

International Journal of Economics and Business Studies

Volume 1, Number 1: Spring 2011

Honorary Editor

Prof. N.Narayana

University of Botswana, Botswana
E-mail: narayana.nettem@gmail.com

Series Editor

Dr. Siddhartha Sarkar

Director, Asian School of Management and Technology, India

E-mail: director.asmt@gmail.com

Editorial Board

Ali Tasiran, Birkbeck College, United Kingdom
Carunia Mulya Firdausy, Ministry of Research and Technology, Indonesia

Clem Tisdell, University of Queensland, Australia
Leftisris Tsoulfidis, University of Macedonia, Greece
Mohit Kukreti, College of Applied Sciences IBRI,
Sultanate of Oman

Munir Hassan, Claflin University, South Carolina, USA
N. P. Sinha, University of Botswana, Botswana

Pundarik Mukhopadhaya, Macquarie University,
Australia

Raghbendra Jha, Australian National University,
Australia

Ramu Govindaswamy, The State University of
New Jersey, USA

R. Boohene, University of Cape Coast, Ghana

Victor Murinde, University of Birmingham,
United Kingdom

ISSN: 0974-3456

ISBN: 978-1-61233-510-0



Content

1. Determinants of Commercial Bank Interest Rate Margins
in Swaziland

**Sibusiso M. Khumaloand, Yinusa D. Olalekan &
Francis Nathan Okurut: 3-21**

2. New Banking Technology and Service Quality in Indian Public
Sector Banks: A Micro Level Study

A. Abdul Raheem & M. Krishnamoorthy: 22-28

3. Supply Response of Perennial Crops: A Case of Balochistan
Apricots

Mohammad Pervez Wasim: 29-41

4. Government Debt and Long-Term Interest Rate: Application of an
Extended Open-Economy Loanable Funds Model to South Africa

Yu Hsing: 42-48

Brown Walker Press

23331 Water Circle, Boca Raton, FL 33486-8540, USA

www.brownwalker.com/ASMT-journals.php

Copyright © Asian School of Management and Technology, India

Determinants of Commercial Bank Interest Rate Margins in Swaziland

Sibusiso M. Khumaloand

Department of Economics, University of Botswana, Botswana
E-mail: sbukhumza@yahoo.com

Yinusa D. Olalekan

Department of Economics, Obafemi Awolowo University, Ile-Ife, Nigeria
E-mail: doyinusa@oauife.edu.ng; yinusaolalekan@yahoo.com

Francis Nathan Okurut

Department of Economics, University of Botswana, Botswana
E-mail: okurutf@mopipi.ub.bw

Abstract: *The study analysed the determinants of commercial bank interest rate margins in Swaziland using bank-specific, industry-specific and macroeconomic data for the period 1997-2008. Panel data techniques were used for analytical work. The study used two different measures of interest rate margin, namely, the net and narrow interest rate margins (NIM and NAIM) as dependent variables. The empirical results indicate that increases in overhead costs, liquidity, equity, bank market power (or concentration), South Africa's interest rate (T-bill rate) and changes in exchange rates have significant effects on the rise in NAIM while intermediation has a negative effect. On the other hand, a rise in overhead costs has a significant positive effect on the NIM whereas liquidity has a negative effect. The study findings underscore the importance of enhancing the efficiency of the financial sector through reduction of intermediation margins to boost investment and economic growth in Swaziland.*

Keywords: Commercial bank, interest rate margin, liquidity, bank market power, economic growth

Introduction

The level of interest rate margin is one of the most important parameters for gauging the efficiency or otherwise of financial institutions (Randall, 1998; Brock and Rojas-Suarez, 2000; Chirwa and Mlachila, 2004; Gelos, 2006; Crowley, 2007).

While a number of authors have investigated the determinants and implications of interest rate margins in different economies of the world, yet the results documented in the literature are far from being conclusive. Although many authors seem to agree on the negative implications of wide interest rate margins for financial intermediation and financial development in general, there is little consensus on the causes or determinants of interest rate margins. While some authors argue that the main determinants of interest rate margins are bank specific factors, others argue that industry specific factors are more important. In fact, another group of researchers believe that macroeconomic factors are more important in explaining the level of interest rate margins in developing countries. This study attempts to test the various hypotheses concerning the determinants of interest rate margins using Swaziland data. The focus on Swaziland is important for a number of reasons: First, there has been the need for an improved understanding of the efficiency of the financial sector following the liberalization of interest rates in Swaziland. As a member of the Common Monetary Area (CMA), Swaziland's monetary policy is closely linked to South Africa policy and interest rate movements depend mostly on South Africa's interest rates. Secondly, there has also been concern in many developing economies about the level and structure of interest rates which remained high with marked interest rate margins during post-liberalization, which have implications for the efficiency of the financial sector (Turtelboom,

1991). High intermediation margins imply inefficiency of the financial sector, which acts as a disincentive to investment and could slow down economic growth. This study therefore investigated the determinants of interest margins in Swaziland using bank specific, industry specific and macroeconomic data.

Overview of Swaziland's Financial System

Swaziland's financial sector is made up of the Central Bank of Swaziland (CBS), four commercial banks with 31 bank branches, one building society, two unit trusts, two development finance institutions, 56 Savings and Credit Cooperatives (SCCOs), a stock exchange, over 200 pension funds (private and public), six insurance companies, and over 100 micro finance institutions (MFIs) (Central Bank of Swaziland Report, 2007). For a long time, the banking industry has been under the dominance of South- African owned banks. Initially there were three major commercial banks in Swaziland, (Barclays and Standard Chartered Bank with headquarters in London) and Swazi Bank, a quasi-governmental bank. First National Bank entered the market after the Bank of Credit and Commerce International (BCCI) failure via acquisition from the curator. Barclays Bank Swaziland Ltd was subsequently sold to Standard Bank of South Africa while Standard Chartered Bank of Swaziland (PLC) was sold to the South African bank, Ned bank. The state owned development bank otherwise known as the Swazi Bank continued to be a loss making institution until March 2001 due to a high non-performing loan book in June 1995. In restructuring the bank, the Swaziland government appointed a full complement of directors and employed an entirely new executive management team. Government has also re-capitalized the bank in order to help it adopt modern technology so as to compete effectively with its competitors. This has also enabled the bank to operate within internationally recognized banking standards. Following its formal re-launch in November 2001, Swazi Bank has since increased its product range and strengthened its operations. In 2002 the bank released its' first annual report since 1993, recording profits of above E13 million. However, the bank faces a daunting and challenging task of meeting a dual objective of being a commercial and a development bank while competing with other banks that are largely private (World Bank, 2005).

The Monetary Authority of Swaziland (MAS) was established in 1974 through an Order of Parliament and became the Central Bank of Swaziland, under the Monetary Authority (Amendment) Act of 1978. It was anticipated that the 1974 order would experience legislative amendments to widen the capacity of the central bank's supervisory powers and to improve the prudential ruling in order to improve banking soundness in the country. This was meant to further facilitate a legal framework conducive to global trends (Central Bank of Swaziland Report, 2000).

Before the establishment of the MAS, Swaziland was a member of a monetary arrangement along with Botswana, Lesotho and South Africa. All circulating currency was issued by South Africa and bank deposits were denominated in the South African currency. Interest rate trends for countries in this monetary arrangement were a replica of the South Africa's economy. Pension and provident funds invested their funds in the Johannesburg market. This loose monetary arrangement was only formalized in 1974 when the Rand Monetary Area (RMA), which allowed a free flow of capital within member states, came into existence. Botswana participated in the RMA negotiations but opted out in 1976 in favour of a managed float of its currency, the pula. Since then, Botswana has pegged the pula to a trade-weighted basket of rand and SDR with the South African rand having a large weight in the basket (Central Bank of Swaziland Report, 2000).

The establishment of the MAS came with the issuance of Swaziland's currency- Lilangeni (Emalangeni in plural), whose exchange rate is at unity with the rand. Domestic holdings of rand notes were converted into bank balances in the South African Reserve Bank (SARB) earning interest, and at the same time held as 100 percent backing for emalangeni issued as required by the RMA agreement (Central Bank of Swaziland report, 2000). The legal tender status of the rand did not change; with the rand circulating alongside the lilangeni. South Africa paid compensation to Swaziland for loss of seigniorage, based on a predetermined formula on the estimated amount of rands in circulation. However, in 1986, after a series of economic events in South Africa, including the huge depreciation of the rand in 1985 which led interest rates to shoot up in all member countries, Swaziland renegotiated the RMA agreement, which changed to the present Common Monetary Area (CMA) agreement of which Lesotho, Namibia, South Africa and Swaziland are members. This agreement resulted in the termination of the legal tender status of the rand; consequently, Swaziland gave up its right to receive compensation from South Africa on account of the rands circulating in the country (Central Bank of Swaziland Report, 2000).

The important part of the CMA agreement is that Swaziland now has the liberty to delink the lilangeni from the rand, should circumstances so dictate. Swaziland has, however, opted to maintain the peg on the grounds that it is in the country's best interest. By implication, pegging the lilangeni at par to the rand means that any change in the international exchange rate of the rand culminates in an equivalent movement in the lilangeni. In essence, the policies pursued by Swaziland are to a large extent influenced by South African policy pronouncements (Central Bank of Swaziland Report, 2002).

In South Africa, for both loans and deposits the national T-bill rates play an increasingly important role in determining interest rates (Sander and Kleimeier, 2004). According to Sander and Kleimeier (2004), the monetary policy of South Africa has an unswerving influence on the bank rates in all CMA countries. This impact is increasingly mediated through T-bill markets. The arrangement under the auspices of the common monetary area has rendered Swaziland's control of its money supply ineffective, as the rand has continued to freely circulate side by side with the Lilangeni, and has also meant that interest rates are determined in a unified market (Central Bank of Swaziland Report, 2002).

Given Swaziland's membership of the CMA characterized by a fixed unitary exchange rate with the South African rand (which eliminates the threat of exchange rate risk), there is very little scope for Swaziland's interest rate to deviate substantially from those ruling in the CMA. Despite tracking the South African interest rate structure, Swaziland's interest rate regulation is largely through moral suasion, where the Central Bank of Swaziland (CBS) uses this instrument to encourage the local banking sector to lend to the private sector. However, the CBS has to maintain slightly lower interest rates than South Africa to stimulate investment, and manage the differential to prevent arbitrage. In practice, there have been occurrences of wide differentials in interest rates between South Africa and Swaziland (Central Bank Report, 2000).

Interest rates are the principal instrument of monetary policy and closely track those obtained in South Africa (Central Bank Report, 2008). Historically, the Central Bank of Swaziland has maintained marginally lower interest rates than the South African Reserve Bank (SARB) to stimulate investment and lower the cost of borrowing and doing business. However, policy rates (the discount rate in Swaziland and the repo rate in South Africa) converged from September 2001, and prime rates from September 2003, until May 2008. According to the 2008 Central bank report, from June 2008 interest rates were 50 basis points lower in Swaziland than in South Africa as the CBS did not raise its discount rate in that month but left rates unchanged. Swazi-

land's discount rate averaged 11.3 percent in 2008 up from 9.7 percent in 2007 and 7.7 percent in 2006, whereas the prime rate averaged 14.8 percent in 2008 up from 13.2 percent in 2007 and 11.2 percent in 2006 (Central Bank Report, 2008). Ho and Saunders (1981) revealed that interest rate volatility leads to larger margins.

Whilst the objective is to minimize the interest rates differentials, there has been direct control on the movement of interest rates against the trend in South Africa in some years. In 1998 for instance when the rand was depreciating and when interest rates were going up within the CMA, the differential between Swaziland and South Africa interest rates reached six percentage points. At that time the CBS felt that raising local rates to the SA levels would put too much pressure on the economy and be contrary to the objective of stimulating investment in the real sector (Central Bank Report, 2008). The general policy is to maintain a differential of 0.25-0.50 percentage points. It should be noted that this policy has serious implications, particularly with regard to the huge capital flows that result as a response to the discrepancy. A related objective is that of ensuring that depositors are compensated positive net returns. However, due to inflationary pressures in the past, it was not possible to reward depositors' positive net returns except since 1999/2000 when single-digit inflation levels were achieved (Central Bank Report, 2008).

From a bank's point of view, interest rate margin is a return for the risk the bank bears. It compensates for the risk of loan default and also for the risks related to funding costs. Banks usually borrow short-term funds from depositors and provide long-term loans. Interest rate margins should consequently cover both spot and future cost of funds. The margin may move up or down depending on the predictions of future short-term interest rate (Ramful, 2001).

To stimulate the economy to recover due to the effects of the global financial crisis of 2007, the Central bank of Swaziland has been pursuing an accommodative monetary policy position by reducing interest rates since 2008. Given the effectiveness of the monetary policy, prime-lending rates also adjusted accordingly in the same direction and magnitude as the discount rate, (Central Bank Report, 2008). The Central Bank reduced the discount rate by a cumulative 200 basis points over the quarter, from a level of 11 percent in December 2008 to 9 percent in March 2009. Consequently, other depository corporations reduced their prime-lending rate from 14.5 percent to a level of 12.5 percent by the end of March 2009. Changes in the deposit rates were also put into place during the three months, with the 31 days deposits rate being revised from a level of 7.30 percent to 6.08 percent, while the 12 months deposits rates were reduced from 9.81 percent to 6.35 percent. Interest rates were reduced by 100 basis points at the beginning of May 2009. The discount rate was revised downwards to 8 percent, while other depository corporations reduced their prime lending rates by the same margin to 11.5 percent (Central Bank of Swaziland Report, 2009).

According to Crowley (2007) and Ndung'u and Ngugi, (2000), when the interest margin is enormous, it contributes to financial dis-intermediation as it discourages potential savers with too low returns on deposits and limits financing for potential borrowers thus reducing viable investment opportunities and therefore the growth potential of the economy. An increase in the inefficiency of banks will certainly increase these intermediation costs, and thereby enlarge the part of savings that is 'lost' in the process of intermediation. This eventually reduces lending, investment and economic growth.

Empirical literature suggests that financial systems in developing countries like Swaziland display momentous, unstable and persistently larger intermediation margins on average than in developed countries. As a result, the interest rates charged by local banks have been a sensitive and recurring policy issue in Swaziland and one which requires an objective examination of all

the factors behind the structure of commercial bank interest rates. In the past, these unstable and high margins have generally been attributed to high operating costs, financial taxation, and lack of competition and high inflation rates (Central Bank Report, 2007). This study, therefore, attempts to investigate the determinants of interest rate margins in Swaziland.

Review of Empirical Literature on Interest Rate Margins

Empirical literature suggests that interest margins are broadly linked to the efficiency of the banking sector. The determinants of commercial bank interest margins have been classified into three categories namely; bank-specific, industry-specific and those determined by macroeconomic variables (Demirguc-Kunt and Huizinga, 1999; Craigwell and Moore, 2000; and Sologoub, 2006).

Bank-specific factors are also known as firm or micro determinants. These come from bank accounts mainly from the balance sheet, income statements and/or profit and loss accounts meaning that they are internally determined. The main source of bank-specific or internal risk in many developing countries is credit risk. Poor enforcement of credit rights, fragile legal setting, and inadequate information on borrowers expose banks to credit risk. At the macroeconomic level, weak economic growth adds to risk as it encourages the deterioration of credit quality and increase the probability of loan defaults. Credit risk could be measured using the loan loss provisions (Crowley 2007).

Using accounting decompositions as well as panel regressions, Al-Haschimi (2007) examined the determinants of bank net interest rate margins in 10 Sub Sahara African countries. The findings suggested that credit risk and operation inefficiencies, which indicate market power, explain most of the disparities in net interest margins across the region.

Wong (1997) found bank interest margins to be positively related to bank's market power, bank's operating costs, credit risk and the degree of interest rate risk. Increase in equity was found to have a negative effect on margins when the bank is faced with little interest rate risk. Angbazo (1997) tested the theory that banks with extra 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, Angbazo (1997) showed that the net interest margins of commercial banks reflected both default and interest-rate risk premiums.

Ho and Saunders (1981) also observed that pure spread is a microstructure phenomenon, influenced by the amount of bank risk management, the size of bank transactions, interest rate elasticity and interest rate variability.

Secondly, industry-specific or market determinants refer to market concentration, competition, size of the industry and ownership. These factors affect the market as a whole meaning that the banking sector instead of just an individual bank is affected by these factors. It must be noted though that many researchers single out bank specific factors as the main determinants of bank interest margins (Crowley 2007).

Demirguc-Kunt and Huizinga (1999) used bank level data for 80 countries to investigate how bank characteristics and the overall banking setting influence both interest rate margins and bank returns. When taking into account both measures, the study provided a breakdown of the income effects of a number of determinants that affect depositor and borrower behaviour, as opposed to that of shareholders. The findings suggested that macroeconomic and regulatory conditions have a prominent impact on margins and profitability. Lower market concentration ratios lead to lower margins and profits, while the effect of foreign ownership varies between developed and devel-

oping countries. In particular, foreign banks have higher margins and profits compared to domestic banks in developing countries, while the opposite holds in developed countries.

Margins have been found to be linked to the level of market concentration in European banking sectors (Saunders and Schumacher, 2000; Maudos and Fernandez de Guevara, 2004). Ho and Saunders (1981) also noted that the magnitude of the margin is much higher in a non-competitive market, which calls for strengthening of the regulatory and legal structure to boost the solidity of the market. Barajas et al. (1996) demonstrated that loan market power has momentous effects on interest margins.

Other empirical results reveal that market imperfections broaden the interest rate spread. Ho and Saunders (1981), approximating market control with bank size, found a huge disparity in spread between large and small banks. Small banks had higher spreads compared to the large ones. Elkayam (1996) found that in a competitive banking arrangement, the interest rate margin derives exclusively from central bank variables (including the discount window loans, reserve requirement and interest on liquid assets on deposit with the central bank), while under a monopolistic (or, oligopolistic) structure the interest rate spread is in addition affected by elasticity of demand for credit and deposits. Moreover, taking into account monetary policy, Elkayam (1996) found that a rise in money supply under elastic demand lessens the margin further in a monopolistic setting than in a competitive market.

Finally, macroeconomic determinants of interest rate margins are external determinants which are not related to bank management but reflect the economic and legal environment that affect the operation and performance of commercial banks. The macroeconomic environment has variables such as inflation, interest rates and cyclical output (Crowley 2007). Most studies have used inflation rate, the long-term interest rate and/or the growth rate of money supply. Allen and Saunders (2004) studied the literature on pro-cyclical operations, credit market exposures and revealed that these cyclical effects originated from systematic risk that emerge from ordinary macroeconomic influences or from financial institution interdependences as a result of international consolidation.

Allen and Bali (2004) noted that macroeconomic variables to a great extent affect bank profitability in developing countries. Inflation in particular, is positively linked to bank profits meaning that banks forecast future changes in inflation correctly and are quick enough to adjust interest rates and margins.

Hanson and Rocha (1986) analysed the determinants of interest rate margins looking at the role of explicit and implicit taxes and other factors like bank costs and profits, inflation, scale economies and market structure. Using aggregated interest rate data for 29 countries for the period 1975-1983, they found a positive correlation between interest rate margins and inflation.

Zarruk (1989), taking note of risk management by banks, found that risk-averse banks operate with a smaller margin than risk-neutral banks, while Paroush (1994) explains that risk aversion raises the bank's optimal interest rate and reduces the amount of credit supplied. Actual margin, which incorporates the pure margin, is in addition influenced by macroeconomic variables including monetary and fiscal policy activities. Hanson and Rocha (1986) emphasized the role of direct taxes, reserve requirements, cost of transactions and forced investment in defining interest rate margin.

Gelos (2006) explored the determinants of bank interest margins in Latin America using both bank bank-specific and economy wide macroeconomic data. He found that interest rate margins on deposits and lending rates are huge because of relatively high interest rates (which in the

study is a proxy for high macroeconomic risk, including from inflation), less efficient banks, and higher reserve requirements.

Data Sources and Model Specification

Data Sources

The study utilised secondary data on four banks in Swaziland for the period 1997-2008 for which consistent data was available on bank-specific, industry-specific and macroeconomic variables. Bank specific data was obtained from the annual balance sheet, income statements and Central Bank of Swaziland Reports. Data on the macroeconomic variables (inflation, T-bill rates and exchange rates) were got from the Central Bank of Swaziland reports.

Model Specification

Following Ho and Saunders (1981), Saunders and Schumacher (2000), Brock and Suarez (2000) and Drakos (2003), a general class of regressions for interest rate margins takes the form;

$$NIM_{it} = \alpha + \beta B_{it} + \eta I_{bt} + \pi M_t + \mu_{it} \dots \dots \dots (1)$$

Where: *it* indicate bank *i* at time *t*, and *b* represents the bank industry (all other variable except for α vary with time).

NIM_{it} = represent the net interest margin *i* at year or time *t*

α = represent the constant term

B_{it} = represent a vector of bank-specific variables for bank *i* at time *t*

I_{bt} = represent industry- specific variables (the banking industry)

M_t = vector for macroeconomic variables over time

μ_{it} = residual

For this study, the bank-specific variables consist of liquidity, intermediation, equity ratio, overhead costs, loan loss provision, taxes and intermediation. For industry or market variables, we used bank concentration or competition measured by Herfindahl-Hirschman Index (HHI) and ownership (market share in loans and deposits markets). The HHI is computed for both the loans and deposits markets. The macroeconomic variables include inflation, exchange rate volatility and the South African interest rate (T-bill rate), which measures the effect of South Africa's monetary policy on Swaziland as a member of CMA where the rand is the anchor currency.

Definition and Measurement of Variables

The variables for the study can be classified under three broad categories namely: bank-specific, banking industry-specific and macroeconomic variables. The definitions of the specific variables are highlighted below.

Dependent Variables

This study used two measures of interest rate margins: the net and the narrow interest rate margins (NIM and NAIM).

i) The *Net Interest Margin (NIM)* is defined as the difference between interest income generated by banks by their lending and interest paid on borrowing (for example, deposits). NIM is expressed as net interest income (interest earned minus interest paid on borrowed funds) as a percentage of earning assets (any asset, such as a loan, that generates income).

$$\text{Net Interest Margin} = \frac{\text{Net Interest Income}}{\text{Average Total Earning Assets}}$$

ii) The *Narrow Interest Margin (NAIM)* is defined as the difference between income received on loans (divided by total loans) and interest paid on deposits (divided by total deposits).

$$\text{Narrow Interest Margin} = \frac{\text{Interest Income}}{\text{Total Earning Assets}} - \frac{\text{Interest Paid}}{\text{Total Deposits}}$$

Explanatory Variables

Bank-specific Variables

Overhead costs: These are the operating costs of the bank. The higher the overhead costs in the banking sector, the higher the interest rate spreads since higher spreads would be required to cover the additional costs as banks pass on these added costs to borrowers. Overhead costs were measured as a ratio of bank's operating expenses to total assets.

$$\text{Overhead cost} = \frac{\text{Bank's Operating Expenses}}{\text{Total Assets}}$$

Liquidity ratio (computed as liquid assets as a ratio of total deposits) measures the liquidity of the banking system. Banks with high holding of liquid assets bear higher opportunity costs which they pass to borrowers through wider intermediation margins. Liquidity ratio was measured as:

$$\text{Liquidity} = \frac{\text{Liquid Assets}}{\text{Deposits}}$$

Intermediation involves the "matching" of lenders with savings to borrowers who need money by an agent or third party, such as a bank. If this matching is successful, the lender obtains a positive rate of return, the borrower receives a return for risk taking and entrepreneurship and the banker receives a marginal return for making the successful match. Banks that are more involved in intermediation of loans should be better prepared for competition and charge lower spreads hence a negative relationship between intermediation and interest margins is expected. It is measured as total loans over total liabilities.

$$\text{Intermediation} = \frac{\text{Total Loans}}{\text{Total Liabilities}}$$

Equity refers to total assets minus total liabilities. If valuations placed on assets do not exceed liabilities, negative equity exists. High equity capital holdings due to banks voluntary decisions or regulation can be costly for banks; hence a positive association with interest rate margins is expected (Martinez Peria and Mody, 2004).

$$\text{Equity} = \text{Total Assets} - \text{Total Liabilities}$$

Equity ratio is equity over assets (equity/assets). It is expected to have a positive relationship with interest rate margins. According to Martinez Peria and Mody (2004), high equity or capital holdings due to either banks voluntary decisions or regulation could be costly for banks so a positive relationship is expected.

$$\text{Equity ratio} = \frac{\text{Total assets} - \text{Total Liabilities}}{\text{Total Assets}}$$

Loan loss provision could be a signal of inefficiency in the banking sector. Since both interest rate income and expenses are ex-post items on the banks' revenue statements, the expectation is that higher loan loss provisions should lead to high interest rate margins.

$$\text{Loan loss provision} = \frac{\text{Bad Debts}}{\text{Total Loans}}$$

The *taxes* considered in this study are taxes on financial operations (taxes on gross revenues). Taxes are expected to have a positive influence on interest margins.

Industry Variables

Bank concentration or competition is measured using the Herfindahl index (HHI), which is defined as the sum of the squares of the market shares of each individual firm. It is a measure of

industry concentration equal to the sum of the squared market shares of the firms in the industry. The HHI ranges from 0 to 100 moving from a very large quantity of very small firms to a single monopolistic producer. The Herfindahl index for both the loan and deposit market would be expected to bear a positive relationship with the interest margins (Demirguc-Kunt and Huizinga, 1999).

Macroeconomic Variables

Annual inflation is the general increase in prices over a given period of time. Inflation can affect interest margins if monetary shocks are not passed through the same extent to deposit and lending rates, or adjustment occurs at different speed. Inflation is used as an indicator of macroeconomic instability and the cost of doing business in an economy. Higher inflation is expected to lead to higher interest rate margins because it causes banks to charge a risk premium.

Exchange rate volatility (measured by changes in exchange rates) is an indicator of macroeconomic instability and is positively correlated with interest rate margins (Ho and Saunders, 1981).

The South African interest rate (Treasury bill rate): Considering Swaziland's membership of the CMA characterized by a rigid unitary exchange rate with the South African rand, it is apparent that there is very little scope for Swaziland's interest rate to swerve significantly from those ruling in the CMA. The South African interest rates (for both loans, deposits and the national T-bill rate) play an important role in determining the rates of interest in Swaziland. The general policy stance in Swaziland is to maintain a differential of 0.25 - 0.50 percentage points between local rates and South African rates (Central Bank of Swaziland Report, 2007). The T-bill rate is generally regarded as an indicator of the interest rate policy being pursued by the government, and a benchmark for the rates charged by commercial banks. This variable is therefore also expected to be positively correlated to the NIM, because lower Treasury bill rates would lead to lower interest rate spreads and vice versa.

Techniques for Data Analysis

This study estimates the NIM equation using pooled OLS and panel regressions in which bank-specific effects are controlled for. It must be noted that the assessment made concerning the NIM equation depend on the assumptions about the intercept and slope coefficients. It is assumed here that the intercept and slope coefficients are constant over time and that the error term captures differences over time in individual banks.

With respect to panel data, various tests were conducted. These include unit root using panel Augmented Dickey Fuller (ADF) to test if the variables are stationary or not and testing the order of cointegration. The ADF may not detect stationarity if structural breaks exist in the data. Hence, ADF test was complemented with Philips Peron, which is a useful tool for detecting unit roots even if structural breaks exist in the data. If variables are not stationary, then the next empirical procedure is to test for cointegration. Panel cointegration was therefore tested in this study using Pedroni test to see if long run relationship exists between and among the variables so that the model can be estimated in Error Correction Form. According to Granger representation (Engle and Granger, 1987), if two variables are cointegrated, then the relationship between the two can be represented in an Error Correction Model. Tests for the significance of variables were conducted using t-test, among others. For estimation purposes, Eviews 6 econometric software was used.

Empirical Results of the Study

Unit Root Tests

The panel unit root tests were used to test for stationarity of the series used in the analysis (Im, Pesaran and Shin, 2003; Levin and Lin, 1992; Maddala and Wu, 1999). The panel unit root test

results with individual effects show that some variables are stationary in levels while in some tests stationarity is achieved after first or second differencing. The ADF test suggested that all variables are not stationary at levels with the exception of market share in deposits market (MSD).

Cointegration Tests

Tests for cointegration were carried out using panel cointegration tests proposed by Pedroni (1999 and 2004) to assess the existence of long-run relationship between the variables. The cointegration tests results suggested that there is cointegration implying the existence of a long run relationship, which justifies the use an error correction model (ECM).

Pooled OLS-Fixed Effects Results

The Pooled Ordinary Least Squares (OLS) model with fixed effects was used to estimate the determinants of net interest margin (NIM) and the narrow interest rate margin (NAIM) for the period 1997 to 2008 and the results are presented in Tables 1 and 2 below.

The diagnostic test statistics suggest that the models are good with adjusted R-squared ranging between 0.582 and 0.625 (for NIM) in Table 1, while Table 2 shows that adjusted R-squared ranges between 0.728 and 0.822 (for NAIM). This shows that between 58.2 percent and 62.5 percent (for NIM), and between 72.8 percent and 82.2 percent (for NAIM) of the variations in interest rate margins are explained by the identified explanatory variables. Looking at the Durbin-Watson statistic in both tables, there is no indication of serious autocorrelation. The F-statistic reveals that the estimated parameters are jointly significantly different from zero [Prob (F-statistic) = 0.000].

With reference to the pooled OLS fixed effects estimation results shown in Tables 1 and 2, there is a positive relationship between overhead costs and net and narrow interest margins (though not statistically significant). The effect of liquidity on the net interest margin is mixed and unclear whereas higher banks' liquid holdings appear to increase the narrow interest margin and this effect is significant. Equity does not significantly influence both the interest margins even though the signs are predominantly negative.

As shown in column 2 of Tables 1 & 2, taxes, whether implicit or explicit, widen the interest margin as they increase the intermediation costs. These include: reserve requirements, withholding taxes, stamp duties, transaction taxes, value added taxes, profit taxes and license fees. With reference to the pooled OLS results presented in tables 1 & 2, taxes (levy on gross earnings) appear to decrease both interest margins (NIM and NAIM) as seen by the predominantly negative signs but do not significantly influence the margins. There is ambiguity with respect to the findings on intermediation. This variable increases net interest margin and the effect is significant. However, intermediation tends to decrease narrow interest rate margin and the effect is also significant. Banks with a higher intermediating role or that have a higher lending portfolio relative to their total liabilities, charge lower margins.

Looking at bank concentration as shown by column 4 and 5 in Tables 1 & 2, the results are conflicting. With respect to the net interest margin the coefficients for concentration in both the deposit and loan markets as measured by the HHI, the coefficients are positive and statistically significant. Focusing on the narrow interest margin, there is significant evidence that a higher bank concentration in deposit and lending market segments lead to significantly lower narrow margins contrary to a priori expectations.

In conclusion, columns 5 to 8 include some macroeconomic variables. There is evidence that domestic inflation tend to increase interest margins (NIM and (NAIM) although this effect is not important in statistical terms. This could be due to the fact that monetary shocks are not passed

Table 1: OLS Fixed Effects - Net Interest Margin (NIM)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Overhead Cost	0.117 (0.703)	0.153 (0.933)	0.063 (0.362)	0.101 (0.559)	0.103 (0.569)	0.101 (0.594)	0.115 (0.660)	0.092 (0.519)
Liquidity	-0.003 (-0.238)	0.026 (1.455)	0.003 (0.222)	-0.002 (-0.139)	-0.002 (-0.147)	-0.003 (-0.249)	-0.003 (-0.181)	-0.001 (-0.052)
Loan Loss Provision	0.425* (5.377)	0.408* (5.352)	0.432* (5.382)	0.426* (5.308)	0.426* (5.306)	0.420* (5.246)	0.425* (5.240)	0.428* (5.337)
Market Share Deposits	0.029 (1.577)	0.035*** (1.875)	0.032 (1.438)	0.029 (1.569)	0.029 (1.567)	0.030 (1.604)	0.029 (1.555)	0.030 (1.595)
Equity	-0.011 (-0.097)	-0.314 (-1.209)	-0.511 (-1.066)	-0.018 (-0.145)	-0.017 (-0.140)	-0.037 (-0.290)	-0.012 (-0.101)	-0.035 (-0.267)
Tax		-0.874 (-0.852)						
Intermediation		0.047** (2.137)						
Market Share Loans			-0.004 (-0.347)					
Equity Ratio			0.084 (1.081)					
Herfindahl Deposits				0.004 (0.233)				
Herfindahl Loans					0.003 (0.212)			
Domestic Inflation						0.004 (0.610)		
South Africa's Interest Rates (T- Bill Rate)							-0.287 (-0.038)	
Changes in Exchange rates								0.001 (0.469)
Constant	0.027** (2.601)	-0.017 (-0.753)	0.024** (2.148)	0.024 (1.406)	0.024 (1.423)	0.025* (2.222)	0.027** (2.100)	0.021 (1.290)
Observations	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000
Total pool (unbalanced) observations	44.000	44.000	44.000	44.000	44.000	44.000	44.000	44.000
Adjusted R-squared	0.593	0.625	0.584	0.582	0.582	0.586	0.581	0.584
Durbin – Watson	2.232	2.475	2.335	2.244	2.243	2.251	2.236	2.272
F- Statistic	8.841	8.154	7.028	7.653	7.649	7.759	7.635	7.708
Prob (F- Statistic)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cross Section Included	4.000	4.000	4.000	4.000	4.000	4.000	4.000	4.000
Method	OLS	FE	FE	FE	FE	FE	FE	FE

FE- Fixed Effects, *Values in parentheses are associated t- values, * Indicates significant at the 1percent level, ** significant at 5 percent level and *** significant at the 10 percent level, Time period; 1997-2008

Table 2: Pooled OLS Fixed Effects -Narrow Interest Margin (NAIM)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Overhead Cost	0.022 (0.059)	0.080 (0.251)	0.252 (0.661)	0.129 (0.313)	0.125 (0.303)	-0.050 (-0.130)	0.315 (0.907)	0.103 (0.256)
Liquidity	0.179 (6.694)*	0.059 (1.670)	0.158 (5.639)*	0.172 (5.982)*	0.172 (5.989)*	0.178 (6.715)*	0.131 *	0.172 (5.964) *
Loan Loss Provision	0.640* (3.531)	0.692* (4.670)	0.615* (3.526)	0.631* (3.451)	0.632* (3.454)	0.619* (3.423)	0.555* (3.432)	0.628* (3.425)
Market Share Deposits	0.066 (1.571)	0.075 (2.045)**	0.028 (0.585)	0.063 (1.498)	0.063 (1.500)	0.069 (1.668)	0.061 (1.648)	0.063 (1.492)
Equity	-0.177 (-0.653)	0.172* (3.407)	0.160 (1.538)	-0.134 (-0.477)	-0.136 (-0.484)	-0.291 (-1.022)	-0.036 (-0.149)	-0.103 (-0.350)
Tax		-0.181 (-0.908)						
Intermediation		-0.181* (-4.203)						
Market Share Loans			0.046 (1.637)					
Equity Ratio			-0.305*** (-1.802)					
Herfindahl Deposits				-0.026 (-0.703)				
Herfindahl Loans					-0.025 (-0.685)			
Domestic Inflation						0.002 (1.227)		
South Africa's Interest Rates (T- Bill Rate)							0.005* (3.320)	
Changes in Exchange rates								-0.003 (-0.660)
Constant	0.022 (0.935)	0.180* (4.106)	0.033 (1.372)	0.044 (1.127)	0.043 (1.112)	0.012 (0.474)	-0.028 (-1.085)	0.041 (1.101)
Observations	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000
Total pool (unbalanced) ob- servations	44.000	44.000	44.000	44.000	44.000	44.000	44.000	44.000
Adjusted R-squared	0.732	0.822	0.753	0.728	0.728	0.736	0.792	0.728
Durbin – Watson	1.709	1.704	1.791	1.771	1.769	1.798	2.105	1.713
F- Statistic	15.697	20.903	14.118	13.806	13.794	14.321	19.174	13.776
Prob (F- Statistic)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cross Section Included	4.000	4.000	4.000	4.000	4.000	4.000	4.000	4.000
Method	OLS	FE	FE	FE	FE	FE	FE	FE

FE- Fixed Effects, * Values in parentheses are associated t- values, * Indicates significant at the 1percent level, ** significant at 5 percent level and *** significant at the 10 percent level, Time period: 1997-2008

through the same extent to deposit and lending rates. Looking at South Africa's interest rate (Treasury bill rate), the findings on both dependent variables are contradictory. Lower T-bill rates as seen on net interest margin lead to a decrease to bank's marginal costs of funds while on the other hand, higher T-bill rates lead to an increase in banks marginal costs of funds with respect to the narrow interest rate margin where the coefficient for South Africa's interest rate is positive and statistically significant. Banks will include these higher funding costs in their lending rates so this might cause the higher margins. The last macroeconomic variable is exchange rate changes. Just like the T-bill rate, the results are conflicting with respect to the two dependent variables. Changes in exchange rates appear to increase the net interest margin and decrease the narrow interest margin. Both effects are insignificant.

Error Correction Model (ECM)

The Error Correction Models (ECM) was estimated with the two aims of separating long-run and short-run dynamic responses. An error-correction model is a dynamic model in which the movement of the variables in any periods is related to the previous period's gap from long-run equilibrium (Kim, Ogaki, and Young, 2003). ECM is useful because they provide a consistent integration of short-run dynamic adjustment with long-run equilibrium specifications, thereby providing empirical models that rest easily with the constraints of economic theory and that focus on short-run disequilibrium behaviour.

ECM requires the variables to be non-stationary and to have the same order of integration within a cointegration system. A simple Error Correction Model has been developed to correct for short-term equilibrium by reconciling the short run behaviour of the variables with their long run behaviour. As shown in Pedroni (1999), the Granger Representation Theorem - according to which a system of cointegrated variables, can be represented in the form of a dynamic ECM model, which also holds for panel data. Thus, the error correction model was carried out repeatedly varying the variables with regard to the two dependent variables (narrow and net interest rate margins). Due to the large number of time varying variables multiple tests were conducted for each dependent variable (varying the variables) to see the effects of the independent variables on the two dependent variables (NIM and NAIM). The results of panel least squares in error correction form are presented in Tables 3 and 4 below:

Since Pedroni (1995) tests support the existence of cointegration, the results of panel least squares in error correction form are presented in Tables 3 and 4. Normally, results from error correction panel least squares appear to support results from pooled OLS. The error correction term is rightly signed (negative) and significant at 1percent level on average for both net interest and narrow margins. The ECM as shown by its sign is also statistically significant and therefore corrects between 63.5 to 73.2 percent (for NIM) and 41.4 to 72.9 percent (for NAIM) of the errors in the two models in case of any shock to the models in the long run.

Based on the ECM estimations for NIM and NAIM, the variables that are significant (at least at the 10 percent significance level) included overhead costs, liquidity, equity, intermediation, bank concentration, South Africa's interest rates (T-bill rate) and changes in exchange rates. The other variables which include: loan loss provision, Herfindahl index for the deposit and loan markets, taxes, equity ratio, domestic inflation market share and loans are all statistically insignificant. The detailed discussion is devoted to only the variables that were significant at least at the 10 percent significance level.

Overhead costs have a positive and significant effect on both NAIM and NIM in Swaziland. This means that an increase in bank operating expenses lead to an increase in the net and narrow interest margins to cover the extra costs. These results are consistent with other scholars who also

Table 3: ECM Regression Results- Net Interest Margin (NIM)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Overhead Cost	0.443** (2.695)	0.463* (2.772)	0.390** (2.345)	0.446** (2.641)	0.447** (2.640)	0.383** (2.223)	0.383** (2.240)	0.504* (3.067)
Liquidity	-0.025 (-1.357)	-0.016 (-0.758)	-0.025 (-1.3040)	-0.027 (-1.420)	-0.027 (-1.420)	-0.028 (-1.470)	-0.033*** (-1.707)	-0.030 (-1.6130)
Loan Loss Provision	-0.181 (-0.891)	-0.174 (-0.852)	-0.158 (-0.770)	-0.174 (-0.843)	-0.175 (-0.844)	-0.181 (-0.887)	-0.193 (-0.941)	-0.156 (-0.779)
Market Share Deposits	0.007 (0.364)	0.013 (0.6300)	0.027 (1.184)	0.007 (0.350)	0.007 (0.350)	0.008 (0.389)	0.008 (0.397)	0.003 (0.158)
Equity	0.106 (0.682)	0.107 (0.368)	-0.676 (-1.044)	0.117 (0.736)	0.116 (0.732)	0.709 (0.445)	0.116 (0.748)	0.111 (0.727)
Tax		-0.121 (-1.218)						
Intermediation		0.024 (1.118)						
Market Share Loans			-0.013 (-1.083)					
Equity Ratio			0.140 (1.250)					
Herfindahl Deposits				-0.003 (-0.202)				
Herfindahl Loans					-0.003 (-0.216)			
Domestic Inflation						0.001 (1.035)		
South Africa's interest rates (T-bill rate)							0.001 (1.243)	
Changes in Exchange rates								0.004 (1.346)
ECM(-1)	-0.635* (-4.131)	-0.642* (-3.969)	-0.652* (-4.1220)	-0.646* (-4.129)	-0.645* (-4.124)	-0.660* (-4.226)	-0.653* (-4.236)	-0.732* (-4.512)
Constant	0.002 (0.726)	0.001 (0.536)	0.001 (0.448)	0.002 (0.699)	0.002 (0.705)	0.001 (0.584)	0.002 (0.827)	0.001 (0.118)
Observations	40.000	40.000	40.000	40.000	40.000	40.000	40.000	40.000
Adjusted R-squared	0.342	0.346	0.334	0.329	0.328	0.339	0.346	0.371
Durbin – Watson	1.853	1.944	1.751	1.834	1.835	1.924	1.837	1.956
F- Statistic	4.373	3.575	3.446	3.729	3.723	3.857	3.948	4.279
Prob (F- Statistic)	0.002	0.005	0.006	0.005	0.005	0.004	0.003	0.002
Cross Section Included	4.000	4.000	4.000	4.000	4.000	4.000	4.000	4.000
Method	PLS	PLS	PLS	PLS	PLS	PLS	PLS	PLS

PLS- Panel Least Squares, values in parentheses are associated t- values, * Indicates significant at the 1percent level, ** significant at 5 percent level and *** significant at the 10 percent level, Time period; 1997-2008

Table 4: ECM Regression Results- Narrow Interest Rate Spreads (NAIM)

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Overhead Cost	0.952*	0.950*	0.889**	0.873**	0.873**	0.803**	0.814**	1.256*
	(2.770)	(3.350)	(2.492)	(2.704)	(2.700)	(2.220)	(2.395)	(4.174)
Liquidity	0.104**	0.501	0.103**	0.095**	0.095**	0.100**	0.080**	0.109*
	(2.624)	(0.138)	(2.537)	(2.610)	(2.609)	(2.520)	(2.119)	(3.253)
Loan Loss Provision	-0.492	0.562	-0.651	0.216	0.202	-0.425	-0.521	-0.544
	(-0.114)	(0.150)	(0.000)	(0.054)	(0.051)	(-0.098)	(-0.128)	(-0.149)
Market Share Deposits	0.053	0.050	0.028	0.050	0.050	0.055	0.045	0.030
	(1.290)	(1.400)	(0.549)	(1.316)	(1.320)	(1.316)	(1.136)	(0.850)
Equity	0.427	0.213*	0.668	0.486	0.488	0.326	0.417	0.302
	(1.320)	(4.450)	(0.482)	(1.636)	(1.640)	(0.958)	(1.364)	(1.102)
Tax		-0.157						
		(-0.915)						
Intermediation		-0.177*						
		(-4.992)						
Market Share Loans			0.023					
			(0.892)					
Equity Ratio			-0.050					
			(-0.210)					
Herfindahl Deposits				0.049				
				(1.585)				
Herfindahl Loans					0.049			
					(1.600)			
Domestic Inflation						0.002		
						(1.120)		
South Africa's' interest rate (T-bill rate)							0.004**	
							(2.187)	
Changes in Exchange rates								0.014*
								(2.846)
ECM(-1)	-0.440*	-0.414**	-0.459**	-0.531*	-0.529*	-0.465	-0.611*	-0.729*
	(-2.778)	-2.211	(-2.712)	(-3.609)	(-3.596)	(0.008)	(-3.455)	(-4.815)
Constant	-0.003	-0.001	-0.002	-0.005	-0.005	-0.003	-0.002	-0.007
	(-0.525)	(-0.289)	(-0.439)	(-1.098)	(-1.097)	(-0.627)	(-0.364)	(-1.646)
Observations	40.000	40.000	40.000	40.000	40.000	40.000	40.000	40.000
Adjusted R-squared	0.402	0.602	0.371	0.495	0.494	0.391	0.465	0.575
Durbin – Watson	1.690	1.282	1.667	1.584	1.584	1.693	1.537	1.796
F- Statistic	5.370	8.372	3.875	6.455	6.434	4.580	5.839	8.541
Prob (F- Statistic)	0.001	0.000	0.003	0.000	0.000	0.001	0.000	0.000
Cross Section Included	4.000	4.000	4.000	4.000	4.000	4.000	4.000	4.000
Method	PLS	PLS	PLS	PLS	PLS	PLS	PLS	PLS

PLS- Panel Least Squares, values in parentheses are associated t- values, * Indicates significant at the 1percent level, ** significant at 5 percent level and *** significant at the 10 percent level, Time period; 1997-2008

found a positive relationship between the interest margin and bank operating costs (Liebeg and Schwaiger, 2006; Estrada et.al , 2006; Naceur, 2003; Affanasief et al., 2002; Maudos and Fernández de Guevara, 2004). From a policy perspective, the government should put in place an efficient credit reference bureau to reduce the credit assessment and contract enforcement costs as a strategy to reduce bank-operating costs in order to reduce interest rate margins in Swaziland.

Bank liquidity may have either a negative or positive effect on interest rate margins. The negative effect of bank liquidity on interest margins implies that excess liquidity by banks does not lead to higher spreads, which may be due to existence of low deposit rates and government debt instruments as safe havens for banks. The positive effect of bank liquidity on interest margins is a scenario where banks with excess holdings of liquid assets incur more opportunity costs which they pass over to borrowers. From the empirical results of this study, bank liquidity had varying effects on NAIM and NIM. While bank liquidity had a negative and significant effect on NIM, the effect on NAIM was positive and significant. By implication, bank liquidity reduces net interest margins and increases narrow interest margin. Martinez Peria and Mody (2004) also found a positive relationship between liquidity and margins due to banks foregone interest income that is recovered from borrowers in the form of higher margins. However holding liquid assets reduces the risk that banks may not have adequate cash to meet deposit withdrawals or new loan demand (i.e. liquidity risk), in that way forcing them to borrow at excessive costs. Consequently, as the proportion of liquid assets increases, a bank's liquidity risk decreases, leading to a lower liquidity premium component of the net interest margin (Angbazo, 1997 and Drakos, 2003).

With regard to *Intermediation*- banks that are more involved in intermediation of loans should be better prepared for competition and charge lower margins and so, a negative association between intermediation and the various margin measures was expected. In relation to the results from this study, mixed findings were observed. Intermediation bears a negative coefficient and is statistically significant in relation to the NAIM but statistically insignificant with a positive coefficient in relation to the NIM. The expected sign for intermediation agrees with the results from the ECM estimation (particularly with the narrow interest rate margin).

The equity variable which is a measure of the level of bank capitalization has a positive and significant effect only on NAIM but predominantly statistically insignificant with NIM. While adequate bank capitalization is important to enhance the stability of the banking sector through restriction of excessive risky asset growth and provision of protection to depositors, undue restrictions of scale of banking operations may negatively impact on bank profitability. So bank regulators need to act with restraint to strike the balance between the safety and soundness of the banking system vis-à-vis bank profitability to as to provide an incentive to reduction of interest rate margins. Martinez Peria and Mody (2004) also found a positive relationship between equity and interest rate spreads, as large amount capital assets can be expensive for banks.

Concentration of the banking sector (measured by Herfindahl index for both loan and deposit markets) did not have any significant effect on interest spreads in Swaziland. This was in sharp contrast to other empirical studies where the bank concentration index had a positive and significant effect on interest rate spreads. For example, margins have been found to be positively related to the level of market concentration in European banking sectors (Saunders and Schumacher, 2000; Maudos and Fernandez de Guevara, 2004), the US (Angbazo, 1997) and Australia (McShane and Sharpe, 1985).

The variability of the exchange rate (rand to dollar) -banks' balance sheets is also affected by changes in the exchange rates. As expected, this variable has a positive and significant association with the narrow interest rate margin as indicated by the ECM estimations. However, the im-

pact of changes in exchange rates with regards to the net interest margin is not significant though the sign is positive. Exchange rate volatility increases risk in cross-border bank activity and losses can occur in foreign exchange transactions. The variability of the exchange rate is a measure of macroeconomic instability, which tends to push up interest rate margins. From the policy perspective, government must work towards stabilization of macroeconomic policies so as to induce banks to charge low risk premiums and to reduce interest spreads.

South Africa's interest rates- (South Africa's Treasury bill rates) have a positive and significant effect on NAIM. As a member of the CMA, Swaziland's interest rates track South Africa's rates and this study have proved that the higher the interest rates, the higher the margins.

Conclusion

Interest rate margins in Swaziland are significantly influenced by overhead costs, liquidity, equity, intermediation, bank concentration, South Africa's interest rates (T-bill rate) and exchange rates volatility.

The intermediation function of banks is important to stimulate private sector investment in the economy and so there is a need for a more specific policy on interest rate margins. The measure of concentration shows ambiguity in the results (statistically positive for NAIM and negative for NIM) hence there should be an improved provision and enabling environment to encourage more banks to set up branches in Swaziland.

An effective role should be continued by the Central bank of Swaziland to maintain a stable and competitive exchange rate since this variable has a positive effect on interest rate margins (for both net and narrow interest rate margins). This is important in order to narrow interest rate margins in the long run. An effective management of exchange rates improves macroeconomic stability which in the process reduces the risks faced by banks and hence banks can reduce the interest rate margins. This also keeps the credibility and trust that banks put on the exchange rate policies. Findings on overhead costs, liquidity (for NAIM) and intermediation with respect to the narrow interest margin show that these variables are statistically significant and therefore important in the determination of interest rate margins in the context of Swaziland economy. It is considered that the higher the operating costs, the higher the margins that banks set out to cover these costs. On the other hand, banks with high holdings of liquid assets bear high opportunity costs. These variables should also be monitored for efficiency's sake in the banking system since such costs are usually passed on to borrowers by charging high interest rates or bank charges.

Overall, margins are driven by bank specific, banking industry-level factors as well as macroeconomic variables. We find strong evidence that the South African real Treasury bill rate and exchange rate volatility are positively related to interest margins. The T- bill rate proxies for the marginal cost of funds, and this are a benchmark for interest rate decisions by banks. The real T-bill rate could also proxy for alternative investment opportunities of banks. Therefore, a stable macroeconomic environment is potentially conducive to reduce interest rate margins.

It is therefore of paramount importance to sustain stable inflation exchange rates in order to induce banks to reduce interest rate margins. This will reduce the cost of funds and stimulate borrowing by private agents for investments, thereby contribute to economic growth. Demirguc-Kunt and Huizinga (1999) found a positive correlation between higher inflation; higher real interest rates and higher spreads. These variables contribute to a stable macroeconomic environment, which is ideal for business.

References

- Affanasieff T., P. Lhacer and M. Nakane. (2002). "The determinants of bank interest spreads in Brazil ", *Banco Central di Brazil Working Papers*.
- Al- Haschimi, A. (2007). "Determinants of Bank Spreads in Sub-Sahara Africa", *draft*.
- Allen, L., and T. Bali.(2004). "Cyclicality in Catastrophic and Operational Risk Measurements." *Working Paper*.
- Allen and Saunders (2004), incorporating Systemic Influences into Risk Measurements: A Survey of the Literature, *Journal of Financial Services Research*, 26, 161-191.
- Angbazo, L. 1997. "Commercial bank net interest margins, default risk, interest-rate risk, and off-balance sheet banking", *Journal of Banking and Finance*, Vol.21: 55-87.
- Barajas, A., R. Steiner and N. Salazar. 1996. "Interest spread in banking: Costs, financial taxation, market power and loan quality in the Colombian case, 1974-1988". *IMF Working Paper* No. 110. Washington, D.C.
- Barajas, A., Steiner, R., and Salazar, N. 1999. "Interest spreads in banking in Colombia 1974-96", *IMF Staff Papers*, Vol. 46: 196-224.
- Brock, P. L., Rojas-Suarez, L., 2000. Understanding the Behaviour of Bank Spreads in Latin America. *Journal of Development Economics* 63(1), 113-34.
- Central Bank of Lesotho, Annual Report, various issues, (2009)
- Central Bank of Swaziland, Annual Report, various issues, (2000)
- Central Bank of Swaziland, Annual Report, various issues, (2002)
- Central Bank of Swaziland, Annual Report, various issues, (2007)
- Central Bank of Swaziland, Annual Report, various issues, (2008)
- Central Bank of Swaziland, Annual Report, various issues, (2009)
- Chirwa, E. W. and Mlachila, M. (2004) Financial reforms and Interest Rate Spreads in the Commercial Banking System in Malawi. *IMF Staff Papers*, 51(1).
- Craigwell, R. and Moore, W. (2000) Market Power and Interest Rate Spreads in the Caribbean, Paper Presented at the XXXII Annual Monetary Studies Conference, Kingston, Jamaica.
- Crowley, J. (2007) Interest Rate Spreads in English-Speaking African Countries. *IMF Working Paper*, WP/07/101.
- Demerguc, Kunt A. and H. Huizinga. 1999. "Determinants of commercial bank interest margins and profitability: Some international evidence", *World Bank Economic Review*, Vol.13: 379-408.
- Drakos K (2003): "Assessing the Success of Reform in Transition Banking 10 Years Later: an Interest Margins Analysis". *Journal of Policy Modelling*, 25:309-317.
- Elkayam, D. 1996. "The effect of monetary policy on local-currency segment in Israel 1986-1900". *Bank of Israel Economic Review*, 68: 1-22.
- Engle, R. F. and Granger, C. W. J. (1987) 'Cointegration and error correction: representation, estimation and testing', *Econometrica*, 55, 251-276.
- Estrada, Dairo, Esteban Gómez and Inés Orozco. 2006. "Determinants of Interest Margins in Colombia". *Boradores de Economia*. No. 393.
- Gelos, R. Gaston (2006), "Banking Spreads in Latin America," *IMF Working Paper* WP/06/44.
- Hanson, J.A. and R.R. Rocha. 1986. "High interest rates, spreads, and the costs of intermediation". *Industrial and Finance Series*, vol. 18. The World Bank.
- Ho, T., and A. Saunders. 1981. "The Determinants of Banks Interest Margins: Theory and Empirical Evidence." *Journal of Financial and Quantitative Analysis* 16, no. 4: 581-600.
- Im, K.S., Pesaran, M. H. & Shin, Y., 1997. "Generalised Impulse Response Analysis in Linear Multivariate Models," *Cambridge Working Papers in Economics* 9710, Faculty of Economics, University of Cambridge.
- Im, K. S., Pesaran, M. H and Shin, Y. (2003). "Testing for unit roots in heterogeneous Panels", *Journal of Econometrics*, 115, pp. 53-74.
- Kim, J., M. Ogaki, and M. Young. 2003. "Structural Error Correction Models: Instrumental Variables Method and an Application to an Exchange Rate Model." Rochester Centre of Economic Research Working Paper No. 502.
- Levin, A., and Lin, C. F., 1992. Unit Root Tests in Panel Data: Asymptotic and Finite Sample Properties, *University of California, San Diego*, Discussion Paper No: 92-93.
- Liebeg, David and Markus S. Schwaiger.2006. "Determinants of the Interest Rate Margins of Austrian Banks", Oesterreichische National bank Financial Stability Report, 12(2006), 104-116.
- Maddala GS, Wu S (1999): A Comparative Study of Unit Root Tests With Panel Data and a New Simple Test. *Oxford Bulletin of Economics and Statistics*, 61:631-652.

- Martinez Peria, M. S., Mody, A., 2004. How Foreign Participation and Market Concentration Impact Bank Spreads: Evidence from Latin America. *Journal of Money, Credit, and Banking* 36(3), 511-537.
- Maudos, J., and J.F. Guevara. 2004. "Factors Explaining the Interest Margin in the Banking Sectors of the European Union." *Journal of Banking and Finance* 28, no. 9: 2259–2281.
- McShane, R.W., and I.G. Sharpe. 1985. "A Time Series/Cross Section Analysis of the Determinants of Australian Trading Bank Loan/Deposit Interest Margins: 1962–1981." *Journal of Banking and Finance* 9, no. 1: 115–136.
- Naceur, B. Samy. 2003. "The determinants of the Tunisian Banking Industry profitability: Panel evidence". Université Libre de Tunis, Department of Finance Working Paper 2003.
- Ndung'u, N. and Ngugi, R.W. (2000) Banking Sector Interest Rate Spreads in Kenya, *Kenya Institute for Public Policy Research and Analysis Discussion Paper*.
- Paroush, J. 1994. "The effect of uncertainty, market structure and collateral policy on the interest rate spread". *Bank of Israel Banking Review*, 4: 79–94.
- Pedroni, P., 1995. Panel Cointegration, Asymptotic and Finite Sample Properties of Pooled Time Series Tests with an Application to the PPP Hypothesis, *Indiana University*.
- Pedroni, P. (1999). "Critical values for Cointegration Tests in Heterogeneous Panels with Multiple Regressors", *Oxford Bulletin of Economics and Statistics*, Special Issue, pp. 653-670.
- Pedroni, P., (2000). "Fully Modified OLS for Heterogeneous Cointegrated Panels". *Advances in Econometrics*, 15, 93-130
- Pedroni, P., (2004). "Panel Cointegration, Asymptotic and Finite Sample Properties of Pooled Time Series Tests with an Application to the PPP Hypothesis". *Econometric Theory*, 20, 597- 625
- Ramful, P. (2001) "The Determinants of Interest Rate Spread on the Mauritian Banking Sector", *Research Department Bank of Mauritius*.
- Randall, Ruby. (1998). "Interest Rate Spreads in the Eastern Caribbean"; IMF working Paper WP/98/59, Washington D.C.
- Reserve Bank of South Africa, Annual Report, various issues, (2009)
- Sander, H., Kleimeier, S., (2004). Convergence in euro-zone retail banking? What interest rate pass-through tells us about monetary policy transmission, competition and integration. *Journal of International Money and Finance* 23.
- Saunders, A., and L. Schumacher. (2000). "The Determinants of Bank Interest Rate Margins: An International Study." *Journal of International Money and Finance* 19, no. 6: 813–832.
- Sologoub, D. (2006). "The Determinants of Bank Interest Margins and Profitability": Case of Ukraine. www.bof.fi/bofit/seminar/bofcef06/sologub.pdf
- Turtelboom, B. (1991). "Interest Rate Liberalisation: some lessons from Africa". *IMF Working Paper* WP/91/121 (Washington: International Monetary Fund).
- 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 Development Report, 2005, World Bank.
- Zarruk, R.E. (1989). "Bank spread with uncertainty deposit level and risk aversion". *Journal of Banking and Finance*, 13: 797–810.

New Banking Technology and Service Quality in Indian Public Sector Banks: A Micro Level Study

A. Abdul Raheem

Faculty, Department of Economics, The New College, Chennai, India
E-mail: abdulraheem1967@gmail.com

M. Krishnamoorthy

Research Scholar, Department of Economics, The New College, Chennai, India

Abstract: *The banking sector in India is facing challenging times. With the advent of globalisation, privatisation liberalization in India, the banks are now focusing on cost reduction, innovative products and technology. Customer's service in banks is a systematic concept. With the competition in banks becoming fierce, it is natural for banks to view with one another to win over customers. In a competitive environment, not only winning new customer, but also retaining he existing customer base assumes greater importance. Though in the eighties Transaction Banking was the order of the day¹. Relationship Banking has regained its prominence once again, with many banks the world over strengthening this concept. Studies indicate that it is much more profitable and cost effective retaining customers rather than getting new customers. Therefore, this paper attempts to analyse the impact of new banking technology on quality service in public sector banks in Chennai city.*

Keywords: Public sector bank, globalisation, customer's service

Introduction

The banking sector in India is facing challenging times. With the advent of globalisation, privatisation liberalization in India, the banks are now focusing on cost reduction, innovative products and technology. The banking industry is expected to be a leading player in e-business. While the banks in developed countries are working primarily via Internet as non-branch banks, banks in the developing countries use Internet as an information delivery tool to improve relationship with customers. Customer service in banks is being talked about everywhere. In various forums, in the press and in conversations, customer service is in the news. Customer's service in banks is a systematic concept. With the competition in banks becoming fierce, it is natural for banks to view with one another to win over customers. In a competitive environment, not only winning new customer, but also retaining he existing customer base assumes greater importance. Though in the eighties Transaction Banking was the order of the day¹. Relationship Banking has regained its prominence once again, with many banks the world over strengthening this concept. Studies indicate that it is much more profitable and cost effective retaining customers rather than getting new customers. A successful bank of the future will be the one that excels in customer service and provides them a range of service and product and does continues exercise in improving its potential to serve well.

Service Scenario up to the 1980s and 1990s

For over two decades, the Government, the Reserve Bank of India and the banks were seriously concerned about the standard of customer service in banks. Several studies were instituted and strategies evolved to improve customer service, as early as in 1972, the Banking Commission appointed by the Government of India under the Chairmanship of Shri R.G. Saraiya, had made several recommendations on customer service. In the year 1975, the Government appointed a Working Group on customer service in banks under the Chairmanship of Shri R.K.Talwar. This Working Group made 176 recommendations covering all the important areas relating to

customer service besides some general recommendations. During the eighties, greater importance was given to the redressal of grievances of customers². The Government and the RBI, to redress the grievances took several steps such as setting up of Customer Service Committees, Customer Service Centers in Various cities, Directorate of Public Grievances under the Cabinet Secretariat, etc., as also in the observance of Customer Day. The year 1986 was elaborated by public sector Banks as Customer service year. In 1988 witnessed further improvement in customer service with the implementation of the recommendations of the Estimate Committee.

During 1990-91 two Committees, viz Narasimham Committee and the Goiporia Committee looked into various issues relating to working of public sector banks and customer service. The recommendations of the Narasimham Committee had a much greater impact on the financial strength, profitability, and commercial character and functioning of Indian banks, whereas, the recommendations of the Goiporia Committee focussed on improving the customer service in banks. In many ways the recommendations of the Goiporia Committee complement the efforts of the Narasimham Committee. Both these Committees have together addressed various issues having a bearing on customer perception and customer satisfaction³. The first major development during this period is the entry of new players in the market. The new breed of private sector and foreign banks has entered the market, with branches established mostly in metropolitan cities and major towns. The ambience and a level of service that is far different from those of an average public sector bank branch. Their emphasis on the state of art technology, banking convenience and staff responsiveness has made them stand out as models worthy of emulation. As a result of this the customer today has a much wider choice of banking institutions to choose from.

Another important development during this period relates to the liberalization of branch licensing policy. Banks were encouraged to fall a market segmentation approach and establish specialized branches such as NRI branch, SSI branch, if branches, AF branch, etc., this period also witnessed the beginning of a new era of price competition. There is a greater degree of freedom available to the banks in pricing their products and service and it is generally believed that any much price competition would help pass on the benefits of efficiency to the customer. In a bid to provide greater value for money, many banks are adding new features to their schemes and services, brining greater flexibility and operational convenience⁴. Another important development is in the area of computerization and technology upgradation. The historic agreement signed between the IBA and bank trade unions has thrown open tremendous opportunities in terms of making Indian banking technologically advanced³. The benefits of such technology upgradation are available to bank customer in different ways such as: Computerized banking environment, Speedier transactions, and accurate statements, ATMs offering 24 hours banking, Telephoning, Anywhere anytime banking, Customers terminals, and so on.

Challenges of the Future

The Talwar Committee put is very aptly when it said that the main purpose of banking is to create and deliver customer needed services in a customer-satisfying manner. Hence, there are two elements of the banking service viz., creation and delivery of service. All the measures mentioned earlier can vouch for a bank's success in creating customer needed service, but we have to go a long way in delivering them in a customer-satisfying manner. Focussing our attention on the following aspects, viz., Technology Product Diversification and innovation can achieve this.

Technological Factors

The foreign banks and the private sector banks having a clear technological advantage and economies of scale right from day one are posing a formidable challenge to the public sector

banks. These new banks are targeting the cream of business through sophisticated services and improved facilities. As competition gains further momentum in a deregulated interest rate regime, banks will have to operate within the ambit of a declining spread. Under such circumstances, reengineering of business through sophisticated technology based services, will not only lead to business creation, but will also help to cut down the operational expenditure and enhance efficiency of operations, payments system, transfer of funds and various housekeeping functions. At the same time, technology can no longer be considered as a backroom expense item, but it should be seen as a competitive asset. In the coming days, technology will have to become the all-pervasive catalyst in matters of product diversification expeditious transfer of funds mechanism, customer friendly payment system and efficient housekeeping functions. The advent of a cashless society has made it imperative for banks. It is abroad to introduce a host of info tech based product. Namely smart and super smart cards, debit cards, the electronic purse, hi tech cash dispensers, shared network of ATMs etc., These have given rise to the concept of anywhere anytime banking that have a clear cut customer focus associated with them. The shorter product life cycle information technology and computer based services⁵. The industry has to take cognisance of the development information technology and apply them not as a compulsion, but as an effective marketing weapon.

Product Diversification and Innovation

In keeping with the market realities, it is almost certain that the range of products and services will enlarge considerably in the coming years. As the life cycle theory suggests, many new products, which have become popular abroad, will soon make their appearance in the Indian financial market. To name a few, concepts like financial derivatives, asset securitisation, futures, and options, custodial services, bought out deal are sure to gain popularity. These could be the areas wherein banks will have to concentrate more to make up for the lost ground in traditional business. Competition inherently calls for specialization of operations and banks, in order to stay afloat in the competitive environment, will have to take recourse to increasing specialization and skill upgradation. Specialization will have to be considered for undertaking agricultural consultancy services, allied activities, venture capital financing, industrial financing etc., Market segmentation will again be the crucial cornerstone on which business prospects will have to be redefined. However, at the same time, it should be ensured that the social considerations and responsibilities are not diluted to promote business. Rather, strong and effective machinery should be evolved to productively channel resources towards socio economic priorities, conceived at the time of nationalization.

Office Atmosphere and People

One of the most important aspects, which should receive our attention, is the layout of the branch. The alignment of counters and the various departments should facilitate smooth flow of activities in an office. The seating arrangements sometimes do not attribute to optimum efficiency. It is advisable to organize the layout of the branch according to the customer profile of the branch. These are simple factors, if ignored that can result in customer inconvenience, which ultimately may affect business. People are often the most discussed but least addressed aspect of retail banking. People are important because they are the ones who with their knowledge and behaviour influence customer perception about the quality of service and the image of the bank. Changes taking place in the market calls for an attitudinal reorientation. Customer care and customer concern becomes far more important⁶. The staff in general, and those at the counters in

particular, should be made to realize that the installation of computers and other machines notwithstanding, it is they who make a major difference in terms of achieving customer satisfaction⁷. Branch managers should make it a point to spend more time with customers to understand their needs and aspirations and take genuine interest in meeting them. Our focus should be on: Re-deploy people released as a result of computerization for customer contact and relationship maintenance; Greater training and upgradation of skills; Trade unions should move away from their traditional roles and bring about a new customer friendly work culture in banks; and Comprehensive and more frequent studies both at the bank level and the industry level to assess customer expectations and service related perceptions. Therefore, this paper attempts to analyse the impact of new banking technology on quality service in public sector banks in Chennai city.

Methodology

This study involved the collection of primary data collected from sample customers of public sector banks viz, IOB, SBI, Indian Bank, and PNB in Chennai City through structured questionnaires. Samples of 60 customers from various selected public sector bank branches in Chennai city for the purpose of this study. This study selected following new banking technology parameters viz., Net Banking, Tele Banking, Web banking, Mobile banking, ATMs smart, credit and debit cards, Phone Banking, ATM and Electronic Funds Transfers, FOREX Remittances, Electronic Clearing Service, E-Finance, ATM and Bill Payments. Most of questions were designed having a 5-point scale excellent (5), very good (4), good (3), satisfactory (2) and poor (1). Interviewee's response to various elements under each question was totalled and multiplies by the grades and divided by number of respondents and scores were calculated. The Multiple Log Linear Model is used to analyse the data.

Analysis of Data and Results

A successful bank of the future will be the one that excels in customer service and provides them a range of service and product and does continues exercise in improving its potential to serve well⁸. The Talwar Committee put is very aptly when it said that the main purpose of banking is to create and deliver customer needed services in a customer-satisfying manner⁹. Hence, there are two elements of the banking service viz., creation and delivery of service. All the measures mentioned earlier can vouch for a bank's success in creating customer needed service, but we have to go a long way in delivering them in a customer-satisfying manner. Focusing our attention on the following aspects, viz., Technology Product Diversification and innovation can achieve this¹⁰. Indian economy is expected to post a growth of around 7 to 8percent in 2006-2007, sustaining the momentum of 2007-2008. Prospects of good performance under agriculture appear bright, with the prediction of normal monsoon. While industry is likely to grow by about 7 per cent service sector may expand by 8 per cent. Economic activity may be accelerated by greater investment by the Government and the private sector¹¹. The Government has already proposed creation of a fund for promoting investment in infrastructure in rural and urban areas for facilitating growth in agriculture and industry including small industry. Banks are to play a positive role in sustaining economic growth through the provision of requisite finance¹². Therefore, this study selected the new banking technology parameters viz., Net Banking, Tele Banking, Web banking, Mobile banking, ATMs smart, credit and debit cards, Phone Banking, ATM and Electronic Funds Transfers, FOREX Remittances, Electronic Clearing Service, E-Finance, ATM and Bill Payments and how far and to what extent these attributes are responsible for ser-