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Efficiency of Commercial Banks in Namibia

By

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ABSTRACT

This paper examines the efficiency of commercial banks in Namibia by using operating ratios and the econometric cost frontier approach. While the ratio analysis focuses essentially on profitability measures, the estimation of a translog cost function enabled us to measure both scale and scope economies. Among others, the study established that profit ratios are high in the Namibian commercial banking industry. Our translog cost function established that there exist economies of scale in commercial banking in Namibia, which could be exploited by banks expanding their scale of operation. The paper also established that more banking firms could still join the industry without necessarily compromising industry profitability since most of the existing firms are producing at the falling portion of their Average Costs curves. In general, the study found little substitutability between factor inputs in the commercial banking industry, a factor that could have added considerably to the observed high costs of producing output in the industry.

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1. Introduction

The study of the efficiency of the financial system and in particular banks has gained a lot of popularity in recent times for several reasons. First, the efficiency of banks is directly linked to the productivity of the economy. Banking system assets constitute a substantial proportion of total output[1]. Banks provide liquidity, payments and safekeeping for depositors` and channel these funds into investment and working capital requirements. In addition, banks are supposed to play a special role in funding small businesses that often have very limited access to other sources of external finance. Banks also play a major role in ensuring a smoothly functioning payment system, which allows financial and real resources to flow freely to their highest-returns uses.

A basic benefit of enhanced efficiency is a reduction in spreads between lending and deposit rates. This is likely to stimulate both greater loan demands for industrial investment (and thus contribute to higher economic growth) and greater mobilisation of savings through the banking system. Banks in most developing countries operate with relatively wide spreads. Although government policies and regulations are considered major causes of such wide spreads, studies on banking efficiency has pointed at operating inefficiencies as one other possible source that needs to be investigated. Wide spreads affect intermediation and distort prices thus impairing the role of the financial system in contributing to rapid economic growth.

With increasing globalisation of financial markets it may be necessary to find out if "production relations are consistent within an industry such as banking"(Fields, Murphy, and Tirtiroglu 1993). This is all the more accentuated by privatisation, increased entry across national borders, deregulation and lower barriers to foreign entry. Globalisation will infer increased entry across national borders. Removing restraints to entry will increase the volume of business done by foreign banks in the domestic economy and may lead to a restructuring of competition. If new entrants bring different production and cost techniques into a developing economy setting, the results may be unpleasant for the domestic industry at least, at the initial stages. Slightly related to this are the rapid changes in the structure of financial service industries determining the cost and revenue efficiency of the evolving financial institutions, a situation that has been facilitated by the globalisation of financial markets. It might be beneficial to find out if the evolving structure has led to greater efficiency that could translate into improved profitability, greater amounts of funds being intermediated, better prices and service quality for consumers and greater safety and soundness of the financial system.

The solvency of banks and the strength and soundness of the banking system is germane to the performance of the entire economy. Without a sound and efficiently functioning banking system, the economy cannot function. Solvency of banks as an enterprise extends beyond solvency considerations for almost all other enterprises. When banks fail, the whole of a nations' payments system is thrown into jeopardy. Therefore, banking

[1] In Namibia the assets of the commercial banking system represent close to 54 per cent of GDP.

supervisors place a lot of emphasis on banks operating efficiency. Finally, understanding the cost structure, operational efficiency and economies of scale of banks are crucial factors in the structure of the nations financial system. One issue that has received considerable attention in the Namibian financial terrain in recent times is the structure of the banking system. The question has been asked as to whether Namibia is over banked given the small size of its population. Are cost curves downward sloping? Have scale economies been increasing as bank size increased in the economy? Do monopoly conditions exist? Efficiency studies will provide answers to some of these questions.

The principal objective of this study, therefore, is to provide answers to some of the issues raised above by empirically investigating the efficiency of the commercial banks operating in Namibia. Specifically, the study will utilise both operating ratios and the cost efficient frontier approach in studying the efficiency of banks in Namibia. Moreover, the study will attempt to provide empirical evidence on the efficiency of banks from countries in the same geographical region. This second objective is informed by the fact that a number of observations have been made with regard to the relatively wide spreads in the commercial banking system in Namibia.[2] This, if it exists, should have severe implications for efficiency.

This study is divided into six parts. In section 2, we do an overview of the Namibian commercial banking system. Sections 3 and 4 focus on the empirical studies. While section 3 utilises operating ratios, section 4 is concerned with the use of an econometric approach to the study of efficiency. In Section 5 we examine some of the issues dealing with the structure of commercial banks in Namibia while finally in section 6 we summarise our main conclusions.

2. The Namibian Commercial Banking System

There are currently five commercial banks in Namibia with total assets valued as at December 1998 at about N$ 8281.1 million and branches totalling 127.[3] These are the First National Bank, Standard Bank, Commercial Bank of Namibia, Bank Windhoek and the City Savings and Investment Bank which is the latest addition having just joined the train in1994.

Commercial banks dominate the nations financial terrain accounting for close to 65% of total financial assets (excluding the Bank of Namibia). They also account for close to 90 % of total credit to the private sector. By far, loans and advances constitute the largest proportion of total assets while deposits composed of demand, savings and time deposits make up a large chunk of total liabilities. Most of the branches of banks are located in the urban areas with the capital, Windhoek accounting for close to 35% of total bank branches. The commercial banking system in Namibia has very strong links with South Africa with one bank, the Standard Bank having 100 % South African ownership. South African ownership in three other banks ranges between 43.6 % (Bank Windhoek) to 78 % (First National Bank). South

[2] See for instance "Namibia: Financial Services and the GATT's" a report prepared for the Co-ordinated African Programme of Assistance on Services (CAPAS), July 1998, the World Bank Private Sector Assessment Report on Namibia (1994) and the Namibian Newspapers (July 7, 1999 p.10).

[3] This figure includes 44 agencies.

African ownership in the Commercial Bank of Namibia is about 47.3 %. Namibian equity is held in only two banks, Bank Windhoek (56.4%), and the CSIB, 46.5 %.

Two main commercial banks, the First National Bank and the Standard Bank dominate the banking industry. These account for close to 62% of the total assets and close to 60% of total deposits and loans in the system. These two banks have in most cases acted as price leaders in the economy determining the trend in interest rates. Collusive behaviour is covert, as banks tend to follow the pattern dictated by the two main banks. As banks offer basically the same facilities, competition in the banking system is mainly non-price in the form of advertising, quality improvement, product packaging and services.

The banks in Namibia are well equipped going by the standards in Sub-Saharan Africa. This is made possible by the good access to the South African electronic network and computer services. The banks are well integrated into the international payments system using SWIFT[4] for international transactions. The Namibian banking system also has SASWITCH[5] facilities providing access to a number of local and international banking and credit card facilities.

The Bank of Namibia established at independence provides regulatory facilities to the commercial banks through the Bank of Namibia Act, 1997, and the Banking Institutions Act, 1998. Apart from performing other central banking functions, the bank also carries out limited monetary policy functions due mainly to its membership of the Common Monetary Area. The activities of the Standard Bank and the First National Bank are also subject to the regulatory authorities of the South African Reserve Bank thus suggesting a dual regulatory arrangement for these two banks.

3. Measuring Efficiency through the Use of Operating Ratios.[6]

Econometric analysis of efficiency suffers from a number of shortcomings. Part of this shortcoming is in coming out with a best measure that is devoid of measurement problems and can produce robust results that will make comparison among banks and between countries possible. This has been a major problem in the literature. Most econometric studies in measuring bank output use aggregative indices like total assets, loans or deposits or the number of accounts as an index of bank output. However, it has been found that none of these can sufficiently capture bank output defined as the value of services rendered by banks. Faced with these problems, a few studies have resorted to the use of accounting data on bank margins, costs, and profits as measures of bank efficiency. Three types of operating ratios may be used in the analysis of bank performance. These are operating asset ratios, operating income ratios and operating equity ratios. Before we go on to discuss each of these ratios and apply them to our set of data, a caveat is in order here.

Although operating ratios are widely used, they suffer from certain serious setbacks. Differences in

[4] Abbreviation for "Society for Worldwide Interbank Financial Telecommunications"

[5] The South African switch system

[6] The approach adopted here relies mainly on the analytical technique of Vittas (1991)

capital structure, business mix and accounting standards across banks and countries may affect these ratios and render comparability inadequate (Vittas, 1991). Differences in capital structure refer to differences in the equity capitalisation ratio of different banks. Banks with a higher equity will generally report higher operating ratios. For business mix, differing combinations of high and low margin business will impact on the ratios computed. Accounting factors like the valuation of assets, the treatment of reserves for depreciation, pensions, and loan losses and the use of hidden reserves are all accounting practices that may distort operating ratios (Vittas, 1991).

A combination of ratios could however serve as a good indicator for the measurement of bank performance. We therefore hope that in this study combining operating ratios with our econometric results will enable us to make one or two deductions about the efficiency of banks in Namibia.

3.1 Operating Asset Ratios (OAR)

Operating Asset Ratios relate bank incomes and expenses to average total assets. The main usefulness of OAR is that they are directly comparable to the rates of interest applied on loans and deposits. But it must be emphasised once more that where banks have different capital structure, business mix and accounting practices, this may affect the usefulness of this ratio. We have reported the ratios computed for Namibian banks in Table 1 and for purposes of comparison, we also report the results from other banks in the region on Table 5.

Table 1: Operating Asset Ratios

Banks/Years	Interest Margin	Non-int. Income	Gross Margin	Opera-ting Costs	Loan Loss Prov.	Total Costs	Pre-tax Income	After tax Income
FBN								
96	7.2	2.8	10.0	4.3	1.3	5.6	4.3	2.9
97	7.5	3.0	10.0	4.1	1.6	5.7	4.4	2.9
98	7.1	3.9	11.0	4.5	1.6	6.1	4.8	3.0
SBN								
96	5.4	2.6	8.0	4.4	0.4	4.8	3.1	2.1
97	5.8	2.6	8.5	4.7	0.4	5.1	3.3	2.2
98	6.3	3.0	9.4	4.7	1.0	5.7	3.6	2.1
CBN								
96	4.8	4.8	9.6	3.8	1.1	5.0	1.8	1.3
97	5.0	2.1	7.2	3.7	1.2	4.9	1.7	2.3
98	4.3	2.4	6.8	3.6	1.0	4.7	2.0	2.0
BW								
96	6.0	6.0	12.1	5.4	0.7	6.2	2.9	1.9
97	6.5	3.1	9.7	5.4	0.8	6.2	3.5	2.3
98	6.1	3.0	9.1	4.7	1.0	5.8	3.3	2.0
CSIB								
96	8.9	0.8	9.8	7.2	2.3	9.6	-13.3	n.a.
97	16.2	0.5	16.8	5.1	4.5	9.6	-6.4	n.a
98	12.8	0.6	13.5	5.4	16.4	21.8	-8.3	n.a

Source: Annual Reports of various banks

Although the period 1996-1998 is rather short for any meaningful trend analysis, the results on table 1 allow for some tentative deductions. Generally, gross margins defined as the sum of interest margins and non-interest income is high for all banks covered by the study ranging from 7.2% to 11 %. High gross margins often correlate strongly with high interest margins and high operating costs. Interest margin is the difference between interest income and interest expense. What has been observed for our sample of commercial banks is that gross margins though correlated with interest margins are, in general, not as robustly correlated with operating costs. This is clearly illustrated in Table 5 where the OAR for Namibia, Botswana, Swaziland and South Africa is reported. By standards in the literature, all the countries reported high gross margins ranging between 6.8 % in Botswana to 9.0 % in Namibia. Except for Swaziland with moderately high operating cost, the other countries reported low operating costs when compared with their gross margins. In particular, whereas operating costs are about 4.5 % in Namibia, gross margins are in the neighbourhood of 9.0 %.

The other factor that could account for high gross margins is non-interest income. In our sample of banks, except for South Africa (4.1%), non-interest income is generally low, 2.4 % for Botswana and Swaziland and 2.7 % for Namibia. This mean value could be deceptive, as there are wide variations among banks. For instance, in Namibia, FNB and SBN have been increasing the share of non-interest income in gross margin over the period rising in the case of FNB from 2.8% to 3.9%. Given relatively low operating costs and non-interest income, one can surmise that a major source of high gross margins in Namibia is interest income resulting from wide interest spreads and in recent times rising non-interest income.

Loss provision shows a considerable spread among the commercial banks in the sample ranging from 0.4 to 1.6 %. A noticeable variation is also observed between banks with FNB generally more generous with provision than the other banks. These provisions were mainly against doubtful debts of which loans to individuals constitute a major share. Loss provisions were generally higher for banks in Namibia and South Africa.

The results for gross margins translate into return on Assets (ROA). Banks with the highest gross margins also recorded the highest ROA as shown in the case of FNB, SBN and BW in that order. ROA is a positive sign of the health of banks but it could also be indicative of some level of risk taking. One is not surprised therefore that FNB with the highest level of ROA also has the highest level of provision. This cannot be said of BW where loss provision is low (compared to industry standards) and profitability is high. The correlation between gross margin and ROA breaks down in the case of CSIB because of high operating costs and large loan loss provision. This is to be understood from the viewpoint of the fact that CSIB is a new entrant to the industry and its ability to raise non-interest revenue is highly constrained. Our inter-country comparisons once again highlight the relative profitability of Namibian banks compared to banks in the other countries in the sub-region (table 5).

3.2 Operating Income Ratios.

Operating income ratios (OIR) relate bank revenues and costs to their gross income. OIR is also affected by differences in capital structure and accounting practices but less by differences in business mix. Three ratios that are of particular importance here are the non-interest income ratio, operating cost/ income ratio and the ratio of net income to gross income. We have summarised the country and inter-country comparisons for these ratios in Tables 2 and 5 respectively.

The share of non-interest income to gross income indicates the contributions of other income to bank earnings. Generally the ratio represents a small part of total revenue but it tends to increase as banks implement fees to enhance earnings. An increase in this ratio is an indication of the extent to which banks are successful in generating income from fee-based services to offset the fall in income from the narrowing of bank spreads. Fee income could be generated in a number of ways. For the corporate sector, increasing securitisation of corporate lending, the issue of commercial paper and other securities, increasing mortgage loans and consumer credit, and other traditional bank services associated with foreign trade, bank guarantees, and mergers and acquisitions are some of the means by which banks can increase fee income. However, banks could also increase non-interest income through fees on deposit and

loan accounts and other transactions with households.

Where non-interest income owes its increase to increased securitisation, this is often accompanied by a narrowing of interest rate spreads[7]. Non-interest income could also increase as a result of non-security related causes such as increases in bank charges and commissions related to bank services to customers. Most commercial banks in developing countries are notorious for the exorbitant charges they levy for day-to-day services rendered to customers. This later source of increase may not impact on interest spreads. It is not clear whether in the case of most developing countries, the increase in non-interest income has been accompanied by narrowing spreads. In our sample of banks' non-interest income range between 27 to 35% (except for CSIB which reported lower figures) and has steadily increased over the years. Interest spreads has also been on the increase lending support to the argument that the cause of the increase in non-interest income is to be found mainly in bank charges and commissions. In South Africa and Botswana, the negative relationship between non-interest income and spreads is established. In these two countries, the major source of non-interest income is security and exchange related and hence the narrowing of spreads (See Appendix 1).

Operating costs/gross income ratio fall within a narrow band for all the banks and across countries. Barring the outlier figure for CSIB, operating costs fall within the range 56-61%. Total costs also exhibit the same pattern. This figure is in conformity with international trends (see Vittas, 1991). Some country variations are worth highlighting here. Average operating cost is lower in Namibia than in the other countries in our sample. However, because of slightly higher provisions in Namibia, total costs are lower in Botswana.

The profit ratio for the five banks shows some variation. This ranges between 42.6- 48.3 for FNB and SBN. The figures for the other three banks are more varied. For the three years under analysis, CBN reported a profit ratio of 22.5-31.9 % whereas, BW reported between 31.5 to 40.4 %. CSIB consistently reported negative profit ratios with noticeable improvements for the period having moved from a low of –186 % in 1996 to –62% in 1998. Except for the low figures reported for the South African banks, profit figures follow the same trend in our regional sample.

[7] Securitisation commonly refers to a situation where borrowing and lending by banks is replaced by the issue of securities

Table 2: Operating Income Ratios

Banks /Year	Interest Margin	Non-Interest Income	Gross income	Operating Costs	Loan Loss Prov.	Total Cost	Pre-tax Profit	After-tax Profit
FNB								
96	79.4	31.2	110.7	47.5	14.8	62.3	48.3	32.2
97	77.7	31.3	109.1	42.9	16.6	59.5	46.1	30.4
98	67.6	37.4	105.1	43.1	15.5	58.6	46.3	29.3
SBN								
96	75.1	36.1	111.2	60.8	6.3	67.1	44.1	29.8
97	74.3	33.4	107.7	59.5	5.5	65.1	42.6	28.1
98	74.4	36.4	110.9	55.4	12.1	67.6	43.2	24.7
CBN								
96	61.6	61.6	123.2	49.9	14.6	64.5	23.9	17.7
97	66.2	27.6	93.9	48.1	16.3	64.5	22.5	16.3
98	67.3	37.2	104.5	56.0	16.5	72.6	31.9	20.0
BW								
96	63.9	63.9	127.9	57.8	7.7	65.5	31.5	20.6
97	67.9	32.9	100.9	56.0	9.0	65.0	36.3	24.1
98	73.7	36.1	109.9	56.7	12.7	69.4	40.4	24.8
CSIB								
96	124.8	12.0	136.9	101.7	32.2	134.0	-186.0	N/A
97	143.7	4.8	148.5	45.1	40.3	85.3	-56.8	N/A.
98	95.9	4.9	100.8	40.4	122.4	162.8	-62.0	N/A

Source: Annual Reports, various banks

3.3 Operating Equity Ratio (OER)

Operating Equity Ratios relate income, costs and profits to average equity. One remarkable difference between this ratio and the two discussed earlier is that they are not affected by differences in capital structure and business mix. Differences in accounting practices however can distort comparisons. The analysis in this section will focus on the Return to Equity (ROE), the gross income to equity ratio, the equity capitalisation ratio and the total cost to equity ratio.

The ROE is a very important ratio when analysing bank performance. The ratio provides an indication of the bank's return on its capital base. Banks that are highly leveraged (rely heavily upon debt to support assets) will tend to have a high ROE. A high ROE can be indicative of the fact that the bank's equity base is too small, and that its ability to borrow further is limited.[8] For these reasons it may be risky to consider high ROEs an indication of efficiency. However, most analysts prefer this ratio to the ROA. The ROE's for the local banks

[8] This is clearly demonstrated in the case of CSIB in Table 4 above.

are quite high with SBN and BW posting returns ranging from 58.0 to 68.3 % for the period under reference. FNB and CBN posted slightly lower ROE ranging from 34.4 to 50.2 %. With an average ROE of 54.2%, Namibian banks outperformed banks in the sub-region when compared with a return of 37.0% for Botswana, 45.1% for Swaziland and 25.3% for South Africa.[9]

The gross income to equity and total costs to equity ratios could serve as indicators of the higher risks faced by banks that are highly leveraged. They indicate the extent of overtrading or under trading by banks and could therefore be helpful in analysing the performance of banks. With ratios in excess of 100% (except for CSIB), the gross income ratios will tend to suggest that most Namibian banks were overtrading during the period under consideration.

The equity capitalisation ratio varied significantly among banks and between countries. For banks in Namibia, FNB has the highest equity capitalisation ratio with a figure of between 10-12%. SBN and BW also maintain a capitalisation ratio of close to 8% in 1998[10]. The equity capitalisation ratio of CBN oscillated around 6.0 % for the reporting period. One noticeable trend is the tendency for all banks to improve on their capitalisation ratio during the reporting period except for the case of CBN. On average, equity capitalisation ratio for Botswana banks is higher than in the other countries in the sample. This is interesting given that gross margins and total operating costs are also lower. One would have expected that Namibian banks that are overtrading should have higher capitalisation ratios as a buffer against possible adverse consequences. One would also want to note here the relatively low after tax ROA and ROE values for Namibian commercial banks

[9] It could be argued that the high values for ROEs here might be distortionary, as they were not adjusted for inflation. But this argument may not be quite valid as inflation rates are virtually uniform across the countries in the sample and for the period covered by our study the rate has been relatively low.

[10] Equity capitalisation ratio is computed as a ratio of equity capital defined in a very restrictive sense as shareholder's fund plus reserves to average total assets.

Table 3: Operating Equity Ratios.

Banks/Year	Interest Margin	Non-Interest Income	Gross Income Margin	Operating Costs	Loan Loss Prov.	Total Costs	Pre-tax Profit	After tax Profit	Equity Cap. Ratio
FNB									
96	82.5	32.4	115.0	49.4	15.4	64.8	50.2	33.4	10.7
97	75.0	30.2	105.3	41.4	16.0	57.4	44.5	29.3	12.0
98	61.6	34.1	95.8	39.2	14.2	53.4	42.3	26.7	12.4
SBN									
96	116.3	56.0	172.3	94.1	9.8	103.9	68.3	46.2	5.6
97	106.8	48.1	154.9	85.6	8.0	93.6	61.2	40.5	6.4
98	99.4	48.6	148.1	74.1	16.2	90.3	57.7	33.0	7.8
CBN									
96	93.9	93.9	187.9	76.0	22.3	98.3	36.4	27.1	5.7
97	101.3	42.2	143.6	73.6	24.9	98.6	34.4	25.0	6.1
98	85.1	47.1	132.3	70.8	20.9	91.8	40.4	25.3	5.8
BW									
96	117.5	117.5	235.0	106.2	14.1	120.3	58.0	37.8	6.5
97	118.3	57.3	175.6	97.5	15.6	113.2	63.1	42.1	7.4
98	101.3	49.7	151.1	78.0	17.4	95.5	55.5	34.0	8.1
CSIB									
96	22.9	2.2	25.2	18.7	5.9	24.6	-34.3	N/A	N/A
97	61.4	2.1	63.5	19.2	17.2	36.5	-24.3	N/A.	N/A
98	51.4	2.6	54.0	21.6	65.6	87.3	-33.2	N/A.	N/A

Source: Annual reports various banks.

3.4 Operating Ratios and Banking Efficiency

One of the major reasons why it might be difficult to make definite statements about the efficiency of banks on the basis of operating ratios is the distortion created by differences in capital structure, business mix and accounting conventions of different banks. This problem becomes more complex as we cross national borders. Perhaps, one way to get around this problem is to ask whether these factors are relevant for the sample of banks in our study. The capital structures for banks in Namibia and for the other countries exhibit the same tendency.

Variations may exist in business mix with Banks in South Africa more likely to be involved in more of corporate banking than retail. They are also likely to offer a wider range of services. This is complicated in some cases with the introduction of the holding companies' arrangement and in others by the merger of banking and insurance activities. These will suggest that they should have relatively higher operating costs that will affect their total costs and hence ROA. Accounting differences

does not appear to have posed serious problems as most of the banks in the sample have relatively uniform accounting (reporting) procedures.

One measure of banking performance that is not affected by capital structure and business mix is the ROE. Given our surmise on accounting procedures, this measure provides a combination of ratios that may best summarise the various operating ratios and could serve as an indicator of efficiency across groups of banks and across countries.

Following the approach adopted by Vittas (1991), we correlate some of the ratios in this analysis with the ROE and make some tentative conclusions about the efficiency of the banks in our sample. From Table 4, it is not easy to establish a direct relationship that will enable us to infer efficiency or the lack of it in our sample of banks. Generally banks with high gross margins also tend to have high ROAs and high ROEs.[11]SBN, BW and FNB exemplify this. This is further illustrated by the country data. Countries with high gross margins as in Namibia, Swaziland and South Africa also tend to report high ROAs and ROEs. The impact of high cost asset ratios on ROE is not clear-cut.

[11] We have excluded CSIB from the analysis since it has an outlier data that may distort our analysis.

Table 4: Gross Margin, Profit Ratio, ROA and ROE (1996-98)

Banks/Ratios	Gross margin	Profit Ratio	ROA	ROE	Equity Capitali-sation	Cost Asset Ratio
FBN	10.3	46.9	4.5	45.6	11.7	5.8
SBN	8.5	43.3	3.3	62.4	6.6	5.2
CBN	7.9	26.1	1.8	37.1	5.8	4.8
BW	10.3	36.1	3.2	58.8	7.3	6.1
CSIB	13.3	-101.6	-9.3	-10.2	4.2	13.6

Source: Annual Reports of various banks

Table 5: Country Comparisons of Efficiency Measures

Ratios/Country	Namibia	Botswana	Swaziland	South Africa
Gross Margin	9.0	6.8	10.8	8.6
Profit Ratio	37.0	40.8	36.3	28.2
Equity Capitalisation	7.9	8.5	5.6	6.8
Cost/Asset	5.5	3.9	6.6	5.6
ROA	3.5	2.9	3.0	3.1
ROE	54.2	37.0	45.1	25.3

Source: Annual Reports of various banks

We have reproduced in Table 6 the correlation between the ROE and the other profitability and cost ratios in an attempt to ferret out any relationships that could help further with our analysis. From the table, we observe a strong negative correlation between ROE and the equity capitalisation ratio (-13). The link between ROE and Gross margin (0.29), ROA (0.34), and Profit/ income ratio (.50) though positive is not very strong.

Table 6: Correlation matrix of efficiency measures

	Gross Margin	Profit/ Income	ROA	ROE	Cost Asset	Equity Cap
Gross Margin	1.0					
Profit/Income	0.57	1.0				
ROA	0.77	0.94	1.0			
ROE	0.29	0.50	0.34	1.0		
Cost Asset Ratio	0.97	0.51	0.69	0.45	1.0	
Equity Cap Ratio	0.73	0.72	0.87	-0.13	0.55	1.0

Source: Annual Reports of various banks

There is a strong correlation between equity capitalisation and gross margin (0.73), Profit ratio (0.72) and ROA (0.87). A strong relationship also exists between cost asset ratio and gross margin (0.97) and ROA (0.69).

One factor that runs through the application of these ratios to our study is the inadequacy of the use of ROE as a measure of efficiency. It would appear that banks with low gross margins and cost asset ratios and those with high gross margins and cost asset ratios can produce high ROE. Compare BW, SBN with CBN in Table 4. From Table 5, we also observe that banks in Swaziland and Namibia with a high gross margin of 10.8 and 9.0 respectively and total cost asset ratios of 6.6 and 5.5 per cent respectively produce ROE of 45.1 and 54.2 respectively. On the other hand banks in Botswana and South Africa with gross margins and cost asset ratios of 8.6, 6.8 and 5.6, 3.9, respectively produce ROE of 25.3 and 37.0 respectively. Thus, it is difficult to make realistic statements about efficiency on the basis of the ROE.

In view of this observation we have decided to use a combination of ratios that are consistently correlated guided by Table 6. Our efficiency measure is thus chosen on the basis of high ROA, high gross margins and low cost asset ratio, and moderate equity capitalisation ratio (between 6.5 to 12 %). Our choice of these variables is guided by two factors. First, they tend to satisfy the demands of all stakeholders viz. Investors (ROA), depositors and management (gross margin) and regulators (equity capitalisation). Second, given the similarity in capital structure, business mix and accounting practices within the country and the sub-region, the likelihood of these measures producing conflicting results is minimal. This is attested to by our correlation analysis. On the basis of the above criteria we can characterise our sample of banks as follows:

FNB: high gross margin, high ROA, high equity capitalisation ratio and high cost asset ratio.
BW: high gross margin, moderate to high ROA, high cost asset ratio, and moderate to high equity capitalisation ratio.
SBN: moderate to high gross margin, moderate to high ROA, moderate to high cost asset ratio, and moderate equity capitalisation ratio.
CBN: low gross margin, low ROA, low cost asset ratio and low equity capitalisation ratio.[12]

It is necessary to remark here that though high cost asset ratios may signify inefficiency, if this translates into a high gross margin and high ROA as in our study, it is a welcome development for both regulators and management.

Using the same approach, we can characterise banks by country as follows:

Namibia: High gross margins, high ROA, moderately high cost/asset ratio, and moderately high equity capitalisation ratio.
South Africa: Moderately high gross margin, moderately high ROA, high cost asset ratio and moderate equity capitalisation ratio.
Swaziland: Moderately high gross margin, moderately high ROA, high cost asset ratio and low to poor equity capitalisation ratio.
Botswana: Low gross margin, low ROA, low cost asset ratio and very high equity capitalisation ratio.
It is difficult here to be definitive about what country posts the highest level of efficiency. While Botswana banks may look inefficient on the

[12] The use of the terms high, moderate or low should be seen in the context of the banks that are being compared in this analysis.

surface to the investor because of the low ROA, management will definitely agree with a combination of low cost asset and low gross margin. On the other hand, regulators will be happy at the rather high equity capitalisation ratio, which is a rough guide to bank soundness.

Finally, two brief remarks are in order here. The first has to do with the relatively high cost asset and cost income ratios observable for these countries. It is generally argued that since most of the banks in our sample of countries provide a narrow group of services mostly in the retail sector, their cost ratios ought to be lower than in developed countries (Hanson and Rocha, 1986). But the reverse is often the case. Vittas, (1991) has attributed this phenomenon which is characteristic of banks in most developing countries to three factors-limited use of modern technology, induced overstaffing and operation of uneconomic branches.

The second issue has to do with the co-existence of high gross margins and wide spreads in the Namibian banking industry. Thus, the wide spreads are no compensation for low interest margins since interest margins are quite high, neither do they result from any extraordinary risk from trading in Namibia. This area requires some further examination. Also of interest here is the fact that non-interest income has also been on the increase. Given the nature of banking in Namibia, which is essentially retail, the source of increasing non-interest income is basically fees and commissions on deposit and loan accounts to households and businesses. Thus, banks appear to be charging more explicitly for their services.

4. Scale and Scope Economies.

4.1. Theoretical Framework

4.1.1 Types of Efficiency

Two types of efficiency come under mention in econometric works on efficiency. Scale efficiency addresses the question as to whether a banking firm has the right size. It refers to the relationship between a firm's per unit average production cost and production volume. When a firm's per unit production cost declines as its output increases, the firm is said to enjoy economies of scale. Diseconomies of scale may also exist when per unit cost of production begins to rise beyond a certain level of production. Scale diseconomies may arise because it may become more costly to manage a very large firm or due to management laxity. A U-shaped average cost curve would imply economies of scale at the early stages of output and diseconomies of scale at high output levels. For the former, it infers that more firms could be allowed to enter the industry without reducing industry profits. A U-shaped average cost curve also infers that there is an optimum level of production at which the per unit average production cost is minimised. For the banking industry it has been found that the average cost curve is U-shaped. What has not been resolved in the literature is the location of the optimum production scale. The consensus, however, is that the optimum scale may be much bigger than has been suggested by earlier literature. Three main reasons are given for this- the practice of large scale branching by banks, the rapid changes in information technology and thirdly financial innovation which has helped banks to develop a number of alternative channels for the delivery of financial products (Kwan, 1997).

X-efficiency or economies of scope on the other hand addresses the question whether a firm produces as efficiently as it possibly can, given its

size. Technically, it assumes that a firm has a cost-efficient frontier that depicts the lowest production cost for a given level of output and attempts to measure the deviation from this frontier. X-efficiency stems from technical efficiency, which attempts to measure the degree of waste and friction in the production process, and allocative efficiency, which measures whether the right levels of various inputs are used.

The measurement process here has focussed on determining total operating costs given the level of output and the prices of inputs of capital, labour and funds by the bank. If the observed total operating cost is higher than the minimised cost, the difference represents the banks X-inefficiency. Most research findings have come out with the result that X-inefficiency is large and that on average the possibility of a bank improving on its efficiency lies more with an improved X-efficiency than economies of scale.

4.1.2 Estimation Techniques

The estimation techniques used in the measurement of efficiency fall into two broad categories-parametric and non-parametric techniques. Popular non-parametric techniques include the data envelopment analysis (DEA) and the free disposable hull analysis (DHA). The non-parametric techniques generally do not take account of prices and can therefore account only for technical inefficiency in using too many inputs or producing too few outputs. They do not also account for allocative inefficiency. They are not suitable for comparing firms that specialise in different inputs or output, nor can they compare firms that tend to specialise in different inputs and outputs since they do not take account of relative prices. The parametric techniques consist of the stochastic econometric frontier approach (EFA), the thick frontier approach (TFA) and the distribution–free approach (DFA). In the parametric methods, a bank is labelled inefficient if its costs or profits are lower than the best practice bank after removing random errors.[13]

The differences among the techniques in the parametric approach lie in the assumption that is made in separating the random error term from the composite error term. The EFA for instance generally assumes that inefficiencies follow an asymmetric normal distribution, and that both are orthogonal to the cost function exogenous variables (Timme and Yang, 1991). The TFA assumes that deviations from predicted costs within the lowest average-cost quartile of banks in a size class represent random error, while deviations in predicted costs between the highest and lowest quartiles represent X-inefficiencies (Bauer et al, 1992). The DFA assumes the efficiency differences are stable over time, while random error averages out over time (Berger and Humphrey, 1992).

This choice of econometric technique has been found to affect the results in the measured inefficiency. More worrisome is the fact that when these methods are compared with one another using the same set of data, the rankings of individual banks often do not correspond well across methods, even when the methods find similar average inefficiency levels (Ferrier and Lovell, 1990). This study has chosen the econometric frontier approach not because it is the most efficient but because it is the most widely used. Moreover studies employing the various parametric techniques have come to inefficiency estimates in the neighbourhood of 20 to 25%.

Finally, having chosen the econometric frontier approach, the next issue has to do with the most suitable functional form to be used in the estimation. By far, the translog cost function is the most popular in the literature. The main shortcoming in this approach is the fact that where we have a heterogeneous collection of banks differing in size, the function might not adequately represent the data set. Studies have shown that the differences in the results on scale economies across studies may be traceable to the ill fit of the translog cost function across a wide range of banks.

An alternative functional form that has been tried is the Fourier-flexible functional form. As the name suggests, it is more flexible than the translog cost function. Its wide applicability to US banks has been established in various studies (McAllister and McManus1993, Berger ET al, 1997). However, due to data constraints, it has not been possible for us to use this functional form in this study as the approach has been found to be very sensitive to the number of observations. In view of this constraint, we have used the translog cost function. Moreover, as shown on table 9, the variation from the mean in terms of output size for our set of banks is minimal and so we do not envisage that this functional form would bias our results substantially.

The stochastic econometric cost frontier is a modification of a standard cost function that allows inefficiencies to be included in the error term. By using this approach we can measure both scale and scope economies.

[13] See Berger, Hunter and Timme (1993) and Berger and Mester (1997) for detailed discussions of these techniques.

4.2 Model formulation and estimation

Following Hunter and Timme (1986), we use a Tran logarithmic cost function to estimate a cost function that allows for more generalised results and fewer restrictions than is commonly found in the Cobb- Douglas functional forms. A one output, three-input translog cost function is used to relate cost, output and input prices thus:

$$\ln TC = \alpha 0 + \alpha_Q \ln Q + 1/2\, \alpha_{QQ}(\ln Q)^2 + \beta_1 \ln W_L + \beta_2 \ln W_K + \beta_D \ln W_D + 1/2\beta_{11}(\ln W_L)^2 + 1/2\beta_{22}(\ln W_K)^2 + 1/2\beta_{33}(\ln W_D)^2 + 1/2\beta_{12} \ln W_L W_K + \beta_{13} \ln W_L \ln W_D + \beta_{23} \ln W_K \ln W_D + \gamma_{Q1} \ln Q \ln W_L + \gamma_{Q2} \ln Q \ln W_K + \gamma_{Q3} \ln Q \ln W_D. \quad (1)$$

where, TC denotes Total Cost, Q denotes bank loans, a proxy for bank output, W_L, W_K, and W_D stand for input prices of labour, capital and deposits. With the help of Shepard's lemma we can produce the derived demand for factor L or for factor K (the share of labour (S_L) and capital (S_K) on costs) by partially differentiating this cost function with respect to the factor price of the respective factor inputs thus:

$$d \ln TC / d \ln W_L = S_L = \beta_1 + \beta_{11} \ln W_L + \beta_{12} \ln W_K + \beta_{13} \ln W_D + \gamma_{Q1} \ln Q \ldots\ldots (2)$$

and for capital

$$d \ln TC / d \ln W_K = S_K = \beta_2 + \beta_{12} \ln W_L + \beta_{22} \ln W_K + \beta_{23} \ln W_D + \gamma_{Q2} \ln Q \quad [14] \ldots\ldots (3)$$

[14] To avoid singularity, the number of cost shares estimated is one less than the number of inputs. Barton,(1969) showed that the estimates are invariant to the share that is omitted in a SUR techniques

It is expected that the joint estimation of the system of equations, composed of the cost and share equations, should produce more efficient estimates than the cost equation alone. Since we are interested in economies of scale, we use the following form in equation (1) to estimate scale economies:

$$E = d \ln TC / d \ln Q = \alpha_Q + \alpha_{QQ} \ln Q + \gamma_{Q1} \ln Q \ln W_L + \gamma_{Q2} \ln Q \ln W_K + \gamma_{Q3} \ln Q \ln W_D \qquad (4)$$

The estimation takes into consideration the linear homogeneity and the attendant restrictions. Thus,

$$\beta_1 + \beta_2 + \beta_3 = 1$$

$$\beta_{11} + \beta_{12} + \beta_{13} = 0$$

$$\beta_{21} + \beta_{22} + \beta_{23} = 0$$

$$\beta_{31} + \beta_{32} + \beta_{33} = 0$$

$$\gamma_{Q1} + \gamma_{Q2} + \gamma_{Q3} = 0$$

The equations were estimated using the Seemingly Unrelated Regression (SUR) procedure.

4.3 Data Definition

The data set consists of observations from all the commercial banks in Namibia for the period 1993-1998. The inter-country comparisons cover 16 commercial banks from four countries for the period 1996-97. This includes 5 from Namibia, 3 from Botswana, 2 from Swaziland and 6 from South Africa.[15] The data was collected from the published annual reports of the banks in the sample.

Our proxy for bank output (Q) is total loans and advances. Total Cost (TC) is measured as the sum of all labour, capital and interest expenses. Average Cost is Total cost divided by Q. The inputs used are Labour, Capital and Deposits. Labour expenses include wages and other employee benefits. Capital expenses include depreciation of premises, equipment and plant plus operating lease rentals plus additions at cost minus disposals. Interest expenses are measured by the total annual interest paid on deposits and borrowings. Price of labour (W_L) is measured by the average wages per employee calculated as the ratio of annual labour expenses to average employee numbers. Price of capital (W_K) is computed as total capital expenses divided by total fixed assets. The price of deposits (W_D) is calculated as the ratio of financial expenses to the average deposits. All data were converted to a common currency unit by using the exchange rates (vis-à-vis the rand) obtaining during the period of estimation and variables are measured in value terms.

The summary statistics of the average size of banks used defined as the value of assets for each year of estimation is shown in Table 7 below.

[15] We would have loved to expand our database to include more banks from the region but for constraints on data collection.

Table 7: Average Size of banks in the Sample

	Asset size 1997	Loans ('000) 1997	Deposits('000) 1997
1. First National Bank, Namibia	2505349	1958118	2170935
2. Standard Bank, Namibia	2336882	1716187	959620
3. Commercial Bank of Namibia	1366130	871581	1009315
4. Bank Windhoek	1232191	970375	1110101
5. City Savings and Investment Bank	176194	164360	91833
Mean	1523349	1136124	1068361
Standard Dev.	942.1	716.5	739.3

Source: Annual Reports of various banks

The maximum size of the assets used in the sample was N$2505349m while the minimum asset size was N$176194m. The dispersion for the other variables follows the same pattern. This may be indicative of some wide spreads but going by the computed standard deviations, this may not render our results ineffective.[16]

4.4 Empirical Results

Table 8 presents the result of the estimation of the Cost function (eq.1) for Namibian commercial banks. From Table 8 it is observed that most estimated coefficients are significant at the 1 % level. The estimated model fits the data well, as measured by the appropriate R^2 and SEE being 0.98 and 0.30 respectively. The R^2 values for the cost share equations are 0.99 and 0.93 for S_L and S_K respectively. There is no conclusive evidence of the occurrence of severe autocorrelation.

Our results suggest that an increase in the price of labour by 1% leads to an increase in costs by 0.94 per cent. For capital, an increase in the price of capital by 1% will increase costs by 0.43 per cent. Dummy variables for the banks show very interesting patterns. All the coefficients are statistically significant at the 1% level. The results confirm that FNB and BW have significantly higher costs followed by SBN. The bank with the lowest cost figures is the Commercial Bank of Namibia. In general, the results suggest that commercial banks in Namibia have downward sloping long-run average cost curves. An increase in output (loans) of 1% causes costs to fall by 1.3%. As part of our analysis we also estimated the cost equation with country dummies. The results show significant country differences.

The measure of economies of scale at the mean level of output is 1.136.[17] This result suggests that significant economies of scale exist in banking in

[16] See for instance the works of Karafolas and Mantakas (1994) for the Greek banking system and Berg et al (1992) for the works on a selection of banks in the Nordic countries.

[17] Elasticity is measured as $1/(d\log TC/d\log Q) = (\alpha_Q + \alpha_{QQ} \ln Q + {}_1\gamma_{Qi} \ln Pi)^{-1}$. This required that the restriction $\alpha_{Q=1}$ and $\alpha_{QQ}=0$ be imposed on the translog cost function. Thus the result E=1 indicates constant returns to scale and E<1 and E>1 means decreasing and increasing returns to scale respectively.

Namibia. Our results for the inter-country regressions are not significantly different from the results for Namibia. Both results are very robust and tend to suggest that there exist economies of scale in banking in this region.

Table 8: Parameter Estimates for Cost Function. (Namibia)

Parameter	Estimate	t-test	Significance
α_0	12.189	6.5581	***
α_Q	-1.288	-4.498	***
α_{QQ}	0.103	0.011	***
β_1	0.943	8.263	***
β_2	0.431	6.045	***
β_3	-0.375	-3.028	***
β_{11}	0.033	6.299	***
β_{12}	0.0003	0.060	Not significant
β_{13}	-0.067	-7.990	***
β_{22}	0.0192	7.109	***
β_{23}	-0.0389	-7.734	***
β_{33}	0.0530	11.152	***
γ_{Q1}	-0.094	-14.998	***
γ_{Q2}	-0.0325	-7.003	***
γ_{Q3}	0.127	15.761	***
D1	0.896	5.993	***
D2	0.948	6.598	***
D3	0.912	7.924	***
D4	1.108	7.924	***

- ***Significant at 1% level. ** Significant at 5% level.

Allen elasticities of substitution were calculated at the mean level of output for the full sample for the years 1993-1998. The results show that for the period, labour is a substitute for capital and deposit and deposit is a substitute for capital. However, the computed elasticities are very low (table 9).[18] The computed elasticity of substitution for labour and capital is particularly low. Initially this might raise some questions but given the rather high cost of labour in Namibia and a rather powerful labour union, an increase in the cost of capital might not engender such a noticeable increase in the demand for labour, as theory will suggest. The addition to cost for a unit increase in labour is almost double the addition to cost of a unit increase in capital. Thus, the substitution of labour for capital when the price of capital increases may suffer some lags.

[18] Elasticities are computed at the means of the input cost shares.

Table 9: Elasticities of Substitution (at mean)

Period	s'_{12}	s'_{13}	s'_{23}
1990-1993	0.007	0.079	0.137

Although the own price elasticities show negative signs, the demand for factors is relatively inelastic indicating that price changes do not lead to a substantial change in factor quantities demanded. For instance a change in the price of labour by 1% may change the quantity of labour demanded by only 0.12%. This change is proportionately less than the change in price. The cross-price elasticities are also less than one. This indicates inelastic factor demand for all inputs (table 10). The result for the cross-country regression (not reported) is not substantially different from the results for Namibia.

Table 10: Own-price and cross-price elasticities (at mean)

Price of			
Demand for	**Labour**	**Capital**	**Deposit**
Labour	-0.1248	0.0722	-0.01115
Capital	-0.1105	-0.1063	0.1469
Deposit	0.1167	0.1004	-0.1961

We can summarise our major findings in this section as follows:

1. Going by the robustness of our diagnostic statistics errors, the cost structure of the banks in our sample is well approximated by a one-output (loans), three input (labour, capital and deposit) hybrid translog cost function.

2. The banking system has been characterised by some degree of economies of scale. This confirms that there still exist economies that can be exploited by an increase in the size of the larger banks. This in turn could be interpreted to mean that the average size of Namibian banks has not reached the optimum size at which their operating costs could be lowest. This size has to increase in order to reach the level at which banks can fully exploit economies of scale.

3. The degree of substitution between factor inputs was found to be generally low. Both the own price elasticities of demand and the cross price elasticities were also found to be low. The low elasticities could be suggestive of lack of flexibility or insensitivity in factor use. More work will need to be done in this area especially given the complaints about relatively higher wages in Namibia. One would have expected some substantial substitution of capital for labour when the price of labour increases. In particular, in the past few years new and cheaper technologies have been introduced into the banking industry and given the high cost of labour the expected substitution has not taken place on an appreciable magnitude.

4. Substantial differences were found to occur across banks as suggested by the bank and country dummies. Since these differences could not have been accounted for mainly by bank sizes (see table 7), it would look like operating costs determined mainly by factor usage is a main causal factor.

5. Is Namibia Over banked?

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Finally in this section we address the issue as to whether Namibia is over banked. There are two approaches to this issue. First, based on our performance ratios and the results from the translog cost function, we can draw some

conclusions on the optimum size of the banking system. Second, we can utilise some of the indicators of banking habit to gauge the extent of the availability of banking services and hence make some inferences on the optimum size of the banking system. Suffice it to say that each measure has its own setbacks but taken together, they could provide an indicator for approaching this issue.

From our measures of profitability, there is no doubt that on average, Namibian banks are more profitable than banks from other countries within the region. On Table 5 we showed the comparative figures for this region. In terms of gross margin, profit ratio, ROA, ROE, banks in Namibia reported higher figures than what obtains for other countries. When compared to data from outside the region, the same analysis holds. It is true that cost ratios are also high in Namibia and are correlated with gross margin and ROA. But from our econometric analysis one major factor that could account for this is the scale of operation of these banks and the rather ineffective use that is currently being made of factors. Moreover, our estimate of scale economies confirms that for now Namibian banks have large economies of scale that have not been exploited.

Lack of sufficient data prevented us from estimating scale economies for different time frames and observing whether this has been increasing. However, we utilised an interactive dummy variable (multiplying our dummy variable for time into output) to test for whether scale economies has been increasing over the period. Thus, for the period 1993-95, our interactive dummy variable took a figure of 0 and between 1996-98, we assigned a value of 1. The variable is negative and significant for the period thus indicating that scale economies have increased from the period 1993-95 to the 1996-98 period. This result coupled with the scale economies estimated for the entire period show that economies of scale exist in the banking system. These scale economies and the high gross margins could be exploited by new banks or at worst by the existing banks expanding their scale of operation.

The second approach to addressing the issue of "over banking" is to examine the banking habit in the economy. The banking habit is broadly defined as the general attitude of individuals and organisations towards the use of banking facilities in an economy. Measures that have been used in this regard include the currency ratio of money stock, banking density ratio, and the share of financial assets in aggregate national savings. An economy that is characterised by high currency ratio, high banking density ratio and low financial assets share in gross national savings is generally considered to have a poor or an underdeveloped banking habit.

Of particular importance to us in this study is the banking density ratio. The banking density ratio measures the number of people to a bank branch. Its variant is the number of banks to a certain area (per square kilometre). This latter measure may not be particularly relevant to a country like Namibia given the low settlement density. We have adapted the banking density ratio to the analysis in this section. With a population per bank branch of 19,856, Namibia ranks among the countries with the highest banking density ratio in the region. The banking density ratio for the USA is 3,708. The scenario is slightly different when we examine the number of persons per bank. With Namibia posting a figure of 320000, except for Botswana, this is considered a high-density ratio when compared to the other figures for the region.

Table 11: Banking Density Ratio-Sub Region

Country	Pop/bank	Pop/bank branch	Area/bank branch
Botswana	305000	25416	13714
Lesotho	840500	152818	2759
Namibia	329600	19855	9917
South Africa	903478	11326	354
Zambia	647500	62661	6069
Zimbabwe	499350	48995	1913

Source: Computed from various countries Central Banks Annual reports

The figures reported here for Namibia might be deceptive when the distribution of bank branches is taken into consideration. On table 12 below we summarise some helpful indicators on banking density in Namibia. It is worthy to note that most of the bank branches are located in the urban communities with a large segment of the population in the rural areas denied access to banking facilities.

Table 12: Banking Density Ratio

Regions	Pop/bank Branch	Area*/bank branch	No of bank branches
Khomas	7033	1643.3	23
Erongo	6200	5423.3	12
Otjozondjupa	9131	9829.5	11
Karas	4020	14762.2	11
Hardap	9034	18397	6
Otjikoto	19536	4460	6
Oshana	40373	1295	4
Omaheke	15700	29067.3	3
Kunene	19675	45516	3
Kavango	62517	21385	2
Ohangwena	190858	10029	1
Caprivi	91431	18530	1
Omusati	153050	12552	0

*Area in sq. km

Source: Research Department, BON

The link between banking habit and the optimum number of banks is a tenuous one, as several factors will definitely come into consideration here. It is expected that as more bank branches are extended to the rural areas, accessibility to banking services is facilitated and banking habit will improve. Viewed from this perspective, the current lop-sided distribution of banks in Namibia

needs to be addressed so as to make banking facilities available to large segments of the society that are currently shut off from banking services.

Thus, our conclusion from the above analysis is that the economy can still accommodate more banks. But there is a cautionary note here. The issue involved here is not so much that of having more banks as finding a way of encouraging commercial banks to extend their branches to the rural areas.

6. Conclusion

This paper examined the issue of efficiency in the Namibian banking system by using operating ratios and the econometric cost frontier approach. The main reason for adopting the two approaches is to come out with a combination of methodologies that may enable us to reach some reasonable conclusions about the efficiency of commercial banks given the controversies surrounding the various approaches used in measuring efficiency in the literature. More importantly, the econometric frontier approach also enables us to make definitive statements about scope and scale economies in the banking industry in Namibia. Some of the findings of the study include the following:

(i) Profitability as measured by gross margins, ROA and ROE is high in Namibia banking industry. We also observed that these measures of profitability are not highly correlated with operating costs. The finding that commercial banks are not producing at the point of minimum average costs also suggests that banks can further lower their operating costs as they expand output. Given these findings, commercial banks in Namibia are in a position to lower their costs of delivering services if they choose to.

(ii) Non-interest income as a major source of revenue has been on the increase in Namibia. The two major sources of non-interest income are exchange earnings and fees and commissions as against the practice in most developed countries where securitisation accounts for a substantial part of non-interest income. The result is that interest spreads rather than falling with an increase in non-interest income has rather increased. It is instructive to note that the two countries in our sample where interest spreads are highest are Namibia and Swaziland-two countries that are also members of the CMA. In Botswana, banks derive a substantial part of their non-interest income from exchange earnings whereas banks in South Africa receive a large proportion of non-interest income from security related transactions. Since neither exchange related nor security -related activities on a large scale are available to banks in Namibia, it is not a surprise therefore that commissions and fees constitute a major source of bank non-interest revenue. This may also account for high bank charges in Namibia. What this study could not explain, however, is the co-existence of widening spreads, rising gross margins, and rising non-interest income.

(iii) Equity capitalisation ratios are on the average low for most of the banks in the system. Data for risk-weighted capital ratios were not available at the time of this

work. The fact that loss provisions are rather high in the sample of banks may be a reflection of the riskiness of bank loans. Generally, ratios tend to suggest that banks are overtrading[19]. If this could be established, the present low levels of equity capitalisation may need to be revisited by the supervisory authorities. This, we are told is already being addressed by Bank of Namibia.

(iv) The cost structure of the banks in our sample shows that banks are not operating at the minimum point of their average cost curves. Also from the cost structure in our sample of banks, we established that factor substitutability is low. This might be indicative of some degree of inflexibility in factor use, a situation that might be held accountable for the moderate to high operating costs established by our ratio analysis.

(v) The existence of substantial economies of scale, high profitability ratios and moderately banking density confirm the existence of opportunities for more banks in the system. However, a cautionary note is needed here. The choice obviously has to be made between the establishment of new banks and the requirement for the extension of more bank branches to the rural areas that are at present under banked. The existence of economies of scale does not itself suggest that new banks should be established. It only confirms that banks are not operating at the minimum point of their average cost curves. It is possible that all that is needed is that banks establish more branches and thus increase their size so as to capture economies resulting from large-scale production.

Finally, more work needs to be done in this area to be able to reach final conclusions on some of the issues raised in this study. The fact that virtually all measures of efficiency have one setback or the other clearly understates this. However, we consider our results in this study indicative.

[19] Overtrading is trading by an organisation beyond the resources provided by its existing capital. This may lead to severe liquidity problems

APPENDIX 1

Non-interest Income and Interest Spreads

Banks	Non-int. income/Assets (%)	Fees and Commissions/ Non-int. income	Exchange Earnings/Non-int. income	Interest Spreads
FNB, Namibia	2.8	80.4	11.3	
SB, Namibia	2.6	84.8	14.9	
CB, Namibia	1.9	66.4	30.9	8.0
FNB, Botswana	3.1	55.7	38.4	
Stanbic, Botswana	2.7	44.8	53.3	
Barclays, Botswana	2.9	56.4	48.9	6.5
Standard Bank, Swaziland	2.5	73.2	26.7*	9.75
Standard Bank, South Africa	3.0	68.7	21.3	
Investec, South Africa	1.4	67.3	13.0	
BOE	3.7	72.6	12.4	
Nedcor, South Africa	2.6	72.7	16.9	4.0

Source: Annual Reports of various banks

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