

**IMPACT OF FINANCIAL SECTOR LIBERALIZATION ON
COMMERCIAL BANK PROFITABILITY IN ZAMBIA**

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Chancellor College, University of Malawi, in partial fulfilment of the requirements
for a Master of Arts Degree in Economics.**

By

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Declaration

I declare that this thesis is my own work and that it has not been presented for a degree in any university. Where other people's work has been used, acknowledgement has been duly given. I am solely responsible for all errors herein.

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Certificate of Approval

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Dedication

*To my dearest husband, Shambana Shalumba - “rogs” and my lovely daughter, **Yoletta** for all the love, endurance and support.*

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Abstract

The commonly observed positive relationship between market concentration and profitability may be explained by non competitive pricing behaviour (monopoly) as argued by the structure-conduct performance hypothesis (SCP), or by the high efficiency of firms with dominant market shares as argued by the efficient-structure hypothesis.

This study assesses the impact of financial sector liberalization on commercial bank profitability and discusses efficiency and monopoly with regard to banks' financial intermediation in Zambia. By applying panel data estimation techniques to variables derived from a theoretical model, we find support for the presence of a non-competitive market structure in the Zambian banking system, possibly hampering financial intermediation. The study however found liberalization to have a significant negative impact on profitability. Hence on the basis of this result financial sector reforms are justified and should be directed more to issues of structure and domestic financing to bring about the desired change in the banking industry. Our empirical implementation of the analytical techniques also shows that competition has not increased and the banks have become more collusive. Further, the study reviews that banks have become more profitable due to the oligopolistic nature of the market that enables them to reap supernormal profits. These are important findings to the extent that regulators rely on market structure to formulate and evaluate policy decisions.

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CHAPTER ONE

INTRODUCTION

1.1 Background

There is reason to believe that the implementation of financial sector reforms in Zambia in the early 1990s significantly altered the structure and behaviour of commercial banks in the economy. This is because these reforms are, among other objectives aimed at enhancing competition, efficiency and bringing about market determined prices for financial products. In this regard financial sector reforms are expected to consequently alter the levels of profitability in the banking industry. The study of the financial system has gained a lot of popularity in recent times. While the banking system dominates the financial sector in most developing countries, it is important to note that profitability (behaviour) of banks is linked to economic development through the savings and investment route. Banks play a major role in ensuring a smoothly functioning payment system which allows financial and real resources to reach their highest return uses. Banking system assets also constitute a substantial proportion of total output. Since financial development is considered a mirror image of economic development, policy movements for the existence of and development of a superstructure of the financial institutions is necessary (Goldsmith,1969).

In uncompetitive market structures prices will be unfavourable to consumers and discourage participation (savings) and investment hence hampering economic growth. Most of the countries in sub-Saharan Africa undertook financial sector reforms in the late 1980s and early 1990s. The aim was to enhance economic growth through increased efficiency, intermediation and competition. Among the expectations from these financial sector reforms is an increase in competition and efficiency as a result of reduced controls and entry barriers often reflected in the convergence of profits towards those experienced in developed countries.

However, even after liberalisation profits could increase due to collusion and not necessarily competition and efficiency. There is a growing body of literature on financial sector reforms that includes some scepticism about the efficacy of such reforms in developing countries. In particular, it has been noted that financial sector reforms have brought about few innovations in financial markets, competition has been limited by oligopoly, and there are doubts as to whether higher real interest rates encourage financial savings and thus deepen the financial system (Brownbridge and Gayi, 1999).

According to the McKinnon-Shaw hypothesis, financial repression in developing countries as reflected in interest rate and price controls resulted in low or negative real interest rates which contributed to low savings and investment. It also resulted in credit rationing. The overall effect was economic stagnation. The McKinnon-Shaw theory concluded that removing financial restrictions and allowing market forces to determine real interest rates can exert a positive effect on growth as interest rates rise towards their competitive levels. In a McKinnon sense Zambia was a repressed economy until the early 1990s. According to this theory, an economy which has interest rate ceilings, high statutory reserve requirements, directed credit policies, and discriminatory taxation of financial intermediaries is said to be financially repressed.

In the period following independence, Zambia pursued socialist economic policies. These policies which entail government ownership of most economic units and direct intervention in markets through administrative controls lasted until the early 1990s. The financial repression which was done mainly through interest and credit controls resulted in an inefficient and non-competitive financial market. The belief was that government could support the real sector through direct involvement in the financial sector, partly by creating their own financial institutions and by selective credit allocation and price control mechanisms for the entire financial sector. This however resulted into negative real interest rates and poor economic performance. The interest rates remained negative in real terms until 1992. They ranged between -8 % in 1980 to -82.9 % in 1990. For these reasons, there were very few entrants into the banking industry between 1970 and 1990 (Maimbo, 2001).

In addition, during most of the post independence period, the sector was dominated by subsidiaries of foreign banks, along with a parastatal bank until in the mid 1980s when some locally domiciled banks were established. The repressive regime also gave way to highly concentrated market structures in the sector leading to monopolistic or oligopolistic market structures. The oligopolistic features of the banking market meant that the retail services provided by the foreign and government banks were usually of poor quality, expensive and limited in range. This has however continued even after liberalization due to fringe competition from small local entrants some of which even collapsed (Brownbrigde, 1998). Since then Zambia's banking sector has evolved along with the country's policy of economic transformation and privatization.

Economic liberalization was undertaken on account of the inefficiencies of these repressive policies. Financial sector liberalisation was one of the major components of the liberalisation process. The objectives were to mobilise domestic savings for domestic investment and to maintain a sound and safe financial system in order to foster economic development. The financial sector liberalisation ushered in a financial market considered competitive leading to new entrants in the banking sector. Among several outcomes of the liberalisation process, a notable one was a spat of bank failures. Failed local banks for instance accounted for as much as 23% of total commercial bank assets in Zambia compared to only 11% in Kenya. Interest rates also increased from 40 % in 1992 to 192% in 1993 which led to a sharp rise in interest rates on loans and government securities (Simwaka, 2002). The resultant wider interest rate spreads resulted in higher nominal banking profit than in the previous years. New entrants were attracted to the sector and by December 1994, there were 19 registered banks¹. The banking industry in Zambia is relatively small and has been dominated by four commercial banks. However, following financial sector reforms within the framework of structural adjustment programmes, since 1992/1993 several existing non-bank financial intermediaries and banks began operations. The increase in the number of financial institutions with commercial banking licences increased competition in the main markets for commercial banks.

¹ A detailed description of the industry and liberalization can be found in Chiumya (1999).

It could be argued that all is not that rosy with the industry. The period after liberalization was also characterised by high and volatile inflation and a precipitous depreciation in the exchange rate. For instance, the banks nominal deposit and lending rates rose from 25% and 55% at the close of 1992 to 110% and 140% at the end of 1993. Further the exchange rate weakened by 160% while inflation rose to 193% from 93% over the same period. The high profitability could also be said to owe less to efficiency and competitiveness than to the structure of the industry that enables most banks to reap supernormal profits (Ziorklui and Gockel, 2000). The curtailing of operations in rural areas by the banks in the post liberalization era has lent credence to the view that the reforms have skewed the distribution of banks in favour of the urban areas; thereby intensifying the financial marginalization of areas considered as unprofitable. Hence, in recent times, the anticipated benefits of financial sector reforms in Zambia are being questioned. This study aims to clarify empirically aspects of the debate relating to competition, monopoly and efficiency in the banking industry.

1.2 Problem Statement and Justification of Study

The major objective of financial reforms has been to foster domestic resource mobilisation by improving the efficiency of and competition within the banking sector. It is expected that the entry of new financial institutions as a result of entry liberalization could create competitive pressure for output and input prices which would be reflected into lower levels of profitability.

Proponents of competition policy hold the view that the efficiency of the banking sector can be heavily undermined by lack of competition resulting in less favourable prices to customers and higher than normal profits for the industry (Smirlock, 1985 and Maudos, 1998). The banking sector in Zambia is still dominated by foreign owned banks which account for 53% of total banking sector assets.

However, despite liberalization that has led to an increase in the number of financial institutions, the profitability of commercial banks has continued to exhibit increasing

trends. For instance, the banking sector profitability increased by 50% in 1996. The trend continued with industry profits increasing by 105% in 2002. This increase was also reflected in the annual return on assets (ROA), which increased by 17.4% in 2002 compared to 4.9% in 2001. ROA further increased from 3.1% in 2003 to 5.4% in 2004. The return on equity (ROE) followed the same trend and increased from 28.9% to 48.5% over the same period (BOZ, 1996, 2002, and 2004). This requires more understanding about the behaviour of commercial banks since according to financial repression theory profits are expected to exhibit downward trends after financial liberalization. What is not known is whether monopoly power or efficiency is the driving force for these high levels of profitability.

The study will be of great relevance to bank regulators and policy makers. This is because in Zambia like many developing countries, policy decisions are based on untested received theories and at best “experience” of technocrats. Given the critical role that banks play in economic development, particularly so in developing countries where the financial system is still undeveloped, there is need to study the response of the banking sector to liberalisation. Civelek and Al-Alami (1991) note that the banking industry is very important to the economy and empirical evidence on the relationship between market structure and profitability can help in government regulatory policies and in modifying the environment in which banks operate. To the knowledge of the author there has been no empirical research on the behaviour of commercial banks before and after liberalisation in Zambia. This study attempts to bridge such an empirical research gap. Specifically, there is a clear gap in empirical work on whether financial sector reforms have increased efficiency and reduced monopoly in the banking sector. The persistence of abnormal profits in a financial system dominated by a few banks is likely to have policy implications for the direction of reform in the financial sector. If there is a positive relationship between market structure and profitability in commercial banks, this would imply that regulatory policies should aim at reforming those aspects of banking which impact on profitability to increase competition. The study also contributes to knowledge by putting together a detailed panel data set for commercial banks in Zambia.

1.3 Objectives of the study

The main objective of the study is to assess the impact of financial sector liberalization on the profitability or performance of commercial banks in Zambia. Specifically the study intends to:

- a) Investigate the relationship between bank concentration (monopoly power) and performance (profitability) of the banking industry in Zambia.
- b) Investigate the relationship between market share (efficiency) and profitability of the banking industry in Zambia.
- c) To assess the impact of financial sector reforms on commercial bank profitability.

1.4 Statement of Hypotheses

The following null hypotheses will be tested:

- a) Bank concentration does not explain variation in bank profitability.
- b) Banks with larger market shares are not more profitable than those with smaller market shares.
- c) Financial sector reforms have no impact on commercial bank profitability.

1.5 Organization of the study

The rest of the study is organized as follows. Chapter Two gives an overview of Zambia's banking sector. This includes the structure of the banking sector and financial sector liberalization. A review of the theoretical literature is presented in Chapter Three. In the same chapter empirical literature is outlined to give direction to the methodological process which is presented in Chapter Four. Chapter Five provides results of estimation and interpretation. Conclusions and policy implications are given in Chapter Six.

CHAPTER TWO

OVERVIEW OF THE BANKING SYSTEM IN ZAMBIA

2.1 Banking Industry Structure

Zambia's banking sector comprises relatively small banks in terms of asset size as compared to banks in other countries in Africa. The rough measure of credit extended by the banking sector to the private sector as a percentage of GDP is used as an indicator of the size of banks. Zambia averaged 20% compared to over 30% for other countries (Simwaka, 2002). Despite their size banks are very profitable with very high overheads. The major revenue streams are earnings from investment in government securities and gains from foreign exchange dealings. Interest incomes on loans are predominantly low when seen from the perspective of the norm of business of banking although the interest spreads average 20% in absolute terms (BOZ, 2002).

Zambia's banking system can categorically be classified as government and quasi-government owned, foreign owned and locally owned. The government owned bank largely services parastatal organizations and the government while foreign banks although having a share of government related business focus on corporations. The number of commercial banks operating in the banking sector is currently thirteen. There are seven foreign banks, four local, one Government owned and a joint venture between the Governments of Zambia and India. The international banks include Barclays, Standard Chartered, Stanbic, Citibank, and the Bank of China, while local banks include Zambia National Commercial Bank, Finance Bank, Inves-trust, and First Alliance, New Capital Bank and Commerce Bank. Finance houses are the Inter-market Discount House and Access Finance. Commercial banks offer numerous services including traditional banking services, trade financing services, financing for projects, merchant and investment banking services, amongst others. Other financial institutions include leasing companies and building societies². The Development Bank of Zambia provides medium and long-term loan finance and equity, to promote agricultural and

² Government established ZANACO in 1969 as it could not nationalise the foreign banks

industrial development, export-oriented projects and development services (Simwaka, 2002). It is worth noting that all banks are required to be incorporated in Zambia. Therefore, the banks that are classified as foreign are in most cases subsidiaries of foreign banks.

The banking sector is still dominated by foreign owned banks which account for 53% of total banking sector assets. Zambia National Commercial Bank (ZANACO), the state owned bank, accounts for a further 19%. Thus in total the four³ largest commercial banks account for over 72% of banking sector assets, 75% of deposits and 80% of loans (BOZ, 2004). Overall, the distribution of banks reveals a concentrated banking industry, as also measured by the percentage of the largest bank assets to those of the industry (25%) and the percentage of total industry assets held by the second largest bank of 20% (Simwaka,2002).

Quantitatively using asset size, the distribution of banks can be tiered into three (statistics based on 1998 data). Tier I constitutes three banks, the largest and government owned bank (ZANACO) that account for 25% of the banking sector assets and the two and oldest foreign banks (Barclays, Standard Chartered banks). On average, assets for tier I banks accounted for 58% of the banking industry assets. Tier II is composed of medium sized foreign banks and locally owned banks that have grown in financial stature over the years. Tier II accounted for an average of 29% of the industry assets. Tier III mainly comprises relatively newly licensed banks and those that have remained small for various reasons. This is where most locally owned banks are concentrated. Tier III while largest in number only contributed an average of 13% to the banking sector assets (BOZ, 2000 and Simwaka,2002). Locally owned Tier III banks also have limited access to large deposits and corporate businesses. The operations are also characterized by rudimentary credit evaluation policies and procedures, which admittedly take time to be fully developed and tested. As a result of less developed credit systems tier III banks increasingly find themselves lending against collateral as opposed to cash flows from financed ventures as the first way out.

³ The four include Stanbic bank which has also grown to capture the market share

The balance sheet structure of banks reflects investment opportunities available. The financial market is fairly basic with less sophisticated products. Equally the depth of the sector remains shallow, as M_2/GDP market depth measure was only 20% as of 1998 as compared to an average of 30% in SADC. For the period 1992 to 1998 loans were the largest balance sheet item accounting for an average of 27.67%, followed by government securities with 17.17% and foreign currency holdings at 16.35 % (Simwaka, 2002). Loans and holdings in foreign investment exhibited an increasing trend while investments in government securities were declining, most likely due to falling interest rates. However this trend has changed with loans being on slightly higher than investments in Treasury bills (major balance sheet items and their trends in appendices 2 and 3).

The structure of income statements largely depicts balance sheet structures. Most earnings come from the risk free government securities due to high interest rates. The other contributor is foreign exchange gains. A sizeable amount of earnings come from interest on loans. Deposits and deposit-like instruments amounted to K28.5 billion in 1996, almost half of which was accounted for by the state owned building society and was the equivalent of 4.5% of the total deposits of the banking sector (Maimbo, 2001).

2.2 Financial System before the 1992/1993 reforms

Before the 1992/93 financial reforms, the banking sector consisted of three distinct groups; old foreign banks, new foreign banks and the local banks. The foreign banks served the interest of foreign corporate entities and the state saw the need to establish local banks to solve the problem. However, government intervention was more pronounced in the non-bank financial sector (NBFI).

Overall, government involvement in the financial sector resulted in an inefficient and non-competitive market. Like other developing countries at the time, government placed greater emphasis on the real sector, with the financial sector only playing an ancillary role. The belief then was that governments could support the real sector through direct involvement in the financial sector, partly by creating their own

financial institutions, and by selective credit allocation and price control mechanisms for the entire financial sector. The effects of these practices on sub-Saharan Africa and Zambia inclusive are low return on capital, high levels of loan portfolio concentration (in agriculture), increased government central bank borrowing, real negative interest rates and liquidity problems. The unregulated nature of bank entry and the inadequate legal and accounting standards permitted easy access for the new banks and compromised the bank industry's capacity to perform its savings mobilisation and intermediation roles.

2.3 Financial Sector Liberalization in Zambia

The financial liberalisation was undertaken against a background of acute macroeconomic instability. Apart from the relatively short period from September 1985 to May 1987 when interest rates were temporarily decontrolled, financial sector reforms have only recently been implemented. Financial deregulation and liberalisation policy came as a major component of the broad economic restructuring program.

Financial reforms have comprised three main components: financial liberalisation which included the liberalisation of foreign exchange markets and interest rates in 1992-93, and reforms to the system of prudential regulation and supervision of financial institutions, which included the enactment of new banking legislation in 1994. Interest rate liberalization and removal of other administrative controls were components of the policy designed to promote the efficient allocation of resources and by implication overall industry efficiency. Entry liberalization was designed to enhance competition in the marketplace while removal of controls was directed at removing price and other distortions. Other prudential regulations were introduced to promote the soundness and safety of the banking system. A third component was the de facto liberalisation of access to banking licenses, which enabled the number of local banks to expand rapidly during 1991-94; although to what extent this was a deliberate policy decision is unclear. The number of non-bank financial institutions, including microfinance institutions, also increased dramatically. By 1996, there were 26 non-bank financial institutions registered with the BOZ, including twelve leasing

companies, three building societies, two deposit taking financial institutions and one development bank. Appendix1 provides details on major Financial Sector Reforms undertaken in Zambia.

The central bank financing of a very large deficit led to a 95% increase in broad money and inflation of 93% in 1991. Interest rate controls in prior to 1991 capped lending rates to 46% and saving deposit rates to 33%. Real interest rates were substantially negative due to high inflation rates. The situation changed in 1994 and by 1998 short-term real interest rates were averaging 6%. Financial policy objectives during 1992 were to reduce inflation and move towards positive real interest rates. Prior to the abolition of interest rate controls, the cap was adjusted upwards to 53% by June 1992. Along side this; foreign exchange controls were substantially liberalized and a market determined exchange rate regime was established. Banks were now allowed to directly transact in foreign currency as opposed to going directly through the central bank. This led to a sharp depreciation of the exchange rate during 1992. In September 1992, bank interest rates were decontrolled and in January 1993 a Treasury bill auction was introduced resulting in market determined bill rates. The latter brought about a steep rise in Treasury bill rates as 91 day bill yields rose from 47% in December 1992 to 181.8% in June 1993-in turn pushing up bank deposit and lending rates: Savings deposit rates rose to 90% and lending rates to 128% by June 1993 (Brownbridge,1996;Chiumya,1999; and Simwaka,2002). From these changes it is clear that the financial liberalization increased the variability of most economic parameters. The standard deviation of average quarterly interest rates during 1993-1998 was 40% that for inflation was 48%, while money supply grew by over 350%. The core liquid reserve requirement also became a source of instability for banks due to frequent variations. Its standard deviation five years after reforms was 9% (Chiumya, 1999).

The liberalisation policies outlined above were implemented before reforms were made to the system of prudential regulation and supervision of the financial system, which only began in 1994. This led to the proliferation of financial institutions in the financial sector (Chiumya, 1999). It became easier to obtain a financial institution license

although prior restrictions may have been due more to political considerations than anything else. Additionally, capital requirements were low due to the depreciation of the Zambia Kwacha (Brownbridge, 1996b). Ten bank licences were issued between 1991 and 1994, with the number of commercial banks in operation increasing from ten in 1990 to eighteen in 1994 (Maimbo, 2001; Chiumya, 1999). Figure 1 below shows the growth of the Zambian banking industry over time.

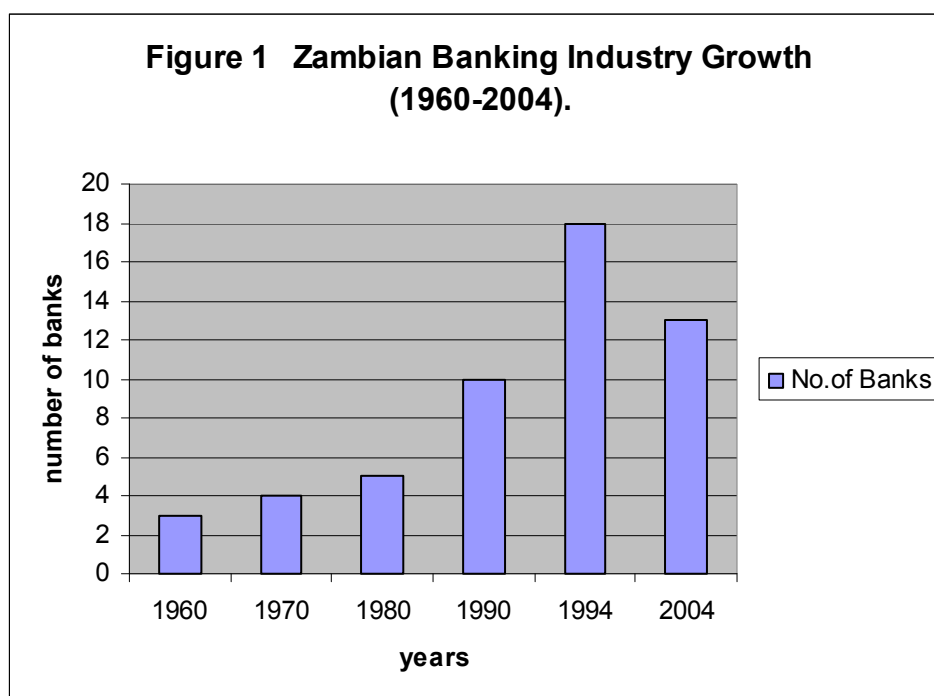


Figure 1: Zambian Banking Industry Growth

2.4 Bank Failures

Bank failures have so far afflicted several local banks in Zambia. Capital Bank was closed for reasons which remain contentious largely because of the political controversy surrounding this episode. After the 1991 elections Capital Bank was recapitalised, with additional shareholders and new management brought in, and it reopened in 1992 as New Capital Bank. Meridien BIAO Zambia (MBZ) - the Zambian subsidiary of Meridien BIAO - was closed in April 1995 following the closure of Meridien subsidiaries in Swaziland and Kenya. The reasons for MBZ's collapse have not yet been made public, but it seems likely that they were connected with problems

afflicting the parent company, Meridien BIAO, which was clearly undercapitalised, faced an acute liquidity shortage and had probably expanded far too rapidly (Maimbo, 2001).

Two more local banks, African Commercial Bank (ACB) and Commerce Bank were closed in late 1995. The former was reported to be suffering from acute liquidity problems while the latter had failed to comply with a request from the BOZ to replace its Chairman, who was also a director of the ACB. Between 1995 and 1998, nine commercial banks failed and several government owned financial institutions were allowed to collapse as previously-guaranteed financial subsidies were withdrawn. Given the problems facing many of the local banks, further episodes of bank distress in Zambia are not unlikely. There is thus need for the Central bank to introduce measures to reduce these bank exits if effective competition is to result.

CHAPTER THREE

LITERATURE REVIEW

3.1 Theoretical Literature

According to Clark (1986) there are many models of the banking firm developed to deal with specific aspects of bank behaviour, but no single model is acceptable as descriptive of all bank behaviour although the portfolio theory approach has played an important role. In the portfolio choice models, banks seek to maximize profits defined by a feasible set of assets and liabilities with interest rates set by the bank and per unit costs incurred by the bank of producing each component of assets and liabilities. These bank models have incorporated various aspects of the competitive process and scale economies.

3.1.1 Structure-Conduct-Performance (SCP) paradigm, Efficient Market and Quiet Life Hypotheses.

Studies that investigate the relationship between market structure and profitability in banking fall into two categories, with respect to the collusion hypothesis and the efficient market hypothesis. First, the traditional paradigm of assessing the effect market power on profitability performance is the structure-conduct-performance (SCP) model due to the pioneering work of Bain (1951). This is also known as the collusion hypothesis. The hypothesis is that certain market structures are conducive to monopolistic conduct, and this conduct enables firms to raise prices above costs thereby making abnormal profits. Thus, the link between market structure and profitability is through firms' pricing behaviour. In perfectly competitive markets where firms face a perfectly elastic demand, theoretically the model predicts that there will be lower profitability compared with all other markets where the demand is less elastic (George and Joll, 1971). Many researchers in the field of industrial economics have empirically tested this hypothesis using the following specification:

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

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 and D is the vector of demand variables.

Civelek and Al-Alami (1991) noted that the banking industry is so important to the economy and empirical evidence on SCP relationship can help in government regulatory policies and in modifying the environment in which banks operate. Increased bank concentration, by increasing the cost of credit, has the effects of reducing firms' demand for credit and consequently affects the level of intermediation and retard the growth of the economy. In a review of the SCP banking literature on the US banking industry, Gilbert (1984) notes that out of 44 studies, 32 report results that support the traditional hypothesis.

The specification of the SCP model in the banking has been based on the various theories of the banking firm (Mullineaux, 1978; Gilbert, 1984; Clark, 1986). The SCP model is the profit-concentration relationship postulated as:

$$\pi_i = f(CR, X_i) \dots \dots \dots (2)$$

where π is a measure of the profitability of the i th bank as measured by return on equity (capital or assets), CR is the banks index of concentration and X_i denotes a vector of control variables that are exogenous to the bank and may affect prices through market or cost considerations. The empirical evidence on this relationship has produced mixed results (Gilbert, 1984).

The mixed empirical results on the profit-concentration hypothesis have led to the questioning of the relevance of the SCP paradigm as an explanation of bank industry behaviour. Following Demsetz (1973) and Baumol (1982), alternative hypotheses have been tested as a direct challenge to the SCP hypothesis. The theory has also been challenged theoretically. The efficient market hypothesis, contestable market theory and quite life hypothesis emerged from such criticism of the SCP hypothesis.

Baumol (1982), in the contestable market theory raised serious questions about the validity of the SCP hypothesis. The market is contestable when barriers to entry are not preclusive, such that no outside potential competitors can enter by undercutting the price and still make profits. In this case there is no basis for assessing a significant value to the market concentration variable in determining profitability. Given the contestability of the market it is possible to have outcomes approximating those of perfect competition although the number of actual competitors is quite small.

The second hypothesis is the efficient market hypothesis that emerged from the criticism of the collusion hypothesis (Demsetz, 1973 and Peltzman, 1977). These economists argue that concentration is not a random event but rather the result of superior efficiency of leading firms. Firms possessing a comparative advantage in production become large and obtain a large market share, and as a result the market becomes more concentrated. Such firms earn Ricadian rents. This is the efficient market hypothesis which implies that market share proxies for relative firm efficiency and is therefore positively correlated with profitability. In this case concentration far from leading to collusion actually emerges from a competitive process. Proponents of the efficient market hypothesis thus hold that the relationship between concentration and profitability is spurious and is a proxy for the relationship between superior efficiency, market share and concentration. Thus, differences in firm-specific efficiencies within markets create unequal market shares and high levels of concentration. Several studies that have directly tested the competing hypotheses using manufacturing data (Demsetz, 1973; Carter 1978; Peltzman, 1977; Smirlock, Gilligan and Marshall, 1984) have found evidence in favour of the efficient structure hypothesis. As Molyneux and Forbes (1995) and Smirlock (1985) note, the hypothesis is the market share-profitability relationship specified as follows:

$$\pi = f(\text{CR}, \text{MS}, \text{X}) \dots \dots \dots (3)$$

where π is a measure of profitability, CR is a measure of market structure (concentration), MS is measure of efficiency and X is a vector of control variables that account for firm specific and market specific characteristics. However, others

argue that market share, which is included in the profit regression to test the efficient market hypothesis is a poor proxy of the efficiency of firms (Berger, 1995 and Maudos, 1998).

The studies that test these competing hypotheses are based on estimating variants of the following model (Mullineaux, 1978; Gilbert, 1984; Smirlock, 1985; Clark, 1986; Molyneux and Forbes, 1995; Maudos, 1998 ;)

$$\pi = \beta_0 + \beta_1 MS + \beta_2 CR + \sum_{i=4}^n \beta_i X_i \dots\dots\dots(4)$$

where; π is a profit measure, CR is a measure of market structure (a concentration measure), MS is a measure of market share and X_i is a vector of control variables that previous studies have found to affect bank profitability. The collusion hypothesis is supported by the significance of the coefficient of concentration measure and insignificance of the coefficient of market share. The significance of the coefficient of market share which is a proxy for efficiency and insignificance of the coefficient of the concentration measure would imply support for the efficient structure hypothesis. Maudos (1998) noted that the market share variable can capture the effects that are unrelated to efficiency and proposes to directly include a measure of overall efficiency in the specification.

Others have argued that differential efficiency is not the only possible cause of a market share profitability relationship. Higher profits can result not only from lower costs but also from higher prices. Mueller (1983) and Ravenscraft (1983) argue that market share may capture market power stemming from product differentiation; banks with a large market share may have higher quality products, enabling them to charge higher prices and earn higher profits. This is the product differentiation hypothesis. Discriminating between this hypothesis and efficient market hypothesis is easier when price is used as a measure of performance. However, measurement of prices using bank call report data is problematic (Osborne and Wendell, 1982).

The other hypothesis of relevance is the Quiet Life Hypothesis or Galbraith-Caves hypothesis. It states that uncertainty avoidance by large firms varies directly with the degree of market power that these firms possess. In other words, banks located in more highly concentrated markets may choose to trade off some of their potential monopoly profit for a reduction in risk by choosing safer portfolios. The implication of this is that although profit rates for banks in more highly concentrated banking markets may not significantly exceed those in less highly concentrated markets, their profits are more secure, subject to less variability. Several studies among them Nyong (1990), Caves and Yamey (1971) and Caves (1970) have shown support for the hypothesis. The reasons are that large firms can afford the quiet life synonymous with less risk because they possess large market power and usually have more risk-averse managers. Generally the results are mixed.

The empirical tests of the SCP and efficient market hypotheses have mainly used single equation, multiple regression analysis approach. However, Clark (1986) argues that bank profits might be jointly determined with other variables, especially where the firms being considered are multiproduct in nature. This necessitates the use of a simultaneous equation approach. Single equation models are likely to suffer from identification problems. Other criticisms include the idea that banks benefit equally from a high level of market concentration. This runs counter to much of the theoretical literature that identifies strategic group behaviour and more elegantly translates asymmetric market structures into performance differences. The Cournot model has been suggested to correct for these inadequacies since it makes it easier to accommodate asymmetric market structures, differences in cost structures and collusive behaviour.

It is however important to determine which of these behavioural hypotheses best describe the banking industry because the assumed positive relationship between concentration and profitability affects regulatory decisions, mergers and entry. Increasing market concentration is viewed as a social cost and a corresponding onus

is put on the petitioning banks to demonstrate public benefits that outweigh these costs. Heggstad (1979) has asserted that high profits in a market signal a need for more resources; they indicate a need for more competition and more entry into those markets. Although this may be true under the traditional hypothesis, it is also clear that such a policy could lead to resource waste under the efficient structure hypothesis.

3.2 Empirical Literature

Empirical findings on the liberalization-profitability, SCP paradigm and the Efficiency hypothesis still yield mixed results. Findings vary from country to country as well as across time periods. This has been attributed to the behaviour of banks which varies with respect to competition policy. Since banking regulation changes with time and across countries, we expect variations in performance.

The research undertaken has focused on profitability analysis of either cross-country or individual countries' banking systems. The first group of studies reviewed includes Haslem (1968), Short (1979), Bourke (1989), Molyneux and Thornton (1992) and Demirguc-Kunt and Huizinga (2000). A more recent study in this group is Bikker and Haaf (2002), though it is different in scope; its emphasis is on the bank profitability business cycle relationship. Studies in the second group mainly concern the banking system in the US (e.g. Berger et al., 1987) or the emerging market economies (e.g. Barajas et al., 1999).

Generally, the fact that bank researchers have been unable to find a consistently positive and significant relationship between concentration and profits is viewed as troublesome. Rhoades (1977) in his survey of 39 studies from 1961-1977 determined that 30 of these studies showed support for the traditional SCP hypothesis. However Rose and Fraser (1976) estimated 27 equations and found only 6 in support of the SCP hypothesis. Osborne and Wendell (1982), in a detailed critique of the literature, argue that it contains so many inconsistencies as to provide no evidence of a positive association between concentration and performance.

Banking performance is often characterized by the level of intermediation spreads or profitability. Financial systems in developing countries typically show significantly high and persistent spreads or profitability (Barajas et al, 2000). These high profit margins have persisted even though most countries have undertaken financial liberalization over the past 15 years or so. Similarly, Brock and Rojas-Suarez (2000) remark that most policymakers in Latin America have been disappointed by the fact that spreads or profit levels have failed to converge to international levels. The expectation is that the removal of government controls on interest rates and of barriers to entry into the financial system would lead to greater competition and lower profit margins or interest spreads of financial institutions.

Several arguments have been advanced for the failure of interest spreads in developing countries to converge toward those observed in developed countries. A number of authors argue that unless bank behaviour changes, financial liberalization cannot be expected to lead to a significant improvement in the efficiency of the financial system, as measured by significant falls in interest spreads or uncompetitive profits. There are several explanations for limited changes in banking behaviour, persistent high spreads, and inefficiency following financial liberalization. First, following Bain's (1951) market structure, conduct, and performance (S-C-P) hypothesis in the industrial organization literature, high levels of profitability may persist if financial sector reforms do not significantly alter the structure within which banks operate. Gibson and Tsakalotos (1994) note that competitive pressures that result from conditions of free entry and competitive pricing will raise the functional efficiency and reduce profits.

Although the empirical evidence of a positive and significant relationship between market structure and profitability or interest spreads in banking yields mixed results, there is compelling evidence that market structure plays an important role in altering the behaviour of banks and in influencing bank profits. Most recent studies on bank spreads or profitability tend to support the hypothesis that profits are positively related to market power (Hannan and Liang, 1993; Barajas et al, 1999 and 2000). Brock and

Rojas-Suarez (2000), and Barajas et al (1999, 2000) further confirm that the critics of the S-C-P hypothesis, particularly proponents of the efficient market hypothesis following Demsetz (1973) and Peltzman (1977), argue that market concentration is a result of banks' superior efficiency, which leads to larger market shares and profitability.⁴

Results from empirical studies on the performance of concentration are mixed. Civelek and Al-Alami (1991) find a positive significant relationship between concentration and profitability in most years with perverse signs in some years in the Jordanian banking industry while (Chirwa 1997, 1998, and 2001; Molyneux and Forbes, 1995) find overwhelming evidence of this relationship. Furthermore big banks were found to have a tendency of relying on loans which are less profitable. Agu (1992) and Goldberg (1996) on the other hand find no significant relationship between concentration and profitability. Where the market share variable is included in the model, concentration fares badly and the results tend to favour the efficient market hypothesis (Evanoff and Fortier, 1988; Smirlock, 1985). Results from empirical studies on the performance of CR are mixed. Civelek and Al-Alami (1991) find a positive significant relationship between CR and profitability in most years with perverse signs in some years in the Jordanian banking industry while Molyneux and Forbes (1995) find overwhelming evidence of this relationship.

Other control variables are also included to explain the behaviour of banks. Size is introduced to account for existing economies or diseconomies of scale in the market. Akhavein et al. (1997) and Smirlock (1985) find a positive and significant relationship between size and bank profitability. Demircuc-Kunt and Maksimovic (1998) suggest that the extent to which various financial, legal and other factors (e.g. corruption) affect bank profitability is closely linked to firm size. In addition, as Short (1979) argues, size is closely related to the capital adequacy of a bank since relatively large banks tend to

⁴ Among others, also see Gilbert (1984), Berger and Hannan (1989), Civelek and Al-Alami (1991), Molyneux and Forbes (1995), Maudos (1998), Demircuc-Kunt and Huizinga (1999).

raise less expensive capital and, hence, appear more profitable. Using similar arguments, Haslem (1968), Short (1979), Bourke (1989), Molyneux and Thornton (1992) Bikker and Haaf (2002) and Goddard et al. (2004), all link bank size to capital ratios, which they claim to be positively related to size, meaning that as size increases – especially in the case of small to medium-sized banks – profitability rises. Thus, the impact of bank size on profitability may be either positive or negative. The empirical evidence on the performance of bank size are mixed, with conclusions of no economies of scale (Civelek and Al-Alami, 1991; Molyneux and Forbes, 1995) and others having significant positive (Evanoff and Fortier, 1988) and negative (Smirlock, 1985) relationships.

Korsah et al (2002) applied market concentration ratios and Data Envelopment Analysis (DEA) to assess the impact of financial sector liberalisation on the performance of Ghanaian Banks. The market concentration technique ascertains the incidence and intensity of competition and DEA measures the relative performance of banks in a multi input-output scenario. The empirical implementation of the analytical techniques shows that competition has increased and the banks have become more efficient although there is evidence of stagnation on both measures in recent years. Further, the banks have become more profitable due to the oligopolistic nature of the market that enables them to reap supernormal profits. Chirwa (2001) also found that financial sector liberalisation had significantly increased financial depth, savings mobilization and reduced monopoly power in the Malawian banking system.

Using a panel data with random effects, Ben Naceur and Goaid (2001) investigate the determinant of the Tunisian banking industry performance. Their results suggest that the best performing Tunisian banks are those that have improved labour and capital productivity; those that have accumulated a high volume of deposits relative to their assets and that have been able to reinforce their equity. Furthermore, Ben Naceur (2003) analysis of the impact of the bank's characteristics, financial structure and macroeconomic indicator on bank's net interest margins, reports that high net interest

margin and profitability are related positively with relatively highly capitalised banks and banks with large overheads.

Saunders and Schumacher (2000) also note that the capital that banks hold to cushion themselves against expected and unexpected risks may lead to monopolistic profits. Arguably, banks often hold more capital above the regulatory minimum capital requirement for additional credit-risk exposure, and such holdings are relatively more expensive than debt because of taxation. The cost of high regulatory and/or endogenously determined capital ratios may be covered by widening the spread between lending and deposit rates. Saunders and Schumacher (2000) provide evidence in developed countries of the positive and generally significant relationship between spreads and capital ratios. For developing countries, where there are often inadequate rules and regulations governing the functioning of the financial system, Brock and Rojas-Suarez (2000) argue that capital to asset ratios mean very little due to inadequate accounting standards and inappropriate classification of the riskiness of loans.

Since profit measures are usually not risk-adjusted, the capital to asset ratio is included to account for differences in levels of risk over time and between firms. Lower capital to asset ratio is associated with high risk and hence the hypothesis is the negative relationship between capital-asset ratio and profitability performance. However this variable produces perverse signs although statistically significant (Molyneux and Forbes, 1995). Evanoff and Fortier (1988) found a negative significant relationship between return on assets and capital to asset ratio.

Empirical studies have shown that the loan to asset ratio variable has produced perverse results suggesting that there is risk reduction behaviour among bank managers (Civelek and Al-Alami, 1991 Molyneux and Forbes, 1995 Evanoff and Fortier, 1988). Agu (1992) also found a negative and weak statistical association between loan to asset ratio and profitability.

Other variables included capture market demand characteristics. These include market size and market growth rate. Market size is measured by total market deposits (MKDEP). 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. However, as Evanoff and Fortier (1988) and Smirlock (1985) noted, this negative relationship may be partially offset if banks in these markets take on riskier portfolios requiring higher returns. The relationship between market size and bank profitability may be either positive or negative. The growth of the market (MKG) is included because rapid market growth expands profit opportunities for existing banks, but if growth encourages entry then we may observe a negative relationship. Civelek and Al-Alami (1991) argued that larger market size or an expanding market enables banks to differentiate its products and consequently generate higher profits.

Ratio of demand deposits to total industry deposits captures the bank's relative cost of funds (Smirlock, 1985; Evanoff and Fortier, 1988). Demand deposits are relatively inexpensive source of funds. One expects that the higher the ratio of demand deposits to total deposit, the higher the level of profitability.

Macroeconomic instability and the policy environment may also affect the pricing behaviour of commercial banks. In order to capture the effects of the macroeconomic and policy environment, profitability functions include inflation, growth of output, Treasury Bills and money market real interest rates as control variables. For instance, there is evidence in the literature on spreads that inflation is positively associated with intermediation spreads, particularly in developing countries where inflation is high and variable (Demirgüç-Kunt and Huizinga, 1999; Brock and Rojas-Suarez, 2000; Claessens et al, 2001).

In summary SCP hypothesis has now been widely used in the analysis of bank markets although the efficient market hypothesis is also gaining empirical popularity. Model specifications have been enriched by the inclusion of control variables. The overall evidence suggests that high market concentration may be an institutional feature that

limits savings mobilization and financial intermediation in general. Alternatively the efficient market hypothesis asserts that market concentration results from firms' ability to secure larger market shares because of their efficiency.

CHAPTER FOUR

METHODOLOGY AND DATA

4.1 Model Specification

The methodology utilised in this study is based on Weiss's (1974) assertion that the correct test of the competing hypotheses is one that "takes both market share and concentration into account at the same time." A direct way to do this is to estimate a cross sectional profit equation that includes both market share and concentration as independent variables and to examine the significance of their coefficients.⁵ Accordingly we estimate the following general single profit equation based on equations 3 and 4 in Chapter three.⁶

$$\pi_{jt} = \beta_0 + \beta_1 CR_t + \beta_2 MS_{jt} + \beta_3 MKG_t + \beta_4 ASSET_{jt} + \beta_5 CAPAST_{jt} + \beta_6 LTOAST_{jt} + \beta_7 MKDEP_t + \beta_8 TBs_t + \beta_9 LB + \beta_{10} EXT + \beta_{11} ENT + \varepsilon_{jt} \quad (5)$$

where t is time (1980-2004) and j runs from 1 to 23 representing specific banks, π is commercial bank profits (return on assets (ROA), return on equity (ROE) and return on capital (ROC)), CR is the three firm concentration ratio (the share of bank deposit accounted for by three largest banks), MS is the market share of the commercial banks, MKG is the annual growth rate of market deposits for the banking industry, ASSET is commercial bank assets, CAPAST is capital to asset ratio of commercial banks, LTOAST is loan to asset ratio of commercial banks, MKDEP is market deposits of the banking industry, TBs is annual Treasury bill yield rate, LB is a Binary variable equal to 1 for t = 1992 to 2004 representing the liberalisation period, otherwise zero, EXT is

⁵ Several authors have done this using manufacturing data (e.g., Ravenscraft 1983; Smirlock, Glligan and Marshall 1984). The general finding is that once market share is included as an explanatory variable, the coefficient of market concentration is insignificant.

⁶ Chirwa, 2001, Demirgüç-Kunt and Harry Huizinga; 1998 estimated a similar model.

a binary variable equal to 1 when there was a bank failure or exit, otherwise zero, ENT is a binary equal to 1 when there was a bank entry, otherwise zero and $\varepsilon_{jt} = \varepsilon_j + \nu_{jt}$; ε_j denotes the unobserved individual effects and ν_{jt} denotes the remainder disturbances.

4.1.1 Variables in the Study and Expected signs

Several authors use different measures of bank profitability in the analysis of the relationship between market structure and performance. The profitability measures mostly used in empirical studies are rate of return on equity (ROE), rate of return on capital (ROC) or rate of return on assets (ROA). We have used these measures because they represent the benefits obtained by the banks before taxes, provision for insolvency and other extraordinary items, and reflect the difference between earnings and costs derived from lending and from bank services. We have chosen to specify profits this way since net profit after taxes captures the effects of random factors that are sometimes beyond the firm's control (Maudos, 1998). In principle, ROA reflects the ability of a bank's management to generate profits from the bank's assets, although it may be biased due to off-balance-sheet activities. ROE indicates the return to shareholders on their equity and equals ROA times the total assets-to-equity ratio. The latter is often referred to as the bank's equity multiplier, which measures financial leverage. Banks with lower leverage (higher equity) will generally report higher ROA, but lower ROE. Since an analysis of ROE disregards the greater risks associated with high leverage and financial leverage is often determined by regulation, ROA emerges as the key ratio for the evaluation of bank profitability.

However, in most bank studies, emphasis is placed on measuring profitability by ROC and ROA. Smirlock (1985) notes that the use of ROA has provided strongest evidence on the concentration-profitability relationship in banking studies. Keeton and Matsunaga (1985) asserted that ROA is especially useful in measuring changes in bank performance over time since bank's income and expense components are more closely related to assets. The basic argument in favour of profitability measures in banking is that banks are essentially multi-product firms and the use of

profitability measures eliminates problems associated with cross-subsidization between products and services.

The main variable of interest in the traditional SCP hypothesis is market concentration. There are several measures of market concentration, but the common ones in both industrial and banking studies have been the concentration ratio and the Herfindahl-Hirshmann index (HHI). As Berger and Hannan (1989) point out, theory provides little guidance on the measure of monopoly power when the type of noncompetitive behaviour is unknown. In the recent literature on the SCP hypothesis, alternative indicators of the degree of competition in banking are provided by the estimation of the Lerner and the Rosse-Panzar indices, which are usually referred to as non-structural measures of competition. The argument is that the structural measures (i.e. the H-H index and concentration ratios) were found to have a weak relationship with profitability when market shares were also included in the regressions. The results generally show that the non-structural measures of competition are not correlated with concentration, i.e. competition could be present in markets even with a relatively high degree of concentration. However, the use of non-structural measures in the profitability function has some major limitations. For example, the Rosse-Panzar test can give misleading results if the banks in the sample have not completely adjusted to market conditions, and this leads to a bias toward the spurious appearance of market power. Similarly, in order to use the Lerner index, one has to effectively proxy bank output and then estimate the marginal cost using an appropriate functional form. The estimation of a cost function requires several assumptions concerning the methodology to be used, which is beyond the scope of the present work.

The preference for CR over HHI in this study is based on the fact that the same traditional banks (three) have been dominating the Zambian industry since pre-liberalization. The HHI measure may not make sense where the market is highly concentrated. Hence, without denying its limitations, we proceed with using the three firm concentration index. The three-firm concentration ratio is used as a

measure of monopoly power in the banking industry. Concentration defined as the extent to which most of the market's output is produced by a few firms in the industry, forms the basis for the explicit link between market structure and performance through firms conduct (Bain, 1951). The definition of market concentration in terms of output poses problems in the banking industry because of its multiproduct nature, although the main products are loan making and deposit taking services. This would result in higher than average profitability. The traditional expectation is that higher concentration leads to higher and monopolistic performance. The more concentrated the industry the higher the level of profitability, ($\beta_1 > 0$).

Results from empirical studies on the performance of CR are mixed. Civelek and Al-Alami (1991) find a positive significant relationship between CR and profitability in most years with perverse signs in some years in the Jordanian banking industry while Molyneux and Forbes (1995) find overwhelming evidence of this relationship. Agu (1992) on the other hand finds no significant relationship. Where the market share variable (MS) is included in the model, CR fares badly and the results tend to favour the efficient market hypothesis (Evanoff and Fortier, 1988; Smirlock, 1985).

The main variable of the efficient market hypothesis is efficiency which we proxy by market share (MS). MS is defined as the ratio of commercial bank deposits to total market deposits. Larger market shares are a result of efficiency that in turn leads to higher profitability. Hence we expect a positive relationship between MS and profitability, ($\beta_2 > 0$).

The traditional SCP can be verified by finding the coefficient of CR, $\beta_1 > 0$ and the coefficient of MS, $\beta_2 = 0$; and the efficiency hypothesis by finding that $\beta_1 = 0$ and $\beta_2 > 0$.

Several control variables that take into account firm specific and market-specific characteristics are included in empirical studies of the banking industry. The growth of the market (MKG) is included because rapid market growth expands profit opportunities for existing banks, but if growth encourages entry then we may observe a negative relationship, ($\beta_3 > 0$ or $\beta_3 < 0$). Civelek and Al-Alami (1991) argued that larger market size or an expanding market enables banks to differentiate their products and consequently generate higher profits.

One of the most important questions underlying bank policy is which size optimizes bank profitability. Generally, the effect of a growing size on profitability has been proved to be positive to a certain extent. However, for banks that become extremely large, the effect of size could be negative due to bureaucratic and other reasons. Hence, the size-profitability relationship may be expected to be non-linear. We therefore use the banks' assets (ASSET) to account for cost and capital ratio differences related to bank size and to control for the possibility that large firms are likely to have greater product and loan diversification (capture economies of scale). This increased diversification implies less risk and hence a lower required rate of return. Larger banks compared with smaller banks are in much better position to reap economies of scale and have greater diversification opportunities. However, according to Evanoff and Fortier (1988) and Smirlock (1985) any positive influence on profits from economies of scale may be partially offset by greater ability to diversify assets resulting in a lower risk and a lower required return. Thus, the impact of bank size on profitability may be either positive or negative. 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, ($\beta_4 > 0$ or $\beta_4 < 0$). The empirical evidence on the performance of ASSETS (bank size) are mixed, with conclusions of no economies of scale (Civelek and Al-Alami, 1991; Molyneux and Forbes, 1995) and others having significant positive (Evanoff and Fortier, 1988) and negative (Smirlock, 1985) relationships.

Since profit measures are usually not risk-adjusted, the capital to asset ratio, CAPAST is included to account for differences in levels of risk over time and between firms. Lower CAPAST is associated with high risk and hence the hypothesis is the negative relationship between capital-asset ratio and profitability performance, ($\beta_5 < 0$). However, CAPAST produces perverse signs although statistically significant (Molyneux and Forbes, 1995). Evanoff and Fortier, (1988) found a negative significant relationship between ROA and CAPAST.

Loan to asset ratio, LTOAST is another measure of risk included in the model. It captures bank specific risk. Portfolio theory postulates that risky investments are usually associated with higher returns than primary assets. We hypothesise a positive relationship between LTOAST and profitability, ($\beta_6 > 0$). Empirical studies have shown that this variable has produced perverse results suggesting that there is risk reduction behaviour among bank managers (Civelek and Al-Alami, 1991 Molyneux and Forbes, 1995 Evanoff and Fortier, 1988). Agu (1992) also found a negative and weak statistical association between LTOAST and profitability.

Other variables included capture market demand characteristics. These include market size and market growth rate. Market size is measured by total market deposits (MKDEP). 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. However, as Evanoff and Fortier (1988) and Smirlock (1985) noted, this negative relationship may be partially offset if banks in these markets take on riskier portfolios requiring higher returns. The relationship between market size and bank profitability may be either positive or negative, ($\beta_7 > 0$ or $\beta_7 < 0$).

Macroeconomic instability and the policy environment may also affect the pricing behaviour of commercial banks. In order to capture the effects of the macroeconomic and policy environment, profitability functions include financial sector liberalization (LB), entry (ENT), exit (EXT) and Treasury bill yield rate

(TBs) as control variables (Demirgüç-Kunt and Huizinga, 1999; Brock and Rojas-Suarez, 2000; Claessens et al, 2001). We hypothesise a positive relationship between TBs and profitability, ($\beta_8 > 0$). This is because Treasury bill is a risk free asset and hence banks are likely to invest in them as the yield rate increases. This falls in line with the Quiet life hypothesis argument.

A dummy variable, LB, is included to capture the effects of financial sector reforms on industry profitability. LB takes a value of zero during the pre-liberalization period (1980-1991) and a value of one for the period after liberalization (1992–2004). The dummy variable also captures the unobservable or unmodeled effects of reforms, such as the democratic political environment and uncertainty in the policy environment. Barajas et al (2000) argue that in a liberalized financial sector, the liberalization dummy would capture the effect of strengthening prudential regulation and the possible announcement effects of the opening of the banking sector to domestic and foreign competition, arguments that are supported in the Colombian banking system.

Financial liberalization should thus generally lead to a lowering of monopoly profits. This is because reforms are supposed to increase competition by encouraging entry and also creating potential threat of entry in the industry, ($\beta_9 < 0$). The results on this relationship are mixed. Chirwa (2001) and Casu et al (2003) found the coefficient of the reform variable positive and insignificant in all measures of performance in the Malawian and Tunisian banking industries respectively. Aryeetey et al (1997) also found evidence of improvements in financial depth, but they observed that the banking sector remained highly concentrated and the financial system was still segmented.

Exit dummy (EXT) is included to capture the effects of bank failures on profitability. Bank failures will result into lower competition or increased monopoly power thereby raising profitability for the surviving banks. We therefore hypothesize a positive relationship between EXT and profitability ($\beta_{10} > 0$). The

entry dummy (ENT) on the other hand is expected to be negatively related to profitability since it has an effect of reducing concentration or monopoly through higher competition, ($\beta_{11} < 0$).

4.2 Data Sources and Sample

The sample comprises commercial banks which operated in Zambia at any time within the period 1980 to 2004. The choice of banks was largely informed by the availability of data and the need to base our analysis, as much as possible, on consistent and uniform sample database. A total of 23 banks were included in the study. The main sources of data are annual reports and financial statements obtained from both BOZ and individual commercial banks. Other sources are BOZ annual reports, Ministry of Finance and National Planning (MOFED) reports, Central statistics publications and International Financial Statistics (IFS).

4.3 Methods of Estimation

There are four approaches involved in estimating panel data. The first one pools all the time series and cross sectional data and estimates the underlying model by OLS. This is done under the assumption of constant intercept and slope coefficients. However, this method makes too simplistic assumptions by ignoring the specificities of individual cross sectional units hence the use of the fixed effect (FE) and Random effect (RE) approaches in panel data estimations. The fixed effects approach makes use of cross section dummies to account for the uniqueness in each unit and the estimator is called the least square dummy variable (LSDV). The RE improves on the efficiency of the FE by accounting for both the cross section and time effects. This is a variation of the generalized least square (GLS) estimation process.

4.3.1 Fixed Effects Vs Random Effects

The difference between the FE and RE approaches is in the way they characterise the disturbance term. We use equation 5 above to illustrate this.

The FE model defines the disturbance term, ε_{jt} in equation 4 as follows;

$$\varepsilon_{jt} = \kappa_j \varepsilon_j + v_{jt}$$

while the RE defines the disturbance term in equation 5, ε_{jt} as $\varepsilon_{jt} = \varepsilon_j + \nu_{jt}$

where ε_j denotes the unobserved individual or bank specific effects and ν_{jt} denoted the remainder disturbances (idiosyncratic error). The later is widely used in most panel data applications and is often referred to as a one-way error component model.⁷

In this study we test the traditional SCP and the efficient market hypotheses using the RE (GLS) and FE (LSDV) approaches. The Hausman and the Lagrangian Multiplier (LM) tests determined the choice between the LSDV and GLS approaches.⁸ Rejection of the null of the Hausman⁹ test suggests that the RE is not appropriate and we are likely to be better off using LSDV estimator and regarding our inference as being conditional on the cross-section units in the sample, or using an estimator that explicitly takes autocorrelation into account such as the Feasible Generalised Least square approach (FGLS). The model was also subjected to heteroscedasticity (Breusch-Godfrey LM test) and other specification tests. Where severe heteroskedasticity occurs others (Green, 2000) have suggested the use of FGLS taking into account heteroskedasticity.

⁷ Parameters are assumed to be constant over time but can vary across individuals or parameters are constant across individuals at a given time but vary over time.

⁸ In fixed effect models, differences between the various members of the pooled dataset are captured by a constant intercept specific to each member. In random effect models, these differences are assumed to be random and estimated with the error term in the regression.

⁹ Large values of the statistic argue in favour of the FE model. LM test is also employed to test for RE and autocorrelation.

CHAPTER FIVE

EMPIRICAL RESULTS AND DISCUSSIONS

5.1 Presentation of Results and Interpretation

This section presents the results of the empirical analysis. Table 1 reports a summary of descriptive statistics of the variables used in the study. The variables are drawn from a panel of 23 commercial banks in Zambia that operated over the period 1980 to 2004.

Table 1 : Summary Statistics of Variables in the Study

Variable	Obs	Mean	Std dev	Min	Max
ROE	250	63.66	110.88	-465.72	730.36
ROC	250	18.20	45.09	-279.74	253.32
ROA	250	4.07	16.09	-168.28	39.76
CR	250	66.31	11.84	49.03	96.19
MS	250	9.80	11.00	0.09	42.67
ASSET*	250	126405.5	249100.5	200	1476033
CAPAST	250	2.86	4.12	0.01	19.29
LTOAST	250	2.36	3.30	0.0000268	12.64
MKDEP*	250	1256855	1478965	998	5326096
TBS	250	39.06	26.57	4.5	124
LB**	250	0.784	0.41	0	1
EXT**	250	0.344	0.48	0	1
ENT**	250	0.456	0.499	0	1

Notes:

- *Variables in millions of Zambia Kwacha, the rest in percentages.
- ** Binary variables

Among the measures of profitability ROE displayed the highest variability followed by ROC while ROA had the lowest. Overall all measures showed great variability suggesting instability in these performance measures across the panel. A look at their standard deviations and minimum and maximum values points to this fact. The standard deviations ranged from 16.09% (ROA) to 110% (ROE). The data also indicate some losses in the banking industry as reflected by negative minimum levels of profitability. The losses occurred among the small banks which eventually closed. Overall the profit levels are high for the sector as shown by the high mean and

maximum values of ROE, ROC and ROA. Further, the profit levels in excess of 100% indicate the presence of supernormal profits among commercial banks. The supernormal profits were recorded by the four dominant banks and some failed banks.

The statistics for CR and MS show less variability. Their standard deviations only differ slightly. The mean of 66.31% for CR shows that the industry is still highly concentrated. However, the low mean value for market share, 9.8% could imply low efficiency among commercial banks. The variability as indicated by the standard deviation is lowest for LTOAST and CAPAST indicating stability of these variables across the panel. The relatively low mean for LTOAST could imply that there is low risk among banks. However the low mean could indicate high risk as measured by the CAPAST. TBs also show significant variability. The mean and maximum values also indicate that the yield rates are high. The ASSET and MKDEP variables show higher variability as shown by their standard deviations and minimum and maximum values. The high mean for ASSET implies that banks are large on average. The market size is also large as shown by the high MKDEP mean value. The mean of the liberalization dummy shows higher frequency of liberalization followed by the entry and lastly exit dummy. About 78% of the period was post liberalization. Over the study period, there were about 45% entry and 39% exit cases in the Zambian banking industry. Hence on average the sector had more entrants than exits.

Table 2 reports regression results from estimating equation 5 in Chapter four above¹⁰. For each measure of profitability we estimate the collusion model (CM) and the efficient market model (EMM). The first equation tests the collusion model. In the second model we introduce market share and test the efficient market hypothesis. The results of the Hausman and LM test justify the use of the RE or GLS methods of estimation for the ROE and FE for the ROA and ROC measures respectively. These results are presented in appendix 4. However the presence of panel level heteroskedasticity necessitated the use of the Feasible GLS approach (FGLS). Breusch-

¹⁰ MKG was dropped from the model on grounds of multicollinearity

Pagan / Cook-Weisberg test for panel level heteroskedasticity were used. Details are in the appendix 4. The results of the FGLS model are presented in table 2.

Table 2: FGLS Estimation Results for the Profit Function

Variables	ROE		ROC		ROA	
	CM	EMM	CM	EMM	CM	EMM
Constant	-66.79	-72.56	-25.95	-24.37	-4.344	-4.246
	(-1.07)	(-1.15)	(-1.19)	(-1.11)	(-0.82)	(-0.8)
CR	1.954**	2.012**	0.593**	0.558**	0.108*	0.105*
	(2.71)	(2.77)	(2.35)	(2.18)	(1.75)	(1.68)
MS	.....	-0.2589	.....	0.41646	.....	0.021
		(-0.37)		(1.56)		(0.32)
ASSET	9.59E-05***	9.85E-05***	3.61E-05***	3.06E-05***	-2.93E-07	-6.41E-07
	(4.43)	(4.29)	(4.91)	(3.69)	(-0.16)	(-0.3)
CAPAST	-3.420*	-3.197	-2.343***	-2.772***	-0.312*	-0.329*
	(-1.68)	(-1.53)	(-3.24)	(-3.56)	(-1.89)	(-1.89)
LTOAST	-2.817	-2.367	-0.301	-0.226	0.081	0.062
	(-1.29)	(-0.97)	(-0.39)	(-0.26)	(0.43)	(0.32)
MKDEP	1.9E-05***	1.9E-05***	1.1E-05***	1.1E-05***	3.51E-06***	3.53E-06***
	(4.47)	(4.28)	(7.54)	(7.78)	(8.23)	(8.14)
TBs	1.078***	1.116***	0.387***	0.362***	0.091***	0.099***
	(4.01)	(4.00)	(4.19)	(3.87)	(3.94)	(3.79)
LB	-125.78***	-124.61***	-43.77***	-42.6***	-9.749***	-9.649***
	(-6.89)	(-6.73)	(-6.63)	(-6.37)	(-5.92)	(-5.76)
EXT	35.748***	36.981***	12.871***	12.977***	2.946**	2.955**
	(3.26)	(3.28)	(3.48)	(3.55)	(2.91)	(2.92)
ENT	25.063**	24.882**	9.787**	9.023**	2.449**	2.406**
	(2.26)	(2.21)	(2.54)	(2.32)	(2.45)	(2.39)
WALD	108.45	104.28	172.58	175.43	107.43	107.55
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)

Note:

- Figures in parentheses are robust z statistics
- ***, **, * asterisks indicate significance at 1%,5% and 10% levels respectively
- Number of Observations: 250,E denotes small figures .e.g. E-05=10⁻⁵ etc
- All regression coefficients are heteroskedastic consistent and are based on the revised covariance estimate of White (1980).

Table 3 provides computed elasticities of continuous variables that are significant at least at 10%. Our interpretations are based on both models presented in tables 2 and 3. The results of the RE for the ROE measure of profitability compare well with the FGLS. However FE results for the ROC and ROA profit measures produced inferior results (Appendix 4).

Table 3: Computed elasticities from significant variables

Variables	ROE		ROC		ROA	
	CM	EMM	CM	EMM	CM	EMM
CR	2.598	2.669	2.538	2.380	1.575	.....
ASSET	0.243	0.249	0.295	0.248	.....	.....
MKDEP	0.485	0.480	0.892	0.907	0.969	0.979
CAPAST	.....	.....	-0.433	-0.510	-0.195	-0.207
TBS	0.844	0.872	0.976	0.910	0.784	0.774

Note:

- Elasticities for dummy variables are not reported, as they may not offer economic meaning.
- Elasticities are evaluated at the mean of the dependent variable.
- denote cases of insignificant variables.

The Wald statistic ranges between 104 and 175 indicating overall significance of the coefficients in the model. Hence the model fares well. In order to assess the economic significance of the various factors in explaining the observed high profit levels, we computed the elasticities using the mean values for each respective measure of profitability and explanatory variable. Table 3 provides a summary of the computed elasticities for the continuous variables. The results of estimating equation 5 show support for the traditional concentration-conduct performance or collusion hypothesis. The coefficient of CR is statistically significant at 5% in the ROE and ROC measures of profitability irrespective of whether the MS variable is included or not. The

coefficient is only significant at 10% in the ROA measure and the statistical significance only improves slightly after dropping the ASSET variable.

Overall, the index of market concentration (CR) is the most important variable that explains the high profitability in the Zambian commercial banking system. The elasticities range from 1.57% to 2.67% as presented in Table 3. This implies that profitability is highly elastic with respect to CR which suggests that a 1 percent increase in the three firm concentration ratio should lead to between 1.57% and 2.7% increase in the levels of profitability. Hence profitability is highly elastic with respect to CR in all specifications. These results are in line with among others Chirwa (2001) and Molyneux et al (1994) for the Malawi and Spanish banking industries respectively. For the ROE and ROC measures of profitability, the inclusion of the market share does not significantly alter the signs or explanatory power of the model. The ROA measure is however sensitive to such a change in specification. This finding (for ROE and ROC) is contrary to most empirical findings where the inclusion of the market share variable makes concentration insignificant or negatively associated with profitability (Smirlock, 1985; Maudos, 1998).

The coefficient of the interaction between market share and concentration was insignificant in all cases suggesting no possibility of high correlation between the two variables and pointing to the fact that we can conclude for collusive behaviour among the dominant firms in the Zambian banking industry.¹¹ The coefficient of the market share is however insignificant and positive in the ROC and ROA measures but negative and insignificant in the ROE measure of profitability. These results thus show no support for the efficient market hypothesis.

Of the control variables, only LTOAST is statistically insignificant in all specifications. It also has perverse signs in all but the ROA specification. Hence risk as measured by

¹¹ If high concentration is associated with collusive behaviour that is characterised by disproportionate rent sharing in favour of large firms, then a positive coefficient on MSCR should be observed. In this case the result is not extant. See Smirlock (1985) for details

the ratio of loans to assets has no significant role in the determination of profitability in the Zambian commercial bank industry. The insignificance of this variable in explaining profitability could be attributed to the shift in commercial bank investment from more risky loans to risk free treasury bills. Other empirical studies have also noted that the coefficient of this variable produces perverse results (Molyneux and Forbes, 1995; Evanoff and Fortier, 1988; Maudos, 1998).

CAPAST carries the correct sign in all specifications but is only statistically significant at 5% in the ROC specification. It is also significant in the ROA specification though only at 10%. This is similar to the results by Chirwa (2001) in Malawi. Hence we can conclude that Zambian banks can earn high profits by maintaining risky positions (i.e. low capital to asset ratios). The elasticity of profitability with respect to CAPAST ranges from -0.2% to -0.51% . This implies that profitability is relatively inelastic with respect to CAPAST. In this case a 1% increase in CAPAST should lead to a decrease in profits of only 0.2% to 0.51%.

The scale or size variable, ASSET is positive and significant at 1% when we use the ROE and ROC specifications but negative and insignificant in the ROA measure. The elasticity of profitability with respect to ASSET is around 0.2% in both cases. Hence profitability is inelastic with respect to size of the bank. A 1 % increase in size will only result in about 0.2% increase in profitability. This however still offers support for the scale economy argument. All things being equal, the larger the bank, the larger the profit levels, confirming the results of earlier studies. Akhavein *et al.* (1997) and Smirlock (1985) also found a positive and significant relationship between size and bank profitability. This denotes strong economies of scale effect, which is consistent with an oligopolistic environment, but also implies that small banks have a definite disadvantage in the system. This finding is consistent with the profitability structure of the banking sector in Zambia, which is skewed towards the larger banks. This could indicate a scope for greater consolidation in the sector in the future, especially if government securities were to evaporate as of relative high yield, risk free source of income for the banks. This further confirms that there still exist economies that can be

exploited by an increase in the size of the larger banks. This in turn could be interpreted to mean that the average size of Zambian banks has not reached the optimum size at which their operating costs could be lowest. Thus size has to increase in order to reach the level at which banks can fully exploit economies of scale. This is contrary to empirical findings by Chirwa (2001) who found the coefficient to be positive and insignificant in all specifications. Molyneux and Forbes (1995) found a negative insignificant relationship.

The coefficient of the market deposits, MKDEP is positive and statistically significant at 1% in all specifications. The elasticity ranges from 0.48% and 0.98%. Hence a 1% increase in market size or potential (MKDEP) should lead to between 0.48% and 0.98% increase in profits. The statistical significance of this variable could imply that the larger financial market in Zambia provides new opportunities for the commercial banks. This could also imply that the large market does not make entry easy. These results are contrary to Chirwa (2001) and Smirlock (1985) who found this variable to be negative and insignificant in all specifications.

The coefficient for the Treasury bill yield rate, TBs is positive and statistically significant at 1% in all specifications. The elasticity of profitability with respect to TBs ranges from 0.77% to 0.97%. The elasticity range is close to one indicating that profitability is close to unitary elastic with respect to the TBs. The relative importance of this variable in the model further points to the earlier assertion that commercial banks have shifted investments from private sector lending to government. This suggests existence of private sector crowding-out effect, fueled by the high financing needs of the government, and may even indicate that competition and efficiency in the banking sector have an important fiscal dimension in Zambia. One possible interpretation is that both the banking sector and the government are trapped in a co-dependency scheme. On the one hand, the persistence of domestic financing needs puts the oligopolistic banking sector in a possible price-maker position regarding interest-rates manifested through chronic under-subscription at T-bill auctions, which results in higher interest rates. On the other hand, banking sector's profitability is highly

dependent upon high interest rates, which dampens financial intermediation, worsens interest spreads at the expense of the private sector, possibly exacerbates the loan quality problem, and ultimately restricts competition. This finding is consistent with that found in a study in Ghanaian banking. Hence the picture painted by the panel supports the argument raised by many observers among them Korsah et al (2001) that the high profits of most banks owe less to efficiency than to their near monopoly position, high returns on risk-free government treasury bills, asymmetric information and the reluctance of loyal customers to shop around.

Another variable explaining the persistent high profit level is the financial sector liberalization dummy (LB). The coefficient of the liberalization dummy is significant at 1% irrespective of the measure of profitability or type of specification used. These results are contrary to Chirwa (2001) and Casu et al (2003) who found the coefficient of the reform variable positive and insignificant in all measures of performance in the Malawian and Tunisian banking industries, respectively. Most of the reviewed studies have not however included this variable in their estimations.

Both coefficients of the exit and entry variables are positive and statistically significant at 1%. The exit dummy has a correct sign suggesting that profitability increases with bank exits. This could be taken to mean that exits which increase (decrease) concentration (competition) result into high profitability. However the entry dummy has perverse signs in all specifications implying that profits will increase even when there are new bank entries. In principle, foreign entry can affect the pricing by domestic firms, and force them to reduce their operating costs and to remain competitive. Both of these effects determine whether the entry of foreign firms is overall welfare improving (Demirg-Kunt and Huizinga, 1997). Based on these results we may conclude that entry is not welfare enhancing in the case of the Zambian commercial banking industry. However this finding is not surprising given the fact that concentration is still high and entry is not as easy. This may also be due to the fact that the new entrants are small and only present fringe competition. Elsewhere, existing empirical evidence suggests that foreign bank entry is associated with reductions in

interest rate spreads and profitability (Barajas et al, 2000; Claessens, Demirgüç-Kunt, and Huizinga, 2001).

However, as shown by the computed elasticities, commercial bank profitability is more sensitive to concentration and quite sensitive to TBs but inelastic with respect to all other control variables. Hence on the basis of elasticity, it is market concentration and Treasury bill yield rates that provide the bedrock for commercial banks' behaviour of maintaining high profitability. In addition the dummy variables included are also important in explaining the profitability of Zambian commercial banks.

CHAPTER SIX

CONCLUSIONS AND POLICY IMPLICATIONS

The study examined the empirical relationship between commercial bank profitability and financial sector liberalization in Zambia. It also reviewed and tested the theories of profitability and hence uncovered the role of bank industry structure in the determination of profitability. This helped to shed light on issues of monopoly power and efficiency in the banking industry. These aspects have important policy implications in that they influence the intermediation and saving mobilization roles of commercial banks which are vital for economic growth.

The main finding of this study is that banks in Zambia are behaving in a non-competitive or oligopolistic manner that could possibly hamper financial intermediation. Hence the results lend support to the Structural-Conduct Performance hypothesis. The results also indicate that the Efficient Market paradigm does not hold in the Zambian commercial bank industry. However, the study still found that financial sector liberalization is effective in reducing the levels of profitability in the sector. Hence the justification for continuing with financial sector reforms. The results also indicate that scale or commercial bank size matters substantially implying that further consolidation might be expected. The market potential variable (MKDEP), capital-to asset ratio (CAPAST) and Treasury bill yield rates are also relevant in the profit function. However profitability was found to be inelastic with respect to all control variables. The study also found both the exit and entry dummies to be positive and significant in explaining profitability in the Zambian commercial bank industry.

The results of this study may thus help shed some light on the apparently low market contestability in the Zambian banking sector, despite seemingly high profitability indicators. Although there have been new entrants in commercial banking activities with

consequent moderate reductions in market power, commercial banks continue to use their monopoly power in determining interest rates that are less favourable to both depositors and borrowers. The econometric results show that profitability measures are highly elastic with respect to the degree of market concentration. On the positive side, the gradual entry of new commercial banks into the financial system is likely to reduce monopoly power in the long term, leading to a downward trend in profit margins. The effect of new entry on competition is limited due to the relative size of new entrants and their limited geographical coverage of the market compared with incumbent commercial banks, thereby providing fringe competition. The three (now four) established commercial banks remain relatively large and do not seem to have been affected by the business diversion effects of new competition.¹² Hence the possible reason behind low contestability is the decisive role of size (both market and individual bank size). Keeping in mind the very low savings base, the size element could act as a serious constraint for market entry. Another reason could be the large investment costs associated with the current telecommunication situation prevailing in Zambia. Together these factors make it difficult for new banks to enter or remain in the industry.

The results further show that entry has a positive impact on profitability levels. This could further add support to the fact that market power is in the hands of a few dominant banks. These findings hence suggest that the dominant banks have established strong customer loyalty which makes it impossible for the new entrants to make a significant impact on profitability. This thus calls for more established international bank entries that would seriously affect the de facto duopoly currently prevailing in the industry.

The study also shows that the economic costs of the non-competitive behaviour might have been exacerbated by the persisting domestic financing needs of the government, making it captive to the banks' behaviour and fostering inefficiency in the banking system. By the

¹² The cost of switching to new banks for existing customers that have long relationships with the incumbent banks may be high, particularly where new entrants are relatively small, with limited branch networks, and are nonestablished international banks. Their long-term survival is still under scrutiny by many bank customers, and it may take some time for the business-stealing effects to manifest themselves in the Zambian financial sector.

same token, large deficit financing through the issuance of T-Bills has not only crowded out the private sector in capturing banks investments, but has also put pressure on interest rates, thereby making access to bank lending even more difficult for the private sector thus hampering private sector development. Therefore, further private sector development appears to be very much dependent upon sound fiscal adjustment, and the possible link between fiscal policy and the efficiency of the banking system deserves further attention.

Several policy implications result from this study. First, the high responsiveness of commercial bank profitability measures to the degree of monopoly power suggests that significant changes in market structure must take place for customers to benefit from the increase in the number of financial institutions through entry of established international banks capable of breaking the monopoly position of the established domestic commercial banks. Second, divestment or privatization of the ownership structure of the three (now four) established banks currently dominated by public and quasi-public institutional investors may facilitate effective competition between the dominant banks and new entrants. Third, the level of government borrowing from the sector through treasury bills should reduce, and, consequently, a reduction in the yield rate would be necessary to reverse the increasing trends in profits in a liberalized financial sector. Banks should also be regulated in their risky undertakings by raising the minimum capital requirements.

Despite the liberalisation process, bank profitability has increased slightly. This might be due to either the increase in bank risk-taking or the market power of certain banks. Therefore, in order to maintain an optimal margin (neither high nor low) that generate positive social welfare results and long-term economic outcomes, the authorities ought to foster competition further through the establishment of alternative financial institutions such as mortgage companies and credit unions. In a similar study, KIPPRA also found that since 1996, the impact of financial sector liberalization has slackened in Kenya. The implications are that it takes time for financial sector liberalisation to impact on competition and efficiency implying that once a reform program is introduced it should be reviewed and updated on an ongoing basis in order for its benefits to be optimised. The

Zambian financial authorities should thus consider doing this to bring about the desired fruits of the liberalization process.

Competition in the Zambian banking industry is increasingly important if banks are to satisfy the needs of the public at the least social cost. The nature, incidence and intensity of competition have an important impact on market performance and have high relevance to devising and applying a competition policy. Even though there has been a certain measure of competition since the advent of reforms, it is not as intense as one would have liked to see and the competition is driven mainly by the four leading banks that together control the biggest chunk of the market. Structurally, as the market progressively becomes concentrated, competition among the many reduces to competition among the few until at the extreme the monopoly structure evolves. The banks will then seek to avoid ruinous price competition and channel their main marketing efforts into sales promotion and product innovation and activities, which enhance profitability. This appears to be the case with the Zambian banking industry.

For real prices to fall it is necessary for the industry to contend with more sophisticated customers whose demands are reflected through a well informed and mobile customer base. Achieving this is a difficult quest but attempts could be made at educating consumers on alternative financial products and promoting these products e.g. unit trusts and insurance products. Besides, consolidations and strategic alliances should be encouraged and any attempts at fostering these in the industry may focus on the lower middle end of the market. This will make the market more contestable, help in breaking the concentration on the market and pave way for real price competition.

Most banks operate under increasing returns to scale. For these banks, an increase in branch network or scope of operations is feasible. If the market does not support this, mergers and strategic alliances with other financial institutions should be explored. This will help enhance efficiency. The new banks must attempt to attract a large client base or enhance scope of operations to avoid the inefficient costs deriving from inappropriate size. This is important because it has the potential of lowering prices, which are at the moment

very high in the industry. In order for any resulting economies of scale not being channelled into asserting dominant positions in the industry, a healthy policy on competition could be introduced by the regulators on restrictive trade agreements, anti competitive practices, mergers and acquisitions etc. However, this is difficult for a country like Zambia which has seen rampant bank failures.

In a financially liberalized regime, it is essential for government to be disciplined and ensure that its policies complement monetary policies. The declining competition in the loans market and the stagnation in efficiency gains are attributed to government's deficit financing which pushes up interest rates thereby enabling banks to generate risk free returns through the purchase of government treasury bills. A stable macroeconomic environment is sine qua non for effective financial sector liberalisation. Hence the success of financial sector reforms in Zambia ought to be judged against a background that the reforms were implemented within a very unstable macroeconomic environment characterised by high inflation rates largely due to structural rigidities, large budget deficits and increased government borrowing from the banking industry and balance of payments instability.

6.1 Limitations of the Study

The overall analysis is fruitful and it could be improved further by accounting for other factors, such as bank ownership (state owned versus private and domestic versus Foreign). It could also help to model factors that affect financial sector liberalization so as to determine which route the reform program should take in future. Further, better information on the market structure, concentration and bank rates structure could help to shed some light on the bank pricing policy. Such information is not currently available for Zambian banks. Future research should also provide additional evidence on the interaction between profits, market share, and concentration in banking, and should extend the analysis to explore potential sources of differential bank efficiencies. The low quality and scanty data will also significantly affect our results.

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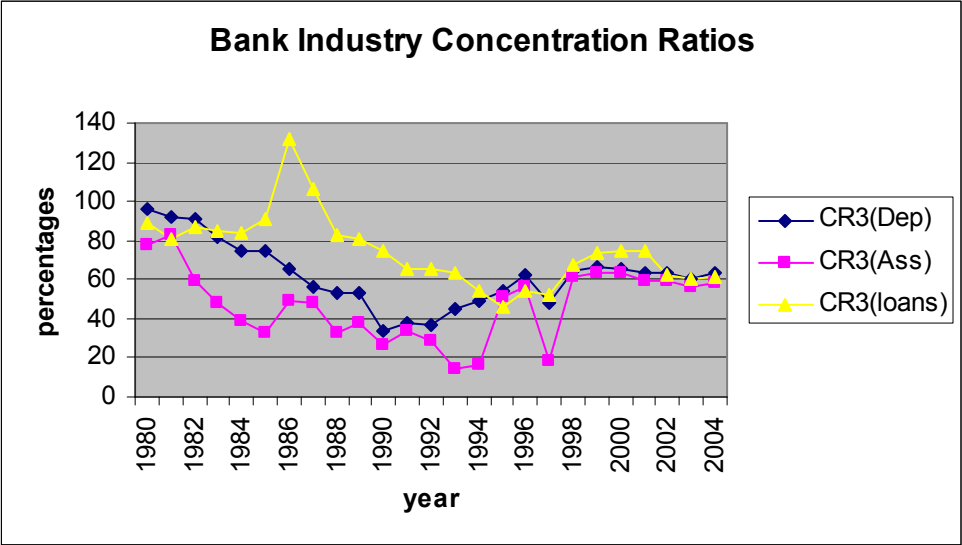
APPENDICES

Appendix 1: Major Financial Sector Reform measures undertaken

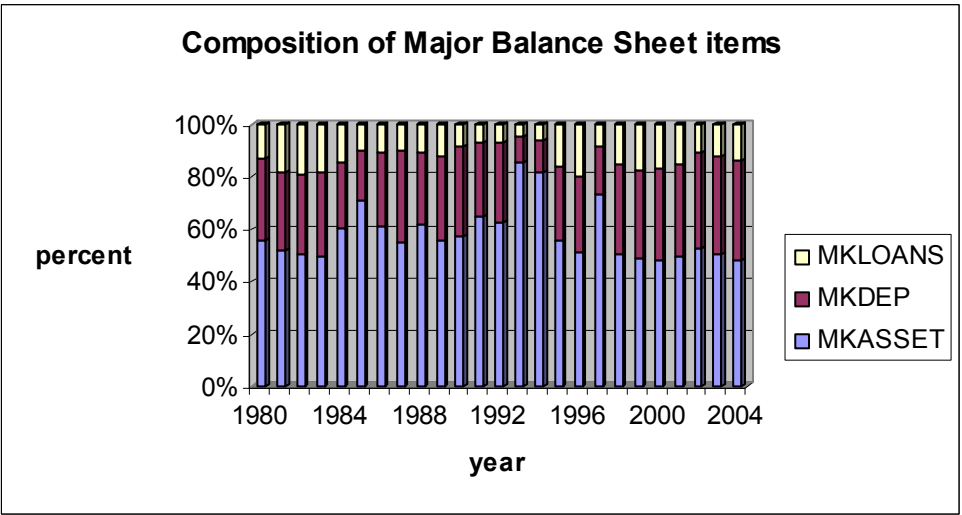
Policy Measure	Date Implemented
Liberalization of commercial bank interest rates	Sep-92
Introduction of foreign exchange bureau de change	Oct-92
unification of the exchange rate system	Dec-92
Introduction of the primary Treasury bills auction	Jan-93
Introduction of the 28-day Treasury bill	Mar-93
Introduction of the 182-day Treasury bill	Aug-93
Introduction of the BOZ foreign exchange dealing system	Dec-93
The Foreign Exchange Control Act revoked	Jan-94
Introduction of foreign currency accounts	Mar-94
Enactment of the Banking and Financial Services Act(BFSA)	Jun-94
Introduction of Government Bond auctions	Dec-94
Introduction of BOZ Open Market Operations(OMO)	Mar-95
Enactment of the BOZ Act No.43	Dec-96
Introduction of the Book-entry trading system in Government securities	Aug-97
Listing of Government bonds on the Lusaka Stock Exchange	Mar-98
Introduction of 18-month Government bonds	Oct-98
Establishment of the Zambia Electronic Clearing House	Sep-99
Introduction of an enhanced early warning system for the financial system	Mar-00
Introduction of longer terms Government securities(273-day TBs and 24-month bonds)	Oct-00
Introduction of BOZ guidelines for foreign exchange trading	Feb-01
Introduction of Repurchase Agreement Transactions in the money market	Feb-02
Introduction of broad-based interbank foreign exchange market	Jul-03

Source: BOZ, various annual reports and circulars

Appendix 2: Trends in Different Measures of Concentration



Appendix 3: Some bank Industry Indicators



Appendix 4: Results of the RE (ROE) and FE (ROC and ROA)

(a)

Variables	ROE	ROC	ROA
Constant	-145.423 (-1.46)	-19.678 (-0.50)	9.423 (0.65)
CR	3.191** (2.69)	0.348 (0.73)	-0.095 (-0.54)
MS	0.180 (0.11)	1.080 (1.47)	0.035 (0.13)
ASSET	0.00014** (3.24)	0.0000446** (2.53)	2.30e-07 (0.04)
CAPAST	-6.317* (-1.68)	-2.999** (-1.99)	-0.202 (-0.37)
LTOAST	1.800 (0.42)	1.170 (0.68)	0.274 (0.44)
MKDEP	0.00001 (1.57)	8.78e-06** (2.71)	2.87e-06** (2.42)
TBs	1.423** (3.22)	0.464** (2.60)	0.102 (1.56)
LB	-125.344*** (-4.03)	-45.209*** (-3.67)	-11.299** (-2.50)
EXT	19.664 (1.04)	8.435 (1.13)	1.811 (0.66)
ENT	50.028** (2.60)	17.176** (2.24)	2.452 (0.87)
Hausman	3.80 (0.9558)	26.11 (0.0036)	20.38 (0.0259)
Wald/F	50.28	4.64	1.27
RESET	0.54 (0.6546)	0.98 (0.4035)	0.06 (0.9792)
Breusch-Pagan	65.05 (0.0000)	12.76 (0.0064)	99.22 (0.0000)

Notes:

- e. Figures in parentheses are z and t statistics
- f. ***, **, * asterisks indicate significance at 1%,5% and 10% levels respectively
- g. Hausman tests support RE for ROE and FE for ROC and ROA specifications respectively

Computed Elasticities from Significant Variables

(b)

Variables	ROE	ROC	ROA
CR	2.836	....	.....
ASSET	0.237	0.309	.....
CAPAST	-0.242	-0.471	.....
MKDEP	0.213	0.606	0.888
TBS	0.745	0.995	....