# Interest Rate Spreads: Empirical Evidence from Tanzanian Banks

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## ABSTRACT

The purpose of this article is to investigate determinants of bank interest rate spreads in Tanzania. The article also sought to map the nature of relationships and strengths of variables that influenced bank interest rate spreads. The article employed two research models sequentially; the first model decomposes interest spreads using the accounting framework (Randall et al. 1998) and the second fixed effect model (Ramful, 2001) uses regression analysis to investigate existence and strengths of relationships between spreads and each independent variable.

High interest rate spreads in emerging economies are generally suggestive of underlying problems in financial intermediation. There is need for a better understanding of interest spread behaviour. However, limited published research is available that identifies factors contributing to such high spreads. This article contributes insight into determinants of interest rate spreads.

Results show the smallest 3 banks in terms of total assets have the highest spreads. These banks have a sizable portfolio of small business enterprises which implies relative high risk. High spreads in these cases reflect the relative high risks assumed by the banks. The article also reports interest rate spreads not only cover costs of operating expenses and poor quality of loans but also reflect the prevalence of market power

## Introduction

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

A number of factors have motivated researchers to investigate the level and determinants of interest rate margins. Firstly, there has been the need for a better understanding of the behaviour of interest rates following the mixed experiences of many Less Developed Countries (LDCs) with interest rate liberalization. There has also been the concern that in many developing countries the level and structure of interest rates remained inflexible with high interest rate margins during the post-liberalization period (Turtelboom, 1991). Finally yet importantly, the use of interest rate margin as a parameter of bank profitability, intermediation cost and financial market efficiency gave impetus to further research.

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Financial systems in developing countries normally exhibit significantly and persistently larger intermediation spreads on average than in developed countries. These high spreads have generally been attributed to high operating costs, financial taxation, lack of competition and high inflation rates. Thus, to the extent that the determinants of the spread are distortionary, these problems can be redressed to permit interest rate spreads (IRS) to narrow with positive effects on economic growth and efficiency of resource allocation.

Financial systems in Tanzania have shown significantly high and persistent spreads even after undertaking financial liberalization over the past 14 years IRS Tanzania is not only much higher than in developed economies but also higher than the average of Sub-Saharan African countries. Beck and Funchs (2002) reported interest spreads for OECD countries, Sub-Saharan countries and that of Tanzania to be 4.1%, 11.5% and 13.1% respectively. In addition, over time the Tanzanian IRS has shown a very slow decreasing trend, where up to 2004 the spread was still wide, at 10%. This spread is more than twice of the developed countries.

High IRS rate spreads to borrowers reflect additional cost of borrowing which deters the speed of development in the country as it stifles industrial growth and business activity. On the other side, high IRS mean a low return to depositors who opt to invest their funds with the banks. High or non-declining IRS causes a concern to both borrowers and depositors about banks tendency to maximize profits in a free and liberalized economy. Customers' worries are compounded if the commercial banks periodically raise fees and charges on banking services.

The primary objective of this article was to find out the key determinants of bank IRS in Tanzania. In addition to this general objective, the article was to map out the nature of relationships or associations and strength vis a vis bank IRS. The article was to also develop a model for use by various stakeholders of the financial system in the determination of bank IRS in Tanzania. Such a model is useful in the efforts to narrow the bank interest rate spreads.

Although high IRS in Tanzania are generally suggestive of underlying problems in financial intermediation, so far no published attempt has been made to identify factors contributing to such high spreads. This article sought to bring insight as to the determinants of IRS.

The remainder of the article is structured in five parts. The second part after this introduction covers prior literature, followed by a brief overview of banking reforms in Tanzania which provides the research context. The third part outlines the methodology employed in the article followed by results and a discussion of the results. The final part is conclusion along with recommendations and suggestions for further research.

## Prior Literature

Setting a spread between lending and deposit rates constitute an incentive for a bank to continue to remain in the industry, the magnitude of the spreads however varies across the world. It is actually inversely related to the degree of efficiency of the financial sector. Early investigation of factors behind large IRS began with the concern that a large spread was a serious impediment to expansion and development of financial intermediation by discouraging potential savers with low returns on deposits and potential investors with reduced feasible investment opportunities (Jayaraman and Sharma, 2003).

Hanson and Rocha (1986) in a World Bank initiated study provides one of the early works that ascribed high spreads to factors such as high operating costs, financial taxation or repression, lack of competition and high inflation rates. Hanson et al (1986) analyzed the determinants of interest rate margins by exploring the impact of explicit and implicit taxes and other causes such as bank costs and profits, inflation, economies of scale and market structure. Using aggregate interest rate data for 29 countries for the period 1975-83, they found a positive correlation between interest rate margins and inflation.

Utilising Canadian data, Yu (1995) tested a number of hypotheses about bank IRS based on risk-neutral bank objective function which was to maximize the return on equity capital. Results appeared to report a consistent size effect in the determination of interest rate margins which favored large banks. Yu (1995) also showed that the margin increased with bank capital-to-asset ratio so that the increase in the cost of capital, which resulted from bank capital regulation seemed to be transferred to borrowers.

However, no direct link was identified between interest margins and bank non- interest expenses. Wong (1996) identified several factors that were positively related to high bank interest spreads. These included a bank's market power, operating costs, credit risk and the magnitude of interest rate risk. Increase in bank's equity was found to be negatively related to IRS especially when the bank faced little interest rate risk. Angbazo (1997) tested the hypothesis that banks with more risky loans and higher interest rate risk exposure selected loan and deposit rates which achieved higher net interest margins. Using Call Report data for different size classes of banks for 1989-1993, he demonstrated that the net interest margins of commercial banks reflected both default and interest-rate risk premiums.

Barajas et al (1998) on the other hand analysed the impact of financial liberalisation in Colombia on interest rate margins in the banking system. Mixed results were reported: liberalisation increased banking sector competition significantly, lowering market power and reduced financial taxation from its highest level of late 1970s. The results also showed that banks appeared to be more responsive to changes in loan quality, which according to them might be an indication of an improvement in banking supervision and/or reporting.

Randall (1998) examined IRS over a six-year period in the Eastern Caribbean and found them to be persistently high compared with other low-inflation countries. He concluded that reserve costs, operational costs and provision for loans accounted for over 75 per cent of the observed margin.

Demirguc-Kunt & Huizinga (1998) analyzed the determinants of commercial bank IRS, margins and profitability for 80 countries in the 1988 – 1995 period. They found out that the differences in interest rate margins in different countries were associated with a number of factors; bank characteristics, macroeconomic conditions, explicit and implicit bank taxation, deposit insurance regulations, overall financial structure and several underlying legal and institutional indicators. Controlling for differences in bank activity, leverage, and the macroeconomic environment, Demirguc-Kunt & Huizinga (1998) report that a larger bank asset to GDP ratio and a lower market concentration ratio lead to lower margins and profits. Foreign banks had higher margins and profits compared to domestic banks in developing countries, while the opposite holds in developed countries. Also, evidence was found that the corporate tax burden was fully passed on to bank customers.

There are several explanations for limited changes in banking behaviour, persistent high spreads, and inefficiency following financial liberalization. In his pioneering contribution on market structure, conduct, and performance (S-C-P), Bain (1951) suggests that high IRS may sustain if financial sector reforms do not bring about significant changes in the structure within which banks operate. Gibson and Tsakalotos (1994) argue that functional efficiency of financial intermediation will increase when free competition permits easy entry and competitive pricing. Pricing competition will put pressure on reduction of the spread between lending and deposit rates.

It is debated whether IRS are a good indicator for measuring banking efficiency because as suggested by Sarr (2000) IRS may not be a good measure of efficiency (Chirwa and Mlachila, 2004). Nevertheless, it has been noted in developing countries that high IRS may have a positive role. Barajas et al. (2000) for example, suggest that high IRS allow banks to consolidate the banking system by providing some protection against inherently high risk, associated with high monitoring costs in developing countries. Lower IRS increase exposure to high risks and consequently makes the banking system more fragile.

There exists some empirical evidence that indicate a positive and significant relationship between market structure and profitability or interest spreads. However, the evidence point to mixed results. Nevertheless, reasonably good evidence point to an important role played by market structure in changing the behavior of banks as well as impacting on the levels of bank interest spreads. Extant literature on bank spreads support the hypothesis that intermediation margins are positively related to market power (Hannan and Liang, 1993; Barajas et al. 1999; 2000).

On the other hand literature exists arguing for the position that removal of credit controls during financial liberalization may actually make quality of loans get worse and lead to even larger systemic crises. As noted by Brownbridge and Kirkpatrick (2000) liberalization of interest rates and removal of credit controls may allow those banks with moral hazard and those that are not constrained by prudential regulations, to invest in risky assets in order to maintain larger market shares. Consequently, the quality of assets may tumble which may lead into a higher levels of non-performing loans and provision for doubtful debts.

Barajas et al. (1999) suggest that charging of higher lending rates may be one avenue for banks to offset the cost of screening and monitoring due to bad loans and/or the cost of forgone interest revenue. Randall (1998) also reports a positive and significant relationship between spreads and provisions for doubtful debts.

Literature also point to evidence that high non-financial costs are a source of persistent and wide intermediation spreads in developing countries (Demirgüç-Kunt and Huizinga, 1999; Barajas et al, 1999; 2000; Brock & Rojas-Suarez, 2000). Demirgüç-Kunt and Huizinga (1999) for example report evidence of a positive relationship between net interest margin and overhead costs. Barajas and others (1999; 2000) as well as Brock and Rojas-Suarez (2000) find significant evidence of positive relationships between interest spreads and wages or financial costs.

Finally Saunders and Schumacher (2000) report that the holding of capital above the regulatory minimum capital requirements in order to maintain a cushion against expected and unexpected risks may lead to high spreads. Widening the interest spread between lending and deposit rates may be one approach towards

covering such costs of high regulatory and/or endogenously determined capital ratios. This proposition is supported by Saunders and Schumacher (2000) who provide evidence of the positive and generally significant relationship between spreads and capital ratios in developing countries. Where there are often inadequate rules and regulations governing the functioning of the financial system it is suggested that capital to asset ratios mean very little (Brock and Rojas-Suarez, 2000).

## Overview of Banking Reforms in Tanzania

Between 1967 (when banks and financial institutions were nationalized under the Arusha Declaration) until 1991, the financial system was entirely owned and controlled by the state. The system was extremely narrow comprising of the central bank, three commercial banks, five DFIs, two insurance companies, two contractual savings institutions and one hire purchase company. The state owned many of these institutions including the three commercial banks, the two insurance companies, the single social security institution and three of the five DFIs. The National Bank of Commerce was the only commercial bank of any significance, with 90% of all deposit liabilities of deposit-taking institutions. These institutions were subject to neither competition nor adequate supervision.

The system was therefore subject to massive financial repression and was geared mainly towards the provision of cheap credit to the central government, parastatals and cooperatives, with the Bank of Tanzania acting as the lender of first resort. Lending to the private sector was residual (mostly about 5% of the total credit supply). Interest rates were fixed for much of the period, with real rates negative up to 1988, reaching a low in 1984. Many branches of the National Bank of Commerce and some of the DFIs made large losses mainly due to bad project choice and poor management.

Financial reforms began slowly in the 1984/85 budget but were intensified in 1986 with Economic Recovery Program (ERP). The objectives of ERP (among others) were to reduce the monetization of the deficit, reduce credit expansion and to direct more credit to the private sector.

A Presidential Commission of Inquiry into the Monetary and Banking System in Tanzania was established in 1988 and a Banking and Financial Institutions Act was passed in 1991 to effect financial sector reform through the restructuring of the then existing financial institutions. Other objectives were to promote private banking, to deregulate the capital market and rationalize and strengthen the legislative and supervisory powers of the central bank. Private banks and financial institutions (domestic and foreign) were free to enter the market. Since 1992, banks were also free to determine both the deposit and lending interest rates. Open market operations were introduced with weekly auctions of short and long-dated treasury bills to absorb liquidity, to finance government expenditures and to determine government rediscount rate. Provision was made for restructuring the existing financial institutions and for tighter regulatory control of the financial system. Non-performing loans were estimated at about 60% of total assets or 50% of government expenditure in 1993/94. The restructuring of balance sheets started in 1991 under the provisions of the Loans and Advances Realization Trust Act (LART) whose main function was to clean the banks' balance sheets and to collect bad debts on their behalf. The non-performing portfolios of the banks were transferred or sold

to the LART, whose liabilities are fully guaranteed by the government. This was completed for commercial banks in October 1993.

To prevent future mismanagement and financial distress, the Bank of Tanzania issued new guidelines in 1991 to gov n the licensing of banks, as well as prudential guidelines for the management of assets, provision for losses and the accrual of interest. The minimum capital requirements to obtain a license was increased and the applicants were required to demonstrate ability to operate efficiently, profitably and prudently. Financial institutions are also required to diversify in order to spread risk and are not allowed to lend more than 25% of their core capital to individual borrowers. To oversee the system, the Bank of Tanzania strengthened its Bank Supervision Directorate.

Several beneficial effects have resulted from financial liberalization in Tanzania (Lwiza and Nwanko, 2002). Liberalization has enabled a stronger legal, supervisory and regulatory framework that provides free entry and exit in the sector. It has also enabled formation of a relatively competitive environment (particularly in urban areas such as Dar es Salaam, Arusha, Mwanza and Moshi) that has forced banks to be more customer oriented as a means to beat competition and ensure survival. Reforms have enabled existence of relatively stronger and financially viable banking institutions. Lwiza and Nwanko (2002) also cite other benefits of financial liberalization as improvement of accountability of the banks through statutory requirements to publish quarterly financial statements.

Customers now have the opportunity to shop around in various banks for attractive/favorable interest rates and fees. In addition to all of the above, reforms have increased the number of banking services providers (as at July 2005, as per BOT data, there are 26 banks and 5 financial institutions operating in Tanzania) and have increased variety of financial products and services to choose from.

Despite the reforms and the above mentioned benefits, much remain to be done to further strengthen the development and efficient functioning of the financial system. The Tanzania's authorities have recently introduced wide-ranging reforms in areas of legal, judicial, and information infrastructure, including the Land Act 1999 and the Companies Act 2002.

## Interest Rate Spreads (IRS) in Tanzania, 1999-2004

Tanzania experiences relatively high bank IRS which can be associated with high intermediation costs. Such spreads are not only much higher than in developed economies, but also higher than Kenya and the average of Sub-Saharan African countries (Table 1). Over time, IRS in Tanzania have shown a very slow decreasing trend (Figure

Table 1: Cross-Country Comparison: Interest Rates, Spreads, 2002 .

**Table 1:** *Cross-Country Comparison: Interest Rates, Spreads, 2002*

| | Real Lending Rate | Real deposit rate | Interest rate spread |
|---|---|---|---|
| OECD countries | 4.6 | 0.5 | 4.1 |
| Sub Saharan countries | 9.9 | -1.5 | 11.5 |
| Low Income countries | 10.8 | -1.6 | 12.4 |
| Kenya | 16.5 | 3.5 | 13.0 |
| Tanzania | 12.0 | -1.2 | 13.1 |
| Uganda | 19.4 | 5.9 | 13.5 |

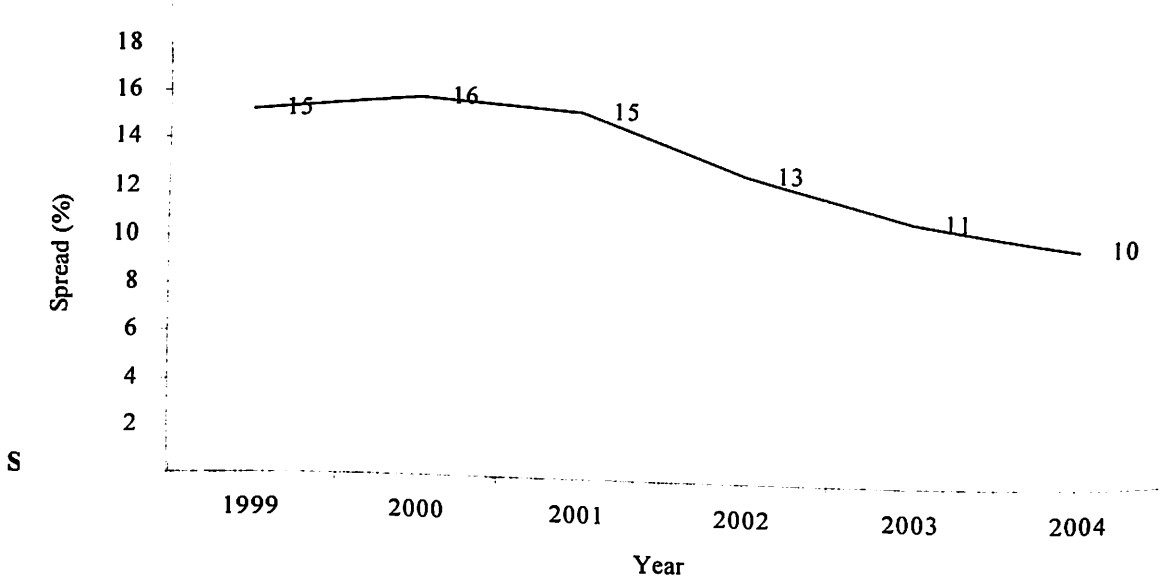


**Figure 1**: *Tanzanian Interest Rate Spreads 1995–2003*

## Synthesis of the Literature Review

Literature points to several determinants of IRS which include operating expenses, loan provisions, market share and magnitude of non-interest income. These variables can be altered to ensure achievement of desirable profit margins of the banks.

## Magnitude of Operating Expenses

This comprises wages, salaries and housekeeping costs as well as newly emerging costs due to introduction of innovations. The latter involves computerization, installation of ATM machines and debit card facilities and their annual operation. One of the offshoots of innovations is the rise in wage cost as banks are forced to employ highly qualified and skilled persons. Although computerization has enabled retrenchment of clerical staff, higher salaries for technically qualified persons have given rise to higher wage bills. It turns out that higher operating expenses require higher IRS.

## Loan Loss provisioning

Adequate level of loan loss provisioning is considered necessary to reflect the quality of available loans. However such provisions are negatively related to the attainment of a desired net profit figure. Consequently where provisions are large it is expected that interest margins are increased to cover such loan loss provisions.

## Market Share

Banks with higher loan portfolios may trade at lower spread and still meet net profit targets. This also applies to banks with huge deposits since they are able to source cheaper funds. However banks with a lower loan portfolio are forced to charge higher margins to achiever their profit targets. Also banks with lower deposit levels are forced to obtain funds from other sources such as borrowing from other banks at expensive rates and consequently forced to increase their spreads to attain desired profits. However in imperfect markets banks with higher market share tend to use this as an opportunity to obtain super normal profits by operating with higher spreads.

### Non Interest Income

Income derived by banks from other sources than interest rate charges decrease the spread. The non-interest income is derived mainly through fees and charges levied on loans and other transactions such as foreign exchange business.

IRS, that is the determination of the lending and deposit rate is a dependent variable that is affected by a number of factors which are operating expenses, loan provisions, market share and non interest income. To attain pre-set profits banks must manage all or some of the variables. For example, banks could decrease factors that widen the spread such as operating expenses by increasing efficiencies. They could also maintain a healthier loan portfolio and consequently reduce loan loss provisions, etc. However, in a free but imperfect competitive market such as Tanzania, banks may opt for an easier route of increasing prices of their products such that they charge high lending rates or lower deposit rates, or both.

## Methodology

### Sample Selection

The targeted population in this article was all banks in Tanzania. Choosing such a large population was possible as only secondary data was collected and analyzed. Tanzanian banks were categorized into two major groups - foreign and local banks.

Banks that did not operate throughout the period under review were removed from the population list. In their individual groups, the remaining banks were then arranged in a descending order based on their Average Total Assets. Total Assets mean values for each group were computed. All banks with average total assets above the groups mean value were classified as big banks and below the mean as small. The process resulted into the following four bank categories:

i. Foreign owned - big banks,
ii. Foreign owned- small banks,
iii. Local owned - big banks, and
iv. Local owned -small banks.

Simple random sampling was used in the selection of 4 banks from each category resulting into a sample of 16 banks. Since the review period was for 5 years, from 2000 to 2004 there was a sample of 80 financial statements over five years for 16 banks. Each bank's annual financial statements were obtained from respective bank's offices. There were occasions where audited annual financial statements published in print press were used especially where information could not be obtained timely from the banks.

### Data Collection and Analysis

Data collected was analyzed using 2 models. The first model was a less sophisticated and simple model that was employed by Randall, 1998 summarised below:

The consolidated income statement of commercial banks defines profit before taxes (P) as interest income (II) plus non-interest income (NII) minus interest expense (IP), operating cost (OC) and provision for loan losses (Prov). This identity can be rearranged and expressed in Equation 1 as the interest margin, that is, the difference between interest income and interest expense.

$$II - IP = OC + Prov + P - NII \quad (1)$$

Dividing this expression by total deposits (D) as a scaling-factor and using total loans (L) and assets (A), the following expression results:

$$II/L * L/D - IP/D = OC/D + Prov/D + P/A * A/D - NII/D \quad (2)$$

where, P/A = Gross return on assets (ROA)

Using the fact that interest income is equivalent to the average lending rate times the average volume of loans and that interest expense is equivalent to the average deposit rate times average deposits as well as the fact that the ratio of loans to deposits is equal to one minus the required reserve ratio, an expression for the IRS is obtained as given by equation (3):

$$i_L - i_D = \rho * i_L + OC/D + Prov/D + ROA*A/D - NII/D + \varepsilon/D \quad 3$$

where, = Required Reserve Ratio
ROA = Return on assets
iL = Interest Income on Loans / Total Loans
iD = Interest Expense on Deposits / Total Deposits
L/D = (1-??)

ε = residual

The residual reflects errors that result from combining data from the income statements (flow data) and stock data from the consolidated balance sheet as well as the assumption that loanable funds are comprised of deposits net of required reserves.

The above model uses information from balance sheets and income statements of commercial banks to derive an accounting framework that decomposes the IRS. This method does not have any predictive power but it provides an anatomy of the IRS.

The second model is a regression model adapted from Ramful (2001) to fit the problem at hand as summarised below:

$$SPR = \alpha_0 + \alpha_1 COST + \alpha_2 PROV + \alpha_3 NII + \alpha_4 MS$$

Where:
COST = Operating Cost/ Total Assets
PROV = Provision for bad debts/ Total Loans
NII = Non-interest Income/ Total Assets
MS = Market share based on Total Deposits
SPR = Interest rate spread based on the model by Randall, 1998 above.
Theoretically, the coefficients were expected to take the following signs:

$$\alpha_1 > 0,\ \alpha_2 > 0,\ \alpha_3 < 0 \text{ and } \alpha_4 > 0$$

## Results

### Bank by Bank Financial Summaries

A summary of key financial components of the 16 banks generated from the financial statements over a period of 5 years are as summarized in Table 2.

**Table 2:** *Average annual Financial results of sampled Banks: 2000-2004 [figures in million TAS.]*

| Bank | Bank Category | Net interest income | Non Interest Income | Operating Expenses | Net Profit Before Tax | Total Loans and Advances | Provision for Losses (B/S) | Total Assets | Return on Asset (ROA) |
|---|---|---|---|---|---|---|---|---|---|
| NBC | LB | 17,158 | 15,796 | 21,201 | 10,849 | 113,262 | 8,422 | 417,316 | 2.60% |
| NMB | LB | 15,564 | 15,054 | 20,038 | 10,394 | 25,695 | 293 | 354,429 | 2.90% |
| CRDB | LB | 14,941 | 10,577 | 17,250 | 5,456 | 63,032 | 3,287 | 316,154 | 1.70% |
| Standard Chartered Bank | FB | 12,665 | 13,059 | 12,086 | 13,025 | 107,936 | 1,369 | 283,184 | 4.60% |
| Citibank | FB | 7,081 | 5,990 | 6,905 | 5,469 | 69,291 | 1,670 | 252,726 | 2.20% |
| Stanbic Bank | FB | 6,578 | 5,600 | 8,586 | 1,867 | 85,651 | 3,175 | 177,696 | 1.10% |
| Barclays Bank | FB | 3,862 | 2,072 | 5,050 | 328 | 58,797 | 863 | 97,251 | 0.30% |
| Exim Bank | LB | 2,746 | 2,592 | 3,093 | 2,305 | 30,869 | 257 | 73,370 | 3.10% |
| Tanzania Postal Bank | LS | 3,100 | 3,602 | 6,066 | 222 | 6,785 | 694 | 53,095 | 0.40% |
| People Bank of Zanzibar | LS | 754 | 1,629 | 2,107 | 594 | 15,799 | 7,214 | 34,273 | 1.70% |
| Tanzania Investment Bank | LS | 1,384 | 1,407 | 2,402 | 447 | 7,892 | 315 | 32,321 | 1.40% |
| Diamond Trust Bank | FS | 1,284 | 767 | 1,429 | 720 | 10,472 | 189 | 27,733 | 2.60% |
| Eurafrican Bank | FS | 869 | 735 | 1,763 | -125 | 9,456 | 150 | 19,182 | -0.70% |
| Kenya Commercial Bank | FS | 706 | 547 | 1,393 | -140 | 3,645 | 36 | 14,646 | -1.00% |
| Akiba Commercial Bank | LS | 1,572 | 537 | 1,502 | 474 | 8,289 | 338 | 14,617 | 3.20% |
| Int. Commercial Bank | FS | 720 | 264 | 789 | -45 | 5,413 | 231 | 12,270 | -0.40% |

Key: **LB = Local Big bank, FB = Foreign Big bank, LB = Local Big bank and FS = Foreign Small bank.**

As observed in Table 2 basing on average total assets for a 5 - year period, NBC is reported to be the largest bank with an average Total Assets of TShs. 417 billion whereas International Commercial Bank the smallest (Total Assets TShs 12 billion). As for profitability, Standard Chartered Bank is shown as the highest profitable bank with a Return on Assets (RoA) of 4.6% and an average annual profit of Shs 13 billion. Kenya Commercial Bank is reported with the lowest with ROA of –1% and an average annual loss of Shs 474 million.

## Results on the Anatomy of Interest Rate Spreads

In the first step, IRS for each of the 80 annual financial statements were computed based on the above equation and using normal spreadsheet formulas. These results show Akiba Commercial Bank with the highest average spread of 15% while Peoples Bank of Zanzibar with smallest average spread of – 0.6%. In the case of PBZ this would indicate serious operational losses as there were more costs incurred than revenues earned. The total results in a descending order with spreads in brackets is: Akiba Commercial Bank (15 .3%); Kenya Commercial Bank (13.5%); International Commercial Bank (13.2%); Barclays Bank (12.8%); Tanzania Investment Bank (12.4%), Eurafrican (8.6%), Diamond Trust Bank (8.2%), Tanzania Postal Bank (8.1%); CRDB (7.1%); Exim Bank (7.0%); Stanbic Bank (6.2%); Standard Chartered Bank (5.9%); NMB (5.6%); NBC (5.6%); Citibank (4.6%) and PBZ (-0.6%). Figure 2 summarises by a graphical presentation the average interest spreads for each of the sampled banks during the five-year period.

**Figure 2:** *Interest Rate Spread in Tanzanian Banks, 2004*

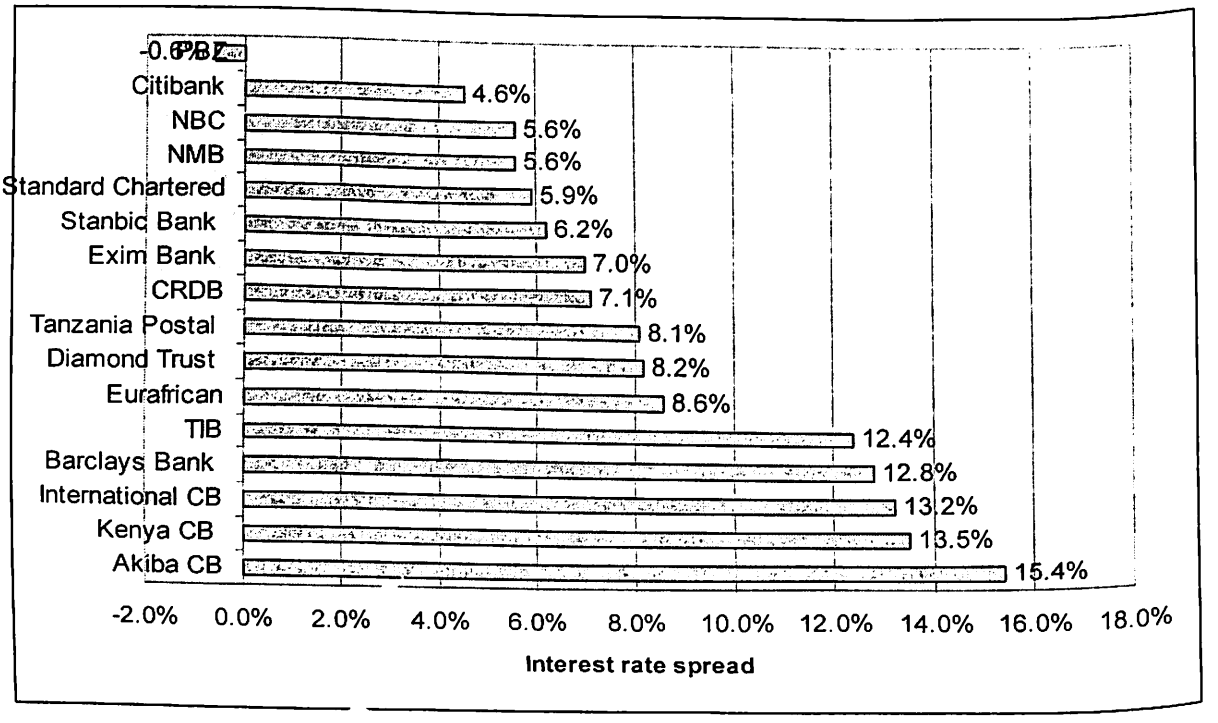

**Table 3:** *Average Decomposed Interest Rate Spreads Of Sampled Banks: 2000-2004*

| | Foreign Big banks | Foreign Small Banks | Local Big banks | Local Small Banks | ALL banks |
|---|---|---|---|---|---|
| Interest rate spread | 7.2% | 10.9% | 6.3% | 8.8% | 8.3% |
| **Factors increasing the spread (+)** | | | | | |
| Operating expenses | 8.8% | 13.4% | 7.1% | 14.8% | 11.0% |
| Reserve | 1.0% | 1.4% | 1.3% | 1.5% | 1.3% |
| ROA | 1.2% | 0.3% | 2.0% | 1.3% | 1.2% |
| provision for bad debts | 0.7% | 0.7% | 0.4% | -0.4% | 0.4% |
| **Factors decreasing the spread (-)** | | | | | |
| Non Interest Income | -4.5% | -5.0% | -5.0% | -8.8% | -5.8% |

Subsequently, to assess the relative importance of the factors behind the high intermediation spreads, the average spread between deposit and lending rates was decomposed into following categories:

i. Operating costs allocated based on the share of total deposits,
ii. The interest paid to recover costs of funds deposited as required reserves,
iii. Loan loss provisions as a share of total deposits,
iv. Pre-tax profit margin on total assets and
v. Non-interest income as a share of total deposits.

Results are as summarised on Table 3.
Foreign owned small banks have the highest IRS of 10.9% while Local big banks have smallest spread (6.3%). The operating expenses are by far the most important component of IRS accounting for about 7-15 points of the spreads. The positive sign signifies the positive relationship with the spread. On average, about 1.3% of the spread is used to cover for reserves deposited with the central bank that bears no return. Contributing to shareholders returns is between 0.3-2.0% of the spread. The last factor adding to the spread of Tanzanian banks is the provisions for bad and doubtful debts with points between –0.4% and 0.7% of the spread. Non interest income is depicted to decrease the spread for about 4.5% to 8.8%.

## Explaining the Interest Rate Spreads using Regression Analysis

The IRS decomposition as presented above is based only on accounting identities calculated at the level of peer groups of banks (Cihak and Podpiera, 2005). Further insight into the factors underlying high IRS can be obtained by econometric estimates that attempt to explain the spread on a bank by bank level as a function of various parameters. The regression model adapted from Ramful (2001) and covered in the

Data Analysis part of the paper yielded results presented in subsequent paragraphs.

Because of unavailability of average deposit and lending rates and thus a series of spreads for individual sampled banks, results of the accounting framework were used to arrive at each bank's spread. To avoid heteroscedasticity, ratios insteadof shillings values of the independent variables were used. Since data for non-performing loans are not available, provision for bad and doubtful debts were used to substantiate asset quality of individual banks.

The sample used consisted of a panel data from 16 commercial banks over a period 5 years from 2000 to 2004. Yearly data was extracted from annual income statements and year end balance sheets of individual banks.

## Regression Results: Foreign owned Big Banks

Regression results of foreign owned big banks are reported in Table 4.

**Table 4:** *Model Coefficients for Foreign Owned Big Banks*

| | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|
| | B | Std. Error | Beta | | |
| (Constant) | -2.504E-02 | .018 | | -1.428 | .174 |
| Non interest income | -1.717 | .446 | -.357 | -3.849 | .002 |
| Operating Expenses | 2.000 | .152 | .995 | 13.118 | .000 |
| Provisions for Loan Losses | .394 | .209 | .126 | 1.883 | .079 |
| Market Share | .553 | .180 | .315 | 3.079 | .008 |

All predicting variables are statistically significant meaning they can be used in determining the IRS. significant at 1% and 10% levels of confidences respectively.

The coefficient of operating expenses is 2.0 depicting a positive relationship with interest spread. The coefficient of 2.0 means that for a one percentage increase in the ratio of operating expenses/total assets we would expect an increase of 2 points of interest rate spread, assuming other variables are held constant.

The coefficient for non interest income is negative (-1.717) which means a one percentage unit increase of the ratio of non interest income/ total assets would result into a decrease of 1.717 percentage units of the spread.

Similarly, a one percent increase of the ratio for loan losses provision to total loans or of the market share to total deposits for this category of banks would result into an increase of .394 and .553 respectively percentage points of the spread, other things being constant.

The Beta coefficients which are the standardized regression coefficients used to show the relative strength of regression variables shows operating expenses as the strongest variable with Beta value of .995 and provisions the smallest with beta of .126 for this category of banks

## Regression Results: Foreign owned Small Banks

Regression results of foreign owned small banks are reported in Table 5.

**Table 5:** *Model Coefficients for Foreign Owned Small Banks*

| | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|
| | B | Std. Error | Beta | | |
| (Constant) | 8.327E-02 | .040 | | 2.064 | .057 |
| Non interest income | -1.662 | .884 | -.414 | -1.880 | .080 |
| Operating Expenses | 1.159 | .503 | .548 | 2.304 | .036 |
| Provisions for Loan Losses | .773 | .312 | .403 | 2.478 | .026 |
| Market Share | -4.352 | 2.435 | -.344 | -1.787 | .094 |

Operating expenses and provisions are significant at 5% level of confidence where as non interest income at 10%. The operating costs are the most important variable in explaining the IRS of foreign small banks with a beta value of 0.548. The coefficient value of 1.159 means such percentage points of the spread will increase for a one percent increase of the ratio operating costs/total assets, other variables being held constant. The next important variable is non-interest income which is negatively related to the IRS with a coefficient of -1.662 and beta value of -.414. This can be interpreted that a percent increase in the ratio of non interest income/total assets will result into a decrease of 1.662 percentage points of the spread, ceteris peribus.

Loan loss provisions is next with coefficient value of .773; and the weakest variable is the Market share with coefficient of -4.352. The last two coefficients can be explained as 0.773 IRS points will increase for a percentage increase of provisions/total loan and 4.352 percentage points decrease for a 1% increase in the ratio of market share to total assets respectively.

## Regression Results: Local Owned Big Banks

Regression results of foreign owned big banks are reported in Table 6.

**Table 6:** *Model Coefficients for Locally Owned Big Banks*

| | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|
| | B | Std. Error | Beta | | |
| (Constant) | 3.258E-02 | .018 | | 1.852 | .084 |
| Non interest income | -.889 | .531 | -.461 | -1.674 | .115 |
| Operating Expenses | 1.330 | .301 | .972 | 4.425 | .000 |
| Provisions for Loan Losses | 3.897E-02 | .062 | .153 | .633 | .536 |
| Market Share | -7.581E-02 | .052 | -.272 | -1.466 | .163 |

As with foreign owned banks, operating expenses emerged the highest contributor of the variability of IRS with a positive coefficient of 1.330, a beta value of .972 and is statistically significant with p-value of .000.

The rest of the variables are not statistically significant (p > 10%) and do not seem to be related to IRS for this category of banks.

**Regression Results: Local owned Small Banks**

Regression results of local owned small banks are reported in Table 7.

**Table 7:** *Model Coefficients for Locally Owned Small Banks*

| | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|
| | B | Std. Error | Beta | | |
| (Constant) | 9.654E-02 | .027 | | 3.602 | .003 |
| Non interest income | -.962 | .419 | -.349 | -2.299 | .036 |
| Operating Expenses | 1.112 | .369 | .470 | 3.015 | .009 |
| Provisions for Loan Losses | -.161 | .033 | -.577 | -4.955 | .000 |
| Market Share | -1.962 | .762 | -.269 | -2.575 | .021 |

All predicting variables are significant at 5% level of confidence. The loan loss provision is the most important variable in explaining the interest rate spread of local small banks with a beta value of -0.577. Its coefficient is –1.61 depicting a negative relationship with interest rate spreads and is interpreted as 1.61 points increase in spread results from a one point decrease of the ratio of provisions to total loans.

The next important variable is operating costs and is positively related to the interest rate spread with a coefficient of 1.112 and beta value of .470. Non- interest income is third with coefficient value of -0.962. The weakest variable is the Market share with a coefficient of –1.962 and a beta value of –0.269.

**Discussion Of The Results**

The primary objective of this study was to find the key determinants of bank interest rate spreads in Tanzania. In addition to this general objective, the study also sought to map out the nature of relationships and strengths of variables that influenced bank interest rate spreads. Results show the smallest 3 banks in terms of total assets have the highest spreads. Akiba Commercial Bank, one of the smallest banks in Tanzania (based on Total Assets) and the only micro finance bank sampled in this study, is seen to have the highest interest rate spreads. It is also the second top profitable bank in the sample in terms of profitability to Asset ratio (ROA=3.2%). Microfinance is categorized as risky business as it deals with small customers who may have no permanent address or any formal legal assets to mortgage against loans. This is a typical organization that takes high risks and reaps the rewards through higher profits.

The other two smallest banks having highest margins are Kenya Commercial Bank and the International Commercial Bank. It is plausible that these two banks charge higher spreads to ensure they remain in business due to the losses they incurred during the study period, probably because of fixed operating expenses and the small scale business they are able to generate from the market.

Of interest are two banks, Eurafican Bank which is actually making losses but is charging reasonable spreads and People's Bank of Zanzibar that is actually charging negative margins and yet profitable, deriving its income from other non core businesses.

The most profitable bank, Standard Chartered Bank, with also reasonable margins, seems to derive the bulk of its income from non interest charges sources. Its non-interest income is actually higher than its net interest income. Standard Chartered Bank offers lower margins but customers presumably pay high fees, commissions and bank charges. Other banks with higher non-interest income include Tanzania Postal Bank, Peoples Bank of Zanzibar and Tanzania Investment Bank.

Citibank appears to be an efficient bank when one looks at the bank on a purely business perspective. It is a bank with smallest positive spread and yet ranked number 7 on profitability basis (ROA=2.2%). Its non-interest income is actually the lowest when one compares such income as a percentage of net interest income.

Other banks that appear to be efficient are NBC and NMB. These make good profits, charge lower margins and operate the largest number of branches across the country. Exim Bank also records good performance in terms of profitability (3rd top profitable bank in the sample) in spite of its large investments in enlarging its branch network and investing in advanced technology. Exim bank is the biggest local bank that was registered and became operational after financial liberalization.

The bank category with the highest spread by far, is that of foreign owned small banks (spread= 10.9%). Despite all this, it is actually the category with the lowest return on profit (ROA = 0.3). It appears that the high spread is actually necessary for their survival. They have very high costs and earn only reasonable income from non interest income.

Local Small banks is ranked second category in terms of high spreads. However, unlike foreign small banks, this category is actually the second most profitable with return of 1.3% points of the spread. However it is the category also with the highest operating expenses and actually one with cleanest loan portfolios looking at their provision for bad and doubtful points.

The third group in terms of high spreads is foreign owned big banks and followed lastly by big local banks, with local big banks being the most profitable category of all, at 2.0 percent. Results confirm that operating expenses, reserve requirement, ROA, provision for bad and doubtful debts and non-interest income are key determinants of interest rate spreads. It shows that the bulk of the spread is used to cover for operating expenses, which also turns to be positively related to the spread.

Non-interest income is also another key determinant of bank spreads, and with a negative sign it means it is a factor that decreases the banks' spreads. However when it is too high it leads to the same outcry as the one we have now for high spreads. The Bank of Tanzania has not considered it prudent to impose any restrictions on bank charges. In South Africa, its Competition Commission is investigating high banking fees (Mail & Guardian, 21 June 2005).

Provision for losses seems to carry a small portion of the spreads. With also a positive sign, it is a factor that adds to the spread meaning the higher the bank's provision the higher the spread.

All the bank categories except local big banks fitted in the framework that predicted operating expenses, provision for losses, market share, and non-interest income as determinants of bank IRS.

The nature of the relationships also has been largely confirmed: The decomposition of spreads provided results that fitted the proposed model except for only one bank category - local small banks and for only one component, the provision for bad debts. The regression results also depicted a negative relationship between provisions and IRS for local small banks. These are inconsistent results that need to be investigated further. As for the rest of the regression results, the inconsistency on nature of relationship between spread and market share is because such a variable is perceived differently by each bank category, some want to take advantage of it and increase their prices as well, while others take advantage through economies of scale and hence decrease their spreads.

## Conclusion

This article examined some of the factors behind IRS in Tanzania both analytically and empirically. The estimation results shows that interest rate spread is used to cover the cost of operating expenses and required reserves and also reflect the prevalence of market power and compensates for quality of loans. The article also showed that banks with high non-interest income can afford to narrow the spread.

On bank category levels, operating expenses was the highest contributor to spreads and had a positive relationship. IRS of all bank categories except for local big banks revealed a negative relationship with non-interest income, where as no significant relationship was observed for local big banks. Mixed relationships between spread and market power were observed. While small banks (both local and foreign) had a negative relationship with market share regardless of their ownership structures, large banks had different patterns. Spreads for foreign big banks are positively related to market share, however no significant relationship was observed for local big banks. Local small banks were the only category with provision for loan losses negatively related to their spreads.

## Recommendations

Although the conduct of open market operations by the Bank of Tanzania continue to be the key component of any successful liberalization and modernization of Tanzanian banking system, further progress needs to be made in achieving a more efficient and competitive financial system capable of operating with lower intermediation spreads. For instance, to make deposit and lending rates more market-conforming, it is imperative to have a wide range of instruments and an even wider range of financial intermediation in order to promote sound competition in the domestic financial market.

Greater transparency and information about banks spreads, if promoted among the customers could also help promoting competition. Perhaps the Bank of Tanzania (BOT) may consider drawing up regulations on publishing of each bank's interest rates as a move to the attainment of perfect competitive financial market.

## Suggestions for Further Research

This article did not obtain views of bankers to validate research results qualitatively. Perhaps a qualitative angle of understanding the phenomenon

of IRS may offer insights not currently captured in this article. Other than the variables studied in this work other macro economic factors determining IRS could also be investigated. Finally conclusions from this article are derived from a sample of 16 out of 26 banks operating in Tanzania. It would be interesting to cover the entire spectrum of banks in Tanzania and the East African Community Region.

## References


African Development Bank (ADB), African Development Report, 1994.

Angbazo, L. 1997, "Commercial Bank Net Interest Margins, Default risk, Interest-rate risk, and Off-balance sheet Banking", *Journal of Banking and Finance*, 21, 55-87.

Aryeetey E. and M. Hyuha, 1991)The Informal Financial Sector and Markets in Africa: An Empirical Study." In A.I. Chhibber and S. Fischer, (eds.) *Economic Reform in Sub-Saharan Africa*, The World Bank. Washington D.C.,

Bagachwa S.D.M., 1994 "Financial Integration and Development in Sub-Saharan Africa: A Study of Formal Financial Institutions in Tanzania." Mimeo.

Bagachwa S.D.M., 1995. "Financial Integration and Development in Sub-Sahara Africa: A Study of Informal finance in Tanzania." *ODI Working Paper*,

Bain, J. S.,(1951). "Relation of Profit Rate to Industry Concentration," *Quarterly Journal of Economics*, 65 (3), pp. 293-324.

Bajaras, A., R. Steiner and N. Salazar, (1998), "Interest Spreads in Banking: Costs, Financial Taxation, Market Power and Loan Quality in the Columbian Case 1974-96", *IMF Working Paper*, WP/98/110, August 1998.

Bank of Tanzania, Annual Report, various issues.

Bank of Tanzania, Monthly Statistical Bulletin, various issues.

Barajas, A. Steiner. R, Salazar. N. (1999) 'Interest Spreads in Banking in Colombia': 1974-1996'. IMF Staff Papers, 40 (2): 196-224.

Barajas, A., R & Steiner, Salazar, (1999). "Interest Spreads in Banking in Colombia, 1974-1996", IMF Staff Papers, 40 (2), 196-224.

Beck, Thorsten, and Michael Fuchs, 2004 "Structural Issues in the Kenyan Financial System: Improving Competition and Access," *World Bank Policy Research Working Paper* 3363 (Washington: World Bank).

Bouton L.C.Jones, and M. Kiguel 1994. "Macroeconomic Reforms and Growth in Africa: Adjustment in Africa Revisited." World Bank Policy Research Working Paper No. 1394.

Brock, P. L., and L. Rojas-Suarez 2000 "Understanding the behavior of bank spreads in Latin America", *Journal of Development Economics*, 63,pp 113-134.

Brownbridge, M., and C. Kirkpatrick, 2000 "Financial Regulation in Developing Countries," *Institute for Development Policy and Management Working Paper No. 12* (Manchester: University of Manchester. Available via the Internet at http:// www.man.ac.uk/idpm/.

Callier P.; 1991. Financial Systems and Development in Africa. Economic Development Institute of the World Bank, World Bank. Washington D.C.,

Camen U., M. Ncube and L. Senbet, (1996) "The Role of Financial Markets in the Operation of Monetary Policy", March. Mimeo.

Chirwa, E.W. and Montfort Mlachila, 2004 "Financial Reforms and Interest Rate Spreads in the Commercial Banking System in Malawi," *IMF Staff Papers*, Vol. 51, No. 1, International Monetary Fund

Cihak, M and Richard Podpiera, 2005 "Bank Behaviour in Developing Countries: Evidence from East Africa" *IMF Working Paper* 05/129.

Demirguc-Kunt, A. and H. Huizinga. 1997. "Determinants of commercial bank interest margins and profitability: Some international evidence". *World Bank Policy Research Working Paper No. 1900.* Washington, D.C.

Feder, G. and R. Just, (1980). "A Model for Analysing Lenders Perceived Default Risk", *Applied Economics, Vol. 12*, pp.125-44.

Gelb A., 1989 "Financial Policies, Growth and Efficiency." *Policy Research Working Paper 202*, The World Bank, Washington D.C.

Hannan, T. H. and J. N. Liang, 1993 "Inferring Market Power from Time-Series Data: The Case of the Banking Firm," *International Journal of Industrial Organization*, Vol. 11, No. 2, pp. 205–18.

Hanson, J.A. and R.R. Rocha, 1986, "High Interest Rates, Spreads and the Costs of Intermediation", *Industry and Finance Series*, Vol. 18.

Healther, D. Gibson and Euclid Tsakalotos, 1994. "The Scope and Limits of Financial Liberalization in Developing Countries: A Critical Survey", *Journal of Development Studies, Vol. 30*, No. 3, April..

Ho, T.S.Y. and A. Saunders, 1981. "The Determinants of Bank Interest Rate Margins: Theory and Empirical Evidence", *Journal of Financial and Quantitative Analysis*, Vol. 16, November 1981, pp.581-600.

Jayaraman, T. K. and Rajesh Sharma, (2003). "Why is Interest Rate Spread High in Fiji? Results from a Preliminary Study", *Fijian Studies Vol. 1 No. 1.*

Lipumba N.H.I., 1994 "Africa Beyond Adjustment, Overseas Development." *Council Policy Essay No. 15*,

Lipumba N.H.I., N. Osoro, and B.M. Nyagetera, 1990 "The Determinants of Aggregate and Financial Saving in Tanzania." *AERC report*, Dar es Salaam, Tanzania

Lwiza, D.R.B. and S. Nwankwo, 2002. "Market-Driven Transformation of the Banking Sector in Tanzania". *International Journal of Bank Marketing, Vol. 20*(1), 38-49.

Nathan, A. and E.H. Neave, 1990, "Cost and Efficiency of Canadian Banks", *Financial Management Association Annual Meeting*. May 1990, Vancouver, Canada.

Ramful, P., 2001, 'The Determinants of Interest Rate Spread: Empirical Evidence on the Mauritian Banking Sector', Bank of Mauritius Research Department paper May 2001

Randall, R., 1998. "Interest Rate Spreads in the Eastern Caribbean", *IMF Working Paper*, WP/98/59, April 1998.

Sarr, A., 2000. "Financial Liberalization, Bank Market Structure, and Financial Deepening: An Interest Margin Analysis," *IMF Working Paper 38* (Washington: International Monetary Fund).

Saunders, A., and L. Schumacher, 2000, "The determinants of bank interest rate margins: an international study", *Journal of International Money and Finance*, 19, 813-832.

Stiglitz J.E., 1989 "Financial Markets and Development." *Oxford Review of Economic Policy, Vol. 5*, No.4, pp. 5568.

Stiglitz, J.E. and A. Weiss, 1981, "Credit Rationing in Markets with Imperfect Information", *American Economic Review, Vol. 71*, No.3, pp. 393-410.

Turtelboom, B. 1991 .Interest Rate Liberalisation: some lessons from Africa, *IMF Working Paper WP/91/121* (Washington: International Monetary Fund)

Wijnbergen van S., 1983) "Interest Rate Management in LDCS." *Journal of Monetary Economics, Vol. 12*, No. 3, pp. 43352.

Wong, K. P. 1997. "On the determinants of bank interest margins under credit and interest rate risks". *Journal of Banking and Finance, 21:* 251–271.

World Bank, *Adjustment in Africa: Reforms, Results and the Road Ahead.* World Bank Policy Research Report, Oxford University Press, New York, 1994.

World Bank, *World Development Report. Oxford, Oxford University Press*, 1989.

Yu, H., 1995, "The Determinants of Interest Rate Margins: Empirical Evidence on the Canadian Banking Industry", *International Journal of Finance, Vol. 7*, No. 4.