

# The Effect of Market Power on Bank Spread in a Diversified Product Portfolio

## The Case of Commercial Banks in Kenya

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### Abstract

This paper examined how the relationship between market power and bank spread is affected by product diversification. Two different indicators were used for bank spread namely: interest rate spread and gross margin. We used bank level data from 13 commercial banks sampled from a total of 40 banks on the basis of availability of complete data for the period 2009-2018 through purposive sampling. The data was captured in panel data form and analysed using SPSS and STATA software to obtain descriptive, correlation and regression analyses. The main findings are that in the presence of a diversified portfolio, the impact of market power on bank spreads turns negative. Kenya's banking sector has a diversified loan and deposits portfolio. Income streams still have a low diversification level with most incomes being linked to the lending activities of the banks. The study recommends further diversification of revenue streams and effective deployment of skilled staff to the credit function for effective management of the loan book to avoid high default incidence as a strategy for reducing bank spreads

**Keywords:** Bank spread, product diversification, market power

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### 1. Introduction

Market Power refers to the ability of a firm to raise the prices of goods and services thereby increasing its profitability. Market Power makes it possible for a firm to control prices or supply of goods and services to a market. This variable is commonly proxied by market share which is derived as a ratio of bank assets to total industry assets for the assets market share, a ratio of bank total loans to total industry loans for the loans market and a ratio of bank deposits to total industry deposits for the deposits market.

In a non-competitive environment, a high market share is positively related to interest margins. This is because banks with comparatively high market share have market power and can exercise this power to act as price setters earning higher margins in the process. Reharjo et al (2014) found this to be true in his study of interest margin determinants in Indonesia where, using the loans market share, he found market share to be positively associated with interest margins. Gounder & Sharma (2012) also found market power to have a positive relationship to interest margins. Ahokpossi (2013) noted that such banks with market power especially in the loans market could also sometimes pick on an interest bearing product as a loss leader in their growth strategy hence resulting in lower margins. In the study, he found that market share was insignificant in the determination of interest margin even when interacted with efficiency to try and bring out the effect of economies of scale. Ugur & Erkus (2010) in their study on Turkey found market share to have a negative effect. The major findings of the study by Chortareas et al (2012) were that market share has little or no influence at all on interest margins in Latin America. Maudos & Guevara (2004), found that market power, has a positive relationship to net interest margins. Unlike Chortareas et al (2012), Vaskov et al (2011) found bank size and market share to be the most important determinants of lending rates and interest rate spreads. According to them, an increase in bank size and reduction in market share of certain banks will lead to reduction in lending rates and narrowing of interest spreads. The results are in favour of consolidation of small banks through mergers and acquisitions which should lead to stronger more competitive large banks. This should benefit customers by way of lower lending rates and narrower spreads.

### 2. The problem statement

Theoretically, competition is known to have the effect of reducing bank margins whereas market power is associated with high margins. In their study of the determinants of net interest margins in the European banking sector, Valverde and Fernández (2007) demonstrated that the relationship between market power and interest margins can be altered by the extent of diversification/specialization of the intermediary. Earlier on Maudos and Guevara (2004) also noted the co-existence of a situation of increasing market power and reducing interest rate spread contrary to theory. This situation, according to Valverde and Fernández (2007) can partly be explained by the existence of diversification as diversified banks are able to engage in pricing competition on one product

or in one market with rivals while making up for the income loss by increasing prices for other products or markets. Not much empirical analysis have been undertaken to test this effect of product diversification on the behaviour of market power with bank spreads. The current study will empirically test this phenomenon in the case of the Kenyan market using three measures of product diversification discussed below.

### 3. Literature review

The original model by Ho and Saunders (1988) assumes a homogeneous loans and deposits composition. Allen (1988) recognizes that bank loans and deposits have different maturities and at any one time a bank will have a mixed composition of these. Her extended model takes into consideration the effect of this difference in the determination of spread assuming the existence of two loan types. Her augmented model assumes that customers switch from one product to another when interest rates vary. The customer's choice in so doing being guided by the most cost saving product. Consequently, interest spread is reduced by the benefits of diversification which at the same time also helps banks to optimize the relative interest spread across products. Valverde and Fernandez (2007) built on this extension by introducing multiple products in loans, deposits and other non-traditional activities that banks are involved in. According to the expanded model, banks with multiple products consider non-traditional assets and other commission and fees sources as alternatives to loans whose presence alters risk and market power and must be considered while setting prices. Banks may set prices for loans relative to deposits and those for non-traditional activities relative to deposits. Interest margins will be the difference between the loans rate and the deposits rate while the gross margin will be the aggregate of the difference between loans rate and deposits rate and the non-traditional assets rate and deposits rate. Consequently diversification directly influences bank spread and at the same time alters the relationship between market power and bank spread.

In the last three decades or so, developments in the financial sector especially with respect to technological innovation have enabled banks expand the range of their loans and deposit products and even venture into non-traditional banking services. These developments have greatly altered the considerations that go into determining margins. According to Valverde and Fernandez (2007), the co-existence of decreasing interest margins with increasing market power witnessed in several European financial systems could be partly explained by specialization or diversification patterns. Diversification increases market power and at the same time diversified banks may use their market power to engage rivals in price competition by reducing interest margins while compensating the lost incomes through non-traditional activities.

#### 3.1 Market share

Banks that enjoy a higher market share of deposits have the power to set prices in their favour resulting in higher margins. The original dealership model associates market power with increasing interest rate spread and indeed a number of empirical studies have affirmed this position. According to (Romero and Rodriguez (2011), Banks in Costa Rica use market power to transfer costs to consumers thereby increasing bank spread. In Kiptui (2014) study based on Kenya, market structure variables namely market share and concentration were both found to be insignificant, a result attributed to the fact that concentration in Kenya's banking system is low. Given that in excess of 66% of the industry's assets, loans and deposits are held by a few large banks in Kenya, the situation could be different now.

Gounder and Sharma (2012) found market power to have a positive relationship to interest margins suggesting that banks with market power in Fiji are charging higher loan rates and offering lower deposit rates to their customers. In their study of interest margin determinants in the European Union, Maudos and Guevara (2004), found market power as measured through the Lerner Index, to be positive and highly significant. Increased market power improves the ability of the financial intermediary to expand their resource allocation activities and extract more profits hence the positive association between interest rate spread and market power. Increased market power improves the ability of the financial intermediary to expand their resource allocation activities and extract more profits hence the positive association between interest rate spread and market power (Romero, Jose Pablo Barquero; Rodriguez, 2011). The positive relationship between market share and interest rate spread was evidence of a market structure that allows banks to pass on increasing costs directly to the customer by way of wider spreads in Belize (Perez, 2011).

Under certain circumstances, other researchers have had outcomes that vary from the theoretical expectations. Ahokpossi's (2013) study based on banks in sub-Saharan Africa found that market share was insignificant in the determination of interest margin even when interacted with efficiency to try and bring out the effect of economies of scale. The study noted that banks with market power especially in the loans market sometimes pick on an interest bearing product as a loss leader in their growth strategy hence resulting in lower margins. Ugur and Erkus (2010) in their study on Turkey found that loans market share had a negative relationship which could be explained by the banks' desire to increase market share by reducing interest rates on loans thereby narrowing bank margins. The major findings of the study by Chortareas et al., (2012) were that

market share has little or no influence at all on interest margins in Latin America. In the case of Rwanda, the insignificant influence of market power on interest rate spread was found to be as a result of improved price-based competition over time (Rusuhuzwa & Karangwa, Mathias; Nyalihama, 2016). The study however focused on the deposit market share alone. Georgievska et al (2011) found bank size and market share to be the most important determinants of lending rates and interest rate spreads. According to them, an increase in market share will lead to reduction in lending rates and narrowing of interest spreads. The results are in favour of consolidation of small banks through mergers and acquisitions which should lead to stronger more competitive large banks. This should benefit customers by way of lower lending rates and narrower spreads.

### **3.2 Product diversification**

Product diversification may be defined as expanding a market for an entity by introducing new products or extending existing ones. This is usually done in response to competition in a bid to maintain market share, profitability or both. In the case of banks, product diversification can take the form of differentiated loans, deposits or other sources of income outside the banks' lending activities.

#### **3.2.1 Income based diversification**

The Ho and Saunders dealership model was designed under the assumption of single product loans and deposits. With most countries of the world embracing financial liberalization, the banking industry has in the most part resorted to addressing the increased challenges of competition by diversifying their activities (Mensi & Labidi, 2015). Diversification can be defined from many different stand points on the basis of the activities of an organization. Diversification can be focused on products, services or geographical locations. Diversification may refer to the entry to new markets, technological innovation, invention of new products to meet changing needs or new ways of information flow (Otieno, A.O.; Moronge, 2014). Some researchers have defined diversification with respect to products, services or markets. Others are of the view that diversification is about the means by which an organization is able to gain growth while minimizing risk (Mulwa, 2018). Mulwa et al. (2015) sought to define diversification in the context of the banking sector and said it is the combination of different business activities, income sources, assets and liability types by a bank.

Income based diversification refers to the expansion of income sources to activities outside the traditional intermediation services (Mulwa et al., 2015). Alongside the developments above is the liberalization of the banking sector which has brought with it competition by way of more commercial banks and more recently, non-bank institutions entering the transactional and lending space hitherto monopolized by banks. This has put a lot of pressure on banks' traditional income sources forcing them to venture into other areas like insurance, wealth management and other non-traditional services in a bid to generate incomes off the balance sheet activities. Such incomes are commonly referred to as non-interest income. Banks seek to reduce their risks and enhance profitability by diversifying their income sources. Diversification of income generating activities to avoid over-reliance on interest income reduces risk brought about by increased competition in the loans market and the incidence of default (Ismail et al., n.d.). According to Prasetyo (2017), diversified banks maintain a close to equal proportion of interest income to non-interest income. Both Afzal and Mirza (2012) and Ghasemi and Rostami (2015) measured income diversification as the ratio of non-interest income to total assets. According to theory, non-interest incomes reduce bank reliance on interest income from loans and therefore a negative relationship with interest spread is predicted (Afzal, 2011). In their study of determinants of bank spreads in Iran's banking sector, Ghasemi & Rostami (2015) found a negative relationship between interest rate spread and non-interest incomes.

The study carried out by Dumicic and Ridzak (2016) found that the ratio of non-interest income to total revenue is significant and negative showing that banks with higher proportions of non-interest income reduce interest rates on loans thus narrowing interest rate spread. Banks are willing to substitute loan interest with non-interest incomes and indeed are known to offer lower interest rates to customers who already have products that attract non-interest charges. It is noted that the share of non-interest income significantly dropped after 2008 with reduced lending following the financial crisis suggesting that a greater proportion of the non-interest incomes were drawn from credit related activities in countries in the Central and Eastern Europe.

#### **3.2.2 Loans based diversification**

Diversification in the loans market refers to lending to multiple sectors of the economy. This is often motivated by the desire to grow market share aggressively or spread risks of default as negative economic performance changes do not often impact different sectors in the same way or at the same time. Diversification is viewed as a strategy employed by banks in the face of competition to help mitigate risk as well as assure continued profitability. When a bank has a well-diversified portfolio, losses realised in one sector either as a result of competitive forces or otherwise, is compensated for by gains made in another (Chen et al., 2013). The study done by Afzal and Mirza (2012) did not derive a diversification index but rather looked at the proportion of contribution to the loan book per sector and analysed how each sector influenced interest rate spread. At a proportion of 21% for the textile industry, 12.9% for individuals, 4.8% for the energy sector and 2.6%

agriculture, Pakistan's loan market appears non-diversified with a strong leaning towards the textile industry which had its lending proportion going as high as 57.7%. The period covered in this study saw a number of macro-economic factors both local to Pakistan and international that affected the textile industry causing high default rates for loans to the sector. This resulted in high risk premiums hence the positive association with interest rate spread. Chen et al.'s (2014), study of how diversification of loans affects banks' return and risk provided a new way of measuring sectoral diversification by introducing a sectoral Herfindahl-Hirschman Index. The Herfindahl-Hirschman-Index (HHI) assumes perfect diversification to be a situation where there is equal exposure to every sector. This approach is useful in ascertaining the level of diversification where the bank is lending to multiple sectors as is the case in Kenya.

### 3.2.3 Demand deposit ratio

Product features affect prices and in the case of banks, deposit product features are known to influence the interest on deposits. Banks have come up with bundled products that have features like exclusive membership clubs, exclusive service and so on; features that are attractive to customers and that are easily traded off for non-interest earning deposit accounts (Gilkeson et al., 1999). This has the ultimate effect of lowering interest paid to depositors thus widening the spread. In the case of Kenya specifically, in the last 10 years following the mobile banking technology revolution, banks have come up with more transaction-based accounts linked to mobile phones which have been a good way of mobilizing cheap and in most cases non-interest earning deposits. This, supported with the onset of agency banking has enabled banks to mobilize more cheap deposits from market segments that could not previously access banking service either due to geographical barriers or costs of maintaining a bank account. Afzal and Mirza (2012) used public sector deposits as a proxy for non-interest earning deposits and found it to have a significant positive relationship with interest rate spread for Pakistan's banking sector. Ghasemi and Rostami (2015) used the ratio of demand deposits to total deposits and the results were positive and significant consistent with theory as well as the study by Afzal and Mirza (2012).

Ghasemi and Rostami (2015) studied the determinants of interest rate spread in Iranian banks using data over 19 months between September 2013 and March 2015. They used descriptive and regression analysis to investigate interest rate spread and the following identified determinants: non-performing loans, ratio of demand deposits to total deposits, non-interest income, interest earnings assets to assets ratio, capital adequacy and return on assets. Of all these the demand deposits to total deposits ratio was found to be most significant with one percentage change resulting to 2.76% change in interest rate spread. The effect is significant and positive as predicted by theory. Short term time deposits were found to reduce spread due to higher deposit interest rate commitments to maintain the deposits in the study done on Costa Rica (Romero, Jose Pablo Barquero; Rodriguez, 2011).

Afzal and Mirza (2012) based their study of interest rate spread on Pakistan's commercial banking sector in the post financial reform period of 2004-2009. This study introduced the variable public sector share in total deposits to measure the influence of level of interest-insensitive deposits on interest rate spread. The study analysed unbalanced panel data from 25 locally incorporated commercial banks using both descriptive and fixed effects regression analysis. They found that bank size, operational efficiency, asset quality, bank liquidity and risk absorption capacity all have an influence on interest rate spread. In this study diversification was measured by the proportion of public sector deposits in total deposits and four sectoral diversification variables in the loans market namely: agriculture, textile, energy and consumer. The study found that the proportion of public sector deposits had a statistically significant and positive influence as a higher concentration of these deposits leads to lower interest costs. The proportion of loans to the textile sector was significant with a positive impact on spreads. Competition in the deposits market has reduced concentration, resulting to a negative impact on interest rate spread.

### 3.3 Bank spread

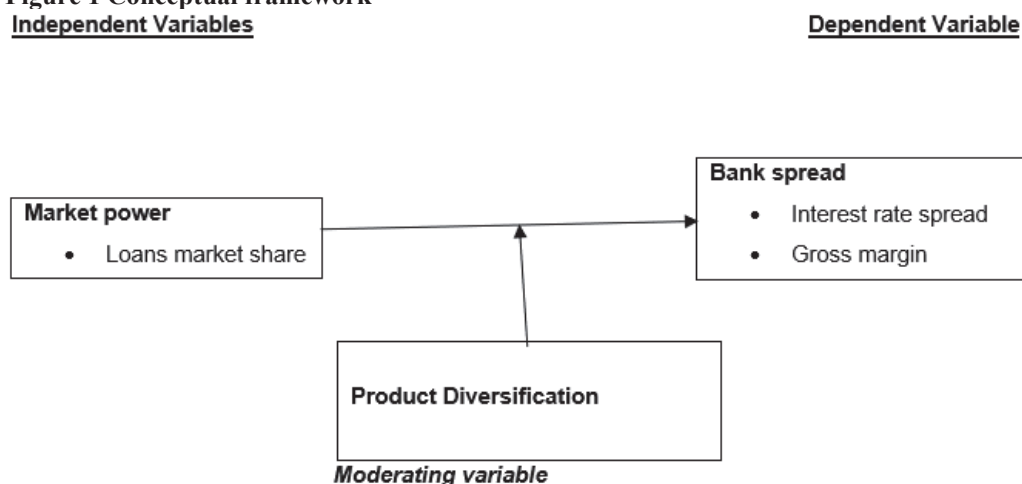
Konar (2014), defines bank spread as wide or narrow depending on the nature of data set used. Where the data covers several countries, the wide definition that uses the ratio of net interest income to total assets is often employed for simplicity. Where the research is done within one country, the narrower definition that is the ratio of interest income to loans minus the ratio of interest expense to deposits is used. The use of year end values in the calculations of these measures presents problems as sudden increases or decreases towards the end of the year distort the actual representation of margins. A loan issued towards the end of the year for example would not have yielded much in terms of interest and yet its value becomes part of the calculation of the interest margin for the year. In recognition of this challenge, the researcher uses average values for assets, loans and deposits. Our current study will be based on bank level data and for that reason will employ the narrow definition of interest rate spread which uses the ratio of interest income to average loans minus the ratio of interest expense to average deposits (Konar, 2014). This approach to calculating spread controls for fluctuations in loans and deposits throughout the year. The second spread measure we employ for this study is gross margin measure derived as the ratio of total income to total assets to reflect the effect of non-traditional activities undertaken by

the banks (Valverde & Fernández, 2007).

#### 4. Conceptual framework

To determine the effect of product diversification on the relationship between market power and bank spread, this study will analyse the direct relationship between market power and bank spread as well as that of market power and bank spread alongside diversification variables. The conceptual framework is set out below. The analysis will be carried out using descriptive, regression and correlation analysis. We hypothesize in this study that product diversification alters the relationship between market power and bank spreads. Figure 1 below graphically shows the operationalization of these research variables.

**Figure 1 Conceptual framework**



Source: Researcher, 2021

#### 4.1 Independent variables

##### 4.1.1 Market power

Banks with comparatively high market share have market power and can exercise this power to act as price setters earning higher margins in the process. Raharjo et al. (2014) found this to be true in his study of interest margin determinants in Indonesia where, using the loans market share, he found market share to be positively associated with interest margins. Market share is a proxy for market power and is derived as a ratio of the value of an individual bank to the total value of all the banks within the sector. Studies have used ratios for assets, loans and deposit values to assess the influence of market share. Rusuhuzwa et al. (2016), and Kiptui (2014) used the deposits market share. Chortareas et al. (2012) and Georgievska et al. (2011) used assets to total industry assets ratio while Raharjo et al. (2014) and Ugur and Erkus (2010) used the ratio of individual bank loans to total sector loans ratio. In a non-competitive environment, a high market share is positively related to interest margins for all the three ratios above. This current study will use the ratio of individual bank loans to total commercial banks' loans to measure market share (Ugur & Erkus, 2010; Raharjo et al., 2014).

##### 4.1.2 Product Diversification

Product diversification may be defined as expanding a market for an entity by introducing new products or extending existing ones. With most countries of the world embracing financial liberalization, the banking industry has in the most part resorted to addressing the increased challenges of competition by diversifying their activities in a bid to maintain market share, profitability or both (Mensi & Labidi, 2015). Financial intermediation was necessitated by information asymmetry and transaction costs that seekers and providers of funding would have to encounter in finding each other (Mulwa, 2018). The landscape as far as these two are concerned is quite different in the world now with the emergence of technological innovation in financial circles, emergence of investment groups where people can save and borrow from each other and the general developments in financial markets. This phenomenon has greatly impacted on banks' incomes forcing them to diversify into other sources. Product diversification can take the form of differentiated loans, deposits or other sources of income outside the banks' lending activities. This study analyses diversification in terms of income, loans and deposits. The diversification index is arrived at as one minus the Herfindahl-Hirschman Index. The Herfindahl-Hirschmann Index is defined as the sum of squared proportions of the various product streams. In a fully diversified portfolio, it is expected that there would be an equal proportion of each product type. The closer to one the index is the more diversified the portfolio while an index closer to zero indicates specialization. In the case of income diversification where this study identified a total of four income streams, an index of 0.75 represents full diversification while loan diversification which has 9 different sectors has 0.89 as signifying full

diversification.

Deposits in the banking sector can be placed in two identifiable product features namely interest bearing and none interest bearing. Banks are more motivated to work with interest free deposits and they attract them by offering incentives on non-interest bearing products such as bundled free services and multiple service platforms. In Kenya particularly technological advancement has enabled mobile phone banking agency banking and other online based banking services which have greatly expanded access to non-interest bearing deposits. The level of diversification for deposits was proxied by the ratio of demand deposits to total deposits of individual banks in the study. Table 1 below shows the measurements for the independent variables (Mensi & Labidi, 2015; Prasetyo, 2017; Ismail et al., n.d.; Mulwa et al., 2015; Turkmen & Yigit, 2012; Afzal, 2012; Ghasemi & Rostami, 2015).

**Table 1 Measurement of independent variables**

Income diversification	Loans diversification	Demand deposits ratio	Market Power (Loans Market Share)
$IDIV_{i,t} = 1 - HHI = \sum_{i=1}^n X_{it}^2$	$LDIV = 1 - HHI = \sum_{i=1}^n X_{it}^2$	$DDR = \frac{\text{demand deposit}_{i,t}}{\text{Total deposit}_{i,t}}$	$LMS = \frac{\text{Loans}_{i,t}}{\text{Total loans}_t}$

*Source: Researcher, 2021*

The theories of interest rate spread determination have identified market power as an important variable that increases bank margins as a result of the dominant banks taking advantage of their market power to set prices to their favour (Ho, & Saunders, 1981; Klein, 1971; Monti, 1972; Koffie et al., 2014). The latter extensions by Allen (1988) and Valverde and Fernández (2007) sought to demonstrate that the behaviour of market power in the determination of bank spread can be altered by the level of diversification/specialization of the bank's product portfolio. This alteration comes in two ways. First is that so long as the products act as a substitute to each other, changes in interest rate in one will cause demand to shift to the other product setting in motion an adjustment in portfolio mix that eventually brings the spread down. The second is that where a bank is diversified, it may elect to use one of its products as a loss leader in order to grow market share or edge out a competitor while making up for lost income from the other products. The hypotheses below is set to help in examining the behaviour of market power in the presence of a diversified product portfolio in Kenya's commercial banks:

*H1: In the presence of diversification, market power has a negative relationship with bank spread.*

This hypothesis will be tested together with the following hypotheses:

*H1a: Market power has a positive relationship with bank spread*

*H1b: In the presence of diversification, market power has a negative relationship with bank spread.*

#### 4.2 Dependent variable

The *ex-post* spread is used more commonly in studies of interest spreads that employ bank-level data due to readily available data as compared to *ex-ante* spread. The *ex-post* spread also controls for the fact that banks with high yields and risky credits are likely to face more defaults. Loans and deposits are not at the same level throughout the year. To achieve a more accurate ratio, this study will be using the *ex-post* interest spread calculated as the difference between average realised interest income and average realised interest expense. Average realised interest income is derived as the ratio of interest income to average loans and advances whereas the average interest expense is the ratio of interest expense to average deposits (Giordano & Lopez, 2015).

$$IRS = \frac{\text{Interest earned from loans}}{\text{Average loans}} - \frac{\text{Interest paid on deposits}}{\text{Average deposits}}$$

This study also employs a second measure of spread that includes non- interest income to take into account the diversification effect. The calculation for this measure are shown below:

$$GRNIM = \frac{\text{Total income}_{i,t}}{\text{Total assets}_{i,t}}$$

Where *i* is the individual bank and *t* the respective year.

#### 5. Methodology

This study employs the use of secondary data from commercial banks in Kenya covering the period from 2009 to 2018. The banks were selected through purposive sampling on the basis of availability of required data for all the years of study. The data was organized in panel data form and analysed using t-tests, correlation and regression statistics in order to determine the level of diversification in Kenya's commercial banks and then to examine the effect of product diversification on the relationship between market power and product diversification. Kenya has 40 commercial banks and after the sampling, a total of thirteen banks were selected which together make up 70%, 78% and 72% of the sector's assets, loans and deposits respectively. SPSS and STATA softwares were used to carry out the analyses.

## 5.1 Data validity and reliability

To ensure validity and reliability, the following tests were carried out: normality, linearity, auto-correlation multicollinearity and heteroscedasticity tests. Figure A 1 in the appendix shows the results of linearity, outliers and heteroscedasticity tests. The Durbin-Watson statistic ranges between 0 and 4 with 2 signifying no autocorrelation. The Durbin- Watson test of autocorrelation returned a value of 0.645 with interest rate spread and 0.948 for gross margin indicative of autocorrelation problems. Heteroscedasticity tests were also found to be non-compliant. When the autocorrelation and heteroscedasticity assumptions are violated there is a high likelihood of committing a type one error. This situation is mitigated by use of a robust estimator in the regression analysis and this study chose to use the PSCE estimator. The table below shows the results of the validity tests.

**Table 2 Validity tests**

Multicollinearity tests			
	VIF	Pearson Correlation coefficients	
		IRS	GRNIM
LMS	2.310	0.046	0.264**
IDIV	1.353	0.409**	0.614**
LDIV	1.398	-0.374**	-0.364**
DDR	2.622	0.412**	0.555**
Autocorrelation tests		Normality tests	
	Durbin Watson	Kolmogorov-Smirnov	Shapiro Wilk
IRS	0.645	0.200*	0.450
GRNIM	0.948	0.200*	0.384

*Source: Researcher, 2021*

## 6. Research findings

### 6.1 Descriptive statistics

Two different measures were used to proxy spread as the dependent variable in this study namely: interest rate spread which captures the spread of traditional intermediation activities and gross margin that captures both traditional and non-traditional banking activities. On the overall the interest rate spread in the banking sector between 2009 and 2018 remained on a downward trend save for 2012 and 2016. Both gross margin and interest rate spread flattened with the introduction of the law capping interest rates suggesting that interest income is still a significant contributor to bank revenues and therefore materially influences the gross margin.

Interest Rate Spread is highest among large banks with a mean (SD) of 0.114(.025) closely followed by small banks at a mean (SD) of 0.112(.024) while medium banks posted the lowest mean (SD) of 0.089(.035). Gross margin means follow the same pattern with large banks recording the highest mean (SD) of 0.119(0.018), followed by small and medium banks at 0.107(0.019) and 0.090(0.028) respectively. Large banks appear to influence interest spread more with their mean (SD) of 0.114(0.025) being closer to the sector mean (SD) of 0.102(0.032) as compared to their medium size counterparts. The small banks also have a mean (SD) of 0.112(0.024) which is close to sector mean (SD) though with a market share of only 8.5% of the sector's assets and loans (CBK, 2018), their influence may be said to be small. There is not much difference in interest rate spread mean (SD) between government and private banks at 0.106(0.018) and 0.102(0.034) respectively suggesting that interest rate spread in Kenya is driven more by bank size than bank ownership. The scenario is no different for gross margins at mean (SD) of 0.102(0.018) and 0.104(0.028) for government and private banks respectively. This is unlike in the case of Pakistan where government banks posted higher spread due to their higher proportions of government deposits which are mostly non-interest bearing (Afzal & Mirza, 2012). The case for Kenya's banking sector is different since the privatization of formerly government-owned banks which still retain the bulk of government deposits owing to their wide branch network across the country.

Income diversification is very low among commercial banks in Kenya. The large banks posted the highest diversification index of 0.4552 against a full diversification index of 0.75. Medium banks posted the lowest index of 0.3420. Medium size banks are least diversified in terms of income diversification at a mean (SD) of 0.3420(.0797). The most diversified banks in the loans market are found among the medium banks with a maximum diversification index of 0.8941 and a mean (SD) of 0.7737(.0909) followed closely by large banks whose highest diversification index was 0.890 and a mean (SD) of 0.7634(.0755). Small banks posted a mean (SD) of 0.7284(.0707) which is still a fairly high index and hence our conclusion that Kenya's banking sector has a fairly well diversified loan book.

The distribution of deposits among the large, medium and small banks is a testament of what the level of outreach to customers and the general population's perception of bank stability can do. This being the period that has seen several banks in the medium and small cadre being closed by the regulator, it comes as no surprise that the bulk of demand deposits are held by the large banks at a mean (SD) of 0.6835(.0823) and a maximum mean

score of 0.8456. A bigger percentage of the demand deposits belong to individual customers and business customers who have such monies in demand accounts. Another good proportion in a few of the banks belongs to government ministries and state corporations. Medium sized banks posted a fairly good proportion of demand deposits at a mean (SD) of 0.4242(.13311). It must be noted though that the variations between banks in this tier is high with a standard deviation of 0.133 and the highest at a proportion of 0.7596 while the lowest at 0.2358. Some of the banks within this tier have a niche market of highly price sensitive clientele and so their depositors will tend to have high interest rate demands resulting in some of the banks even paying interest on certain current accounts hence the smaller proportion of demand deposits. Another explanation is of course the steep competition for these deposits that they face from large banks. Since they do not have the infrastructure and stability advantage that large banks have, these banks tend to attract deposits through pricing. Small banks grapple with the same challenges but are at an even more disadvantaged position than the medium banks. As such, their mean (SD) is the lowest at 0.3015(.0596) with the highest having a proportion of 0.4027 which is even lower than the medium banks' mean. Table 3 below shows the comparative performance of diversification variables.

The overall market share mean (SD) for the selected banks is 0.0565(.044). It is clear that there are huge disparities in terms of market share between the banks selected with the lowest having 0.002 market share and the highest at 0.187. With only 3 government banks out of the 40 commercial banks, it is expected that government banks would hold the least aggregate market share compared to their privately owned counterparts some of whose market share is as high as 18.7%. The large banks selected for this study returned a mean (SD) of 0.1024(0.032) with the highest individual bank taking as much as 18.7% of the sector's loans market share. Even the lowest among this cadre holds 5.1% of market share which is still significant in a market of 40 players. This scenario lends credence to the regulator's desire to see more of the small and medium banks merging to form bigger stronger institutions that can compete effectively with the large banks.

**Table 3 Descriptive statistics**

	IRS	GRNIM	LMS	IDIV	LDIV	DDR
<b>ALL BANKS</b>	0.10(0.03)	0.10(0.03)	0.056(0.04)	0.39(0.09)	0.76(0.08)	0.50(0.18)
<b>LARGE</b>	0.11(0.02)	0.12(0.02)	0.102(0.03)	0.45(0.06)	0.76(0.07)	0.68(0.08)
<b>MEDIUM</b>	0.09(0.03)	0.09(0.03)	0.036(0.02)	0.34(0.08)	0.77(0.09)	0.42(0.13)
<b>SMALL</b>	0.11(0.02)	0.11(0.02)	0.004(0.002)	0.40(0.12)	0.73(0.07)	0.30(0.06)
<b>GOVT</b>	0.11(0.02)	0.10(0.02)	0.016(0.01)	0.42(0.10)	0.72(0.05)	0.39(0.11)
<b>PRIVATE</b>	0.10(0.03)	0.10(0.03)	0.064(0.04)	0.39(0.09)	0.77(0.09)	0.52(0.18)

*Source: Researcher, 2021*

## 6.2 Hypothesis testing

The objective in this section was to examine the effect of product diversification on the relationship between market power and interest rate spread in Kenya's banking sector. The research question to be answered was: *What is the effect of product diversification on the relationship between market power and interest spread in Kenya's banking sector?* The following hypothesis was formulated to help in answering the question guiding this objective and the same analysed using correlation and regression statistics:

*H1: In the presence of diversification, market power has a negative relationship with bank spread.*

This hypothesis will be tested together with the following hypotheses:

*H1a: Market power has a positive relationship with bank spread*

*H1b: In the presence of diversification, market power has a negative relationship with bank spread.*

The Pearson Correlation Analysis was used in this study to measure the direction and strength of correlation between variables. From the correlation results shown in table 2 the relationship between the two measures of spread, and all the independent variables under the study objective are significant at the 0.01 level with the exception of the loans market share variable. The correlation coefficient for loans market share and interest rate spread is small and non-significant meaning that while there is enough evidence that these variables are associated, the magnitude of correlation is small. This may point to the fact that the competition among commercial banks in the loans market has translated into lower interest rate charges to the customer. The correlation between loans market share with gross margin is positive and significant, an indication that banks with larger market shares are exploiting economies of scale to extract more incomes. Income diversification and loans diversification are significant. Loans diversification has a negative significant correlation with both spread measures. The income diversification variable and demand deposit ratio are found to have significant positive correlations with spread measures.

Market share was first analysed without the diversification variables to examine its relationship with bank spreads in Kenya. Preliminary tests done revealed violation of autocorrelation and heteroscedasticity assumptions. The study therefore used the PCSE estimator to run the regression and the results are shown in table 5 below. Market share has a positive relationship with both spread measures though the relationship with



interest rate spread is non-significant. The relationship for gross margin is significant with every one unit change in market share resulting to a 0.16 units' increase in gross margins. These results suggest that much as the size of loan book does not significantly influence the price charged to the customer, banks with a large loan book exploit economies of scale to drive greater margins through cross selling to the borrowers or centralization of common activities to reduce on resources used.

Loans market share and the three diversification variables were regressed against interest rate spread and gross margin to test the impact of market power on spread in the presence of diversification. The results and comments are presented below. The overall model has predictive power ( $p = 0.000$ ) and the variables analysed account for 32.38% of changes in interest rate spread and 51.45% of changes in gross margins of Kenya's commercial banks. The effect of loans market share on interest rate spread is negative and significant ( $z = -3.19$ ,  $p = 0.001$ ) at  $p < 0.05$ . The impact on gross margin is positive though non-significant ( $z = 0.87$ ,  $p = 0.383$ ) at  $p < 0.05$  respectively. Every unit change in the loans market share results in a -0.15 units' reduction in interest rate spread and 0.045 units increase for gross margin. The relationship between loans diversification is negative and significant for both spread measures at ( $z = -3.18$ ,  $p = 0.001$ ) at  $p < 0.05$  and ( $z = -4.08$ ,  $p = 0.000$ ) at  $p < 0.05$  for interest rate spread and gross margin respectively. A unit change in loans diversification results to a -0.08 units' reduction in interest rate spread and -0.084 units' reduction in gross margin. Income diversification and deposits diversification both have positive and significant relationships at ( $z = 2.35$ ,  $p = 0.019$ ) at  $p < 0.05$  and ( $z = 4.73$ ,  $p = 0.000$ ) at  $p < 0.05$  respectively for interest rate spread and ( $z = 5.62$ ,  $p = 0.000$ ) at  $p < 0.05$  and ( $z = 2.73$ ,  $p = 0.006$ ) at  $p < 0.05$  in that order for gross margin. One unit change in income diversification results in a 0.076 units' increase in interest rate spread and 0.12 units' increase in gross margin. One unit change in demand deposits ratio results in a 0.069 units' increase in interest rate spread and a 0.036 units' increase in gross margin.

**Table 5 Linear regression, correlated panels corrected standard errors (PCSEs) without diversification variables**

	IRS			GRNIM		
	Coef.	z	P> z	Coef.	z	P> z
<b>LMS without diversification variables</b>						
<b>LMS</b>	.0325513	1.16	0.247	.160575	4.20	0.000
R-squared	0.0020; Prob > chi2= 0.2468			R-squared 0.0707; Prob > chi2= 0.0000		
<b>LMS with diversification variables</b>						
<b>LMS</b>	-.1504237	-3.19	0.001	.0451658	0.87	0.383
<b>IDIV</b>	.0763302	2.35	0.019	.1196558	5.62	0.000
<b>LDIV</b>	-.0801383	-3.18	0.001	-.0841224	-4.08	0.000
<b>DDR</b>	.06953	4.73	0.000	.0363001	2.73	0.006
R-squared	0.3238; Prob > chi2=0.0000			R-squared 0.5145; Prob > chi2= 0.0000		

*Source: Researcher, 2021*

From the above correlation and regression analyses the following conclusions are made regarding the hypotheses:

*H1a:* The relationship between market power and bank spread is positive.

*H1b:* In the presence of diversification, the relationship between market power and bank spread turns negative.

### 6.3 Discussion and conclusion

We first sought to establish the level of diversification in terms of incomes, loans and deposits in Kenya's banking sector. The overall results were that the sector has low diversification levels of incomes and higher diversification for loans and deposits. Income sources are not well diversified in Kenya's banking sector with a mean of 0.4043 against a full diversification index of 0.75. Interest income was found to make up 75% (appendix table A 1) of total incomes for the 13 banks under this study which is quite significant revealing that Kenya's banking sector is still heavily reliant on interest income as the key revenue stream.

Income diversification was found to be low in Kenya as the bigger proportion of the commissions and fees in the banking sector is still pegged on making of loans. They therefore grow alongside interest income and that might be the reason for the positive relationship between income diversification and both spread measures. There is need for policies that encourage banks to venture into non-traditional revenue streams like bancassurance and other off balance sheet commissions like guarantees, performance bonds, letters of credit and trade documentary collections to beef up their non-lending related commissions and fees. Given the level of information asymmetry in the financial sector, perhaps it is time banks are encouraged to package financial advice and sell it as a service as well. This will encourage them to cascade information on competitive investment and funding choices to the general public at a fee. It is expected then, that customers will make informed choices that will be cost effective for them whether on where to invest their surplus cash or where to borrow from for their development needs. As banks set themselves to be the customer's choice in either venture, a competition will set in that will naturally

bring interest rate spread down.

The main motivation for diversification according to financial theory is to mitigate risk and increase profitability (Chen et al., 2013). This motive is pegged on the assumption that diversification spreads risk such that business failures in one segment are covered for by other segments not affected by the same events. Similarly, in the face of competition especially in the loans market, non-interest incomes assist banks to meet their revenue goals without being over-reliant on interest income. Empirical studies have shown that diversification can sometimes lead to more losses and risk exposure (Acharya et al., 2002). This is especially so with loans diversification where skill and expertise are required to effectively lend to multiple sectors. Given the high loans diversification in Kenya's banking sector, a good area for further research is on the impact of diversification on lending risk.

The loans diversification index revealed that Kenya's banking sector has a diversified loan portfolio. At a mean of 0.76, loans diversification is high with most of the banks in this study lending to all nine identified sectors. This diversification is largely attributed to technological advancement and competitive pressures among the commercial banks over the years. Enhanced regulatory support in the area of information sharing and disclosure has also gone a long way in unlocking commercial banks' appetite for lending to some sectors that had long been considered high risk. Indeed although sector wise the personal/household sector still takes a comparatively larger share of commercial banks' total lending (CBK, 2018), the fact is that loans taken by individuals under this segment end up financing businesses under any of the other sectors. It must here be noted that the borrowings under personal/household are classified as such mainly because their repayment source tends to be salaries.

The demand deposit ratio mean of 0.50 is evidence of a diversified deposits book. Customer deposits form the main source of funding for commercial banks in Kenya (CBK, 2018) and as such banks are motivated to mobilize as much of it as possible to continue to grow their loans portfolio. Mobilization of demand deposits has been greatly aided by agency banking and mobile-phone based banking which has enabled commercial banks to diversify their deposit sources both geographically and across economic sectors as they are no longer limited by the need for physical branch presence.

Spread measures were generally on a downward trend throughout the period under review. The reduction seen from 2016 to 2018 may be attributable to three factors. One is the high default rates prevailing at this period as compared to other periods during the study which must have led to interest reservation. The non-performing loans ratio for the sector grew by 20% in 2016 and 23% and 25% respectively in 2017 and 2018 (appendix table A 2). The second factor may be the effects of the law capping interest rates that limited lending rates to no more than 4% above the Central Bank Rate (CBR) and the deposit rates to no less than 70% of the CBR (CBK, 2016). The third possible reason is the reduced lending to private customers as banks opted for the risk free government paper in the wake of reduced spread. As expected lending to government comes at lower rates because of the apparent risk free nature of such lending.

With an overall loans market share mean (SD) of 0.0565(0.044), a minimum mean score of 0.002 and maximum of 0.187, Kenya's banking sector has some dominant players. The large banks which are few have a mean of 10.24% while medium and small banks have means of 3.57% and 0.04% respectively. The Pearson correlation statistics were not significant for interest rate spread but significant for gross margin albeit with a small coefficient of 0.264. Regression statistics showed that market share has a positive relationship with both interest rate spread and gross margin though the relationship with interest rate spread is not significant. When regressed alongside the diversification variables, the relationship is negative and significant for interest rate spread. The result for gross margin is positive but not significant.

Theoretically, market power is associated with wide interest rate spreads as dominant players in a market are seen to exercise their dominance to set high prices. Gounder and Sharma 2012 found a positive relationship between market power and spread in Fiji suggesting that banks with market power charge higher loan rates and lower deposit rates. In our case, the positive relationship of loans market share with interest spread was not significant meaning though its effect is positive, market share does not play a significant role in influencing spread. One of the reasons for this is seen in examining the impact of product diversification on this relationship. When loans market share is analysed alongside the diversification variables, the relationship with interest rate spread becomes negative and significant suggesting that with diversification, banks no longer look to increasing spread as the only way to increase income as they have more avenues. Moreover, diversification mitigates risk thus reducing the need to increase risk premium even in the face of high defaults as these are compensated for by lending to other sectors not faced with the same risks.

High market share can be used by banks in two different ways and spreads are influenced differently in either case. According to (Kiptui, 2014), if market share is translated into market power then banks are able to charge higher lending rates. Market power therefore predicts a positive relationship with spread. On the other hand, a bank might use its market share to exploit the economies of scale or temporarily lower prices of certain products to edge out competition and further increase market share. This would lead to a negative relationship

between market share and spread. Ugur & Erkus (2010) found a negative relationship between market share and net interest margin, a result credited to banks' desire to increase their market share by lowering interest on loans. In his study on the Kenyan market (Kiptui, 2014) did not find a significant relationship between market share and interest spread, a result attributed to low concentration in Kenya's banking sector. With the advent of technology-aided banking coupled with the mergers and acquisitions that have happened in the period under review, the number of banks in the large tier category has now grown to 8 as at 2018 (CBK, 2018) introducing a fair share of competition in the sector. In response to this competition, the players in the sector have sought to diversify their product portfolios and though there is still a lot of opportunity to diversify income sources, there is evidence from this study of diversification in the loans and deposits sector. This diversification, coupled with the competition especially in the deposits and loans markets, has helped to sustainably bring down interest spread in the industry in the period under review. The study done by Rusuhuzwa et al. (2016) on Rwanda's banking sector found market power to be insignificant, an indication that price-based competition had improved over time among Rwanda's commercial banks.

According to Valverde and Fernández (2007), diversification comes with reduction of risk effects as losses in one sector can be compensated by gains in another thereby eliminating the need for high risk premiums on loans. Secondly, a well-diversified bank can use one of its products as a loss leader to gain more market share while compensating for lost income through other products. With a diversified loan book, a bank can apply risk based pricing so that less risky loans do not have to bear high risk premiums. Another proponent of diversification having a moderating effect on market power relationship to spread was Allen (1988) who argues that pure interest spreads may be reduced when cross elasticities of demand between bank products are considered. The resulting diversification benefits emanate from the interdependence of demands across bank services and products – a type of portfolio effect. A close demonstration of such effect in our case is seen in the size of personal/household loans in relation to other sector loans. These loans are mostly granted to employed persons with the repayments being received directly from the employer. This way, the risk of non-payment is lower and therefore the loans granted where such arrangements exist tended to have lower interest rates. Customers will elect to take such loans to finance business ventures rather than take a loan under the relevant business segment due to the lower cost and simpler access.

With competition, banks will tend to set their prices competitively and make up for lost revenues through incomes generated from other non-interest sources. According to Georgievska (2011), consolidation of banks through mergers and acquisitions strengthens competition and ends dominance leading to decreasing bank spreads. Increased competition as a result of the growth of large banks does not appear to have resulted in reduced margins to the level acceptable going by the persistent debate on this topic in Kenya. This may be attributed to the fact that Kenya's financial market still remains underdeveloped as a consequence of which the banking sector remains the main source of funding for businesses. Although there is some considerable level of competition in the sector, the high demand for funding has given banks the opportunity to set prices that maximize their revenues notwithstanding the risk mitigating advantages of loans diversification.

## 7. Recommendations

The main objective for this paper was to establish the effect of product diversification on the relationship between market power and bank spreads. There still remain huge disparities in market share as seen in the loans market share where some banks control 18.7% while others make do with only 0.2% of the sector's loans market. With eight banks in the large tier category however, this disparity has not exposed the players to any collusive forces as the eight players have set in motion a fairly competitive environment amongst Kenya's commercial banks. The result of this is that market share did not have a significant influence on interest rate spread as seen in both the regression and correlation analysis. The results for gross margin were positive and significant showing that in a competitive environment, banks with larger market share are able to use economies of scale advantage to drive higher margins. Banks in Kenya have responded to competition by diversifying. Diversification in the loans market specifically has spread the risk of default hence the negative association of market power with interest rate spread in the presence of diversification. This study recommends growth in the number of larger stronger banks through balance sheet growth, mergers and acquisitions to further solidify the competitive environment and stable banks where customers feel safe to keep their deposits. There is still room for diversification especially in the income sources and banks need to explore more avenues. Interventions by the regulator and policy makers to create a more enabling environment for this would go a long way. This study found that Kenya's banking sector has a fairly well diversified loan book which does help reduce interest rate spread thus contributing to the sector's efficiency. These gains are however eroded by high costs owing to high default rates and operating costs. With the level of diversification in banks a study needs to be done to assess the level of expertise bank employees have in each sector to understand whether the lack of knowledge is resulting in poor assessment and therefore high default rates. An area of further research would be to study customer behaviour in the deposit market in Kenya. This study was limited to the Kenyan situation and it is recommended

that the same is done in other different countries and economic blocks to see if the results are influenced by the different geo-political and economic environments.

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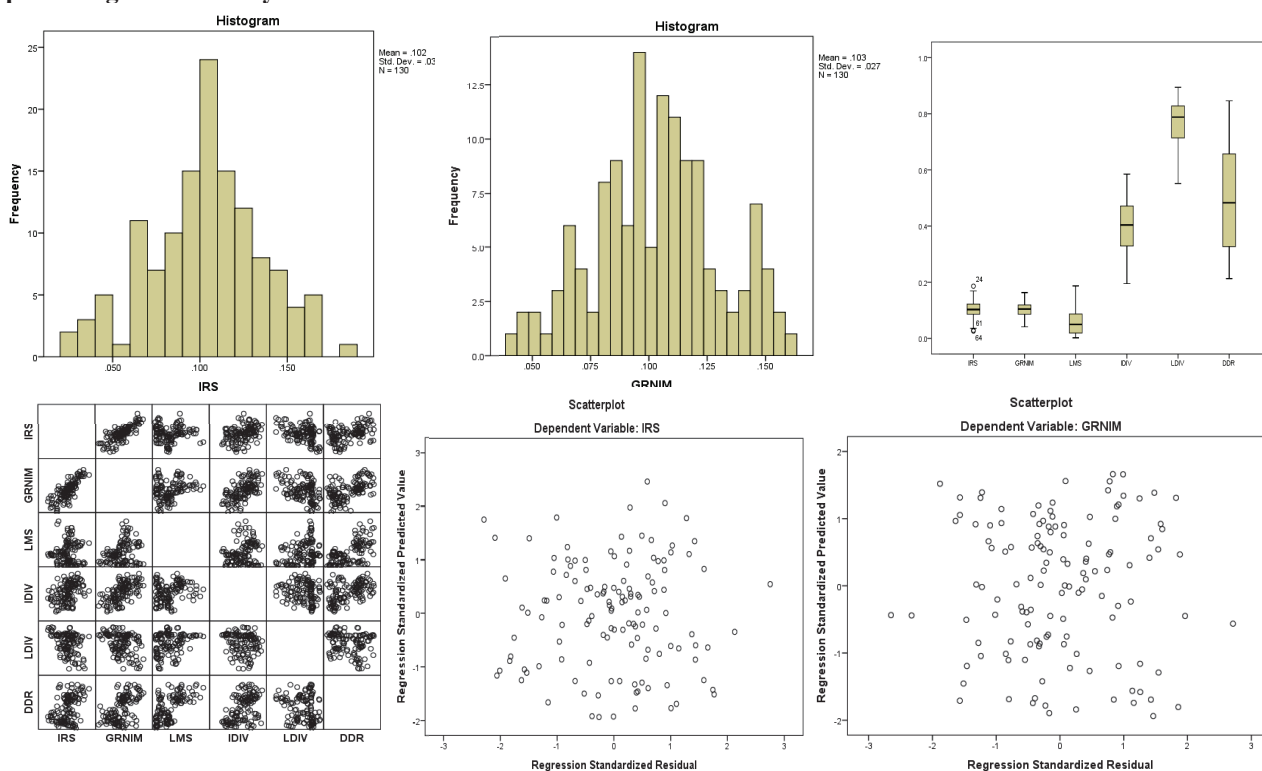
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## APPENDIX

Appendix figure 1 Validity tests



**Table A1 Proportion of interest income in total income**

ALL BANKS	0.747
LARGE BANKS	0.697
MEDIUM BANKS	0.790
SMALL BANKS	0.744
GOVERNMENT BANKS	0.727
PRIVATE BANKS	0.751

**Table A 2 Banking sector annual growth of NPL and NPL ratio**

YEAR	Total loans	NPL	NPL% growth	NPL ratio
2009	757760	111700		15%
2010	914910	98443	-12%	11%
2011	1190985	108180	10%	9%
2012	1330365	137532	27%	10%
2013	1578768	193105	40%	12%
2014	1940781	233017	21%	12%
2015	2165329	324896	39%	15%
2016	2293190	468513	44%	20%
2017	2413851	563005	20%	23%
2018	2488117	622079	10%	25%