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Working Paper

Income diversification in the banking sector and earnings volatility: Evidence from Kenyan commercial banks

KBA Centre for Research on Financial Markets and Policy Working Paper Series, No. 2

Provided in Cooperation with:

Kenya Bankers Association (KBA), Nairobi

Suggested Citation: Kiweu, Josephat Mboya (2012) : Income diversification in the banking sector and earnings volatility: Evidence from Kenyan commercial banks, KBA Centre for Research on Financial Markets and Policy Working Paper Series, No. 2, Kenya Bankers Association (KBA), Nairobi

This Version is available at:

<https://hdl.handle.net/10419/249503>

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Joséphat Mboya Kiweu

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Working Paper Series

2



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Income Diversification in the Banking Sector and Earnings Volatility: Evidence from Kenyan Commercial Banks

Joséphat Mboya Kiweu

December 2012

Abstract

This paper investigates whether diversification of income sources for Kenyan banks leads to better earnings and reduced individual bank and systemic risks. The study seeks to analyze the extent to which observed shift toward fees income generating activities has improved bank performance and reduced volatility of revenue. The findings show that there are few benefits, if any, to be expected from income diversification from traditional banking although there is growing importance of non-interest income during the study period 2000 – 2010. The benefits of the evolution of non-interest income do not seem to fully offset the increase in risk that come with fee based income. A positive correlation between net interest income and non-interest income seems to exist, a finding that suggests that non-interest income may not be used to stabilize total operating income. The findings also reveal that lending rates are significantly correlated with net interest income, and the relationship is negative meaning that more lending takes place when interest rates are favorable.

Introduction

In the last few years the Kenyan banking industry has experienced volatile interest rates margins and profitability. At the same time the focus on interest income has grown, perhaps driven by the fact that the increase lending rates trail the monetary policy rate – the Central Bank Rate (CBR). A notable public concern is that Kenyan banks do not reduce their lending rates in tandem with the CBR's reduction.

This view, also echoed by the central bank, raises the question whether there are possible viable alternative sources of income away from interest-based revenue for Kenyan banks (CBK 2007). This paper examines income diversification effects on bank earnings, for it is claimed that it can reduce risk and volatility of bank profits (Pennathur et al., 2012; Stiroh, 2004). The study focuses on banks' primary income sources of interest and noninterest/fee based earnings.

The current debate on capping interest rates in Kenya over a perception of unreasonable lending rates charged by commercial banks raises several concerns addressed by this paper. Loan-making banks tend to generate a higher share of their operating income from interest income (Laeven and Levine (2007), a state of affairs underlying two perspectives. On the one hand there is competitive pressure in the lending market for commercial banks given lending as their core activity. As a result, driven by the need to maximize profit, banks are likely to pay great attention to lending rates that they charge. Lending rates on the other hand are highly depended on interest rates guided by the central bank which exposes bank earnings to sensitivity on changes in such rates. This raises the question on whether banks should diversify income sources to

ease this pressure on lending rates and stabilize their income or focus on the traditional banking activity.

This paper seeks to assess whether or not income diversification is beneficial to commercial bank in frontier economies like Kenya. Specifically, the paper aims to empirically analyze the question: Does diversification of revenue deliver benefits for banks and make them resilient to adverse effects on income and bank earnings shocks? There is no consensus in the empirical literature on the benefits of income diversification on profitability in banking (Vallascas et al. 2011; Wolfe and Sanya, 2010; Pennathur et al., 2012). While Mercieca et al. (2007) confirms absence of benefits of diversification for small European banks, Stiroh (2004,) investigating if noninterest income is the answer for reducing over-reliance on interest income, finds that the shift to noninterest income for US banks is associated with higher risk and reduced risk-adjusted returns.

The theoretical case for income diversification seems to be supported by Markowitz portfolio theory and the conventional wisdom of seeking not to put all ones eggs in the same basket. It has also been argued that combining different types of income earning activities – non-interest and interest earning assets – results in rebalancing of income away from interest income and may increase return and diversify risk (Gamra and

Plihon, 2011). Nonetheless, the evidence that benefits of revenue diversification exist is quite mixed. For example, Wolfe and Sanya (2010) in their study of 226 listed banks in 11 emerging economies highlight the fact that revenue diversification by banks can create value. However, they warn that there are adverse effects in over-relying on non-interest income.

Despite the risk to ‘over diversify’ hypothesis, and overwhelming research evidence that tends to support zero gains for diversifying banks (Bush and Kick, 2009; Mercieca et al., 2007; Berger et al., 2010; Acharya et al., 2006), the benefits of diversification cannot in some instances be overstated (Tabak et al., 2011). These findings have important implications for Kenyan banks which may be trying to follow a diversification model away from traditional interest based income to fee income believed to be more stable. A key motivation for this research derives from the fact that there is no agreement on whether it is beneficial to diversify or not, which suggests that there is still need for further research.

The remainder of this paper is organized as follows: Section 2 provides a brief background of the survey of the literature, followed by data, variable definition and methodology in section 3. Section 4 presents empirical results and discussion. Summary of main results and concluding remarks are presented in section 5.

Background and Literature Review

2.1. The Kenyan banking sector

The Kenyan banking industry is one of the broadest and most developed in sub-Saharan Africa (SSA) with 49 financial institutions, comprising 43 commercial banks, 1 mortgage finance company and five deposit-taking microfinance institutions (CBK 2011). These institutions, along with the Kenya Post Office Savings Bank, make up Kenya's formal banking sector and serve 22.6 percent of Kenya's adult population, according to FinAccess household survey (Beck et al., 2010).

Non-bank financial institutions, including microfinance institutions (MFIs), savings and credit cooperatives, and mobile phone service providers serve another 17.9 percent of the population, bringing the total served by formal financial services to 40.5 percent. Another 26.8 percent of Kenyans rely on the informal financial sector, including NGOs, self-help groups, and individual unlicensed money lenders, and 32.7 percent of the population does not use any form of financial services.

The profitability of Kenya's banking industry in the recent past has been a subject of public interest and debate. The industry posted KSh89.5 billion pre-tax profits in 2011, a 20.5 per cent increase from 2010's KSh74.3 billion (CBK 2011). While the profit growth has also been helped by a steady growth in the customer base over the past four years from 4.7 million to 15.7 million, the outcome caused public furor, sparking debate that prompted the Kenyan legislature to make fresh efforts to cap the pricing of bank loans. The Kenyan

public's concern is that banks, especially the big ones, exploit their customers as they race to report 'super profits' by way of charging high interest rates. However, it is believed that the problem is embedded in over-concentration on one type of income – interest income. This raises the question: can Kenyan banks reduce the effect of this over-concentration to ease the pressure on interest rates?

Whether the public view is correct or not is a matter of empirical research and to some extent depends on how independent or interdependent on each other the various earning sources are. A more intriguing question to the banks perhaps is: What other financial product(s) can boot performance or can a shift to fee based income provide the answer? Should Kenyan banks move away from traditional intermediation to remove focus on sensitive interest rates? The findings of this study will help shed light on some of these issues and provide motivation to examine Kenyan banks in the context of non-interest income viability in boosting bank performance.

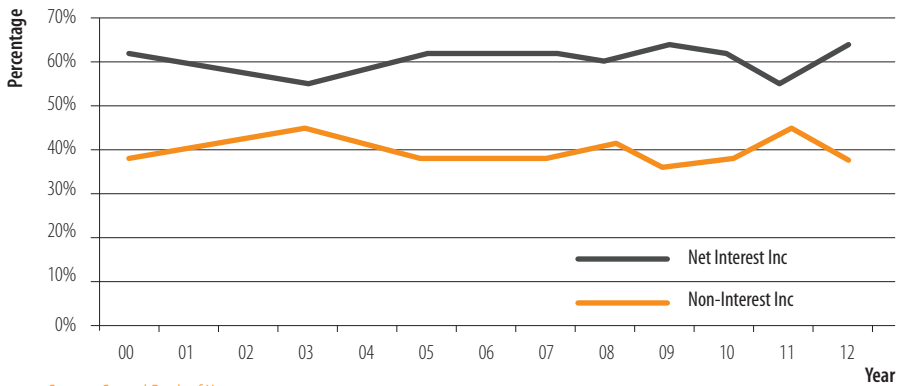
Generally, banks have two income streams namely interest based income and non-interest income. Academics have given a lot of attention to lending activity that generates interest income due to the link of this traditional activity to bank performance (Bush and Kick, 2009). There is the view that Kenyan banks over-emphasize this stream of income, but it is sensitive to changes in the CBR which is an exogenous factor for banks. To avoid high volatility in

reported profits, banks need to refocus and engage in non-interest activities. This will also ease pressure on lending rates as banks don't have to raise lending rates to earn more, assuming that there is scope for cross-subsidy amongst the two income sources.

A report by the Central Bank of Kenya on 'Developments in the Kenyan Banking Sector for quarter ended March 31, 2012' indicates that there was growth in non-performing loans (NPLs) in 4 out of 11 sectors. In addition, the gross NPLs increased by 1.3 percent from KShs. 53.0 billion in December 2011 to KShs. 53.7 billion in March 2012. The report notes that high lending rates contributed to the increase in NPLs, notwithstanding banks' endeavor to enhance appraisal standards to mitigate credit risk. The report also indicates that the main sources of income were interest on loans and advances accounting for 62 percent of revenue while fees and commissions made up 38 percent.

Figure 1 clearly shows the emphasis on interest income from lending and the lack of importance for non-interest income. A similar report for the previous year shows a decline in the interest income share of income to 55 percent from over 60 percent. This -shift in one out of 10 years is indicative of the fact that noninterest income can grow. However, the trend analysis of the two streams of revenue shows that on aggregate interest income has always been the focus for Kenyan banks for last 10 years.

Figure 1: Bank's Share of Income



Source: Central Bank of Kenya

The heavy focus on interest income has been debated for some time in Kenya. Questions abound on whether profitability of banks is driven by traditional lending activities or there are viable sources away from interest on loans. There is a push in a number of economies for banks to move their business from interest to fee earning activities such as investment banking and insurance services (Busch and kick, 2009). The Reserve Bank of India urged public sector banks to shift to non-interest income in 2002/2003, a move that has paid off in that Pennathur et al. (2012), studying ownership structures, finds that fee-based income significantly reduced risk. Researchers reveal that diversification benefit India's public sector banks as well as greatly reducing default risk because as non-interest income increases banks shift from lending activities. Perhaps this strategy could be the answer to the fight in Kenyan credit market about high lending rates

This study tests the proposition that income diversification can rebalance income and reduce the

problem of unreasonable lending rates in the banking industry. Specifically, the paper tests if diversified banks in Kenya had stable incomes and reduced risks between 2000 and 2010. Analysts on diversification have tended to argue that in markets that have high competition, diversification reduces chances of financial distress and provides a necessary reduction in risk (Gamra and Plihon, 2011). They further indicate that banks with greater fee-based services charge lower lending rates (Pennathur et al., 2012).

The debate over diversification however raises questions on whether the shift of banks' business towards non-interest income has a negative or positive impact on sustainability of profitability. Since Kenyan banks are used to reporting increasing profitability, there is need to explore other viable sources of income that will maintain profitability at current levels. This study therefore intends to assess potential fee-based product mix on their potential to boost the performance of Kenyan banks.

2.2. Income diversification theory

Literature on diversification in the banking industry suggests that there exists several type of diversification: geographical, source of income, product/services, and economic sectors (Tabak et al., 2011; Pennathur et al., 2012). These studies are particularly concerned with discussion as relates to income diversification into non-interest income sources. Traditional banking theory for example argues that credit diversification reduces the probability of default (Tabak et al., 2011). In this case less diversified banks are seen as more vulnerable to economic downturns by exposing themselves to fewer sectors. This suggests that credit portfolio would yield benefits if it is diversified. Among other reasons, it is argued that concentration strategy (lack of diversification) is highly related to risk because of the general belief that diversification by firms reduces risk (Lin et al., 2012; Smith et al., 2003).

The above argument, while reasonable, creates tension in finance theory which postulates that when firms concentrate in for instance serving one specific sector, they generate knowledge and information which they can take advantage of against their competitors. For banking institutions, relationship lending is based on the understanding that long term relationship with borrowers is beneficial to the bank in terms of reduced screening costs, monitoring and ultimately interest rate on loan. Relationship banking studies indicate that concentrated lending lowers the cost of credit by 31 basis points (Peltoniemi, 2007). Research evidence is divided on the extent of limiting benefits of diversification to the case where it is only helpful in reducing bank failure (Tabak et al., 2012).

Banks' traditional income comes from interest charged on loans. However, this income source raises a number of issues and in developed countries such as the USA, it is widely believed that the traditional banking activities are on the decline (Smith et al., 2003). As banks diversify income to fee-based activities, finance theory suggest that this leads to increased profitability and stabilization of income (Wolfe and Sanya, 2010; Mercieca et al., 2007; Tabak et al., 2011; Leaven and Levine 2007; Stiroh, 2004).

Whether diversification into fee-based activities actually increases or decreases risk seems to be a contentious research issue with results differing from study to study, and sometimes between emerging and developed economies (Sanya and Wolfe, 2010; Smith et al., 2003; Tabak et al., 2011; Pennathur et al., 2012). Even the theory does not seem to conclusively answer this question. Diversification of income sources is said to comparatively yield to advantages since it can reduce the shocks to net interest margins (idiosyncratic risk) arising from adverse changes in lending rates (Lin et al., 2012). Lepetit et al. (2008) finds that bank expansion into fee-based services leads to low lending rates, observing that diversification impacts on loan pricing and interest rate margins effectively curb volatility in bank earnings. This finding ties in well with the fact that it has been established lending to specific loan activities is one cause of banking crises in the last 5 years (Tabak et al., 2011). Examples are Argentinean financial crisis of 2001 and 2002 (cited in Beczuk and Galindo, 2008), and Australian bank crisis over the years 1997–2003 (Tabak et al., 2011).

Acharya et al. (2006), studying Italian banks, finds that diversification increases risk while in other cases it reduces bank performance like in the German banking sector and small European banks (Busch and Kick, 2009; Mercieca et al., 2007). A number of research studies report negative side of diversification: Berger et al. (2010) states that diversification reduces bank performance in Chinese banking sector, but Kamp et al. (2007) finds neither of the arguments are true with regard to German banking sector. From prior research, there is evidently no consensus on the effect of income diversification on return and risk. Mercieca et al. (2007), in a study of 15 European countries for period 1997-2003, reports no direct benefits of diversification for small banks, while Baele et al. (2007) shows that in fact banks with high proportions of non-interest income have higher market betas and therefore higher systematic risk. However, Elsas et al. (2010) finds that diversification increases profitability and bank value.

In the US banks, the shift of emphasis in bank revenue from interest income to non interest income from 1984 to 2000 did not only contribute to higher levels of bank revenue over time, but also led to the belief that the two streams of revenue are highly correlated Stiroh (2004). This correlation is true at both the aggregate level and individual bank level, suggesting that various business segments can be exposed to

same economic shocks. This wipes out any potential gains from diversification. A revisit to the same study by Stiroh and Rumble (2006) reports worsening risk-return trade off on earnings gains caused by growth in a non-interest income, outweighed by the volatility increases, resulting in a non-commensurate increase in stock returns (Pennathur et al., 2012). Similar studies have also found that diversification benefits from non-interest income tend to diminish with bank size; small banks with very small proportions of non-interest income recording significant gains.

Overall, the literature surveyed in this section reveals a number of policy implications for this study. First, commercial banks are no less concerned about the cries of the public over high lending rates and are just as likely to be comfortable with a shift to non interest income as banks in Europe, the USA and or India. If this observation is obtainable in the Kenyan banking industry, it may redefine the future of banking, with far reaching implications on bank resource allocation for bank supervision and risk management. Second, the literature is mixed about the effect of a shift to fee based activities on profitability and risk profile of banks. Bank size seems to determine expansion into fee-based services. If fee based income lowers volatility of bank profits, this may suggest advantages for mergers and acquisitions and a move to create universal bank models.

Data and Methodology

The main objective of this study is to examine how income focus verses diversification impacts on bank performance. This study employs data on Kenyan commercial banks covering the years 2000 – 2012 The data deployed in this analysis was obtained from central bank, Kenya bankers association and augmented by Think Business Banking Survey dataset.

Annual income statements and balance sheets of individual commercial banks are mainly used to construct variables of interest. After excluding banks with missing data over the duration of the study, the final sample consists of 35 banks. The timeframe of the study ensures that multiple business cycles are represented, with the dataset providing 385 bank observations.

The dataset classifies interest income into: interest on loans and advances, interest from government securities interest from deposits and placement with other institutions and other interest income while fee-based income comprises fees and commission on loans, trade income, foreign exchange trading income and other income (including dividend income). In addition, information on size (total assets), equity is used to compute bank earnings such as Return on Assets and Return on Equity. Risk is captured using coefficient of variation measures such as dispersion from mean for both sources of income. This is computed as standard deviation divided by mean over time.

3.1. Measures of diversification

To measure income diversification, the Herfindahl Hirschmann Index (HHI) is computed for all banks to account for diversification between the two major types of income generating activities. The HHI considers diversification as equal exposure to every source of income, and is itself a relative measure. Thus, this measure is used to estimate and verify the level of concentration or diversity of banks' income sources. The study differentiates between two sources of income: net interest income (NII) and non-interest income (NoNII). The Income diversification index is thus computed as follows:

$$\text{HHI (inc)} = (\text{NoNII}/\text{TOI})^2 + (\text{NII}/\text{TOI})^2$$

TOI = NII + NoNII and TOI represents total operating income

The HHI (inc) measures the shift into non-interest income or fee based income generating activities. As HHI rises the bank becomes more concentrated and focused on one source of income and less diversified. Hence, well diversified banks are reflected by a small HHI index; the smaller the index, the more diversified the bank. The study also tests diversification within non-interest types of income where three categories are identified. These income types are fees and commission on loans and advances, fees and commission on trade income (including other fees and dividends) and foreign exchange (forex) income.

An asset-based measure of diversity used in literature is loans to asset ratio (Lin et al., 2012). Since the main business of any bank is to sell loans it can be argued that this is the main asset of any bank. Hence by examining the structure of assets researchers have been able to interpret the trend of this ratio as an orientation to either towards mainstream banking activities or away from non-interest income. The lower the ratio of loans-to-assets overtime is thus regarded as a shift to fee based activities. This measure of asset diversity as a stock rather than a flow variable is similar in spirit to HHI of asset activities or revenue stream (Baele et al., 2007; Laeven and Levine, 2007).

3.2. Control variables

Some control variables are included to reflect banks strategic choices and characteristics that can affect risk and performance. Control variables commonly used in diversification studies include: total assets, equity/assets, return on assets (ROA), return on equity (ROE), loan/asset ratio, GDP growth and inflation, and interest rate. The natural logarithm of banks' total assets is used as a control for bank size since large banks may have better diversification opportunities (Baele et al., 2007). Small banks may have less flexibility in dealing with risks inherent in diversification of activities, which suggests they would rather be better off with traditional banking activities.

Besides ROA and ROE, risk adjusted returns are used in this study. Non-performing loans are used as measures of credit risk, while equity/asset ratio is used to control

for bank fragility, level of leverage and capitalization. The link between economic development and financial stability has long been established in literature (Sanya and Wolfe, 2010). During periods of economic growth measured by GDP growth rate, banks may find it more profitable to expand into particularly fee based activities. Banks that have a strong lending policy may not find it feasible to shift to non-interest activities since they can make loans and improve their earnings. Loan to asset ratio is included to capture for banks' differences in loan asset portfolio as well as a proxy for bank managers' risk aversion.

It is argued that the effects of diversification contribute to reduced risk (Sanya and Wolfe, 2007; Stiroh, 2004; Smith et al., 2003; Lin et al., 2012; Baele et al., 2007). To construct a measure of adjusted profit

risk, this paper uses risk adjusted returns on equity and assets after Stiroh (2004 and other researchers consistent with diversification literature (Busch and Kick, 2009; Sanya and Wolfe 2010). This risk measure is constructed as the standard deviation (σ) of ROA and ROE over the entire sample period of the study as follows:

$$\text{RAROA}_{i,t} = \text{ROA}_{i,t} / \sigma \text{ ROA} \text{ and } \text{RARE}_{i,t} = \text{ROE}_{i,t} / \sigma \text{ ROE}$$

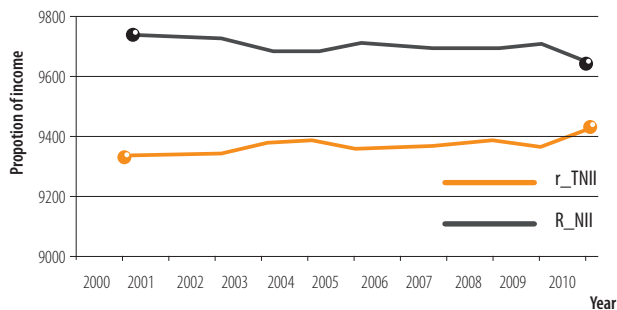
Where $\text{RARE}_{i,t}$ is defined as risk adjusted return on assets of a bank i at a point t time t , and ROA is the ratio of profit after tax to total assets. A higher risk adjusted return ratio indicates higher risk-adjusted profits and an increase in risk.

Empirical results

4.1 Trend analysis

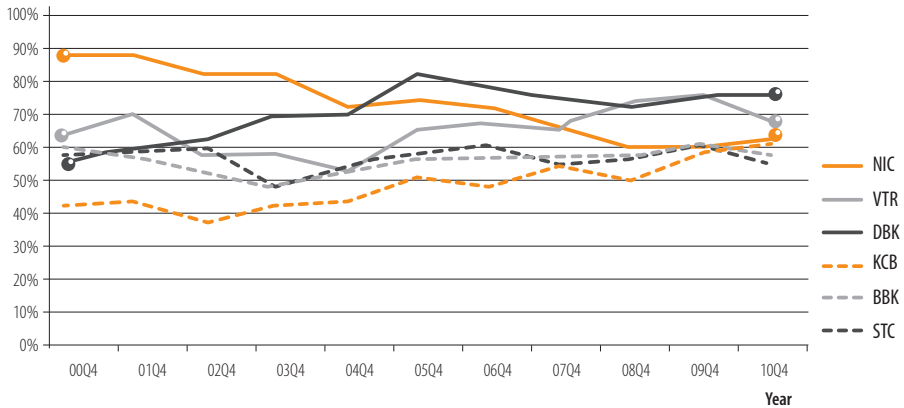
The findings of trend analysis over 11 years of the study are presented in figure 2. The study compares the evolution of the main main streams of income for commercial banks in Kenya to identify tendency and sudden changes in revenue generation behavior. As shown in figure 2, there seems to be a rising trend in fee based income and a drop on interest income from the year 2000 to 2003. Arguably, with the incoming of the NARC Government and change over from the Moi Regime, there was a shift of this trend where banks seem to have retreated to their traditional income bases.

Figure 2: Evolution of Income Proportions of Banks in Kenya
A trend of NII and TNII propotions between 2000 and 2010



A resumption of the shift started again in 2005 to 2008 when the trend slowed on account of post-election violence and the financial global crisis of 2007/8. There seems to be a constant trade off between NII

Figure 3: Evolution of the Proportion of Net Interest Income (%) for 3 small banks and 3 big banks (CBK's categorization)*

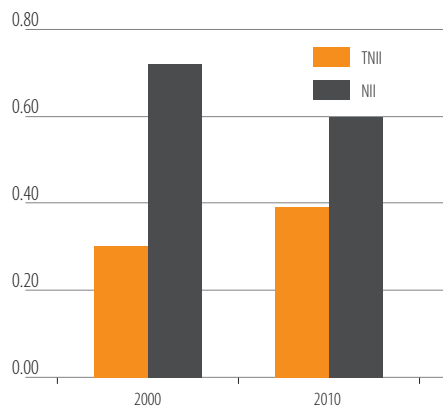


*The dotted line banks are bigger while the solid line ones are smaller. The bigger banks are more diversified since they have a low proportion of Net interest income.

and TNII with an upward trend towards TNII in recent years. The diversification trend seems to be magnified by a sample of three biggest banks and three smallest banks over the sample period (figure 3).

It is clear that there is a persistent move towards fee-based activities by Kenyan banks given the observed trend. Although a mild shift, the results are indicative of a steady growth of non-interest income since 2000. Figure 4 shows that fees and commission for banks is becoming increasingly important over the years. This is consistent with findings from other studies on USA, European banks, Brazilian, Indian, German and Italian banks (Tabak et al., 2011; Pennathur et al., 2012; Stiroh, 2004; Mercieca et al., 2007).

Figure 4: Net Interest Income and Non-Interest Income Share of Operating Income.





The summary statistics of the variables in the study specifications is as follows: The mean of bank's size was approximately Kshs. 11 billion or about 131 US\$ in current dollar terms in the year 2000. Bank assets have however grown to 42 billion Kenya billion by the year 2010. Profits have also grown from 115 Kshs. million to 2.0 billion over the sample period driven by increased net interest income which grew more than 2.6 times. Non- interest income has also grown in the same measure from Kshs. 472 millions to Kshs. 1.635 million in a decade. Another interesting statistic is a measure of volatility of earnings measured by coefficient of variation (standard deviation divided by the mean). The summary statistics indicate that in 2000 earnings were more volatile than in 2010; with the coefficient moving from 7.61 to 1.45. The same reduction in risk profile of banks obtains by looking

at ROA whose coefficient of variation decreased from 14.70 to 0.77. This could mean that an increase in fee based income ushers in less volatility of earnings.

Table 1, and comparison between the main streams of income with regard to volatility, indicates that in the year 2000, non-interest income was more volatile than interest income- 2.38 versus 1.99. However over time both revenues streams have seen reduced risk to the extent that by 2010, this measure of volatility stands at 1.66 for both income measures. This suggests that volatility has reduced faster for non-interest income than has for interest income. In other words, the increase of non-interest income over the sample period is accompanied by its lower variability. This is unlike findings for smaller EU banks studies (Smith et al., 2003; Mercieca et al, 2007)

Table 1: Summary Descriptive Statistics for a sample of 35 commercial banks a

Variables	N	Mean	Std. Deviation	Mean	Std. Deviation
		Year 2000		Year 2010	
Net Interest Income	35	729.2788	1450.31849	2624.8286	4362.73468
Net Interest Income Volatility	35			3.3922963E3	2.98818257E3
Total Non-Interest Income	35	471.81437	1123.102423	1635.07057	2715.309410
Non-Interest Income Volatility	35			2.1128160E3	1.84347252E3
HHI within non-Interest Income	35	.61914	.250404	.60229	.242549
HHI Between Interest and Non Interest Income	35	.61612	.084384	.56005	.075824
Total Assets	35	10680.26214	1.804022E4	41714.28571	5.704894E4
Equity	35	1408.6843	2249.56627	6855.9429	9786.85423
Net Profit	35	115.4574	878.55760	1929.3750	2806.30823
Return on Assets	35	.0036360	.05346491	.0353548	.02724376
Return on Equity	35	-.2368739	1.75437044	.2271825	.14133684
Total Loans	35	5.5661277E3	9.89086583E3	2.1526669E4	3.16494697E4
ROA Volatility	35			.0241340	.01458489
ROE Volatility	35			.1397114	.04916314
Non-Performing Loans	35	1.0917526E3	2.10859454E3	526.9696970	1.11856656E3
Valid N (listwise)	35				

a. both Year 2000, and 2010. Variables in millions of Kenya shillings, Total assets, Equity, Total loans, Non-performing loans, Net interest income and Net profitability.

Finally, and important to this study, we present the analysis of the concentration/diversity measures. The HHI rises it is indicative of a non-diversification

of income sources. According to the HHI, the level of diversification into non-interest income stood at an average of 0.61612 in year 2000. Overtime however, the level of concentration on interest revenue has decreased for Kenyan banks to an average HHI of 0.56006. This suggests that Kenyan commercial banks have more diversified income sources now (to fee based activities) than in the last 11 years.

Table 2: Relationship between return and diversification- HHI Estimation.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.614	.020		30.587	.000
	Return on Assets	-.443	.129	-.204	-3.445	.001
	Return on Equity	.047	.021	.135	2.228	.027
	Non-Performing Loans	-4.003E-6	.000	-.088	-1.414	.158
	Total Loans	3.237E-6	.000	.839	2.795	.005
	Total Assets	-2.285E-6	.000	-1.077	-3.627	.000
	Equity to Total Assets	.051	.034	.081	1.489	.137
	Loans to total Assets	-.068	.033	-.126	-2.052	.041
	Risk Adjusted ROA	.006	.002	.179	2.734	.007
	Risk Adjusted ROE	.000	.001	-.018	-.304	.761

Note: This table represents the results for HHI estimation of the relationship between return, measures by ROA, Risk adjusted ROA, ROE and bank performance. a. Dependent Variable: HHI Between Interest and Non Interest Income

Table 2 analyses the effects of income diversification on bank return and portfolio performance. The results give strong evidence that concentration is highly related with less profitable banks. The coefficient of ROA is significant at 1% while Risk adjusted returns measured by ROA are positive and significant at 1%. This suggests that banks focusing on diversification (opposite of concentration) are more profitable. However, when we adjust for diversification risk, the same banks become unprofitable. Although results on this finding are mixed, Tabak et al. (2011) and Stiroh (2004) explain that non-interest income is more volatile and tends to introduce offsetting effects on profits. This predicts that the benefits of diversification are remote; which evidence is also supported by the coefficient of ROE and adjusted ROE.

There is clear evidence of a positive relationship between banks' size and diversification. Total assets are considered as a measure of size. This means that diversifying banks tend to be large and also have high returns. As per the results of table 2, diversifying banks are also associated with high non performing loans and asset diversification as measured by loan to asset ratio.

The study includes a measure of relative diversification within fee and commission based revenue sources. The key categories tested are fees and commissions from loans and advances, fees and commissions from trade including dividend income and other fees, and foreign exchange commission- a growing income stream in Kenya.

An examination of diversification levels within the components of fee-based income indicate that the HHI moved from 0.61914 to 0.60229 in 10 years. Overall the results as presented in table 1 indicate that banks have been diversifying within fee based income sources. This in general is a good sign, since there is no focus on one or two product lines. The riskiness of diversification strategy measured by the coefficient of variation of the HHI is however more within non-interest income than in the shift from interest to non-interest income. This suggests that diversification into fee based has more permanent benefits than diversification with fee-based sources of income. For banks pursuing these strategies, the findings point to a prioritization rather than overall implementation across product lines.

4.1 Return, risk reduction and correlation of income sources

It is argued that expansion into non-interest income product line could be beneficial for banks due to the ability to exert a stabilizing influence by offsetting the fluctuations in interest rate (Mercieca et al., 2007; Smith et al, 2003). Although this has been proved by a number of researchers, the effect of diversification on risk is still inconclusive. Studies particularly in USA tend to differ with Europe and other emerging country studies (Lepetit et al., 2008). The formers' findings suggest that expansion into less traditional financial activities is associated with more volatile revenue streams that offset the risk spreading benefits of diversification (Goddard et al., 2008; Mercieca et al., 2007). The results in the Indonesian banking



industry reported by Hidayat et al. (2012) appear quite categorical that the trend of financial product diversification to fee based activities in the search for new sources of revenue causes small banks to reduce risk successfully but magnifies bank risk for large-sized banks.

Conventional wisdom as well as investment theory suggests that a bank should reduce earnings volatility (risk) through diversification (Smith et al., 2003), where diversification is defined as product diversification. Given that the main banking activity is regarded as making loans, researchers define non-interest income activity as a measure of the degree of product diversification (Stiroh, 2004; Hidayat et al., 2012). Overall, studies from USA, Europe and small banks in emerging economies (Tabak et al., 2011) show tension in the literature with regard to whether diversification leads to better bank performance and lower risk.

The ability of product diversification to reduce risk emanating from changes in central bank of Kenya (CBK) base rate is particularly important to Kenyan banks. This is because of the link between banks' interest rate setting and the base rate provided by the CBK. The relationship between setting of lending rates and diversification to fee-based activities has been investigated by Lepetit et al. (2008) using a

sample of European banks. The findings were rather captivating as the authors found evidence that banks decrease their lending rate when they are more reliant on fee income. Indeed the shift to non-interest income generation offers enormous opportunities for cross-selling of loans.

However, an issue of importance to this study is if non-interest income stream is related to interest income generation process. And as an annex to this empirical question, does the shift to fee-based products stabilize banking systems? Table 3 presents the results of test correction between net interest income and non-interest income. The Pearson correlation test between the two sources of income indicates that both traditional bank activities and non-traditional activities are highly and positively correlated. This result could mean that Kenyan banks are involved in cross-selling their products using loans and possibly under-pricing credit risk as found out by Lepetit et al. (2008) about European banks (Gamra and Plihon, 2011). Naturally, banks increase their profitability by charging appropriate interest margins that account for credit risk and better market spreads. Expanded lines of business that indicate a weak or negative correlation would have spelled good news for diversification benefits.

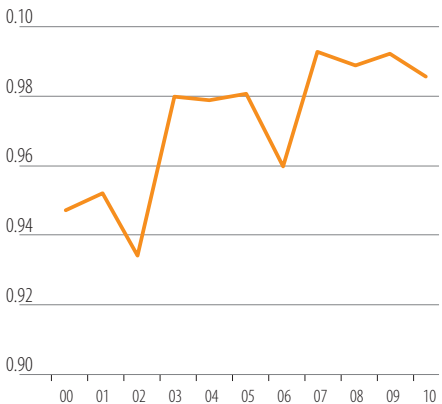
Table 3: Correlation between NII and NoNII

		NII	NoNII
NII	Pearson Correlation	1	.973***
	Sig. (2-tailed)		.000
	N	385	385
NoNII	Pearson Correlation	.973***	1
	Sig. (2-tailed)	.000	
	N	385	385

***. Correlation is significant at the 0.01 level (2-tailed).

To check for correction between the income streams overtime, the present study estimated the relation over the sample period, and figure 4 illustrates this.

Figure 4: Correlation between interest and non-interest income



The results show that the two revenue segments are exposed to the same economic and financial shocks and naturally reduce the potential for diversification benefits. The cross-sectional correlation in each year seems to have increased from about 0.945 in 2000 to 0.986 in 2010. This means that, as non-interest income becomes increasingly important business in the Kenyan banking industry, potential diversification benefits seem to be receding (Stiroh, 2004). The growth trend almost gets to a perfect match by the year 2007, showing that yearly increases in non-interest income are associated with higher and higher correlation. A decreasing correlation is indicative of potential benefits for benefits from diversification due to possibility of volatility reduction. The empirical results point to the fact that the chances of diversification benefits are very slim for Kenyan banks. These findings are consistent with those from developed countries where the shift to fee based activities not only yields less benefits for banks but fails to offer revenue smoothing effects (Mercieca et al., 2007; Stiroh, 2004; Lepetit et al., 2008).

Further investigations on the cross-sectional correlation between different variable in the current study are presented in table 4 and 5. Looking at the correlations between the sources of income and profitability and non-performing loans (NPLs), the study finds that the sources of income are positively related to profitability and negatively related to NPLs. This result is arguably not surprising but emphasizes the inability of noninterest income to reduce cyclicality in bank earning flows.

Table 4: Correlations assessed per bank

	Net Interest Income	Total Non-Interest Income	Return on Assets	Return on Equity	Non-Performing Loans
Net Interest Income	1	.973***	.224***	.133***	.514***
Total Non-Interest Income	.973***	1	.189***	.111**	.601***
Return on Assets	.224***	.189***	1	.472***	-0.086
Return on Equity	.133***	.111**	.472***	1	-0.048
Non-Performing Loans	.514***	.601***	-0.086	-0.048	1

***. Correlation is significant at the 0.01 level (2-tailed).

**. Correlation is significant at the 0.05 level (2-tailed).

Table 5: Correlations of bank income macro- economic factors and profitability

	Total Non-Interest Income	Net Interest Income	Return on Assets
Non-Performing Loans	.599***	.513***	-.087
Return on Assets	.189***	.224***	1
Lending Rates	-.097	-.113**	-.141***
T-Bills Rate	-.093	-.097	-.105**
GDP Growth	.043	.057	.111**

Note: *** $p < 0.01$, ** $p < 0.05$,

An examination of the correlation of the revenue streams with macro-economic factors paints the same picture. Lending interest rates are significant and negatively related to income and profitability. For more variable correlation tests, see appendix (Table A1)

As expected, lending rates are significantly correlated with net interest income and the relationship is negative, meaning that increased interest income or more lending takes place when interest rates are favorable. This is an interesting finding in the sense that banks don't have to rush to raise interest rates to gain more income unlike the current thinking in the industry. Thus reduced or cutting lending rates are beneficial for banks as this leads to increased net interest income.

The earning capacity of a bank is also related to lending rates. This result could have implications on the fact that low lending rates reduces loan default and thus boosts profit due to low NPLs. This suggests that the banking industry could possibly be expected to exploit the benefits that come with reduced interest rates so as to increase financial performance. The results also indicate that economic growth is important for better bank returns.

The above findings have profound implications for banking strategies that lead to improved earnings as well as policy recommendations on lending rates and credit risk management.

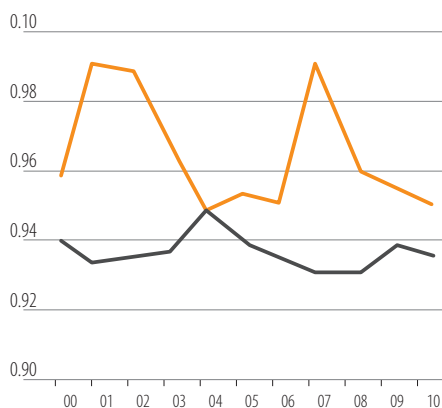
4.2 Bank earnings volatility and diversification

Banks wish by all means to avoid risks. It's a well known theory that there is risk return trade off for any business, but more so for banking institutions. In this section we estimate the potential gains that can arise from existing returns and risks of interest and non-interest related activities. Bank shocks are of two types- bank specific and system wide (Smith et al., 2003). Bank specific shocks can be internal or external. However, external shocks can only have their effects reduced through diversification across a wide range of customer base. Internal shocks on the other hand are related to fraud, failure of systems or failure of part of the business due to cyclical events. These types of shocks can effectively be mitigated through diversification of income sources.

This study assesses the volatility of the two primary streams of revenue and consequently checks if non-interest income stabilizes total operating income over the sample period. The study uses coefficient of variation for measuring the fluctuations around the trend for both revenue streams. The coefficient of variation is computed as the standard deviation divided by mean of the respective income source based on individual bank annual averages. The interpretation of the coefficient of variation as a measure of volatility is that the higher the ratio, the higher the volatility. The main question is which of the two income streams have a higher volatility?

The results are presented in figure 5, and indicate that noninterest income is on the overall more volatile than interest income. Except for 2004, interest income has maintained a more stable trend (between 0.30 and 0.45) over the 11 years of the study. On the other hand, non-interest income has fluctuated between between a high of 0.90 and a low of 0.49. This suggests that as banks shift to fee based income, they expect this income stream to inject the same shock in the total income of the banks. The outcome can be expected to be more volatility on bank earnings.

Figure 5: Volatility of income components



An assessment of figure 5 shows that volatility for interest income has declined since 2004 save for the last few years. Hence, it can be concluded that any fluctuations in Kenyan bank earnings will be more

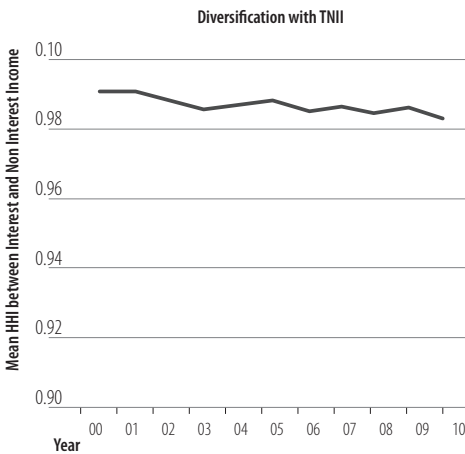
attributed to non-interest income than it related to interest income shocks. This finding is consistent with other studies that find noninterest income more volatile than interest income (Stiroh, 2004; Mercieca et al., 2007; Tabak et al., 2011; Smith et al., 2003). Given increase in fee based income, Kenyan banks can expect increased volatility in bank earnings and less benefits from income diversification. This result indicates that the banking industry in Kenya is vulnerable to economic and financial shocks. This could spell bad news to investors as unstable incomes are quite unsettling.

An examination of earnings volatility (see appendix) shows that between return on assets and return on equity, ROA has experienced an overall decline unlike ROE. In addition, it shows that investors' returns from banks investments are quite risky. This finding on return volatility does not seem to match the growth in non-interest income. Although it can also be explained by the fact that interest income that drives overall return in banks has been more stable, thus stabilizing total income. However, the interpretation could be limited by lack of analysis on the observed trends on operating expenses. Risk exposure and earnings volatility is not highly associated with concentration or less diversification as per this study- a finding that is contrary to conventional investment theory (Tabak et al, 2011)

4.3 Income diversification

This study examines the extent of income diversification by Kenyan banks away from traditional banking activities. The results for the HHI are presented in figure 6.

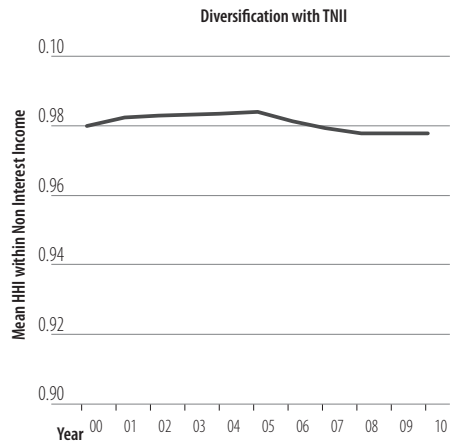
Figure 6: Evolution of the behavior of fee based activity over sample period.



The concentration growth indicates that focus on traditional activity for Kenyan banks has been on the decline over the years. Although the decline is not pronounced, it reflects a rising in fee based activity in the industry. This result is consistent with world trends where banking systems are slowly increasing fees and commission based revenue (Pennathur et al., 2012; Tabak et al., 2011; Busch and Kick, 2009).

This study also assesses the level of diversification within fees based activities. The results are presented in figure 7. As is evident in figure 7, before 2005 banks tended to concentrate in certain fee based activities. However, after 2005 there has been a trend of diversifying within trade fees, foreign exchange commission, dividend income or other income.

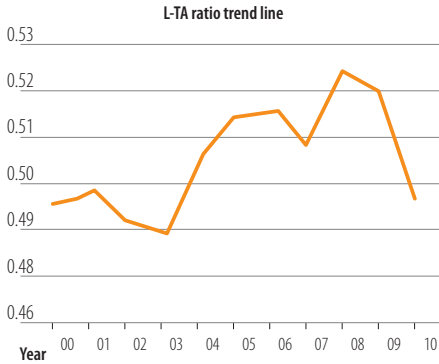
Figure 7: Diversifications trend for Kenyan commercial banks within fee based income.



The study also used a measure of asset diversity, loan to asset ratio to assess the extent to which the Kenyan banking sector has been diversifying to fee based revenues. Figure 8 indicates that there have been attempts on diversification by the sector. A downward trend is clear to 2003 showing a shift to fee based activities until a rise in the ratio kicked off to 2006.



Figure 8: Asset diversifications trend



The higher ratio suggests a return to traditional interest income. Besides disturbance during the global financial crisis period, it seems that Kenyan banks are keen on diversification since the ratio is on the decline again. The results while fitting in with the HHI show a push for Kenyan banks to diversify their revenue stream.

Conclusion

This study examines if there are any benefits for income diversification in the Kenyan banking industry and also looked at effects of diversification on returns. The findings show that there are few benefits if any to be expected from income diversification from traditional banking to fee based revenue. However, the results show a growing importance of non interest income in the 11 years under the study.

It was also established that bigger banks are more diversified than small banks and tend to have higher returns. A positive correlation between net interest and non interest income seem to exist; a finding that suggests noninterest income may not be used to stabilize total operating income. The benefits of the evolution on non-interest income do not seem to fully offset the increase in risk that come with fee based income. Thus, expansion of bank's financial product offering to fee based activities does not reduce the variability of its earnings stream.

The study assesses the volatility of the two primary streams of revenue and consequently checked if non-interest income could stabilize total operating income. The findings were clear that non-interest income is much more volatile than interest income as observed over the sample period. Given increase in fee based income, Kenyan banks can expect increased volatility in bank earnings and less benefits from income diversification.

The findings also reveal that lending rates are significantly correlated with net interest income. The relationship is negative, meaning that more lending takes place when interest rates are favorable. A high level of diversification is often associated with low lending rates. This finding seems to agree with the CBK's policy. Thus reduced or cutting lending rate is beneficial for banks as this leads to increased net interest income and more diversification as per this study.

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Table A1: Matrix of Interbank Exposures (continued)

GDP Growth	Pearson Correlation	.223	.202	.216	.481	.557	-.520	1	-.695*	-.421
	Sig. (2-tailed)	.510	.552	.524	.134	.075	.101		.018	.198
	N	11	11	11	11	11	11	11	11	11
Lending Rates	Pearson Correlation	-.445	-.463	-.453	-.611*	-.698*	.735**	-.695*	1	.712*
	Sig. (2-tailed)	.170	.152	.162	.046	.017	.010	.018		.014
	N	11	11	11	11	11	11	11	11	11
T-Bills Rate	Pearson Correlation	-.381	-.442	-.404	-.454	-.424	.453	-.421	.712*	1
	Sig. (2-tailed)	.248	.173	.218	.161	.194	.162	.198	.014	
	N	11	11	11	11	11	11	11	11	11

Figure A1: Returns volatility



Note: This figure, which shows returns volatility between 2000 and 2020 for Kenyan banks, indicates the level of bank risk related to shareholders' returns.

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