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Efficiency of the Financial Market Intermediation Process in Kenya: A Comparative Analysis

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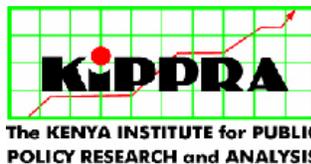*Stephen Karingi*
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Macroeconomics Division
Kenya Institute for Public Policy
Research and Analysis

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Abstract

Interest rate margins have been used severally in literature to indicate the extent of financial sector repression and inefficiency. Wide interest margins are detrimental for savings mobilization and stifle investment growth. Wide interest margins, as witnessed in Kenya, are a sign of a repressed and inefficient financial sector. This study analyzes the determinants of the efficiency of the financial sector intermediation process in 11 countries, with a view to recommending policy options for reducing the spreads and improving the financial market efficiency in Kenya, in line with the findings from other countries. The study estimates a fixed-effect, Seemingly Unrelated (SUR) regression model using panel cointegration technique. The findings show that the major contributor to the widening interest rate margins in Kenya, leading to inefficient intermediation process are: high operating costs, poor asset quality and a concentrated banking sector. The findings call for measures that will further reduce the non-performing loan portfolios, increase competition in the banking industry and reduce operating costs as well as improve the efficiency of the capital markets (Nairobi Stock Exchange).

Abbreviations and Acronyms

CBK	Central Bank of Kenya
CCSA	Competition Commission for South Africa
FNB	First National Bank
IFS	International Financial Statistics
IMF	International Monetary Fund
MEK	Marginal Efficiency of Capital
NBFIs	Non-Bank Financial Institutions
NPLs	Non-Performing Loans
OMO	Open Market Operation
SACC	South African Competition Commission

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1. Introduction

The ability of the financial market to efficiently allocate and reallocate loanable funds is critical for economic growth. When financial markets are efficient, increased competition among the financial institutions and reduced transaction and operation costs will imply higher deposit rates and lower lending rates as the financial institutions compete to attract borrowers and savers. If competition for instance is lacking in the market, there is a possibility that lending rates may be higher than the free market average, and deposit rates will be lower than the free market rates. Would-be depositors will therefore not save as much; they may opt to consume and not save. This stifles savings mobilization and reduces funds available for investments, leading to misallocation of resources in the economy. On the other hand, investors will shy away from borrowing, as the lending rates rise. Since the main role of financial institutions is to intermediate between the borrowers and lenders in the market, high lending rates and low deposit rates, and by implication, wide interest rate spreads, are indications of inefficient financial sector intermediation process. Interest rate spread is the difference between lending rates and deposit rates, and has been used severally in literature to indicate the efficiency of the financial sector intermediation process (see for instance Ndung'u and Ngugi, 2000). Widening spreads indicate an increasingly inefficient financial market.

Discussions on interest rate spreads in Kenya have dominated many forums on economics and business in the recent past. Lending interest rates in Kenya, although they have been falling from 2003, remain very high, while deposit rates are very low. At the gist of this discussion is the concern about the consequences that such high interest rates spreads have on economic performance of the country and on the welfare of the average Kenyan who must borrow to invest or save to consume in future. The other concern is that the low deposit rates stifle savings. The two concerns question the ability of the financial sector in Kenya to mediate efficiently between borrowers and lenders in the economy. The high lending interest rates in Kenya has its genesis in 1993, mopping up of excess liquidity in the economy following the printing of money in 1992 to finance the first multiparty elections. During this period, interest rates and yields on Treasury bills soared to unprecedented levels, reaching 80 to 90 per cent annual equivalents (Kimura, 1997). High interest rates on loanable funds have a negative impact on private investments, and since the deposit rates are not proportionately high, the large spreads discourage domestic savings.

1.1   Study Motivation

There are increasing concerns as to why the margin between the lending rates and the deposit rates should be so large and wide. Financial liberalization advocated for in the financial sector reforms by Kenya's development partners, including the International Monetary Fund (IMF) and the World Bank in the 1990s was meant to improve the intermediation process, hence narrow down interest rate margins. Interest rate margin is an important indicator of the efficiency and the performance of the financial markets. The large margin, as witnessed in Kenya, is a sign of financial sector repression, which compromises the financial sector's role in the intermediation process of deposit mobilization and lending. This is therefore an indicator of financial market inefficiency, and it discourages savings and limits potential borrowers.

There is a widespread perception that commercial banks in Kenya have intentionally and arbitrarily widened their margins unjustifiably by failing to pass on to the borrowers the full extent of falls in their operation and funding costs. The commercial banks in Kenya levy over 12 percentage points spread between the deposit and lending rates as opposed to 3.7 per cent in South Africa, Singapore (3%) and in Korea (1%) (Think Business, 2007). These differences jeopardize Kenya's international competitiveness as international competitors are at an advantage of at least 4 per cent points in their cost of production, against their Kenyan counterparts. Interest rates are important measures of the cost of capital as well as a return on savings. In a liberalized financial environment, interest rates are important in the mobilization of domestic savings and allocation of resources for investments. A comparison of some of the fundamental determinants of interest rates with those of other countries shows no significant differences. For instance, banking sector concentrations in South Africa and Egypt are almost similar to Kenya's, yet interest margins in the two countries are much lower than in Kenya. It is therefore important to examine the relative importance of the determinants of interest rate margins in Kenya, vis a vis those of other countries to determine the factors that explain the high margins, specifically to Kenya. Studies on interest rate margins in Kenya have not analyzed cross-country differences in the financial sector determinants of interest rates spreads to establish whether they significantly differ.

In addition, Njuguna and Ngugi (2000) did not capture the influence of non-performing loans (credit risk), market power or structure, and the transaction costs that are very important variables in explaining the financial market efficiency. This study, in addition to filling this knowledge gap, will inform policy on the major focus areas in line with the significance of the fundamentals in the other countries as compared to their significance in Kenya. To analyse the main determinants of interest rate spreads as an indicator of financial sector efficiency, we use panel cointegration method. Using data from 1990 to 2007 for eleven countries, the results show that the major contributors to the widening interest rate margins in Kenya and hence inefficient intermediation process are high operating costs, poor asset quality (non-performing loans) and a concentrated banking sector (market structure).

The rest of this paper is organized as follows; the remainder of section one gives the trends in interest rate spreads in Kenya and other countries and comparisons of its determinants in Kenya with those of other countries. Section two provides the literature review. Section three gives the empirical framework and the empirical results, section four discusses the results, while section five gives the summary, conclusions and recommendations.

1.2   Interest Rate Trends in Kenya

Prior to the liberalization of the financial sector and the sub-sequent liberalization of interest rates market, Kenya followed a policy of low interest rates adjusting for inflation to maintain positive real rates. This policy was meant to keep the cost of funds low, with the belief that cheap credit promoted development through increased investments. The government controlled interest rates by fixing minimum savings rate for all deposit-taking institutions and maximum lending rates for all commercial banks, non-bank financial institutions (NBFIs) and building societies. Interest was calculated on a reducing balance method, and levying of extra charges on loan was not allowed. The minimum savings rate was 3 per cent and the maximum lending rates 10 per cent up to June 1978.

The oil crisis of 1979 made interest rates negative in real terms because of the low nominal rates and high inflation rates. The government thought it wise to review interest rates from time to time in line with the prevailing economic conditions. The minimum deposit rates and the maximum lending rates were therefore abolished in

December 1980, and the government embarked on adjustments of the rates from time to time. In 1989, ceilings on deposit rates for both commercial banks and NBFIs were progressively increased, while the ceiling on long term bank loans were brought to the same level as the ceilings for NBFI lending. These moves were expected to reduce interest rate margins by harmonizing interest rates across the institutions and allowing the banks greater flexibility in varying rates according to loan maturity. However, this did not narrow the margin between the lending and deposit rates. Treasury bill rates were fully liberalized in November 1990, making it possible for the Central Bank of Kenya (CBK) to use the bill rate to influence the level of other short-run interest rates.

In July 1991, bank interest rates were fully liberalized. Prior to the liberalization, the lending rates followed a downward trend from 16 per cent in October 1986 to 14 per cent in June 1991. But they soon started rising again, reaching 15 per cent in July 1991. Exchange rates were also fully liberalized in October 1993. The mopping up of excess liquidity by the CBK using such monetary instruments as the open market operation (OMO), increased the treasury bill rates as the government tried to attract more money from the public by giving more attractive returns. Commercial banks in response had to increase their deposit rates as they competed with the government for the same funds from the public. This process increased the operating costs of the banks, compelling them to increase the lending rates to cover for the increased operational costs. However, the increase in the commercial banks lending rates was more than proportionate to the increase in the deposit rates, leading to an increasingly widening margin between the lending and deposit rates.

Figure 1.1: Interest rate margins in Kenya (1990-2007)
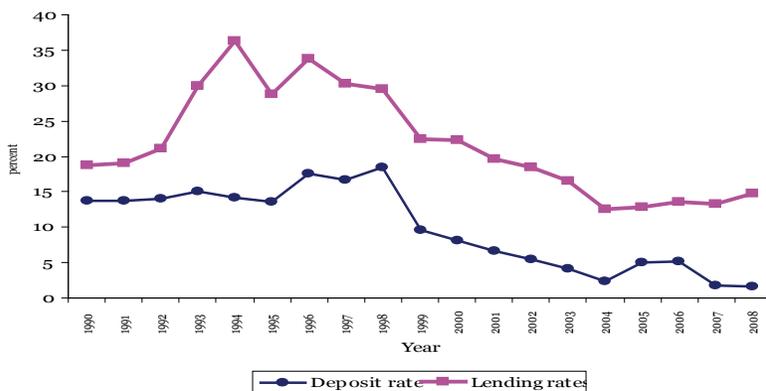
Source: International Financial Statistics (IFS), February 2008

Since 2003 when a new government came to power, the lending rates have been falling partly due to the initiative of the government to disclose the commercial bank's interest rates and charges and a reduction in government domestic borrowing. However, deposit rates have equally been falling in the same period, implying that interest rate margins have remained relatively unchanged (Figure 1.1). According to the figure, margins have generally been widening since the liberalization of the rates in 1991.

1.3   Comparisons

A graphical comparison of Kenyan margins with those of some Kenya's strongest competitors in the export markets reveal great disparities as shown in Figure 1.2 and 1.3.

The comparisons show quite lower margins for the other countries particularly South Africa (Figure 1.2) and Egypt (Figure 1.3). Whereas Kenya had average interest rate margins of 11.5 per cent in 2007, Kenya's main competitors, South Africa (3.7%) and Egypt (3.2%) had lower rates. This puts these countries at a clear competitive advantage than Kenya.

A look at the regional interest margins shows that the other East African countries, Uganda and Tanzania, have even higher margins (Figure 1.3). In Uganda, for instance, lending rates remained high at 18.20 per cent in May 2009, while the weighted average deposit rate stood at 1.77 per cent over the same period (Bank of Uganda, 2009).

Figure 1.2: Interest rate margins in Kenya and some selected countries of the world
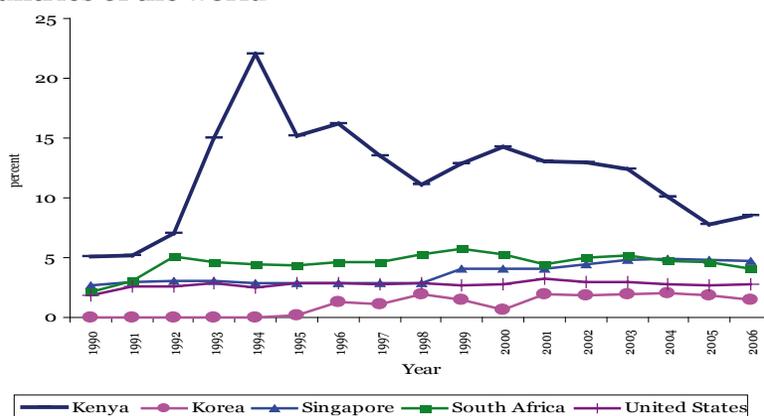
Source: IFS, February 2008

Figure 1.3: Interest margins between Kenya and other regional countries
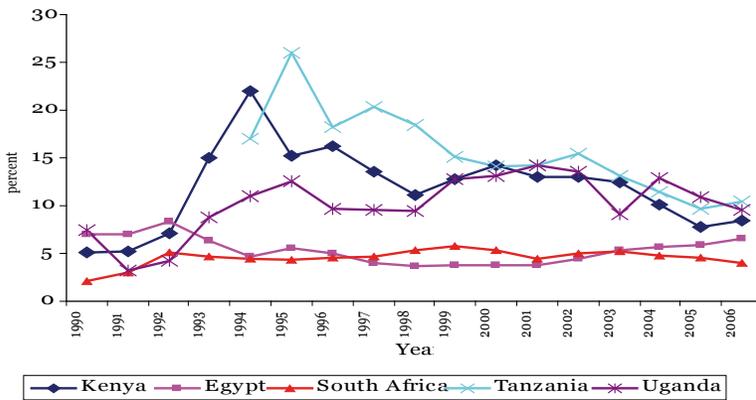
Source IFS, February 2008

While Tanzania's interest spread was higher than Kenya's since 1994, Kenya's was higher than Uganda's until 2000 after which, except for 2003, Uganda's spread has been higher than Kenya's. Certain macroeconomic fundamentals that should be acting as indicators of the levels of interest rates margins in Kenya seem not to be tracking the interest rates.

1.3.1 Profitability of banks

Interest rates charged by commercial banks not only cover for the operation costs but also the profits margin of the banks. Bank profitability is determined by the returns on assets and the returns on shareholders funds. According to the Banking Survey (2007), commercial banks' returns on assets and shareholders funds are 4 per cent and 37 per cent, respectively. The returns on shareholders funds in Kenya are way above the returns earned in developed countries, for instance Australia (15%), UK (20%), and Canada (17%). It looks no lower either when compared with rates in some of the developing countries such as South Africa at 22.5 per cent, and Mauritius at 14 per cent (Competition Commission for South Africa-CCSA, 2008).

The Central Bank of Kenya-CBK (1995) argues that if the non-performing loans were to be reduced by 5 per cent as stipulated in the prudential banking regulations, then the return on assets would be 2 per cent and the return on shareholders funds would be 21 per cent.

With these great disparities, bank profitability is probably one of the major drivers of the widening margins.

1.3.2 Taxes (Explicit and Implicit)

Both explicit and implicit corporate taxes, if high, will significantly reduce the funds available for discretionary lending. It also discourages the development of the interbank market. The interbank market plays a major role in improving resource allocation and the effectiveness of monetary policy. Ndung'u and Ngugi (2000) note that with heavy taxation at the interbank market level, all financial transactions make short-term overnight borrowing uneconomical and increase commercial banks' reliance on the Central Bank discount facility that provides inexpensive and unlimited loans instead of deposit taking. Logically, rates of return and profits are judged on the basis of after-tax profits, and it is only imperative that the relative tax benefits influence the flow of funds in ways that do not comply with the productive use of finance. A comparison of corporate taxes in Kenya and the other regional countries however, shows no significant differences. Corporate taxes for resident companies in Uganda is 30 per cent, the same to Kenya and for non-resident companies is also 30 per cent. Tanzania has the same tax structures as Kenya and Uganda. South Africa levies a tax of 30 per cent on the resident companies and 35 per cent for the non-resident companies. In Singapore, corporate taxes are 22 per cent since 2003 for resident companies down from 24.4 per cent in 2002. This insignificance in differences may suggest that corporate taxes are not so important in explaining cross-country differences in the spreads.

1.3.3 Non-performing loans (NPLs)

The level of non-performing Loans is another cost implication that impacts negatively on the level of lending interest rates through its effects on the marginal efficiency of capital. There seems to be a two-way causality between the lending rates and the level of non-performing loans (NPLs) in the banking sector. On one end, due to the high interest rates, there is a high risk of default. The banks therefore pin a high defaulting rate on the remaining good portions of their debt to cover their operating costs. On the other hand, the high levels of NPLs put a higher risk premium on subsequent advances. A specific provision for bad debts is established to provide for an estimate of credit losses as

Figure 1.4: Non-performing loans in Kenya
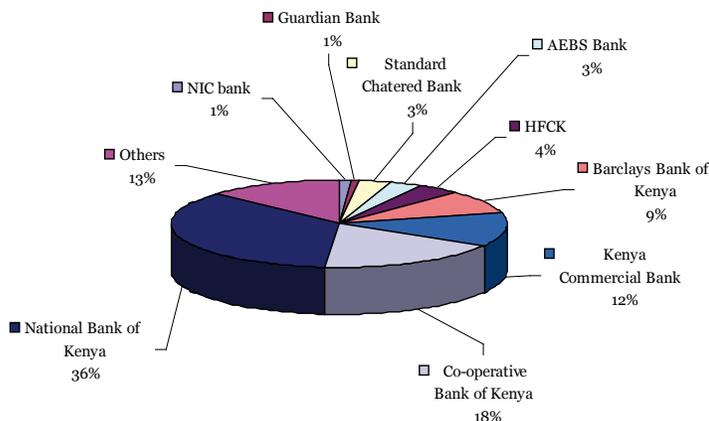
Source: Banking Survey, 2007

soon as the recovery of a loan is identified as doubtful. Another general provision is established to cover losses that are judged to the present in the lending portfolio at balance sheet date, but which have not been specifically identified as such.

According to the prudential banking regulations, all banks are required to provide for specific and general provisions in their balance sheet and the profit and loss account. These provisions deplete profits, with the result that less money is left at the banks hands for discretionary lending. With the high and increasing levels of NPLs in Kenya, currently standing at 16.53 per cent of the total loan advances (Banking Survey, 2007), provisions for bad debts stood at 19.33 per cent of the total loan advances. NPLs are always cited by the commercial banks as one of the major reasons for high lending rates, hence wider margins.

1.3.4 Cash and liquidity ratios (Monetary policy operations)

The Central Bank of Kenya (2009) contends that in Kenya, movements in interest rates have been closely associated with monetary policy measures implemented by the central bank. The CBK instruments - increased cash ratio, open market operation, increased liquidity ratio and credit ceilings, put pressure on the bank interest rates to either increase or ease. The cash ratio was raised from 6 per cent in April 1993 to 20 per cent by March 1994. As at June 2002, the cash ratio was 11 per cent and liquidity ratio 20 per cent. The cash ratio was, however, reduced to 6 per cent in 2003 and further to 5 per cent in December

2008 to improve bank liquidity in the face of the global financial crisis. The Central Bank rate on the other hand, was reduced to 8.0 per cent in May 2009 for the same reasons. The liquidity ratio remained at 20 per cent as at June 2009. The high cash and liquidity ratios, otherwise considered as implicit taxes, had put pressure on banks to retain high interest rate on loans since they want to top up on their profits for the non-interest (idle) deposits at the Central Bank. This idle cash held at the Central Bank clearly entails holding costs to the banks, making them to maintain high lending rates to cover for these costs. These ratios tend to increase the opportunity cost of the banks as it squeezes the excess reserves available for banks to advance credit. It is however worth noting that the cash ratio has reduced since 2004, when it was 20 per cent to 6 per cent as at June 2009. With the decreased cash ratio, it was expected that lending rates would fall as deposit rates rise, since this reduction implies a cost reduction. This however has not been the case, putting in doubt the significance of cash and liquidity ratios in influencing the direction of interest rates in Kenya. Due to the decreased ratio, there is a reduction in the amount of cash and balances banks held with the Central Bank, as this money somehow finds its way back to the central bank as banks invest more in treasury bills.

1.3.5   Treasury bill rates

In Kenya, one of the fundamental substitutes of the commercial bank deposits is government bonds and securities. The price paid for the government securities is the Treasury bill rate. As Treasury bill rates increase, for instance, government bonds and securities become more attractive than the commercial bank deposit rates. This withdraws investible funds away from the banks to the government. For the commercial banks to maintain their depositors, they will increase the deposit rates. Given that increasing the deposit rates is an added direct

Table 1.1: Structure of the banking sector in Kenya (%)

Category	Holding (by total banking assets)
Largest bank	15
Top 3 banks	38
Top 5 banks	51
Top 10 banks	77
Bottom 32 banks	28

Source: Author's computations from the Banking Survey (2007)

cost of funds to the banks, and the banks would want to maintain their profit margins, they will compensate for this by increasing their lending rates. Commercial banks have argued in the past that they had to raise lending rates due to the rising Treasury bill rates. However, in most cases, trends in the Treasury bill rates seem not to be tracked by trends in deposits rates in Kenya. For instance, the 30-day treasury bill fell from a high of 8.59 per cent in December 2008 to 7.33 per cent in April 2009, but the deposit rates over the same period increased from 4.89 per cent in December 2008 to 5.12 per cent in April 2009. This puts to question the response of deposit rates to changes in treasury bill rates.

1.3.6   Inflationary expectations

Expectations of inflation higher than the actual rates are another factor that holds interest rates high. The theoretical relationship between interest rates and inflation is governed by the Fisher effect given by the equation:

(1+Nominal rate)=(1+Real rate)*(1+Inflation rate)

From the Fisher effect, it is expected that falling inflationary expectations would lead to a fall in nominal interest rates. Banks, other deposit taking institutions, deposit holders and even the government build expectations of inflation in their plans. The higher the inflation rates they expect, the higher the interest rates they will settle for. The implementation of monetary policy by the Central Bank of Kenya since 2002 continues to aim at containing underlying inflation to below 5 per cent. The Fisher effect relationship seems to be contradicted by the prevailing trends in the lending rates. The setting of interest rates at much higher levels than the expected inflation indicates that commercial banks have not taken into consideration the rates of inflation (at least not explicitly) fully in deciding the levels of interest rates. Alternatively, financial sector agents do not trust the 5 per cent target of CBK as an achievable target, in which case they expect inflation to be higher than 5 per cent, thereby setting interest rates above the 5 per cent target.

### 1.3.7   Banking sector market structure

Fry (1995) defines market structure to include the degree of competition, concentration and interlocking control between financial institutions and business enterprises and the degree of specialization. Even with

the full liberalization of the financial sector in Kenya, competition in the banking sector has not become entrenched enough to bring about the desired reduction in interest rates, particularly the lending rates. Central Bank of Kenya (1995) notes that commercial banks in Kenya continue to have a cartel like structure; that is, a few of them behave as if they have agreed to jointly keep the lending rates high and deposit rates low and consequently widen the interest rate margins. In Kenya, the top five banks out of the 42 banking institutions control more than half (53%) of the total loan liabilities of the banking sector (Banking Survey, 2007). This leaves the other 37 banks to compete for the remaining 47 per cent of the loan market. Further analyses of the total banking assets show bigger disparities. The largest five banks (Barclays Bank, Kenya Commercial Bank, Standard Chartered bank (K) Ltd, the Co-operative Bank of Kenya and the CFC Bank) control more than half (51%) of the total banking assets (Table 1.1).

Together, the first ten biggest banks in Kenya control more than three quarters of the banking industry assets at 77 per cent. The individual share of each banks' control of the total banking assets is given in Figure 1.5.

Figure 1.5 shows that out of the 42 banks, the bottom 32 banks control a meager 28 per cent of the total banking assets. In the light of this market structure, which is clearly concentrated at the top, competition in the banking sector in Kenya is not strong, with the top banks in Kenya not competing aggressively against each other. At the

Figure 1.5: Market share of Kenyan banks
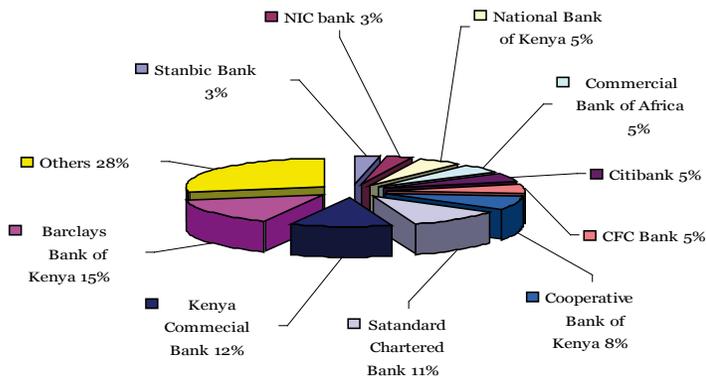
Source: Banking Survey, 2007

Figure 1.6: South African banks market shares (June 2007)
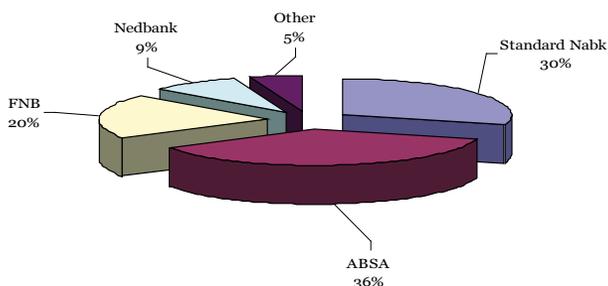
Source: SACC (2007)

lower end, the smaller banks are also not actively competing against each other.

The structure of the banking industry in Kenya is however not any different from those of other developing countries. For instance, according to the South African Competition Commission-SACC (2007), most of the banking industry segments are dominated by what it calls the 'Big four'—First National Bank (FNB), Standard Bank, ABSA and Nedbank. Their combined market share for a cluster of personal banking products (as at June 2007) accounted for approximately 95 per cent of the total market share while the share of the remaining banks accounted for only 5 per cent of the market share for the same period (Figure 1.6).

With these market structures and concentration levels, the formation of large financial conglomerates may develop to a point where an oligopolistic situation develops, characterized by informal cartel arrangements or informal market leadership. This may lead to inefficient allocation of loanable funds and is likely to drive interest rate spreads wider.

1.3.8   Bank operating costs and efficiency

Another factor that is more institutional than fundamental is the commercial banks operating costs. These are different from the funding costs (cost of funds) in that they cannot be directly identified with the costs associated with deposit taking and loan advancing. The costs that commercial banks incur on salaries, rent, wages, water and rent are

Table 1.2: Kenyan banking sector cost structure

Cost component	Percentage (%)
Operating costs	8.79
Direct cost of funds	7.44
Non-performing loans	3.69
Cost of liquidity	1.25
Cost of holding cash	0.25
Total	21.69

Source: KBA (2001)

paid off from income earned from lending and other charges. These costs tend to increase and fall with the efficiency with which banks carry out their business and get translated into high or low lending rates.

According to the Kenya Bankers Association (2000), the highest component of the current cost structure or cost ratio of the banking sector of 21.69 per cent are the operating costs at 8.79 per cent. Other cost components of the ratio are the direct cost of funds at 7.44 per cent, cost of liquidity at (1.25%), cost of holding cash (0.25%), and the costs associated with the provisions for non-performing loans at 3.69 per cent (Table 1.2).

An increase in these costs will translate into higher spreads as banks try to recover their costs.

2. Literature Review

To develop a theoretical and empirical model to be used in this study, the theoretical and empirical literature on the determinants of financial sector efficiency is reviewed.

A number of studies have examined the relationship between interest rate margins (financial sector efficiency), the bank characteristics and the macroeconomic variables. Demirguc-Kunt et al. (2003) examined the impacts of bank regulations, concentration and national institutions on bank net interest margins. The study, which was done for over 1,400 banks in 72 countries, while controlling for bank specific characteristics, found that bank concentration (market share) is positively related to the net interest margins. The findings further indicate that while the impact of concentration on the net interest rate margins is not inconsequential, the economic magnitude is not huge.

The results also showed that regulatory restrictions substantially increase bank interest rate margins. First, this is consistent with the view that restricting entry protects existing banks and allows them to enjoy large margins. Secondly, the authors noted that countries that restrict banks from engaging in non-traditional activities such as securities underwriting, real estates and owning non-financial and insurance firms, have margins that tend to be larger. Reserve requirements, on the other hand, are positively related to interest rate margins. The study also finds that countries where the overall institutional environment is conducive to private sector competition tend to have lower interest rate margins. Individual bank characteristics explain a substantial part of the within country variation in bank net interest rate margins. Higher net interest rate margins tend to be associated with small banks that hold a low fraction of liquid assets, those with a relatively low amount of capital, those without substantial income from fee-based activities, and banks with large market share.

Ndung'u and Ngugi (2000) examined the factors behind the widening interest rate spread in Kenya following interest rate liberalization. The study assessed the impact of financial liberalization on the bank interest rate spread by deriving a theoretical model of the relationship between the spread and various macroeconomic variables. The model captures the Kenyan-specific situation with the assumption of market power in both the loans and the deposit market. This was meant to reflect market microstructure. They defined the spread in terms of credit risk, market

power, operational costs, development of the interbank market and the fiscal-monetary policy actions.

Using monthly data for the period 1993 to 1996, and an error correction model, the study finds that disequilibrium in the loans market is a major factor in widening the interest rate spreads. The other factors that drive interest rate spreads are availability of deposits, alternative investment channels for banks, and the ease of portfolio adjustment at the end of the period. Some institutional factors such as the micro-market structures and policy actions explain substantial variations in interest rate spread. The study also found that high implicit taxes, particularly the liquidity ratio and the cash ratio, increase the spread through the lending rates as the banks aim to maintain their profit margins. Furthermore, the performance in the loans market reflects the macroeconomic environment where macroeconomic stability reduces the risk premium and ensures positive returns for investment, reducing the credit risks. However, the study did not capture the influence of non-performing loans (credit risk), market power or structure, and the transaction costs, which are very important variables in explaining the financial market efficiency.

Afanasieff and Lhacer and Nakane (2000) used panel data to uncover the main determinants of bank interest spreads in Brazil. The study examined whether macro or microeconomic factors are the most relevant ones in affecting the behaviour of such rates. It highlighted the roles played by inflation rates, interest rate volatility, economic activity and microeconomic factors in influencing the spread. They used a two-step approach to measure the relative relevance of the micro and the macro elements using monthly data for all the commercial banks operating in Brazil from February 1997 to November 2000. The results suggested that large banks charge higher interest rate spreads. They interpreted this as an exercise of market power by the large banks. This finding conflicts with the findings of Demirguc-Kunt et al. (2003), which found that higher margins are associated with smaller banks. The study also finds that the ratio of non-interest bearing deposits to total operational assets affects positively the interest spread. The results suggest that microeconomic factors in the form of individual differences among the bank do not seem to be a major determinant of interest rate spreads in Brazil. The results further suggest that the spread increases with increases in either the basic interest rates or in the inflation rate. Output growth is found to reduce bank spread.

Demirguc-kunt and Huizinga (1999) investigated the determinants of bank interest margins using bank level data for 80 countries in the years 1988 to 1995. The findings of the study showed that there is a positive relationship between bank interest margins and the ratio of equity to lagged total assets. The study also finds a positive relationship between bank profitability and capitalization. This is because well-capitalized firms face lower bankruptcy costs for themselves and their customers, thereby reducing funding costs. The study found a negative and significant relationship between the non-interest earning assets and the interest rate margins in the net interest rate margin equation. The foreign ownership variable had a positive and a significant coefficient. This suggested that foreign banks realize relatively high net interest margins and profitability in relatively poor countries. Output growth by contrast does not seem to have any significant influence on realized net interest rate margins. The variable for explicit taxes in the regression has a significantly positive impact on interest margins and profitability. The study interprets these results to suggest that both interest margins and profitability increase with tax rates, and that corporate taxes are passed on to bank customers to some degree.

Angabazo (1997) studied the determinants of bank net interest margins for a sample of US banks using annual data between 1989 and 1993. The results for the pooled sample suggest that the proxies for default risk (ratio of net loan charge-offs to total loans), the opportunity cost of non-interest bearing reserves (ratio of core capital to total assets), and management efficiency (ratio of earning assets to total assets) were all statistically significant and positively related to bank interest margins. The ratio of liquid assets to total liabilities, a proxy for low liquidity risk, is inversely related to bank interest margins.

Barajas (1999) used a structural model based on profit maximization assumptions for Colombian banks operating in imperfect markets to establish the effects of financial liberalization on bank interest margins for Colombia. The results show that although the overall spread has not reduced with financial liberalization, the relevance of the different factors behind bank spreads were affected by such measures. Market power test shows that Colombia's banking sector was imperfect before the liberalization period. The level of non-performing loans reduced after liberalization, signifying improved loan quality. The study notes that this may be a signal of increased awareness on the part of bank managers, regarding credit risks or it may imply improved reporting of non-performing loans. The results further show that before

liberalization, operating costs were made up of about 38 per cent of bank spread, while market power accounted for 36 per cent, financial taxation (22%) and loan quality (4%) of the spread. Assuming perfect markets for the post-liberalization period and setting market power equal to zero, then loan quality now accounted for 29 per cent of the spread, operating costs (45%), and financial taxation (26%).

Brock and Rojas-Suarez (2000) studied the determinants of bank interest margins for five Latin American countries (Argentina, Bolivia, Colombia, Chile, and Peru). The results show positive coefficients for capital ratio for Colombia and Bolivia and the liquidity ratio, which is found to be statistically significant for Bolivia, Colombia and Peru. The coefficient for the non-performing loans is negative for all the countries, except Colombia where the coefficient is positive and highly significant. This, according to the study, is suggested under provisioning for the bad loans. The results further show that interest rate volatility increases interest rate spread in Bolivia and Chile, while inflation increases the spread in Colombia, Chile and Peru.

3.   Methodology

3.1   Theoretical Model

The methodology applied in this study is based on an adaptation of Ho and Saunders (1981) model of bid-ask prices of security dealers to the determination of bank interest rate margins. The representative bank is modeled as a risk averse agent that acts as an agent in a market for the immediate provision of deposits and loans. It holds illiquid assets and therefore, runs the risk of an unbalanced portfolio with either excessive demand for loans or insufficient supply of deposits. The bank sets both the loans and the deposit rates with the aim of maximizing a mean variance objective function, subject to the end-of-period wealth. Ho and Saunders (1981) developed a two-step methodology to empirically evaluate the main determinants of the bank interest spread. The first step relates the bank level interest spread to the vector of bank-specific characteristics plus a set of time dummies, which they interpret as a measure of the pure bank spread. The vector of variables in the second regression includes a set of macroeconomic variables.

The theoretical model uses panel estimations because of the cross-country analysis instead of the two-step approach used by Ho and Saunders (1981). In the model, a set of bank-specific characteristics and a set of macroeconomic variables are regressed against the interest rate spread in the following panel regression.

$$y_{it} = \alpha + \beta X_{it} + \gamma Z_{it} + \mu_{it} \quad \mu_{it} \mid \mid N(0,\sigma_{it}^2) \quad \text{...............................(3.1)}$$

where: $\mu_{it} = \mu_i + \lambda_t + v_{it}$ and μ_i are unobservable individual effects, λ_t are unobservable time effects, v_{it} is a stochastic disturbance term, y_{it} is the interest spread for country i measured as the difference between the lending and the deposit rates in period t for (i=1. . . , N; t=1,...,T), N=11 is the number of countries, T=12 is the number of years, x_{it} is a set of bank-specific variables in country i, in time t, Z_{it} is a vector of macroeconomic variables in country i at time t, ε_{it} is the disturbance term, and α, β, γ are parameters to be estimated. The vector of bank characteristic variables are the following: (a) bank size, (b) bank liquidity, (c) default risk, (d) bank liabilities, (e) cost inefficiency, (f) share turnover to capture alternative investments, and (g) bank concentration. The vector of the macroeconomic variables contains treasury bill rates to capture fiscal policy pressures on interest rates.

The bank-specific characteristics aim at controlling different individual factors that are due to affect the bank interest rate spread. Cost inefficiency is the ratio of total bank overheads to the gross income. From literature, banks with higher operating costs to gross income ratio are expected to have higher interest rate spreads. The coefficient of the variable is therefore expected to be positive. Bank liquidity is defined as the ratio of total outstanding interbank debts to total bank deposits. The variable is expected to be negatively related to the bank interest spreads. An increase in liquidity reduces the bank's liquidity risks, reducing the liquidity premiums charged on loans. Default risk, which measures how risky a loan portfolio is, is expected to have a positive coefficient. Increased bank size implies a more concentrated market. Increased bank size will therefore widen the margins with an expected positive coefficient. However, a negative coefficient on the bank size would imply that the high concentration of banks leads to increased cost efficiency due to economies of scale. Increased bank liabilities will increase bank margins. The coefficient is expected to be positive.

3.2   Data and Sample Countries

The countries included in the study are Kenya, Uganda, South Africa, Egypt, Japan, Germany, Malaysia, Poland, Korea, Botswana and USA. The choice of counties in the panel is based on regions and the level of financial sector development. It was projected that the study could cover more than the countries covered but due to data limitations, this was not achieved. This study uses panel cointegration technique using time series data from 1990 to 2007. This technique is chosen because it helps control interest rate margin heterogeneity across countries.

3.2.1   Panel Unit Roots

According to Granger and Newbold (1974), econometric estimation using non-stationary time series data often leads to spurious results (unless there is cointegration). Spurious results arise when the regression of non-stationary series, which are known to be unrelated, indicate that the series are correlated. The need to test for unit root in time series therefore arises on this basis. Panel-based unit root tests have been advanced by Qua (1994); Levin and Lin (1993); Levin, Lin and Chu (2002); Maddala and Wu (1999); Hardi (2000); Breitung (2000); Im, Pesaran and Shin (1995 and 2003), among others. The panel unit root tests the null hypothesis that $\rho = 1$, against the alternative that $\rho < 0$

in the autoregressive equations:

$$\Delta y_{it} = \alpha_i + \rho_i y_{it-1} + \sum_{j=1}^{p_i} \theta_{ij} \Delta y_{i,t-j} + \varepsilon_{it} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(3.2)$$

where ρ are the autoregressive coefficients and are allowed to vary from one variable to another, and ε_{it} is identically and independently distributed disturbance term. The hypothesis to be tested can be stated as:

$H_O : \rho_i = 0$ for all i (all cross-sections are non-stationary)

$H_A : \rho_i < 0$ for at least one cross-section (at least one cross-section is stationary)

If $\rho_i < 0$ then y_{it} is stationary and if $\rho_i < 0$, y_{it} is non-stationary.

The lag order is determined as $In(T^{\frac{1}{3}})$, where T is the time period (number of years). The final IM, Pesaran and Shin (IPS) test statistic can be constructed as:

$$\bar{z} = \frac{\sqrt{N}\left(\bar{t}_{NT} - a_{NT}\right)}{\sqrt{b_{NT}}} \mid \mid N(0,1) , \bar{t}_{NT} = \frac{1}{N}\sum_{i=1}^{N} ADF_i$$

where N is the number of cross-sections, $\overline{t}_{NT}$ is the average ADF test statistic of all the individual cross-section test statistic, a_{NT} and b_{NT} are means and variances respectively computed based on Monte Carlo simulated moments. They depend on the lag order ρ , the number of cross-sections and the deterministic structure of the ADF test performed. The deterministic structure should be the same for all *i*.

There are two classes of panel unit roots. The first class of tests assume that the autoregressive parameters are constant across countries so that for all i. The second class of tests allows ρ_i to be different across countries. The unit root test results when ρ_i is allowed to vary across countries are reported in Table 3.1.

The results from both the ADF and PP tests fail to reject the null hypothesis that each of the series in all the cross-sections contains unit roots except for bank concentration. This implies that all the series are non-stationary except concentration.

3.2.2 Pooled ADF and Phillip-Perron (PP) tests for cointegration

Panel cointegration follows the conventional residual-based cointegration test introduced by Engle and Granger (1987). Panel cointegration, however, tests the null hypothesis of no cointegration

Table 3.1: Summary of panel unit root tests
Null: Unit root

Variable	ADF	PP	Conclusion
Margins	-0.36615	1.17135	Non-stationary
Concentration	-4.99552*	-2.21271*	Stationary
Cost inefficiency	0.25868	-4.65366	Non-stationary
Bank size	0.21006	0.61302	Non-stationary
Bank liabilities	1.31287	0.79194	Non-stationary
Bank liquidity	1.02731	2.50464	Non-stationary
Default risk	2.72476	2.98928	Non-Stationary
Share turnover	4.64248	10.12607	Non-Stationary
Tbill rates	-0.08067	-0.91713	Non-Stationary

Note: IPS is a one-tailed test (left tail) and * denotes rejection of null hypothesis at 5% with a test statistic of -1.645

against the alternative that there is cointegration in the series. This is a departure from the conventional time series way of testing the null of cointegration against the alternative of no cointegration. There are four different panel estimation situations: the panel spurious regression (no time series cointegration); the heterogeneous panel cointegration where each individual cross-section has its own cointegrating vector, but the set of dependent and independent variables that are cointegrated are the same; a homogeneous panel cointegration where cross-sections have identical cointegrating vectors with possible fixed effects; and homogeneous panel cointegration where cross-sections have a slight variation in the cointegrating vector due to a localizing parameter. This study assumes a homogeneous panel with identical cointegrating vectors. The hypothesis to be tested in this section can then be stated as:

H_o: None of the relationships is cointegration

H_A: At least one of the relationships is cointegrated.

With the test statistic $\dfrac{\sqrt{N}\left(A\bar{D}F - \mu\right)}{\sqrt{\sigma^2}}$, where $A\bar{D}F = \dfrac{1}{N}\sum_{i=1}^{M} ADF_i$

i is M dimensional, and μ is the mean. It is possible to use either ADF or the PP tests to calculate the test statistic because they are asymptotically similar. The test statistic results are reported below:

ADF-based test = $\dfrac{\sqrt{21}\left(-3.98782 - (-3.4816)\right)}{0.7583}$ = -3.059200143

PP-based test=$\dfrac{\sqrt{21}\left(-6.26906-(-3.4816)\right)}{0.7583}$=-16.84526543

Panel cointegration test is a one-tailed test. The critical value at 5 per cent is -1.645. The ADF and the PP test results above reject the null hypothesis of no cointegration. This means that the non-stationary series of the model are cointegrated. These findings allow us to proceed with the estimation of the model, but exclude bank concentration from the estimations because it is integrated at a different order from the other variables.

3.2.3 Test for Poolability

Slopes and intercepts in a panel can be the same across years and cross-sections, or the slopes can be the same while the intercepts vary. This study conducted tests for poolability under the null that all coeffients are equal against the alternative that not all are equal using the chow test under the assumption of common intercept:

H_O: $\delta_1 = \delta_2 = \delta_3 ....= \delta$

H_A: Not all are equal

where δ_i are the cross-section coefficients.

Table 3.2: Poolability test results

F-statistic	69877.86		Probability	0.000000
Chi-square	6079374.0		Probability	0.000000

The values of both the F-statistic and the Chi-square test statistic indicate that we can decisively reject the null hypothesis of homogeneous coefficient. This means that the slopes of the different cross-sections vary.

3.2.4 X_{it} Exogeneity test

Conventional panel analysis assumes that all the regressors are exogenous so that $E\left(\mu_{it}\,/\,X_{it}\right)=0$ However, the error term μ_{it} contains individual and time effects, which are correlated with the regressors then X_{it}. To test this, we use the Hausman specification test. Extending the assumptions about the distribution of the error term in equation (3.1) so that:

$$\mu_i \mid\mid IID\left(0,\sigma_\mu{}^2\right)$$
$$\lambda_t \mid\mid IID\left(0,\sigma_\lambda{}^2\right)$$

$v_{it} \mid\mid IID\left(0, \sigma_v^{\,2}\right)$ (implying that X_{it} is independent of μ_i, λ_t, v_t for all i and t), then the Hausman specification test is equivalent to testing for random effects against a fixed effects model. It tests the null of random effects against an alternative of fixed effects:

$$H_O : E(\mu_{it}/X_{it}) = 0$$

$$HA : E(\mu_{it}/X_{it}) \neq 0$$

This is a normal Chi-square test. The test results reject the null hypothesis at 5 per cent with calculated $x^2 = 14.5698$ against the critical of 2.17 for seven degrees of freedom. This implies that we use the fixed effects model. We also tested for one-way error component model, where only country specific effects are important, against a two–way error component model where both the country-specific and the time specific effects are important. The two way effects model can be constructed based on the difference between fixed effects (time and individual dummies) and two-way random effects GLS. Four equivalent hypotheses are tested:

$$\mu_i \text{ are fixed, test } H_O : E(\lambda_t/X_{it}) = 0$$

$$\mu_i \text{ are random, test } HA : E(\lambda_{it}/X_{it}) = 0$$

$$\lambda_t \text{ are fixed, } H_O : E(\mu_t/X_{it}) = 0$$

$$\lambda_t \text{ are random, } HA : E(\mu_t/X_{it}) = 0$$

The test results indicate that the time specific effects are not important. The calculated F is 0.6598 against the critical of 1.75. We therefore use a one-way error component model in the estimations.

3.3   Estimation Technique

However much panel models are appealing, they reduce the degrees of freedom for large samples when OLS is used in the estimation. This is because the estimation requires that all parameters of the original regressors are estimated, and that one parameter for each of the regressors' intercepts and one parameter for each of the cross-section fixed effects are also estimated. To increase the degrees of freedom, the Least Squares Dummy Variable (LSDV) technique is used. It entails estimating the parameters, including the fixed effects. The estimated model is of the form:

$$y_{it} = \alpha_{it} + \beta_{it} x_{it} + u_i + v_{it} \quad \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(3.3)$$

where u_i are country-specific effects, x_{it} is the error term that represents the effects of the omitted variables that are specific to the individual units but not time periods and v_{it} is a random term. However, it is suspected that the cross-section disturbances are correlated due to different similarities in the countries used in the study. To solve this problem of contemporaneous correlation, this paper uses a seemingly unrelated regression (SUR).

3.3.1   Seemingly unrelated regression model

This study uses the Zellner's (1962) seemingly unrelated regression (SUR) model in its estimation. This is because the error terms in equation (3.3) might be contemporaneously correlated (that is capturing same effects given that the countries in the study share several common characteristics). Contemporaneous cross-country correlation may be caused by being members of the same regional trading bodies, the time of liberalization, same bank characteristics across the countries by the fact that the banks are subsidiaries of the same parent like Barclays bank, general state of the economy in the different countries, the political environment among others. Letting $y_{it} = \ln\left(\dfrac{M \arg_{it}}{1 - M \arg_{it}}\right)$,

then equation (3.3) can be written in SUR form as:

$$
\begin{bmatrix} y_{1t} \\ y_{2t} \\ y_{3t} \\ . \\ y_{11t} \end{bmatrix} =
\begin{bmatrix} \gamma_{1t} & 0 & 0 & \ldots & 0 \\ 0 & \gamma_{2t} & 0 & \ldots & 0 \\ 0 & 0 & \gamma_{3t} & \ldots & 0 \\ . & . & . & . & . \\ 0 & 0 & 0 & \ldots & \gamma_{11t} \end{bmatrix}
\begin{bmatrix} \beta_1 \\ \beta_2 \\ \beta_3 \\ . \\ \beta_{11} \end{bmatrix} +
\begin{bmatrix} \varepsilon_{1t} \\ \varepsilon_2 \\ \varepsilon_{3t} \\ . \\ \varepsilon_{11t} \end{bmatrix}
\quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(3.4)
$$

The numbers 1 to 11 correspond to the various cross-sections (countries). The covariance matrix of the joint disturbance vector, which is not equation specific, is given by:

$$
E\left(e'e\right) = \Omega = \sum \Phi I
$$

where $\quad \sum \Phi I = \begin{bmatrix} \sigma_{1,1} & \sigma_{1,2} & . & . & \sigma_{11,11} \\ \sigma_{2,1} & \sigma_{2,2} & . & . & \sigma_{11,1} \\ . & & . & . & . \\ . & & . & . & . \\ \sigma_{11,1} & \sigma_{11,2} & . & . & \sigma_{11,11} \end{bmatrix}$

If the explanatory variables in the SUR model above are orthogonal to the errors, that is $E\left(\gamma_{it}\varepsilon_{it}\right) = 0$, and the matrix $\left(\gamma_{it}\gamma_{it}\right)$ are singular, then the vector of the parameters β can be estimated by the generalized least squares (GLS). For this to be done, however, the covariance matrix of

the joint disturbance vector must be known. The GLS estimator is then given by:

$$\hat{\beta} = \left[\gamma^{'} \left(\sum {}^{-1} \Phi I \right) \gamma \right]^{-1} \left[\gamma^{'} \left(\sum {}^{-1} \Phi I \right) y \right]$$

when $\sigma_{ij} = 0$ for $i \neq j$ or if $\gamma_1 = \gamma_2 = ... = \gamma_{11}$ the SUR estimation and ordinary least squares estimations are not different. In the first step of SUR estimation, the equation for each country is estimated separately using ordinary least squares, then in step two, the residual from the ordinary least squares is used to estimate Σ ΦI. Finally, all the eleven country equations are jointly estimated using the feasible GLS from step two. The estimation results of the SUR model is reported in Table 3.3.

3.3.2 SUR LSDV estimation results

Table 3.2: SUR (LSDV estimation) results

		Banking size	Bank liquidity	Bank liability	Default risk	Cost inefficiency	Share turmover	Treasury bills
Kenya	Coefficient	0.608031	0.094750	0.310712	0.640669	0.690035	-0.18757	-0.000380
	t-Statistic	7.252045	1.745270	0.081521	10.35857	2.103599	-2.216246	-0.063923
Japan	Coefficient	0.088119	-0.027142	0.000889	0.110427	0.175841	-0.003234	-0.017228
	t-Statistic	16.55494	-4.544350	0.247958	8.022801	2.977272	-2.135630	-1.152077
Germany	Coefficient	-.008524	-0.003673	0.071703	0.041818	0.346112	-0.001335	-0.031755
	t-Statistic	-2.546134	-1.341916	3.125664	2.472693	3.785419	-1.258310	-1.377088
Egypt	Coefficient	0.032456	-0.18510	0.133144	0.042473	0.384414	-0.000318	-0.007433
	t-Statistic	1.922566	-6.362881	5.713557	4.193054	0.979001	-0.096041	-0.676891
Malaysia	Coefficient	-0.006884	-0.065985	0.023827	0.048100	0.032616	-0.001051	-0.109603
	t-Statistic	-0.796799	-1.907852	1.85264	3.690073	0.543140	-0.318349	-1.442760
Poland	Coefficient	-0.010092	-0.646743	0.515725	0.084311	0.243070	-0.007897	-0.075891
	t-Statistic	-0.381776	-2.788777	1.714485	0.057944	1.361200	-1.482166	-1.241925
Uganda	Coefficient	-1.513840	-1.735063	2.850944	4.269448	0.029113	-4825.509	-0.105493
	t-Statistic	-1.417104	-1.304054	2.148162	1.689117	0.164843	-1.147432	-2.347580
South Africa	Coefficient	-0.009942	0.015507	0.679999	0.007092	0.116125	-0.174997	-0.684756
	t-Statistic	-1.338041	0.637636	2.670534	0.071574	0.392874	-3.144332	-2.985418
Korea	Coefficient	-0.123932	0.051031	0.020389	0.071814	0.117018	-0.002222	-0.061715
	t-Statistic	-3.986558	6.806588	5.393589	2.184372	5.296470	-7.132344	-7.940792
Botswana	Coefficient	2.782427	0.304195	0.233708	3.309407	0.194595	-0.005470	-0.416577
	t-Statistic	6.629940	2.467915	3.373130	7.047386	0.600470	-0.476673	-5.247518
USA	Coefficient	-0.022470	0.431978	0.454035	0.033033	0.276721	-0.001983	-0.124186
	t-Statistic	-1.200379	2.778622	2.822450	3.165894	2.082142	-1.920540	-3.865732

Table 3.3: Fixed effects

Constant	Coefficient	Std. Error	t-Statistic	Prob
_JAPAN—C	0.060628	0.021769	2.785039	0.0079
_GERMANY--C	0.020872	0.006604	3.160474	0.0028
_KENYA—C	0.183487	0.032426	5.658596	0.0000
_EGYPT—C	0.020660	0.004959	4.166190	0.0001
_MALAYSIA--C	0.021749	0.007030	3.093614	0.0034
_POLAND—C	0.094737	0.033245	2.849689	0.0066
_UGANDA—C	26.93010	23.45408	1.148205	0.2571
_S.AFRICA—C	-0.134332	0.061819	-2.172997	0.0352
_KOREA—C	0.042592	0.001100	38.70324	0.0000
_BOTSWANA--C	0.048060	0.023368	2.056641	0.0457
_USA—C	0.085423	0.007833	10.90573	0.0000
Log likelihood	1012.015			
R-squared	0.989626	Mean dependent var	0.048518	
Adjusted R-squared	0.969114	S.D. dependent var	0.026682	
S.E. of regression	0.004689	Sum squared residuals	0.000968	
Durbin-Watson stat	2.768032			

4. Discussion of Results

Default risk is an index that measures how risky the loan portfolios are. This study uses default risk instead of the non-performing loans due to data limitations on non-performing loans for all the countries. The results indicate a positive and a statistically significant coefficient for Kenya. This means that as default risk increases, the banks increase their default premium on new loans, and this is reflected on higher lending rates, which increases interest margins. The high default risk and low quality of the loans could be attributed to the high non-performing loans portfolio in Kenya. The only countries where default risk is not a problem are South Africa and Poland. For all the other countries in the study, default risk is a major determinant of the margins in the respective counties. This finding implies that the efficiency of the intermediation process is hampered by the level of non-performing loans in Kenya.

Bank liquidity variable, which is the ratio of outstanding interbank debt to total deposits, was expected to have a negative coefficient. The variable is found to be positive and statistically significant (at the 10% level) for Kenya. The expectation for the positive sign is that banks will increase the deposit rates to attract funds as they increase their borrowing from the interbank market. The positive coefficient for Kenya is curious and would only imply that Kenyan banks increase their liquidity positions to invest in other securities such as treasury bill rates instead of using the extra liquidity for lending. If the extra liquidity were used in lending activities, the lending rates would go down reducing the margins; however this is not the case. Increased investment on treasury bill leaves little funds in the banks' vaults for lending to the public. The shortage of funds for lending pushes up the lending rates, which further widens interest margins implying that boosting liquidity positions by the banks increases the inefficiency of the financial sector since the banks use the extra liquidity instead to invest in treasury bills instead of using it for lending. The coefficient is positive also for Botswana, Uganda, South Africa, Korea and the USA. It is, however, not significant for only three countries: Germany, Uganda and South Africa.

Bank size, which are the total assets of bank i over the total assets of the banking industry is used in this study instead of concentration, which was found to be stationary at levels. The bank size coefficient reflects market power. Increase in bank size will imply increased

market power with a more concentrated banking sector. A concentrated banking industry from the structure-performance hypothesis will imply that the banks behave oligopolistically with the expectation that they have the leeway of fixing interest rates.

Increased bank size would increase interest margins with expected coefficient being positive. The results indicate positive coefficients for Kenya, Japan, Egypt and Botswana, all of which are statistically significant. This implies that bank concentration have significantly widened the interest margins in these countries. The other countries including USA, Korea, South Africa, Uganda, Poland, Germany and Malaysia have negative coefficients. This fact may be indicative of lowering margins as bank concentration increases, probably due to increased efficiency and economies of scale. However, the coefficients are not significant for Malaysia and Poland, implying that bank size is not important in explaining the margins in those countries. The coefficients for Uganda, South Africa and USA are all significant at 10 per cent significant level.

The cost inefficiency in the banking industry reflects the degree of inefficiency in delivering banking services. It is the ratio of operating expenses to gross income. Increases in operating costs signify increased cost inefficiency, which widens the margins making the intermediation process inefficient. The coefficients for all the countries are positive indicating that increased cost inefficiency widens the margins in the respective countries. Cost efficiency is important in explaining interest rate margins in Kenya, USA, Korea, Germany and Japan. With the coefficient for Poland significant at 10 per cent level, Kenya has the highest cost inefficiency impact on the margins at 69 per cent. The results imply that higher bank operating costs lead to inefficient financial market intermediation process in Kenya.

Share turnover at the stock markets indicate alternative investment market money other than putting the money in the banks and on treasury bills. It is expected that increased share turnover which implies higher returns from the stock markets, will pressurize banks to increase their deposit rates in order to attract money from the public, in competition with the share market. This will have the effect of reducing interest rate margins. This hypothesis is confirmed for all the countries with negative coefficients. However, the coefficient is not significant in countries such as Egypt, Malaysia and Botswana. The result here implies that increased activity and returns from the stock markets improve the

efficiency of the financial markets as this increases competition for deposits with the banks.

Fiscal policies, just like the share markets, act as competitors for funds with the banking sector. Increased returns from treasury bills will therefore put pressure on banks to increase their deposit rates, hence reducing the margins. Except for Kenya and Egypt, which has a statistically insignificant coefficient, all other countries used in the study indicate that treasury bill rates, which are an alternative investment window for public funds, are important in explaining the bank interest rate margins in the respective countries. The coefficients of Japan, Germany, Malaysia and Poland are significant at the 10 per cent level. The fiscal policy impacts are greatest for South Africa than any of the other countries in the study.

In general, the results show that the major contributor to the financial sector inefficiency in Kenya, going by the magnitude of the significant coefficients, is high operating costs (cost inefficiency) followed by default risk or level of non-performing loans, bank size or bank concentration, and share turnover.

4.1   Fixed Effect Results

The fixed effect coefficients confirm the existence of country-specific characteristics that are unique to the particular countries. For all the countries, these country-specific characteristics are significant in explaining interest rate margins, as can be seen from the highly significant t-values. Except for South Africa, all the other country-specific characteristics lead to a widening interest margin in the respective countries. The country-specific characteristics widen the margins most in Uganda, followed by Kenya, and South Africa among the countries in this study. In this sample of countries, Uganda is unique in that it has a political environment that is different from all the other countries, given that it operates in a one party state with limited democratic space. Another distinguishing characteristic in Uganda that may affect the cost of borrowing from the banks is the civil strife brought about by the fighting between the government forces and the rebels. This tends to increase the country's credit risk and limits the expansion of the financial sector. Kenya's country specific characteristics are also important in widening interest rate margins. Kenya's financial sector has experienced rampant corruption and lack

of enforcement of contracts, more so during the regime of the former government (KANU) where many government-owned banks advanced political loans to politically correct individuals who never bothered to refund the money. This increased default risk and credit risk. In most cases, these loans became bad and non-performing leading to the collapse or near collapse of the banks. This was the case with most National Bank of Kenya (NBK) loans at the time. The NBK, for instance, almost collapsed under non-performing loans and had to be bailed out by tax-payers money and then privatized to stand on its own.

5.   Conclusion and Policy Issues

Widening interest rate margins, which is the indicator of financial sector inefficiency in this study is hypothesized to be detrimental for savings mobilization and stifles investment growth. Wide interest margins as witnessed in Kenya are therefore a sign of a repressed and inefficient financial sector. This study analyzes the determinants of the efficiency of the financial sector intermediation process in 11 countries, with a view to recommending policy options for reducing the spreads and improving the financial market efficiency in Kenya, in line with the findings from the other countries. The countries are selected from the African region and other developed countries and include Kenya, South Africa, Uganda, Egypt, Japan, Germany, Malaysia, Poland, Korea, Botswana and USA. To achieve its aim, the study estimates a fixed-effect, Seemingly Unrelated (SUR) regression model using panel cointegration technique. The SUR model is used since it is suspected that there could be contemporaneous correlation among the errors of the different countries included in the study, as they share several common characteristics including belonging to the same regional blocs, same political and economic environment, same stage of liberalization of the financial sector and same financial sector structure.

The results indicate that the major contributor to the widening interest rate margins, hence inefficient financial market intermediation process in Kenya is cost inefficiencies. Cost efficiency, which was the ratio of operating expenses to gross income, includes both the managerial and operational inefficiencies in the banking sector. The same results were obtained for Japan, Germany and Egypt, which also had cost inefficiency as the major contributor to the widening margins. The recent initiative by the banks in Kenya to invest in modern technologies, such as the automated teller machines, is expected to reduce the operational costs. In the recent past also, the banks have embarked on recruitment of staff that targeted only university graduates. In the long run, this is expected to reduce management inefficiencies at the branch levels.

The second major contributor to inefficient financial markets in Kenya is asset quality (non-performing loans), which was proxied by the default risk. It measures how risky the loan portfolios in each country are, and the possibility that a loan can become bad and non-performing. Asset quality is also the highest contributor to the wide margins in Botswana, as well as the second largest contributor to the wide margins in Uganda. To make the default risk in the credit market

low, the government must come out strongly to protect the lenders by enforcing contracts between the borrowers and the lenders. The banks must also improve on the credit appraisal of their customers to avoid giving loans to customers who are not credit worthy. Another way to deal with the problem of non-performing loans is to establish a credit reference system. Many countries in the world, including South Africa, have developed a viable credit reference system to identify potential credit unworthy customers. In Kenya, the necessary mechanism that would help identify such customers is lacking. The establishment of credit reference and rating bureaus can improve loan quality, as banks will be in a position to know the credit rating of their potential customers reasonably well. There is a credit reference bureau in Kenya, but it lacks the regulatory environment and the support of both the government and the banking sector. It is therefore important that both the government and the banking sector put in place structures that will enable credit referencing and rating.

With the introduction of the In Duplum Rule, which puts a ceiling on the cumulative interest that a bank can charge on non-performing loans, the banks are likely to be more stringent in the vetting of potential borrowers to reduce the risk of default. This may mean that lending rates may not come down as banks cover up for the lost revenue. The recent government initiative to curb other bank charges is sealing another avenue for revenues for the banks. For the banks to survive with many avenues for extra revenue sealed, they must find a formula that will encourage lending to the private sector, while discouraging default among borrowers.

The third major factor that is important in explaining the financial market inefficiency in Kenya is bank size, which implies a more concentrated banking sector. Bank size is also the highest contributor to the wide margins in Korea, and is also important in explaining the wide margins in Uganda and Botswana. The initiative by the CBK to make public individual bank charges is a move in the right direction, meant to make the banks more competitive. Similar initiatives of disclosure should be encouraged to remove the oligopolistic characteristics of the market. However, the Central Bank has closed doors to licensing of new banks over the last few years. In this period, only K-Rep Bank and Equity Bank have been licensed to operate as mainstream banks. Closing the door to new entrants is a sure way of blocking competition from new entrants. With customers having fewer choices when existing banks such as Trust Bank, Euro Bank and Daima Bank exit, and no

new entrants, the existing banks will operate without fear of new competition. The government through the CBK must therefore come in to license more new banks for increased competition.

The results further indicate that increased share turnover will reduce interest margins. This will be as a result of the commercial banks competition for funds with the share market. As share turnover increases, the banks are compelled to increase their deposit rates to convince particularly the time-deposit investors that the banks are an alternative to investment in shares. Therefore, there is need to improve the efficiency of the Nairobi Stock Exchange, which is the hub of trading in shares in order to increase the efficiency of the financial sector.

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