks. The relation of bank concentration and financing constraints turns insignificant in countries with well developed institutions, high levels of economic and financial development and a high share of foreign banks (Harvey 1993). State owned banks and a high degree of government interference in the banking system, on the other hand, exacerbate the impact of bank concentration on financing constraints. The interaction between bank concentration and restrictions on banks' activities also shows that with very few activity restrictions bank concentration may actually reduce financial obstacles and increase access to bank finance, Ashton (1999).

Under the price-concentration relationship we have just discussed we have observed that concentration implies lower deposit rates. In other words under this relationship most studies prove the theory that in highly concentrated markets, competition tends to be reduced and as a result consumers pay higher loan interest rates and receive lower deposit interest rates.

Methods of measuring concentration

There are two methods of measuring industrial concentration. These are;

- i. Concentration Ratios; and
- ii. Herfindal-Hirschman Index (HHI) of concentration.

The concentration ratio measures how much of the total output of an industry is produced by (n) largest firms in that industry. For instance, when an industry is composed of a large number of firms, the concentration ratio would be close to zero. When there are few firms in an industry, the concentration ratio might be one. In this case, the industry would be more concentrated and consequently one would say that there is very little competition in the industry. The model used in measuring concentration ratio is given by equation 3 below.

$$CR_n = \Sigma(X_i + \dots + X_n) \quad (3)$$

Where: CR_n = Concentration Ratio of n banks; X_i = individual banks. It is the function of total market sales accounted for by each firm.

The Herfindahl-Hirschman Index (HHI) takes into account the market shares of all the firms in an industry. It is calculated by summing the squares of the market shares of all firms in an industry. Therefore, the HHI places a greater weight on firms with large market shares so that it takes account of the size distribution problem.

The corresponding Herfindahl Index values are presented in table 1 below.

Table: 1 HHI Measure of Concentration Levels

LEVEL	CONCENTRATION RATIO
High	80% to 100%
Medium	50% to 80%
Low	0% to 50%

Source: Helman M and Stiglitz E. (2000)

The Herfindahl Index ranges from a low of 0% indicating perfect competition, to a higher of 100% indication monopoly. Greater values mean greater concentration, less competition, and more market control held by individual firms.

Basically the competition authorities split the range of HHI values within which the merged firm can fall using the following model labelled as equation 4.

$$H = \sum_{i=1}^n x_i^2 \tag{4}$$

where: H= Herfindal Hirschman Index; x_i = market share of firm i.;
n= number of firms.

A post-merger HHI of between 0% and 50% indicates a market with low concentration and so is unlikely to lead to negative competition effects. A HHI value of between 50% and 80% indicates a relatively concentrated industry. If the market has a HHI value of more than 80%, this indicates that a market is highly concentrated.

The HHI index has been widely used in the US to determine bank concentration which is mainly caused by merger, bank failures and government bank regulation. Bank mergers mean that there will be only a few banks which will be operating and the depositors will have little choice on which banks they should put their money in. Secondly, if there are bank failures in an economy, the sector tends to be concentrated because there will be only a few banks which would remain operating. Lastly is the issue of deregulation. Socialist governments tend to impose monopolistic type of policies. In such type of economies, competition is not favourable and usually governments tend to establish their own banks.

We can conclude this section by quoting Chirwa (2001). In his study of the Market Structure, liberalization and Performance in the Malawian Banking Industry, he has argued that for the financial system to be efficient, it must pay depositors favourable rates of interest and should charge borrowers favourable rates of interest on loans. This is a vehicle for domestic capital mobilization and for gaining competitive advantage in the global markets for capital which would in turn led to economic development.

CHAPTER THREE

STRUCTURE OF THE BANKING SECTOR IN ZAMBIA

HISTORICAL OVERVIEW OF THE BANKING SYSTEM IN ZAMBIA

Pre-independence. Before independence there were three foreign banks operating in the then Northern Rhodesia. These were the Barclays Bank which was established in 1918, the Standard Chartered Bank established in 1906 and the Grindlays Bank established in 1956 with the first two dominating the market share (Brownbridge and Harvey, 1998). The purpose of establishing these banks were basically to serve the interests of the mining sector. The poor had limited access to loans for their businesses from these banks and this continued for sometime after Zambia got its independence in 1964.

State-owned banks. During the first Zambia's economic reforms in 1968, the Government perceived the foreign banks as not serving the interests of the local population in need of small and medium scale financial services. The Government then attempted to nationalize the foreign banks with a view to service the local population, but failed as the foreign banks threatened to withdraw their expatriate management (Brownbridge and Gayi 1999). At that time the Government did not have the expertise to manage commercial banks (Brownbridge and Gayi 1999). As alternative, the Government decided to establish its own bank that would serve the interest of the indigenous people.

In 1969, the Government established the Zambia National Commercial Bank (ZANACO) to improve credit services in the Zambian economy.

In the agriculture sector, the Government established the Land Bank to provide credit to the small-scale farmers. The Land Bank was later replaced with the Credit Organisation of Zambia (COZ). However, the COZ became insolvent due to poor repayment rates and was replaced by the Agricultural Finance Company Limited (AFC). The Zambia Agricultural Development Bank (ZADB) to cater for the commercial farmers was also established by the Government (Brownbridge, 1998). In 1987, the two government institutions, the Agricultural Finance Company and the Zambia Agricultural Development Bank were merged to create Lima Bank (Brownbridge, 1998).

In addition to the commercial banks, the Government in 1971 established a number of Non-Bank Financial Institutions (NBFIs), notably, the Zambia National Building Society (ZNBS), which was a merger of building societies in Zambia, the Zambia National Provident Fund (ZNPf) and the Zambia State Insurance Corporation (ZSIC) a merger of insurance companies. These institutions provided long term mortgage, pension funds and insurance covers.

Other financial institutions the Governments established to serve the interest of citizens in the early 1980, were the credit guarantee scheme by the Bank of Zambia as a means of encouraging financial institutions to expand more credit to small-scale industries, the Small Industries Development Organization

(SIDO), Village Industries Service⁴ and the Small Enterprise Promotion Ltd (Mwenda, 2002).

However, the commercial banks and NBFIs which were established immediately after independence were heavily regulated (in terms of credit allocation and interest rates) by the Bank of Zambia. The deposit rates were below the market value, they offered easy account opening procedures and were accessible over 200 branches (Mwenda, 2002). Such regulations led to financial markets in Zambia to be characterized by financial repression. Overall, the Government involvement in the financial sector resulted in an inefficient and non-competitive market, which inhibited the development of the private sector financial institutions and discouraged private savings (Kalima, 2001).

Interest rate controls, which, together with, high reserve requirements, deteriorating macroeconomic conditions, political interference, negative interest rate policies, and directed credit policies, depressed profit margins for banks and reduced returns on financial assets for savers (Brownbridge and Gayi, 1998). Furthermore, an inefficient payments system, an inadequate legal framework, and weak accounting standards reduced the banking systems efficiency, especially its ability to perform its financial intermediation function. Because of the above reasons, few private banks entered the sector between 1970 and 1990.

⁴ An non-governmental organisation supported by the Government.

FINANCIAL SECTOR REFORMS

Prudent financial reforms in the banking sector only took place in the 1990s when the Zambian economy was liberalised. Through the liberalization policy the Banking and Financial Services Act of 1994 and the Bank of Zambia Act of 1996 were enacted. These pieces of legislation distinguish banking business from financial institutions. Banking business involves receiving funds from the public by accepting demand, time and saving deposits or borrowing from the public or other banks, and using such funds in whole or in part for granting loans, advances and credit facilities and for investing funds by other means. Financial institutions are institutions whose regular business consists of granting loans, advances and credit facilities, and investing funds by other means, and whose business is financed by own or borrowed funds or with funds not acquired by accepting or soliciting deposits from the public.

We can divide the formal banking system in Zambia into five markets: commercial banks, corporate banks, leasing finance, savings banks and building societies. These form the core of the financial system in Zambia and have been outlined below.

Commercial banks. There are thirteen commercial banks in Zambia. These banks accept deposits and offer credit services to both individuals and companies. Barclays Bank and ZANACO dominates commercial banking and current account services under this sub sector.

Corporate banks. Corporate banks accept deposits only from corporate investors and institutions, with emphasis on time deposits. The corporate banking sector comprises Citibank in Zambia.

Lease finance companies. Lease finance companies accept corporate deposits and provide financial leases to companies. Currently, there are a number of leasing companies in Zambia which were registered recently. The lending portfolio of lease finance companies is concentrated in financial leases to the households and small business in the country.

Savings banks. Savings banks mostly accept time and savings deposits from individuals and companies. The only savings bank is the Savings and Credit Bank established to provide facilities for small savers in both rural and urban areas.

Building society. The main role of building society is to provide loans for commercial buildings and residential housing. The building societies also accepts savings and time deposits and offers short term private loans in addition to its lending activities to finance private dwellings and commercial buildings.

The objectives of the financial sector reforms were in part to mobilize domestic saving for domestic investment and to maintain a safe and sound financial system in order to encourage economic development through the efficient allocation of resources. The reforms included granting the Bank of Zambia (BOZ) more autonomy in conducting monetary policy, liberalizing interest rates and eliminating administrative credit allocation mechanism. The reforms also focused on restructuring commercial banks in order to restore their solvency; developing financial markets and improving accounting and auditing practices (Mwenda, 2002).

In addition, the BOZ adopted indirect instruments of monetary policy and streamlined its operations, focussing more on price stability. The financial liberalisation was also aimed at removing operating obstacles in the banking sector in order to foster competition and efficiency (Musonda, 2008).

Prior to 1992, only three local private banks were in existence and commanded a small share of the market. Private foreign banks and a state-owned bank took up much of the market share. However, between 1992 and 1997 the structure of the banking industry changed significantly following financial liberalisation. There was a proliferation of local private banks. A total of twelve new banks were licensed between 1992 and 1994. The entry of new local private banks introduced some level of competition especially on the deposit side of the market (Brownbridge and Gayi, 1999). Tables 2.0 shows the growth of banks from 1918 to 2007.

Table 2.0 Growth of Local Banks

Period	Bank	Ownership
Colonial Period	Standard Chartered	Foreign
	Barclays	Foreign
	Grindlays (now stanbic)	Foreign
1965-79	ZANACO	Government
1980-85	Citibank	Foreign
	Indo-Zambia Bank	Govt /Foreign
	Meridien	Local
1986-90	African Commercial Bank	Local
	Finance Bank	Local
	Capital Bank	Local
	Bank of Credit & Commerce	Foreign
1991-95	Manifold Investment Bank	Local
	Union Bank	Local
	Commerce Bank	Local
	Credit African Bank	Local
	Prudence Bank	Local
	Safe Deposit Bank	Local
	First Merchant Bank	Local
	Cavmont	Local
1995-2007	Standard Chartered	Foreign
	Barclays	Foreign
	Stanbic	Foreign
	Citi bank	Foreign
	Finance Bank	Local
	ZANACO	Government
	Indo-Zambia	Govt/Foreign
	Bank of China	Foreign
	Investrust Bank	Local
	Savings and Credit Bank	Government
	Alliance Bank	Local
	Cavmont	Local/Foreign
	Intermarket-Banking Corporation	Foreign
	African Banking Corp.	Foreign

Source: Brownbridge (1998) - Banking in Africa, Bank of Zambia, Annual Reports (2007)

Besides the increase in the number of commercial banks, real interest rates also rose dramatically, from largely negative real rates at the end of 1992 to substantial positive rates by the end of 1993. Prior to this, real interest rates had been negative for most of the time since independence, (Chiara, 2004). Foreign exchange controls were also removed around the same time. The exchange rate and the allocation of foreign exchange were permitted to be market determined. By March 1993 most foreign exchange controls on current transactions had been removed and in February 1994 the capital account of the foreign payment systems was liberalized (Chiara, 2004).

In 1995, the BOZ allowed commercial banks to hold foreign currency deposits. In 1996 the final phase of liberalization of the foreign exchange market was implemented with the Zambia Consolidated Copper Mines (ZCCM) being allowed to retain all its foreign currency earnings and supply foreign exchange to the market directly (Chiara, 2004).

Some of the components of the financial sector reforms are outlined in table 3 below.

Table 3: Components of the financial sector reforms in Zambia 1992-2007

Policies	Action Taken
Interest rates	Interest rates raised and the decontrolled in 1992. Treasury bill auctions introduced in 1993
Direct lending	Sector lending directives not imposed before reforms
New entry	New entry by the private sector banks allowed, although entry criteria not made explicit. Increase in new entry during 1991-1994 before enactment of new banking legislation indicates a de facto liberalization of licensing new banking legislation raised minimum capital requirements
Prudential reforms	New banking Act enacted in 1994 covering banks and other financial institutions and gives Central Bank authority to issue prudential directives eg. Capital adequacy requirement restrictions on large loan exposure, insider lending etc. bank supervision strengthened
Restructuring of government-owned banks	Government re-capitalized ZANACO and privatized it.

Source: Brownbridge (1998) and Bank of Zambia, Annual Reports (2007)

BANK FAILURES

Deterioration of the financial situation of some banks resulted from risky lending to attract new customers, lower revenue from foreign exchange operations, lower treasury-bill yields, periodic shortages of liquidity, limitations to raise capital and additional competition for small banks from emerging non-bank financial institutions. The consequent period of turmoil led to the closure of nine commercial banks between 1994-2000.

The Meridien BIAO Zambia was closed down in 1995 following the closure of Meriden subsidiaries in Swaziland, Kenya and West Africa. Commerce Bank and African Commercial Bank (ACB) were also closed down in the 1995. The reasons for the collapse of these two banks were outlined as acute liquidity

problems. More banks also collapsed between 1990 and early 2000 such as Prudence Bank, Manifold Bank, Merchant Bank, Union Bank and Lima Bank.

Table 4 Banks in Liquidation, 1990-2001

No.	Name of Bank	Liquidation date
1.	Meridien Biao Bank	September 1995
2.	African Commercial Bank Limited	February 1996
3.	Zambia Export Import Bank Limited	May 1997(not deposit banking)
	BCCI	
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

Source: Bank of Zambia, Annual Report (2006)

Secondly a good number of the remaining commercial banks closed their branches in rural areas which were not profitable due to high costs of operating branches. For instance Standard Chartered Bank closed almost 50% of its branches which were spread throughout the country (Ministry of Finance, 2002).

However, by 2006 the Zambian banking industry was boosted by six foreign banks, four local private sector banks, and three state-owned banks (Musonda 2008). State-owned banks included one wholly owned by the Zambian

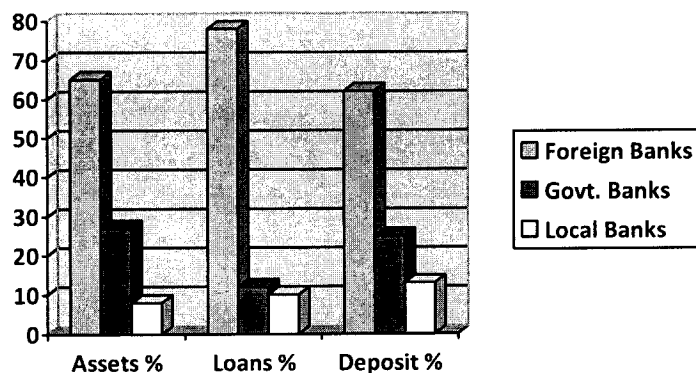
government and two other foreign state banks⁵. For the size of the Zambian banking system, the number of foreign banks (both private and state-owned) is relatively large to foster competition in the industry.

MARKET SHARE OF INDIVIDUAL COMMERCIAL BANKS IN ZAMBIA

The liberalization process of the financial sector in 1992 led to a deep reconfiguration of the Zambian banking system (Luna, 2006). Prior to the liberalization, the banking system was composed of a group of state and privately-owned domestic banks holding approximately 60% of the assets of the banking system. A group of foreign banks held the remaining 40% of the assets (Luna, 2006). However, at the end of 2005 seven foreign banks namely Barclays, Standard Chartered, Stanbic, Citibank Bank, and Bank of China held 73% of the total assets. Graph 1 below shows the average distribution of commercial bank assets from 2002 to 2007.

⁵ The public sector banks comprised the Zambia National Commercial Bank wholly owned by the state but it has been privatized and transfer of ownership was concluded in April 2007, a Chinese state bank and a joint venture between the governments of Zambia and India.

Graph 1: Average Distribution of the Banking Sector's Assets, Loans and Deposits by type of ownership, 2002-2007



Source: Bank of Zambia, Annual Reports (2004,2005,2006,2007)

The foreign banks dominate the banking industry in Zambia in terms of assets, loans and deposits. On average they controlled 62% of the banking industry's total assets, 74% of total loans and 62% of total deposits in 2007. In the same year, the state-owned banks accounted for 28% of the industry's total assets, 13% of total loans and 13% of total deposits. On the other hand the local commercial banks only accounted for 10% of the industry's total assets, 13% of total loans and 15% of total deposits.

In 2002 the foreign banks increased their assets to 83% of the total lending portfolio, 66% of the deposits in the commercial banks and operated 91 of the existing 156 bank branches in Zambia. This is shown in table 5 below.

Table 5: Market Share of Banks in Zambia as at December 2006

Commercial Banks	Total Assets		Loans and Advances		Deposits		Branches	
	Assets	% of Total	Loans and advances	% of Total	Deposits	% of Total	Branches	% of Total
Foreign Banks								
1.Barclays Bank	1,587,948	20.3	750,489	32.5	988,120	17.9	17	10.9
2.Standard Chartered	1,214,629	15.6	344,322	14.9	967,324	17.6	15	9.6
3.Stanbic	1,122,275	14.4	414,368	17.9	735,346	13.4	9	5.8
11.Intermarket Banking Corporation	87,108	1.1	21,292	0.92	70,170	1.3	2	1.2
5.Citibank	560,095	7.2	80,710	3.5	338,161	6.1	2	1.2
6. Indo-Zambia	453,116	5.8	71,532	3.1	314,287	5.7	9	5.8
7. Bank of China	112,117	1.4	109	0.0005	93,123	1.7	1	0.64
8.African Banking Corporation	124,314	1.3	68,539	0.96	31,240	1.2	1	0.96
Subtotal	5,261,572	64.5	1,682,822	71.9	3,506,531	63.8	55	35.3
Domestic Banks								
9. Cavmount Merchant Bank	72,510	0.93	6,381	0.28	58,836	1.1	11	7.1
10. First Alliance Bank	110,884	1.4	21,074	0.91	58,343	1.1	4	2.6
12. Investrust Bank	197,333	2.5	80,109	3.5	162,912	2.9	5	3.2
13. ZANACO	1,537,857	19.6	278,552	12.1	1,297,752	23.6	42	26.9
4.Finance Bank	604,535	7.8	174,556	7.5	384,176	6.9	38	24.4
Subtotal	2,647,433	34.0	629,211	27.2	1,993,259	36.2	101	64.7
Total	7,784,721	100%	2,312,033	100%	5,499,790	100%	156	100%

Source: Luna(2006)

From the foregoing it is clear that the banking sector in Zambia has continued to be dominated by foreign commercial banks namely Barclays Bank, Standard Chartered Bank, and Stanbic. In 2006 they held 65.8% of assets in the commercial banks, 72.9% of the total loan portfolio, 63.8% of deposits and 35.3% of all branches.

On the other hand, the domestic banks hold 34.0% of assets, 27.2% of the loan portfolio, 36.2% of deposits and 64.7% of all the branches. Out of this ZANACO hold 19.6% of the commercial banks assets. Four other private local commercial banks; Cavmount Merchant Bank, First Alliance Bank, Finance Bank, and Investrust Bank hold together 15.8% of the commercial banks assets. The Indo-Zambia Bank a joint venture between the Governments of Zambia and India holds the remaining 5.8% of the commercial banks assets.

PERFORMANCE OF THE BANKING SECTOR IN ZAMBIA

From the above it is clear that the majority of banks in Zambia are relatively small banks with few branches and operating along the line of rail. For instance in 2004, fourteen commercial banks were registered in the country out of which six were classified as small by the BOZ with a combined market share totaling 4.5%. Two banks including ZANACO had less than US\$ 1 million in capital and four banks had between US\$ 1million and US\$ 2 million in capital at the end of 2003.

Table 6 below shows the average performance rating for the banks from 2002 to 2007.

Table 6: AVERAGE PERFORMANCE RATING FOR BANKS, DECEMBER 2002-DECEMBER 2007

Performance	Capital Adequacy			Asset Quality			Earnings			Liquidity		
	2002-2007			2002-2007			2002-2007			2002-2007		
Strong	12	10	11	10	8	5	7	5	2	1	2	1
Satisfactory	1	1	1	4	6	6	5	7	6	12	7	5
Fair Needs Improvement	0	1	1	0	0	3	3	2	3	1	5	7
Marginal	1	1	0	0	0	0	0	1	2	0	0	0
Unsatisfactory	0	1	0	0	0	0	0	0	0	0	0	0
Total	14	14	13	14	14	13	14	14	13	14	14	13

Source: Bank of Zambia, Annual Reports (2002, 2004, 2005, 2007)

From the table above, the sector continued to be adequately capitalized and all the banks met their minimum regulatory capital requirements throughout the years. The asset quality was satisfactory over the years.

However, liquidity has been the major problem facing most of the banks. In 2002, only one bank was graded to be strong. This increased to two banks in 2003 and later dropped to one in 2004. On average a good number of banks were recorded to be satisfactory with all of them meeting the minimum liquidity ratio of 50%, BOZ (2004).

Table 7 below shows the composite rating for banks from December 2002 to December 2004.

Table 7: COMPOSITE RATING FOR BANKS FROM DECEMBER 2002 TO DECEMBER 2004.

Performance Category	Number of Banks			Proportion of Industry Assets (%)		
	2002	2003	2004	2002	2003	2004
Current Condition Satisfactory	14	10	7	100	74.5	55.3
Possible Emerging Problem	0	3	4	0	4.6	21.6
Watch	0	1	2	0	20.9	23.1
Problem	0	0	0	0	0	0
Total	14	14	13	100	100	100

Source: Bank of Zambia, Annual Report (2004⁶)

From the table above it is clear that banks in the year 2002 performed well. All the fourteen banks were recorded to be satisfactory. By 2004 the condition

⁶ A bank is rated **Current Condition Satisfactory** when generally, the institution is doing well in all respects with regards to its major areas of operation, ie Capital, asset quality, earnings, management and foreign exchange exposure are all considered to be satisfactory. It is rated **Possible Emerging Problem** when it is generally doing well but potential problem areas have been identified and if they are not addressed immediately might result in the deterioration of the financial condition of the bank. An institution is rated Watch where weaknesses have crystallized in one or more areas and where if these matters are not resolved immediately may lead to the overall deterioration in the financial condition of the institution. Where an institution has been found to have problems in most, if not in all major areas of operation it is rated **Problem**.

worsened. Only seven out of thirteen were recorded to be satisfactory. In the same year four banks were recorded as likely to face financial problems and two were recorded as having financial problems.

Generally speaking, despite the liberalization reforms undertaken by the Government, the growing presence of the local owned banks in Zambia as a whole remains small and under-developed (Luna, 2006). At the end of 2005, total assets of the commercial banks amounted to only US\$ 1.7 billion dollars, which represented 35% of Zambia's GDP (Luna, 2006). Commercial banks in Zambia are small and serve only a small segment of the population and private sector. For instance, in 2006, five of the thirteen commercial banks had each less than US\$ 5 million in capital, seven commercial banks had capital in the range of US\$ 5 million to US\$ 30 million, and only one bank (Barclays) had a capital of US\$ 52 million (Luna, 2006).

At the end of 2006, there were only 405,888 deposit accounts (kwacha and dollar accounts) at all commercial banks in Zambia (BOZ, 2006). This number is too low for a country with a population of 10.5 million people. This translates to 3.8% of the population with bank accounts and is one of the lowest in Sub-Saharan Africa (Luna, 2006).

According to Luna (2006), 64% of the accounts at banking institutions in Zambia have balances below K 320,000.00, 8% of the accounts have balances between K 320,000.00 and K 640,000.00 and the remaining 28% have balances

above K 640,000.00. The account holders are usually people living in urban areas and with a regular employment in the public sector or a large private firm.

STRUCTURE OF THE INTEREST RATES IN ZAMBIA

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 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 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%. This is shown in table 8 below.

In 1999 the average lending rate was 51.5% whereas that of interest on saving was only 11.2%. In 2003, the average simple lending rate stood at 44.8% compared to 7.6% simple average rate on savings above K 100,000.00. Table 8 below shows that interest rates paid by commercial banks on deposits are very low in Zambia. The commercial banks in turn charge comparatively higher rates on loans given to its customers.

Table 8: Interest rates Developments, 1999-2003 (%)

Item	/Years	1999	2000	2001	2002	2003
28-day Treasury bill		36.1	11.0	41.5	25.3	24.8
91-day Treasury bill		36.2	34.0	50.5	32.0	31.9
182-day Treasury bill		36.4	36.7	50.4	32.9	32.6
273-day Treasury bill		-	38.7	46.4	33.2	32.9
WATBR		36.2	33.8	48.2	31.7	32.5
12-month bond		48.1	38.7	54.1	41.0	35.9
18-month bond		49.2	43.3	54.9	41.5	38.6
24-month bond		-	45.8	55.4	41.6	39.4
WALBR		42.4	37.5	46.7	42.5	37.2
ALR		51.5	45.9	54.6	50.0	44.8
ASR		11.2	11.5	8.7	8.1	7.6
Deposit> K 20 m (30 days)		19.5	17.8	19.5	19.5	17.8

Source: Bank of Zambia, Annual Report (2004)

Key:

- WATBR = Weighted average Treasury bill rate
WALBR= Commercial banks' weighted average lending rate
ALR = Commercial banks' simple lending rate
ASR = Commercial banks' simple average rate for savings above K100,000

Table 9 below also shows the same picture as outlined above. During the period 1998 to 2007, the commercial banks' lending rate increased from 31.8% to 45.5%. With regard to deposit interest rates, due to the rigidity in their upward movement, these rates did not rise at the same pace as lending rates. In 1998 the interest rates on deposit for amount less than K 100,000.00 was 9.3% and this reduced to 3.3% in 2007. This resulted in the widening of the spread between the lending and borrowing rates for amounts less than K 100,000.00.

In general, interest rates for small depositors (less than K 100,000.00) has been reducing from 10.2% in 2000 to 4.6% in 2004. The picture is the same for amounts more than K 100,000.00. In 2000, the interest rate was recorded at 11.5% and by 2004 it had reduced to 6.4%. On the other hand, the interest rate spread continued to widen, as commercial banks shifted the costs of non-performing loans and required reserves to their clients (BOZ, 2004). The spreads between the two interest rates from 1998 to 2004 are in the range of 30 to 40%. This is shown in table 9.

Table 9: Weighted lending rates versus Saving deposit rates 1998-2007

Year	Weighted lending base rates	Savings deposit rates (%)			
		Less than K 100,000.00	Spread	More than K 100,000.00	Spread
1998	31.8	9.3	22.5	7.1	24.7
1999	42.6	7.6	35	7.9	34.7
2000	37.5	10.2	27.3	11.5	26
2001	45.9	5	40.9	9.4	36.5
2002	45.3	4.1	41.8	8.6	36.7
2003	40.4	5.6	34.8	7.7	32.7
2004	30.7	4.6	26.1	6.4	24.3
2005	47.6	4.4	43.2	5.5	42.1
2006	46.0	4.7	41.3	5.1	40.9
2007	45.5	3.3	42.2	4.2	41.3

Source: Bank of Zambia, Annual Reports (1998,2000,2004,2007)

Table 10 below outlines the current levels of lending interest rates compared to inflation.

Table 10: Nominal Interest Rates and Inflation
(%)

Year	Savings Deposit	Lending	Rate Inflation
1970	3.5	7.0	2.2
1975	4.0	7.5	10.1
1980	7.0	8.5	11.7
1985	14.8	19.2	37.4
1990	23.5	37.5	109.5
1991	31.5	44.5	93.4
1992	41.5	55.8	191.3
1993	78.9	116.6	187.1
1994	54.0	80.8	90.0
1995	25.5	45.8	42.3
1996	30.0	54.6	65.5
1997	20.5	44.3	27.0
1998	5.1	31.8	93.4
1999	7.9	42.6	22.3
2000	10.5	37.5	36.1
2001	7.7	45.9	34.9
2002	6.8	45.3	23.4
2003	6.7	40.4	24.5
2004	6.1	30.7	20.8
2005	4.4	47.6	15.0
2006	4.7	46.0	8.6
2007	3.3	45.0	9.5

Source: Bank of Zambia, Annual Reports (2004, 2005, 2006, 2007) and CSO (2003)

With the achievement of relative macroeconomic stability in the recent years as evidenced by a significant reduction in the inflation rate to 8.6 percent as at June 2006, one would expect all lending institutions to make downward adjustments to their lending interest rates. However, this is not the case in Zambia. Interest rates on deposits continue to remain low compared to the lending rates when inflation has been declining over the years.

This scenario has caused low national savings to levels that are inadequate to contribute to sustainable productive investment in the country and has made the vital role that the banking sector plays in economic development and growth difficult.

In addition to low interest rate payments, most commercial banks in Zambia have adopted high balances to open or maintain an account, making it impossible for most people to hold savings or deposit accounts. Table 11 shows that five banks require a minimum balance of K 50,000.00 to open a savings account. In the context of Zambia, where 71% of the population lives on less than one dollar a day, the minimum balances currently required by banks are high and prevent most people from having access to basic banking services.

Table 11: Minimum Balances to Open and Maintain a Bank Account in March 2006

BANK	ACCOUNT OPENING BALANCE IN ZMK	MINIMUM BALANCE TO AVOID PENALTY IN ZMK
African Banking Corporation of Zambia	500,000.00	500,000.00
Bank of China	1,000,000.00	1,000,000.00
Barclays Bank	N/A	N/A
Cavmount Capital	1,000,000.00	N/A
Citibank	N/A	N/A
Finance Bank	100,000.00	50,000.00
First Alliance Bank	250,000.00	250,000.00
Indo Zambia Bank	150,000.00	150,000.00
Intermarket Banking Corporation	1,000,000.00	250,000.00
Investrust	50,000.00	50,000.00
Stanbic Bank	50,000.00	N/A
Standard Chartered Bank	750,000.00	750,000.00
ZANACO	50,000.00	50,000.00

Source: Bank of Zambia, Annual Report (2006)

Another important aspect of commercial bank sector is the low number of bank branches in Zambia. This has made access to banking services difficult. For instance in 1990 there were 120 bank branches. This increased to 152 in 2006. This shows a ratio of one bank branch per 70,000 people in 2006. This is one of the lowest bank penetration ratios in the world (BOZ, 2004). Secondly this modest increase of branches has been in urban areas. With the removal of the requirement to open a rural branch for every urban opened, there was a reduction in the proportion of rural branches to urban branches from 50% in

1990 to 43% in 2004. The change is most notable in the period 1995 to 2000 when the number of urban branches increased from 65 to 77.

This scenario shows that the Zambia banking sector is concentrated. For the banks to make profits they shift their costs to their customers. At the same time, banks do not pay interest on small savings accounts. Only the large firms receive positive interest rates on their deposit.

CHAPTER FOUR

MODEL SPECIFICATION AND METHODOLOGY

Model specification

In this Chapter we develop an econometric framework to estimate the price concentration relationship in the retail banking sector of Zambia during 1990-2007 period using time series data.

The analysis is based on models of the banking firm found in Diamond (1984), and Hughes and Mester (1994), which focus on the bank's role as investment agent for households. That is, banks take savings in the form of deposits from households and transform these funds into loans or securities by lending them out as investments. Banks use the deposits (savings) as inputs to produce loans or securities (investments).

The model assumes that the loan and security markets in which banks invest are competitive. However, because banks tend to draw their deposits from confined geographical areas, such as urban areas as discussed in the previous chapters, the deposit markets are assumed to exhibit departures from perfect competition.

As in Neumark and Sharpe (1992), departures from perfect competition framework provide part of the basis for the empirical model developed here. For example, if banks in more concentrated deposit markets face a relatively less

elastic deposit supply schedule they may extract more of the producers' surplus from the business of investing by paying lower rates on their deposits.

In our study we examine the behaviour of the three commercial banks (the dominant firms) in the banking industry, which may be pursuing profit maximization through their common ownership structure. Our dependant variable is the weighted deposit rates while explanatory variables include market concentration ratios, annual market deposits rates, banks market share, total assets of commercial banks in the market, number of commercial banks branches and annual per capita income.

All variables are in the first difference except for total assets of commercial banks and the dummy. Thus our model of bank consumer deposit rate setting behavior is estimated as the following reduced-form price equation:

$$Y_t = \alpha + \beta \text{CONC}_t + \gamma X_t + \varepsilon_t \quad (5)$$

where;

Y_t represents a weighted interest rate paid by banks for the following categories of consumer deposits: saving accounts, one month fixed accounts, three months fixed accounts and six months fixed accounts.

CONC_t represents a measure of market concentration in banking at time t ,

X_t represents a vector of explanatory variables,

α, γ, β represents parameters, and
 ϵ_t represents an error term.

Based upon the reduced-form price equation developed above, the following equation is estimated:

$$R_{index} = \alpha + \beta CR3_t + \beta_1 AGR_t + \beta_2 BR_t + \beta_3 PCI_t + \beta_4 MKTS_t + \beta_5 TA_t + DUM_t \quad (6)$$

The explanatory variables are,

R_{index} is a weighted index (average) of the consumer deposit accounts.

CR3 three-firm concentration ratio (the share of bank deposits accounted for by the three largest banks). The more concentrated the industry the higher the level of profitability.

AGR annual growth rate of market deposits for the banking industry. Higher profits are expected when a market grows, while lower profits may be expected if the growing market makes entry relatively easy

BR a proportion of three firm and number of total bank branches

PCI annual per capita income in Zambia in thousand of kwacha per quarter

MKTS	market share of the three commercial banks. Larger market shares leads to higher profitability
TA	commercial bank assets (thousands of kwacha). The relationship may be positive, reflecting economies of scale, or negative, reflecting greater ability to diversify assets, which results in lower risk and lower required return
DUM	is time dummy variable to account for the impact of interest rate cycle for the period covering the 1 st quarter 1990 to the 4 th quarter 2007.

The dummy variable is equal to a vector of dummy variable and their associated coefficients. For example the dummy variable (Q_t) equals one when the quarter variable equals t . We have included the dummy variable in our model because it is assumed that banks tend to adjust deposit rates differently (i.e., more rapidly) in a period of falling interest rates relative to a period of rising interest rates [Berger and Hannan,(1998) and Neumark and Sharpe (1992)]. Therefore time dummy variables are included in the equation to distinguish rising rate from the falling rate.

Further, the justification for the use of bank prices (interest rates) is that in the price–concentration relationship it is assumed that high levels of concentration allow for non competitive behaviour that results in lower interest rates offered to depositors and/or higher lending rates to borrowers (Berstein, 2003).

The main variable in the efficient market hypothesis is the efficiency of firms that can be proxied by market share (MS). We use the market share of industry deposit for the three dominant commercial banks to test our hypothesis. We expect a positive relationship between market share and concentration. Larger market shares leads to higher profitability.

Several control variables that take into account firm-specific and market-specific characteristics are theoretically justified and included in empirical studies of the banking industry. One of the variables is bank size. Bank size is measured as banks total deposits or assets or as an average measure based on total assets (Molyneux and Forbes, 1995). The bank size variable takes into account differences brought about by size such as economies of scale. We expect that larger banks compared with smaller banks' can reap economies of scale and have greater diversification opportunities.

Other variables are included to account for market demand characteristics. These include market size and market growth rate. Market size is measured by total market deposits. Large markets should be easy to enter and bank customers in such markets tend to be sophisticated, hence a negative relationship between market size and profitability.

The growth of the market is included because rapid market growth expands profit opportunities for existing banks, but if growth encourages entry then a negative relationship may be observed. Hjalmarsson and Osterholm (2007), and Peltzman (2000) have argued that larger market size or an expanding market

enables banks to differentiate their products and consequently generate higher profits.

Competition theorists also argue that firms in highly concentrated industries refrain from competing among themselves and might also refrain from raising deposit rates or lowering lending rates (Peteraf, 1993). This would result in higher than average profitability. The traditional expectation is that higher concentration leads to higher and monopolistic performance.

In summary, the price-concentration has now been widely used in the analysis of bank markets and there exists evidence in support of the structure-performance hypothesis, although the competing efficient market hypothesis is also gaining empirical support. The econometric software to be used in the estimation is Eviews 3.0.

Methodology

Unit root test for stationary

Cointegration tests require a certain stochastic structure of the individual time series involved. For the purpose of this study, we will focus on first order non stationarity integrated processes, which require first difference to become weakly stationary. Thus, to test for the presence of stochastic non stationarity in our data, we first investigate the integration order of our individual time series.

According to Thomas (1997), Dickely and Fuller provide a procedure to formally test for the presence of a unit root. The Augmented Dickey Fuller (ADF) test, provides the appropriate test statistics to determine whether a series contain a unit root, unit roots plus drift and/or unit root plus drift plus a time trend.

The more general ADF test (that with a drift plus a time trend) is based on the following regression model (Madala, 2007):

$$\Delta Y_t = \delta Y_{t-1} + \beta_1 \sum_{i=1}^p \Delta Y_{t-i} + \varepsilon_t \quad (\text{without a constant}) \quad (7)$$

Which is estimated by ordinary least squares (OLS). The ADF is centered on testing for null hypothesis that $\delta = 0$ in the Ordinary Least Square Auto Regressive (AR) of any of the following regression including the one above.

$$\Delta Y_t = \alpha_1 + \delta Y_{t-1} + \beta_1 \sum_{i=1}^p \Delta Y_{t-i} + \varepsilon_t \quad (\text{with a constant}) \quad (8)$$

$$\Delta Y_t = \alpha_1 + \alpha_2 t + \delta Y_{t-1} + \beta_1 \sum_{i=1}^p \Delta Y_{t-i} + \varepsilon_t \quad (\text{with constant with trend}) \quad (9)$$

Where $\delta = \phi - 1$, Δ is the first difference operator, $\Delta Y_t = Y_t - Y_{t-1}$, ε_t is the uncorrelated error term. The term Y denotes the variable to be tested.

The present study adopted equation (9) on the basis that it takes into consideration both the stochastic trend and the constant rather than assuming unequivocally that there exists a stationary trend. Most importantly is the fact that the data generating process for the model is unknown and so the use of

this equation ensures that the deterministic components present are taken care of as much as possible. Equations 7 and 8 are rather too restrictive.

Testing for cointegration

Having tested for unit root, the next step will be to run the co-integration analysis of non-stationary variables. We have already discussed how to perform unit root tests in the time series. We normally do these tests to decide on the variables for the cointegration analysis. Generally, all variables must be $I(1)$. Stationary, $I(0)$, variables are also allowed but we must remember that in the Johansen Vector Error Correction Model (VECM) each $I(0)$ variables creates an additional cointegration equation. Variables such as $I(2)$ are generally not allowed in the cointegration analysis.

The main idea behind cointegration is the linear combination of non stationary variables. Theoretically, it is quite possible that non-linear long-run relationships exist among a set of integrated variables. Cointegration can be interpreted as a specification of models that include beliefs about movements of variables relative to each other in the long run (Harris, 1995).

This study expects to observe whether a long run relationship exists between price and concentration in the retail banking sector of Zambia. There are various tests for cointegration among non-stationary variables, for example the Augmented Engle-Granger Test, Johansen Procedure and many others.

The Johansen procedure is mostly preferred because it tests for cointegration in a multivariate regression model by adopting a more general framework that determines the number of cointegrating relationship and exogeneity of variables (Harris, 1995). It normally applies where there may exist more than one cointegrating relationship among a set of more than two variables and also allows for estimation between variables with different orders of integration. In addition, this technique also helps a researcher to determine if a model can be conditioned/restricted on any predetermined $I(0)$ variables including those that account for possible policy interventions.

Error Correction Mechanism (ECM)

The next step in the analysis is to carry out the error correction mechanism. Suppose that Y_t and X_t were cointegrated, that is there is a long term relationship between the two. Therefore one can treat the error term in this relationship as the “equilibrium error”. Therefore we can use this error term to tie the short-run behaviour of say Y_t to its long-run value. The error correction mechanism (ECM) was first used by Sargan and popularised by Engle and Granger and corrects for disequilibrium (Gujarati, 2007).

An important theorem, known as the Granger representation theorem, states that if two variables Y and X are cointegrated, then the relationship between them can be expressed as error correction mechanism (Gujarati, 2007).

Data sources and Types

This study uses quarterly data spanning the period 1997 to 2007 from BOZ annual reports and bulletins; Commercial Banks annual reports; CSO, World Bank reports and Ministry of Finance and National Planning economic reports.

CHAPTER FIVE

ESTIMATION AND INTERPRETATION OF RESULTS

This chapter presents the empirical econometric results based on the unit root tests, cointegration analysis and the Error Correction Model. It is divided into two parts. First we analysis the bank concentration level in Zambia and secondly we estimate the effects of bank concentration on retail banking products in Zambia.

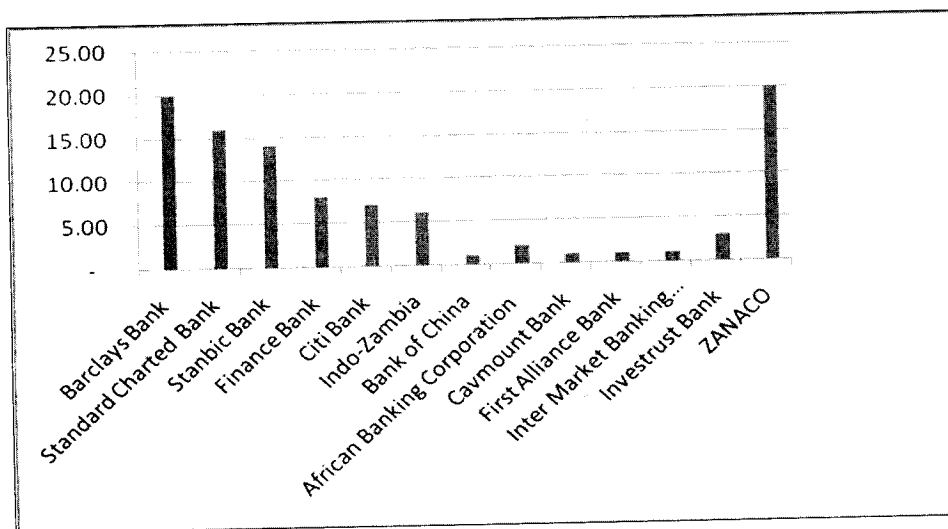
ESTIMATING BANK CONCENTRATION IN ZAMBIA

In estimating the bank concentration in Zambia, we look at the following bank portfolios: (a) assets structure; (b) loans and advances; (c) deposits structure; and (d) branch structure; as outlined below.

Total Assets structure

Figure 2 below shows the commercial banks individual total assets market share.

Figure: 2 Market share of Bank Assets 1997-2007

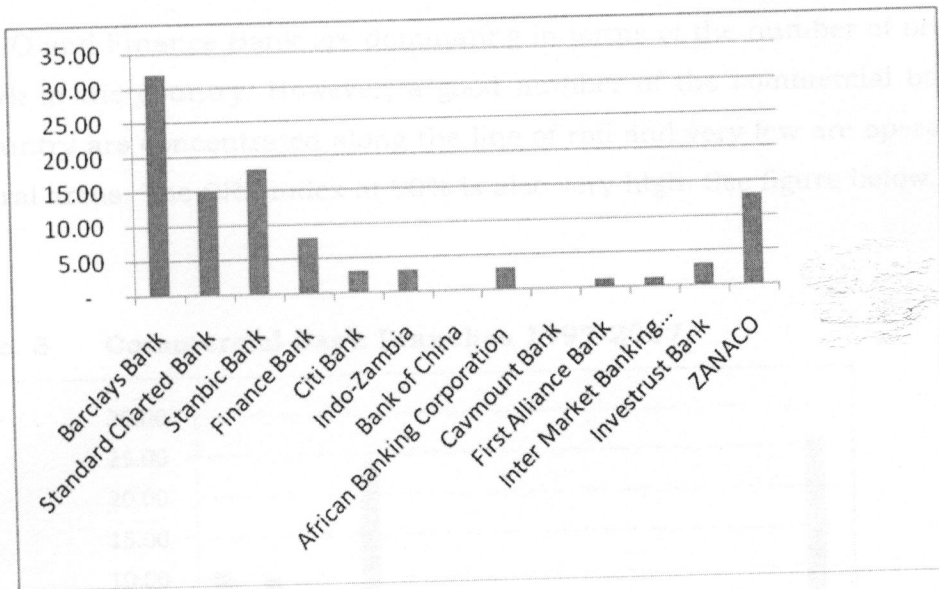


Out of the thirteen banks shown in figure 2, ZANACO and Barclays Bank have control in terms of assets ownership followed by Standard Bank and Stanbic. ZANACO and Barclays bank have a 20% share each of the total assets in the sector. The rest of the banks have below 6% each in total market share. The picture is the same when we use the CR3 ratio for the three largest commercial banks in Zambia namely Barclays Bank, Standard Chartered Bank, and ZANACO. The CR3 concentration index is equal to 70% on average for a period of ten years (1997-2007).

Loans and Advances structure

With regards to loans and advances, the table below shows that Barclays Bank is dominating. The bank has a share of 32% followed by Stanbic and Standard Chartered Bank with 17% and 15% respectively. Indo-Zambia, Cavmount Bank, African Banking Corporation and Intermarket Banking are having below 1% each of the total loans and advances share. The average CR3 concentration index for the largest three commercial banks under this portfolio is 77% also indicating weak competition in the market.

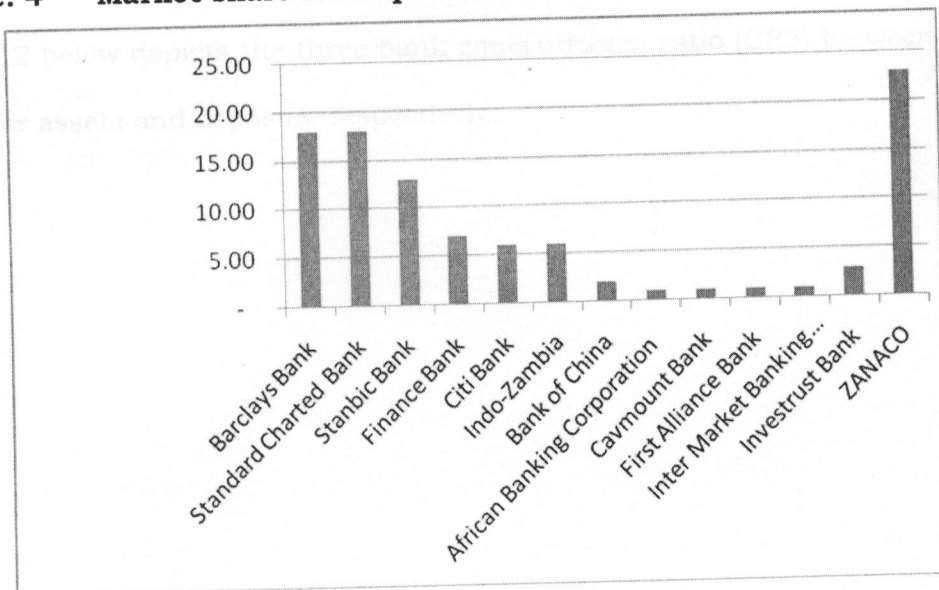
Figure: 3 Market share for Loans and Advances 1997-2007



Deposits structure

ZANACO, Barclays Bank and Standard Charetered Bank are dominating in terms of the deposit market in the country. Again competition under this portfolio is weak. The CR3 concentration ratio is 73% indicating high concentration too. This is shown in figure 4.

Figure: 4 Market share for Deposits 1997-2007



Branches structure

ZANACO and Finance Bank are dominating in terms of the number of branches network in the country. However, a good number of the commercial banks in the country are concentrated along the line of rail and very few are operating in the rural areas. The CR3 index at 90% is also very high. See figure below.

Figure: 5 Commercial Bank Branches 1997-2007

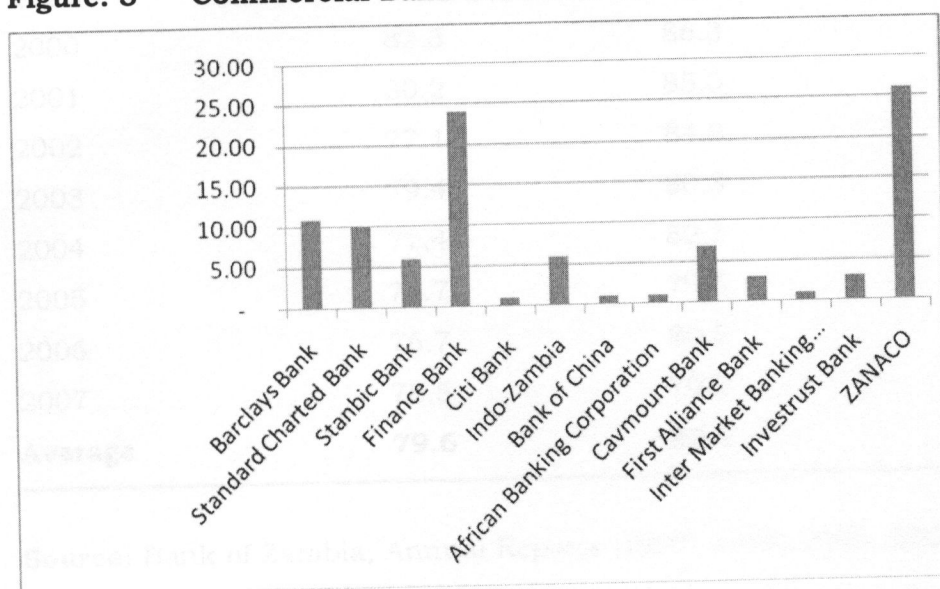


Table 12 below depicts the three bank concentration ratio (CR3) between 1997-2007 for assets and deposits, respectively.

Table 12: concentration of assets, deposits and loans: three bank concentration ratio, 1997-2007

Year	Concentration Ratio (%)		
	Assets	Deposits	Loans
1997	80.6	83.4	87.8
1998	82.7	83.4	89.0
1999	85.4	84.5	91.9
2000	82.3	86.3	92.4
2001	80.2	85.0	83.5
2002	77.1	84.8	84.3
2003	79.4	80.3	85.5
2004	77.4	82.3	84.8
2005	75.7	79.5	85.7
2006	76.7	80.5	84.9
2007	78.5	79.2	83.6
Average	79.6	82.7	86.7

Source: Bank of Zambia, Annual Reports (1997, 1998, 2000, 2003, 2005 2006, 2007)

In summary it can be seen from table 12 that the three largest banks (Barclays, ZANACO and Standard Chartered Banks) accounted for at least 80 % in all three segments of the industry. Over the entire period, the three largest banks held an average of 79.6 % of assets, 82.7 % of deposits and 86.7% of loans. Clearly, these indices show the dominance of the small number of banks in the banking industry. Out of the three banks, two are foreign banks and the other one is the state-owned bank. Thus, the relatively large number of foreign banks has not been reflected in improved competition, contrary to economic postulations.

Such foreign bank dominance has led to the Zambian authorities to conclude that foreign private banks in the Zambian banking industry are an obstacle to the development of the sector (BOZ, 2004).

Whilst we cannot, a priori, determine the degree of competition using concentration ratios, these data can only be used as indicative. The CR3 index depict a slight decline in concentration and market power, suggesting that competitive pressures may slowly be setting in. However, these measures are only indicative of market structure and provide a crude analysis of competition in banking (Musonda 2008).

Thus, actual competition levels must be estimated to ascertain the degree of banking competition by analysing bank conduct with respect to revenue generation. Nonetheless, the observed high levels of concentration, wide margins and low intermediation may reflect ineffectiveness of financial reforms. In particular, these factors may be a reflection of structural problems specific to the sector but may also be due to macroeconomic instability experienced over the years. Specifically, structural problems have resulted in banks charging high fees and commissions, making it difficult for the public to access financial services (Musonda 2008).

ESTIMATING THE EFFECTS OF BANK CONCENTRATION ON RETAIL BANKING PRODUCTS IN ZAMBIA

Under this section we test stationarity of our variables using the Dickey-Fuller (DF) and the Augmented Dickey-Fuller (ADF) tests, using equation 9 in order to determine if the variables can unspuriously be entered into a cointegration equation. The lag length for the augmenting term is selected according to Akaike information criterion (AIC) and Schwarz information criterion (SIC) in a way to make the error term as much white noise as possible.

We specify the number of lagged first difference terms to add to the test regression (selecting zero yields the DF test; choosing numbers greater than zero generates ADF tests).

The results to these tests are summarized in table 13 below.

TABLE: 13 Augumentated Dickey-Fuller Tests with constant and Trend

Variable	DF	ADF	Integration	*ADF Statistic
$\Delta(\text{LRINDEX})$	-8.83032	-5.878650	I(1)	-3.5312
$\Delta(\text{LCR3})$	-8.36640	-3.817884	I(1)	-3.5312
$\Delta(\text{LAGR})$	-6.818248	-4.623695	I(1)	-3.5328
$\Delta(\text{LBR})$	-8.583372	-3.850711	I(1)	-3.5312
$\Delta(\text{LPCI})$	-8.000456	-3.605068	I(1)	-3.5312
$\Delta(\text{LMKTS})$	-7.213563	-4.141189	I(1)	-3.5312
LTA	-2.496608	-2.938404	I(0)	-3.5297

***95% critical value for the ADF Statistic**

Table 13 gives us a summary of the ADF unit root tests on the first difference of the variables when a constant and trend term are included. For all the variables except for LTA (log of total assets) which is stationary at order of integration $I(0)$, the ADF statistic is significant at 5% when the first difference of the variables were used implying that the variables became stationary after differencing once. As can be seen from the last column of table 13, the DF and ADF values are less than the ADF statistic implying stationarity of the variables after differencing.

Test for Co-integration

Having tested for the unit root, we observed that some of the variables were stationary while others were not. Non-stationarity of variables forms the necessary condition for co-integration to occur. Harris (1995) notes that co-integration among a group of variables is confirmation of the theory showing that variables are moving together in the same direction. This economic theory helps us to identify the long run relationship that may exist in a linear combination of various variables that may converge to equilibrium over time.

To determine the number of co-integration relations r conditional on the assumptions made about the trend, we can sequentially from $r=0$ to $r=k-1$ until we fail to reject. The result of this sequential testing procedure is as shown below.

Table: 14 Johansen Maximum Likelihood Co-integration Tests

Eigenvalue	Likelihood Ratio	5% CV	Hypothesis
0.463281	99.899996	94.15	$r=0^*$
0.283623	57.58488	68.52	$r\leq 1$
0.219987	34.90357	47.21	$r\leq 2$
0.161941	18.00929	29.68	$r\leq 3$
0.084110	5.995927	15.41	$r\leq 4$

CV=critical values

*denotes rejection of the hypothesis at 5% significant level.

Starting with the null hypothesis of no cointegration ($r=0$) among the variables, the likelihood ratio 99.89 is above the 5% critical value of 94.15. Hence it rejects the null hypothesis $r=0$, in favour of the general alternative $r\geq 1$. As is evidenced in table 15, the null hypothesis of $r\leq 1$, $r\leq 2$, $r\leq 3$, $r\leq 4$ and $r\leq 5$ cannot be rejected at a 95% level of significance. Consequently we can conclude that there is only one co-integration relationship involving six (6) variables: Rindex, AGR, BR, PCI, MKTS and TA.

Thus the likelihood ratio test statistics reject the null hypothesis of $r=0$ at the 5% level of significance, and suggest that there is unique co-integration vector. Therefore our quarterly data from 1997 to 2007 appear to support the proposition that in Zambia's retail banking sector there exist a stable long-run relationship of price-concentration.

From the normalized cointegrating coefficients shown below;

Table: 15: Estimates of Long-run Co-integration Vectors

LRINDEX	LPCI	LMKTS	LCR3	LBR	LAGR	C
1.000000	-0.520101 (1.11020)	-14.71646 (37.5396)	-18.57429 (34.1340)	79.42038 (157.687)	-6.227256 (13.3836)	-239.7375
Log likelihood	314.2092					

We find weighted interest rate paid by banks (LRINDEX) form stable and significant negative relationships with personal income (LPCI), market share (LMKTS), concentration ratio of the three banks (LCR3) and average growth rate of deposits (LAGR). Number of branches (LBR) has a positive effect on the weighted interest rate paid by banks (LRINDEX). In other words, apart from the number of branches (LBR) variable, all the other variables used in the model influence the interest rates on various deposit accounts offered by commercial banks in Zambia.

Commercial banks in Zambia can increase the number of branches in the country, but this cannot influence a change in the interest rates paid on various deposit accounts.

Error Correction Model Analysis

From the Johansen co-integration tests carried in table 14, the results revealed that there is a long run relationship among the variables. Thus, a dynamic error correction model of weighted deposit interest rates (LRINDEX) that reflects both

short and long run determinants of weighted deposit rates as well as the convergence to its long run equilibrium will result in re-specification of equation estimated. We now present the results of the ECM of the variable LRINDEX by OLS based on cointegration in the table 16.

Table : 16 Estimated Error-Correction Model

DEPENDENT VARIABLE: $\Delta(\text{LRINDEX})$			
Regressor	Parameter Estimates	Standard Errors	T-stats
ΔPCI	-0.098308	0.05755	-1.70812
ΔMKTS	-0.439287	1.73398	0.25334
ΔCR3	-6.376277	2.65492	-2.40168
ΔBR	17.57246	4.64453	3.78348
ΔAGR	-1.017259	0.36481	0.36481
ECM	-0.065402	0.02968	-2.20328
R-squared=0.72 Adj. R-squared=0.65 F-statistic = 2.12(0.272323)[0.057] Durb. Wat. 2.2095/ *5% level of significance			

Table 16 shows PCI, MKTS, CR3 and AGR are significant at 5% level of significance while BR is not. The implication of this results are that only per capita income (PCI), market share (MKTS), concentration ratio (CR3) and growth of deposit (AGR) play a significant role in determining changes in deposit interest rates in Zambia. Per capita income, concentration ratio and growth of deposit rates have the expected negative signs, implying an inverse relationship with deposit interest rates.

For instance, holding all factors constant, 1% increase in per capita income would lead to approximately 0.09% decrease in deposit interest rates awarded to consumers. Similarly, 1% increase in market share of banks would lead to 4.3% in deposit interest rates. A 1% increase in concentration ratio of commercial banks in the country led to approximately 6.31% decrease in deposit interest rates awarded to consumers by the banks in Zambia. Again 1% increase in deposit growth by the banks will result into a decrease of 1.01% in deposit interest rates.

The estimated regression line also fits the data fairly well. The R^2 value 0.72 means that 72% of the variations in the weighted deposit interest rates are explained by per capita income, market share, concentration ratio and growth of deposit rates, while 28% are explained by the error term. At 5% the F-test is not statistically significant, $F_{2,12}$ (0.272323). The p value is 0.06. Therefore, we fail to reject the null hypothesis that pricing of retail banking deposit in Zambia is related to bank concentration.

The ECM coefficient shows us that the per capita income, market share, concentration ratio and growth of deposit rates have a negative relationship with weighted deposit interest rates in the long run. The coefficient of the ECM gives the speed of adjustment of each endogenous variable towards equilibrium. The higher the coefficient, the faster the speed of adjustment towards equilibrium. If the sign of the coefficient is negative, it entails convergence towards the equilibrium in the long run. The estimated coefficient of ECM is statistically significant at the 5% level and with the appropriate negative sign.

The estimated value of the coefficient of EMC is -0.06 which indicates that the system corrects its previous period's level of disequilibrium by 6.5% per quarter. Notably, the negative significance of the ECM term also suggests that the variables in the model are indeed co-integrated.

CHAPTER SIX

CONCLUSION AND POLICY IMPLICATIONS

In our empirical analysis of price concentration relationship in banking, the co-integration and error correction modeling approaches have been used. We find a unique equilibrium relationship to exist among the following variable per capita income, concentration ratio, growth of deposit held by banks and weighted deposit interest rates. In estimating ECM, per capita income, concentration ratio and growth of deposit held by banks have all emerged as important determinants of the weighted deposit interest rates in Zambia. The estimated coefficient of the error correction of (-0.065) indicates speed of adjustment to equilibrium.

In the case of per capita income, we found out that Zambia has low per capita income compared to other countries in the Sub-Saharan Africa. This is a reason why few people in Zambia hold bank accounts with commercial banks. Due to low per capita income, Zambian banks have a tendency of offering low interest on deposit accounts as opposed to the loans in order to make profits. From the literature review in the previous section this fact came out very clearly and it has been supported by the econometric results obtained.

Commercial banks concentration in Zambia is also major contributor to low deposit interest rates. This could be attributed to the commercial banks collapse in the 1990s and the dominance of the sector by a few banks i.e

Barclays Banks, ZANACO and Standard Bank, which are leading in all the portfolios discussed above such as loans and advances, deposits and total assets. Despite the banking sector reforms introduced by the BOZ in the 1990s the banking sector continues to be dominated by the said three banks, with the other banks providing very minimal competition.

It is worthy to note that most of the banks in Zambia with the notable exception of ZANACO and Finance Bank are predominantly urban-based. Secondly most of the local banks are doing business with small enterprises in the country and therefore cannot compete favorably with foreign banks whose main customers are the corporate sector. Such type of structure indicates that the banking industry in Zambia is concentrated. The structure does not favour the welfare of customers. As a result high banking costs are being borne by the depositors due to inadequate competition prevailing in the country.

The low deposit rates and high interest rates on loans prevailing in the country also have adverse effects on the economy such as low investments, low savings and low economic growth.

Through this study the policy makers are urged to explore ways and means to reduce the concentration ratio of about 0.73 in the sector and try to promote competition for the benefit of depositors and the development of the country. High concentration reflects that the banking sector in Zambia is under banked. Policy should therefore focus on the promotion of opening efficient local banks with creditable management and innovative business acumen. The local banks

should provide excellent customer services and attractive incentives on its deposit and loan portfolios in order for them to compete favourably with the foreign banks. Presently local banks which are in a majority hold 27.2% and 36.2% of loan and deposit portfolios respectively. The BOZ should, in turn, reinforce its monitoring mechanism to ensure that the local banks are managed according to set standards.

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