

Full Length Research Paper

Income Source Diversification and Financial Performance of Commercial Banks in Kenya

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Abstract

The profitability of commercial banks depends heavily on the net of income generating activities and the related activities' expense. Due to the problem of profitability and stiff competition in the industry, commercial banks have changed their behavior of income sources, by increasingly diversifying into non-intermediation income generating activities as opposed to the traditional inter-mediation income generating activities. The objective of this paper was to establish the impact of income source diversification on financial performance of commercial banks in Kenya. This has been achieved through: establishing the level of income source diversification of commercial banks in Kenya and establish whether income source diversification improves financial position of commercial banks. This was a census study of all registered 44 commercial banks in Kenya and relied heavily on documentary secondary data for 5 year study period (2005-2009) and validated by primary data achieved through key-informant method. Herfindahl-Hirschman Index, Correlations and Regression analysis were mainly used and revealed on aggregate that all commercial banks in Kenya are diversified with large banks in lead while Islamic banks trail. Further, diversification level has a positive influence on financial performance of commercial banks in Kenyan and the two main revenue streams are positively related.

Keywords: Non-interest, Net-interest, Returns, Net-operating income

JEL Classification: G21, L25, C12

1.0 Introduction

Banks exist to inter-mediate the transactions between demanders and suppliers of money at a given consideration. Earnings from these transactions form bank's traditional income generating activities. However, critical analysis of financial statements for commercial banks reveal a different trend, where over 40% of their net operating income comes from non-intermediation income generating activities. The growth of non-intermediation income activities suggests intermediation activities are becoming less important part of banking business strategies and strategically, banks have shifted their sales mix by diversifying in income sources.

Financial institutions generate increased portion of their income from non-intermediation activities (DeYoung and Rice, 2004) and this could be associated to financial liberalization policies. Deregulation and new technology have eroded banks' comparative advantages and made it easier for non-bank competitors to enter these markets, necessitating banks to shift their sales mix and diversify towards non-interest income sources (Montiel 1995, Angbazo L., 1997). Findings from USA studies show that in 1990's non-interest income grew rapidly to be a large part of banks operating profits. Non-interest income accounts for 43% of U.S.A commercial banks net operating income (Stiroh 2004).

Financial liberalization of early 1990s in Kenya opened the banking industry to a number of players leading to stiff competition and weakening of financial performance of a number of commercial banks leading to collapse of some. In response, commercial banks have changed their behavior of income sources by diversifying as a possible way of improving performance.

Kenya's commercial banking sector comprises of 3 public, 28 local (private), 11 foreign (private) and 2 Islamic (private) as at 31st Dec.2009. The sector was not affected by the first round effects of recent financial global crisis (U.S.A credit crisis), as it had no exposure to the toxic assets at the heart of the crisis (CBK report, 2009). However, threats to the sector continued to be posed by the lag effects of the crisis as it spread from the centre, (CBK, Kenya Bankers Association and Reuters 2009).

Research findings from developed (USA and Europe) markets on impact of income source diversification on banks financial performance differs greatly. It worsens risk-return trade-off in USA while it increases risk-return trade-off in European banks. Stiroh (2004), De Young and Rice (2004), Stiroh and Rumble (2006) indicate a worse risk-return trade-off for U.S.A commercial banks venturing into income source diversification. Chiarozza et al. (2008), Baele et al.,(2007), and Staikouras and

wood 2003 show that income source diversification increases risk-return trade-off for European banks.

Further, Shawn, (2002) financial sectors in most developing countries are characterized by fragility, volatile interest rates, high-risk investment and inefficiencies in the intermediation process. The industry further differs in: ownership structure, financial liberalization level and accounting treatment of various sources of income. Therefore, this paper determines the impact of income source diversification on financial performance of commercial banks in Kenya. The study was guided by the following two directional hypotheses: H1: Commercial banks in Kenya are diversified in source of income and H2: Income source diversification improves financial performance of commercial banks.

The results of this paper may be useful to the financial institutions, Non-Governmental organization and the Government of Kenya. It may provide a guide to remedial regulatory schemes and supervisory programme to support the operation of financial institutions. Further may give direction to the donor agencies, entrepreneurs and business people and importantly, fills the research gap and provide further data for scholars.

2.0 Literature Review

Diversification benefits from shifting into non-interest income in U.S.A banks (Stiroh, 2004) increases bank revenue and reduces volatility of bank profits. Diversification worsens the risk- return trade-off for USA banks(Rumble and Stiroh,2006) and earnings gained from diversification caused by growth in non-interest income is outweighed by the volatility increases, resulting in a non-commensurate increase in stock returns. Non-interest income and Interest income were increasingly growing highly correlated over time in USA banks (De Young and Roland 2001; De Young and Rice, 2004) and exists along with, rather than replace each other.

Income source diversification increases risk-adjusted returns and diversification gains from non-interest income diminish with bank size (Chiarozza et al, 2007) in European banks. Unlike U.S.A banks, non-interest income and interest income relates negatively (Staikouras and Wood, 2003) and tends to stabilize bank earnings in European banks. Baele et al, (2007) find that non-interest income increases bank franchise value positively and banks with higher non-interest income have higher market betas and therefore higher systematic risk.

No direct diversification benefits within and across business lines in small European banks (Merceica et al., 2007) and interestingly, an inverse relationship between non-interest income and bank performance. Banks with greater fee-based services charge lower lending rates and default risk is under-priced (Lepetit et al, 2008) and may use loans as a loss leader. Financial sectors in most developing countries are (Shawn 2002, Montiel 1995) characterized by fragility, volatile interest rates, high-risk investment and inefficiencies in the intermediation process. McAllister and McManus (1993) contend that diversification may lower bank risk and reduce the Probability of failure; particularly if the returns of assets have

relatively low or negative co-variance and beneficial if the worst states of nature for each of the assets do not coincide.

Diversification improves (Moon,1996) cost efficiency through lower risk from diversification if it occurs, and lowers the required risk premiums on un-insured debt and other contingent claims , such as derivative contracts. Financial institutions may also have higher average revenues if the institutions use some of the gains from diversification to make higher risk investments(Hughes and Mester, 1998).

Deregulation and technological advances have fostered increased (Keeton, William R, 2000) competitive rivalry among banks and non-banks alike. Banks have faced an increased competition in retail markets due to deregulation, financial innovation and advances in communications technology, all of which have provided banks' retail customers with alternatives to traditional bank deposit accounts. Deregulation fostered (De Young, Hasan, and Kirchhoff, 1998) competition between banks, on-banks and financial markets where none existed before and these competitive threats and opportunities, many banks have embraced the new technologies that drastically altered their production and distribution strategies and resulted in large increases in non-interest income.

3.0 Data and Methodology

Secondary data was mainly used - An audited financial statements of commercial banks and validated by Primary data achieved through key-informant method. We employed longitudinal approach to study the 5 years trends of income source diversification. Census of all registered 44 operational commercial banks in Kenya as per Central Bank of Kenya (CBK) record for the study period 2005-2009. However commercial banks which were not operational for the entire 5 year period or under receivership were dropped due incomplete records or missing data.

Close-ended Questionnaires were used and two separate interviews were conducted once for both CBK staff and Commercial banks respondents and the response rate was 81% (36/44). The financial statements (secondary data) were obtained from individual banks websites, CBK supervisory data bank and National daily news papers (Nation and Standard). These sources were authentic thus reliable, suitable and valid. Both descriptive and Inferential statistics were used with the aid of SPSS programme at 95%, 99% confidence level. Herfindahl - Hirschman Index, Correlations and Regression were mainly used.

Diversification and focus were analyzed using Herfindahl-Hirschman Index (HHI). HHI is the sum of squares of exposures as a fraction of total exposure. According to Stiroh (2004) the sum is squared in order to give due weight on the size of a bank.

$$HHI = \sum_{i=1}^n \left(\frac{X_i}{Q} \right)^2 \quad (i)$$

Where, $Q = \sum_{i=1}^n X_i$ or Total exposure, \sum = sum, HHI=level of diversification, and X_i = an exposure variable. However, this paper adopted an Adjusted HHI approach (Acharya *et al.* 2002; Stiroh and Rumble 2003; Stiroh 2004) as shown;

$$HHI = 1 - \left\{ \left(\frac{NII}{NOI} \right)^2 + \left(\frac{NONII}{NOI} \right)^2 \right\} \quad (ii)$$

Where: HHI = Diversification level, NII = Net Interest Income, NONII = Non-Interest Income, NOI=Net Operating Income and 1 is a unit. The sum of squared revenue is subtracted from a unit so that HHI level increases with the level of diversification which takes on values between $0 < HHI < 0.75$. For the purpose of this paper diversification is denoted by HHI.

From any Kenyan commercial banks' audited published financial statement, there are three sections; Balance Sheet, income statement and other Disclosures. Income statement contains net interest income (NII) and non-interest income (NONII) as major revenue streams. Interest income components are; loans and advances, government securities, deposits and placement with other banking institutions, and other interest income. Non-interest income components are; fees and commissions on loans and advances, other fees and commissions, foreign exchange trading income, dividend income, and other non-interest income. Diversification level for commercial banks per year was calculated and averaged for the banking sector, peer group, ownership and faith as per CBK classification (see table 4.1). ROE and ROA are returns (EBIT) on equity and assets respectively.

4.0 Discussion And Results

4.1 Diversification

In order to assess the level of income source diversification of commercial banks in Kenya, the study had set the hypothesis: H1: Commercial banks in Kenya are diversified in income sources. The mean diversification levels for commercial banks according to sector, peer group, size (assets) and faith as shown in table 4.1, and further justified by figure 4.1. This reveals varying levels of diversifications; large (HHI=.45) commercial banks are above the sectors' level (HHI=.43), while medium (HHI=.42) and small (HHI.41) commercial banks fall below. However private and public banks tie up at HHI=.43 and at par with the sector while Islamic (HHI=.40) banks trail. This implies that all commercial banks in Kenya are moderately ($0.25 < HHI < 0.75$) diversified at aggregate level and no extreme.

At individual banks level (see table 4.5 figures truncated to 2 decimal places), apart from bank of Baroda (HHI=0.23) all banks are moderately diversified ($0.25 < HHI < 0.5$), with Larger banks recording higher towards balanced in revenue streams. This matches Chiarozza et al 2007 findings on European banks where diversification diminishes with bank size, and supported by MC Allister and MC Manus 1993 with conclusion that larger banks have greater ability to diversify risk.

The interpretation is that large banks enjoys economy of scale and could take risk projects which medium and small could not enjoy. Ownership does not influence income source diversification level of commercial banks in Kenyan, since private and public banks are at par. The Islamic banks are diversified though at early phases of market product development.

Large banks may have more developed risk management techniques or may be involved in fundamentally different types of activities with different distributions. On the basis of the results, all commercial banks confine within $0 < HHI < 1$; hence, we fail to reject H1.

4.2 Diversification in Revenue Components and Profits

Both interest and non-interest incomes are heterogeneous and diagnosing each component reveals different levels of diversification as shown in Table 4.2 Construction of HHI:

$$HHI_NONII = 1 - \left\{ \left(\frac{FL}{NONII} \right)^2 + \left(\frac{OF}{NONII} \right)^2 + \left(\frac{FOREX}{NONII} \right)^2 + \left(\frac{DIV}{NONII} \right)^2 + \left(\frac{ONONII}{NONII} \right)^2 \right\} \quad (iii)$$

$$HHI_NII = 1 - \left\{ \left(\frac{L}{NII} \right)^2 + \left(\frac{GOVT}{NII} \right)^2 + \left(\frac{DP}{NII} \right)^2 + \left(\frac{ONII}{NII} \right)^2 \right\} \quad (iv)$$

Where: HHI_NONII=diversification level of NONII components, 1 =a unit, FL=fees and commissions on loans and advances, NONII=Non-Interest Income, OF=other fees and commissions, FOREX=foreign exchange trading income, DIV=dividend income, ONONII= other non-interest income, NII=Net interest income, L=loans and advances, GOVT=government securities, DP=deposit and placement, ONII=other interest income. Their diversification level are shown in table 4.2 and further demonstrated by figure 4.2.

From the figure 4.2, profits have been increasing at increasing rate from year 2005-2008, but increased at decreasing rate in year 2009. Similarly (HHI_NONII) increased at increasing rate up to the years 2008 and stagnated at 0.70 in year 2009. However (HHI_NII) increased in the years 2005-2007 and decreased for subsequent years (2008-2009) to 0.36. Evidently, the growth of profits could be associated with the movement of diversification level of non-interest income which has been steady and stable. This has been hailed by Stiroh (2004) that diversification into non-interest income increases bank revenue and reduces volatility of banks profits.

Therefore the stability of profits of commercial banks in Kenya could be stable because of the stability of non-interest income diversification level. The drastic and sporadic reduction in diversification level in interest income could be associated with 2008/2009 anti-economic activities (U.S.A credit crunch, new Kenya's economic policies, Inflation rate, and effect of post-elections violence in Kenya). During the period, the traditional banking generating activities decreased and suppressed non-traditional income generating activities.

4.3 Trends of Income Sources Components and Profits 2005-2009

In order to establish the growth of income source components and its relationships with profits, annual aggregates of NII, NONII and profits were taken for each year as shown in the table 4.3.

From figure 4.3 NII and NONII have been increasing annually and replicated by NOI, but at varying rates for the study period (2005-2009). NONII growth was recorded (5.6, 7.1, and 12.1) while the growth of NII doubled (13.3, 14 and 24.5) that of NONII in years (2005-2008) and the increase were, 102 % (NONII= 49.1-24.3), 106 % (NII= 100.4-48.6). In both cases it grew at decreasing rate in 2008, 2009. The profits have been steady and stable all through the study period. This increase in non-interest income is supported by De young and Rice 2004 findings that financial institutions generate increased portion of their income from non-intermediation activities.

The increase and decrease reveal the revenue stream growth move in same direction and can be affected by a given shock similarly. Significantly, non-interest income begs allot on

interest income generating activities. If all traditional activities respond to the same economic shocks like regional economic activity, then one would expect to see a high correlation between these revenue streams. It is evident that noninterest income components are highly positively correlated with net interest income. This is not surprising as non-interest income are closely aligned with traditional banking operations linked to deposit-taking activities, loans and advances and further the revenue streams co-exists alongside each other.

These results show a relatively high degree of positive correlation between noninterest income and net interest income across banks and thus substitution of the revenues streams is impossible. This suggests little obvious diversification benefits as growth in one type of income is typically associated with similar growth in the other type. Moreover, the correlation has been trending up, implying less diversification benefits as the banking industry steadily shifts its revenue focus to noninterest income sources. Results are supported by De Yong and Rice 2004 and De Young and Roland (2006) non-interest and interest income exists along rather replacing each other.

4.4 Relationship among the Study Variables (Correlations Analysis-Zero Order)

The table 4.4 shows varied degree of interrelationships, but all are statistically significant at 95% and 99% levels of confidence. For instance, there is a strong significant positive correlation between net interest income ($r=.998$, sig. $=.000$) and net operating income at 99% confidence level (see table 4.4).

The interpretation of this high correlation is that Kenyan commercial banks rely heavily on interest income to outdo operating expense. All the variables in table 4.4 relates positively ($0 < r < 1$) and sig. < 0 . Thus in general, the relationship between diversification and financial performance measures has been positive. This implies that with a unit increase in diversification level, results to a corresponding increase in financial performance measures and thus influences financial performance of commercial banks in Kenya. This could explain findings by Rumble and Stiroh (2004) on USA banks that diversification and financial performance relates positively and cannot be substituted.

The partial correlation coefficients were compared with that of zero order correlation coefficients in order to establish the magnitude and the direction of change. The results suggest that on whole, financial performance change when one of the income sources is controlled. However the degree of change on each variable varies. For instance, when NONI is controlled, results will be suppressed and statistically significant (e.g. EBIT $r=.6413$, ROA $r=.2036$, ROE $r=.3611$) but the margin will be positive, indicating that in absence of non-interest income source, the relationship between NII and financial performance will be suppressed. On the other hand, when NII is controlled, the results worsens and suppressed further (e.g. EBIT($r=-.1720$, ROA $r=-.1405$, ROE $=-.2759$) leaving negative margin. Thus removing NII would worsen the state of banks profitability. This matches explanation of Rice and Roland on why interest and non-interest have to exist along each other.

Significantly, commercial banks in Kenya may specialize only in interest income generating activities but not in non-interest income generating activities because non-interest income

generating activities depends heavily on banks intermediation activities.

4.5 Regression of Diversification against Financial Performances Measures ($Y=a+bx+e$)

Hypothesis H2: Income source diversification improves financial performance of commercial banks in Kenya.

Regression was conducted using degree of diversification as a predictor of NOI (see table 4.6). The model revealed that HHI accounts for 16.5(R-square 0.165) percent of the variance in NOI with a Pearson $r=.406$, $F(1, 37) = 7.303$, $p = .010$. The resulting linear regression equation to estimate; $NOI' = -10137.458 + 29,358.604HHI$.

Where: 29,358.604 = an estimate of the expected change on NOI corresponding to change in HHI level; 0.010, 0.036 = p-values and measures how significant the results are or significant different from zero (error factor); -10,137.458 = y-intercept (constant) and represents the predicted value when HHI level is zero. Since $\beta \neq 0$ and $p\text{-value} < 0.05$, we fail to reject H2. Therefore, for one unit increase in diversification (HHI), we expect 29,358.604 unit increases in net operating income (NOI) ceteris paribus. Alternatively, a one standard deviation increase in HHI results to.406 standard deviation on predicted NOI, ceteris paribus.

Regression was similarly conducted using HHI as a predictor of EBIT (see table 4.7). The model reveal HHI accounts for 14.3(R-square .143) percent of the variance in EBIT with a Pearson $r=.378$, $F(1, 37) = 6.163$, $p = .018$. The resulting linear regression equation to estimate; $EBIT' = 10,237.3HHI$. Where: 10,237.3 = an estimate of the expected change on EBIT corresponding to change in HHI level. Since $\beta \neq 0$ and $p\text{-value} < 0.05$, we fail to reject H2.

It reveals statistically significant positive linear relationship between HHI level and EBIT. It meaning for one unit increase in diversification we expect 10,237.3 unit increases in EBIT. Similarly, a one standard deviation increase in HHI leads to.376 standard deviation in predicted EBIT ceteris paribus. Hence income source diversification improves financial performance of commercial banks in Kenya

Regression was conducted using HHI as a predictor of ROA (see table 4.8). The model reveals HHI account for 0.4 percent of the variance in ROA with a Pearson $r=.062$, $F(1, 37) = .143$, $p = .707$. The resulting linear regression equation to estimate $ROA' = .686 + 2.664 HHI$.

Where: 2.664 = an estimate of the expected change on ROA corresponding to change in HHI level; .707 = p-values and measures how significant the results are or significant different from zero (error factor); .686 = y-intercept (constant) and represents the predicted.

It reveals positive linear relationship between HHI level and ROA though not statistically significant. Meaning for one unit increase in HHI, we expect 2.664 unit increases in ROA. Hence income source diversification improves financial performance of commercial banks in Kenya.

Regression was conducted using HHI as a predictor of ROE (see table 4.9). The model reveal HHI accounts for 0.6 percent of the variance in ROE with a Pearson $r=.075$, $F(1, 37) = .211$, $p = .649$. The resulting linear regression equation to estimate $ROE' = 7.068 + 20.315 HHI$. Where: 20.315 = an estimate of the expected change on ROE corresponding to change in HHI

level; .649 = p-values and measures how significant the results are; 7.068 = y-intercept and represents the predicted value when HHI level is zero.

It reveals positive linear relationship between HHI level and ROE though not statistically significant. Meaning for one unit increase in HHI, we expect 20.3 unit increases in ROE. Hence income source diversification improves financial performance of commercial banks in Kenya. This result negates European banks findings by Merceica et al (2007) of inverse relationship between diversification and financial performance.

5.0 Summary and Conclusion

The main concerns was to establish HHI level considering commercial banks sector, peer group, ownership and believe (religion). The results reveal that commercial banking sector in Kenya on aggregate is moderately diversified (HHI=.43) while at individual bank level 97% of target population are diversified ($0 < \text{HHI} < 1$). Large commercial banks level of diversification (HHI=.45) was found to be above the industry diversification level while Islamic (HHI=.40) trails. Although the HHI level varies, it reveals that commercial banks in Kenya embrace diversification as a strategy to improve financial performance.

Importantly, ownership and religion seemly has no effect on diversification level since private and public are at par (HHI-private.43=HHI-public.43), while Islamic banks was at HHI=.40, but at early stage of financial products development. However, it emerged that size and clientele influences diversification level greatly in Kenyan commercial banks.

It reveals statistically significant positive linear relationship between HHI level and financial performance measures (NOI, EBIT, ROA and ROE) and consistent with USA study's findings Rumble, (2006) while contrast to European banks (Staikouras and wood 2003), hence income source diversification improves financial performance of commercial banks in Kenya.

Larger banks have greater ability to diversify risk and should be safer in operation and thus have lower cost of funding than smaller ones. Hence, larger banks may have relatively better profitability than smaller ones. Based on too-big-to-fail argument, larger banks may take on riskier activity than smaller ones and decrease their cost of funding and may have developed risk management techniques or may be involved in fundamentally different types of activities with different distributions (McAllister and McManus 1993).

Large banks are prone to engage in risky activity (Demsetz, 1997). Similarly larger banks considering their capital base can diversify and provide variety of financial products and thus forming a financial supermarket, where clients can shop at one point and pay at premium. Diversification level is influenced greatly by size, however ownership and believes seemingly have no influence on diversification level. Further diversification was steady, stable and less volatile in non-interest income while net interest income diversification level was found to change abruptly, which may be explained by external variables.

Further the analysis reveal that non-interest income components –fees and commission on loans and advances are

highly correlated with interest income. The two revenue streams (interest and non-interest income) are highly and positively related implying that they move in same direction and can be affected by same shock. This is not surprising as non-intermediation activities begs a lot on intermediation or banks traditional activities and thus the two streams cannot be substituted for each other. The effective ratio of interest income to non-interest income has been found to be 6:4, and when tilted in favour of any, similarly profits will tilt.

Findings from the results of regression indicate that all financial performance measures (NOI, EBIT, ROA, and ROE) reveal positively linear relationship with HHI level, implying they increase with increase in diversification level. ROA and ROE shows weak positive linear relationship and the model reveal HHI accounts for little variance in ROA and ROE since ROA and ROE are ratios of EBIT to Asset and Equity respectively. Seemingly there exists a spilt over positive effects resulting through EBIT. However, ROA and ROE shows weak positive linear relationship since are ratios of earnings before interest and tax to Asset and Equity respectively (e.g. $\text{ROA} = \frac{\text{EBIT}}{\text{ASSETS}}$, $\text{ROE} = \frac{\text{EBIT}}{\text{EQUITY}}$). NOI and EBIT are directly

influenced by diversification and changes proportionately with change in HHI level. This is because the two measures of financial performance are income statement components and therefore are useful in making decision to diversify. ROA and ROE however, are neither income statements nor balance-sheet components, thus seemingly there exists a spilt over positive effects resulting through EBIT.

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Appendices

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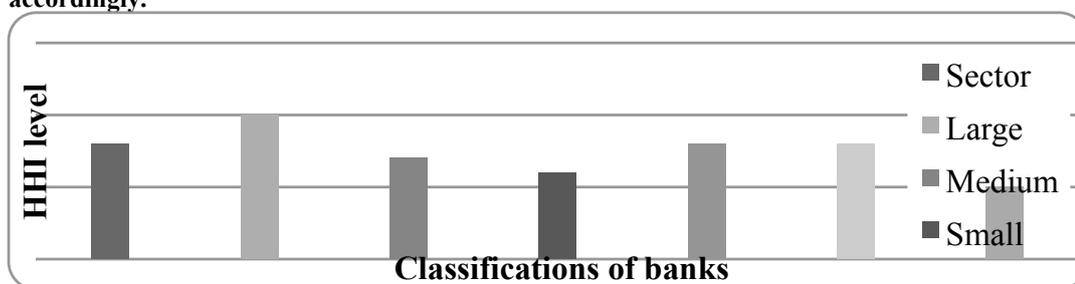
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Table 4.1: Mean Diversification Levels for the Study Period (2005-2009)

Period	no	Industry	Large	Medium	Small	Public	Private	Islamic
2005	37	.42	.46	.43	.37	.40	.42	-
2006	37	.43	.46	.40	.44	.40	.44	-
2007	37	.43	.45	.44	.41	.45	.43	-
2008	39	.43	.44	.43	.42	.46	.43	.41
2009	39	.42	.44	.42	.42	.45	.45	.39
mean		.43	.45	.42	.41	.43	.43	.40

Source: Research data and Result of equation (ii)

Figure 4.1: Diversification levels for commercial banks accordingly Figure 4.2: Diversification levels for commercial banks accordingly.



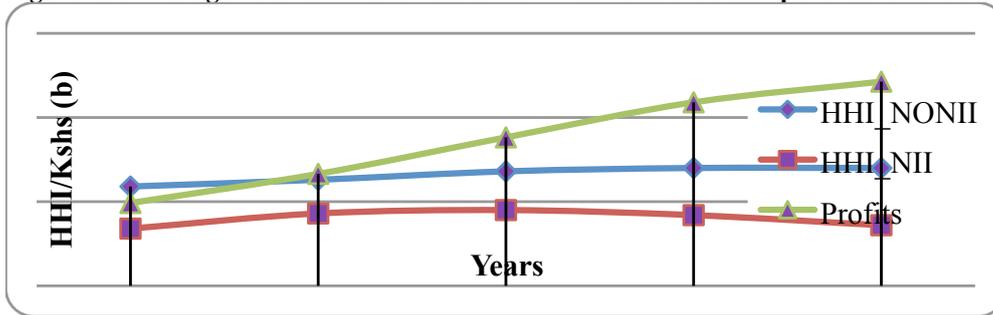
Source: Based on table 4.1

Table 4.2: Average Diversification Levels and Profits

	2005	2006	2007	2008	2009
HHI_NONII	.59	.63	.68	.70	.70
HHI_NII	.34	.43	.45	.42	.36
Av.Profits(Kshs b)	.492	.665	.882	1.09	1.213

Source: Based on data (equations,iii,iv)

Figure 4.2: Average Level of Diversification for Income Source Components for the Study Period



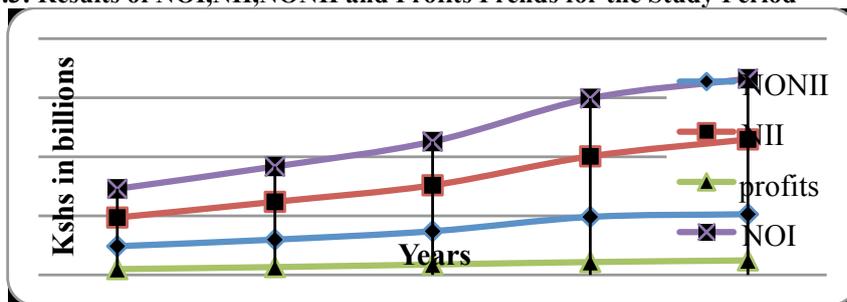
Source: Based on table 4.2

Table 4.3: NOI,NII,NONII and Profits Trends for the Study Period

Kshs (bn)	2005	2006	2007	2008	2009
NONII	24.3	29.9	37.0	49.1	51.4
NII	48.6	61.9	75.9	100.4	114.7
NOI	72.9	91.8	112.9	149.5	166.1
PROFITS	4.92	6.65	8.82	10.90	12.13

Source: CBK and Research data.

Figure 4.3: Results of NOI,NII,NONII and Profits Trends for the Study Period



Source: Based on table 4.3

Table 4.4: Zero order Correlation of Study Variables

		HHI	NII	NONII	NOI	EBIT	ROA	ROE
HHI	Pearson(r)	1	.340*	.379**	.364*	.355*	.338*	.335*
	Sig. (1-tailed)	.	.017	.009	.011	.013	.018	.019
NII	Pearson (r)	.340*	1	.987**	.998**	.973**	.441**	.582**
	Sig.(1-tailed)	.017	.	.000	.000	.000	.002	.000
NONII	Pearson (r)	.379**	.987**	1	.996**	.954**	.412**	.534**
	Sig.(1-tailed)	.009	.000	.	.000	.000	.005	.000
NOI	Pearson (r)	.364*	.998**	.996**	1	.968**	.434**	.567**
	Sig.(1-tailed)	.011	.000	.000	.	.000	.003	.000
EBIT	Pearson (r)	.355*	.973**	.954**	.968**	1	.528**	.655**
	Sig.(1-tailed)	.013	.000	.000	.000	.	.000	.000
ROA	Pearson (r)	.338*	.441**	.412**	.434**	.528**	1	.888**
	Sig.(1-tailed)	.018	.002	.005	.003	.000	.	.000
ROE	Pearson (r)	.335*	.582**	.534**	.567**	.655**	.888**	1
	Sig.(1-tailed)	.019	.000	.000	.000	.000	.000	.

* Correlation is significant at the 0.05 level (1-tailed).

** Correlation is significant at the 0.01 level (1-tailed).

Source: Research data

Table 4.5: Summary of HHI Level for the Study Period (Truncated 2 Decimals Places)

Name of commercial banks	2005	2006	2007	2008	2009	Average
Africa Banking Corporation	0.45	0.43	0.46	0.46	0.43	0.45
Bank of Africa Kenya	0.47	0.48	0.49	0.49	0.49	0.48

Bank of Baroda (K) Ltd	0.21	0.22	0.29	0.21	0.22	0.23
Bank of India	0.41	0.31	0.28	0.30	0.29	0.32
Barclays Bank	0.48	0.48	0.47	0.48	0.46	0.47
Commercial Bank of Africa	0.49	0.47	0.47	0.48	0.48	0.48
Chase Bank (K) Ltd	0.37	0.43	0.47	0.42	0.46	0.43
Citibank N.A Kenya	0.49	0.48	0.48	0.49	0.49	0.49
City Finance Bank Ltd	0.31	0.49	0.43	0.47	0.49	0.44
Consolidated Bank	0.50	0.49	0.50	0.49	0.49	0.49
Co-operative Bank	0.49	0.50	0.48	0.48	0.47	0.48
Credit Bank Ltd	0.33	0.38	0.35	0.49	0.43	0.40
Development Bank	0.29	0.32	0.38	0.39	0.39	0.35
Diamond Trust Bank	0.44	0.44	0.38	0.31	0.40	0.40
Dubai Bank Kenya Ltd	0.43	0.48	0.49	0.45	0.49	0.47
Equatorial Commer bank	0.35	0.39	0.35	0.34	0.31	0.35
Equity Bank Ltd	0.49	0.49	0.49	0.50	0.48	0.49
Fidelity Commercial	0.48	0.49	0.47	0.50	0.49	0.49
Fina Bank Ltd	0.41	0.41	0.41	0.38	0.43	0.41
Giro Commercial	0.45	0.41	0.43	0.36	0.42	0.41
Guardian Bank Ltd	0.39	0.38	0.50	0.41	0.33	0.40
Habib Bank A.G Zurich	0.34	0.35	0.34	0.33	0.34	0.34
Habib Bank Ltd.	0.49	0.35	0.33	0.30	0.28	0.35
I and M Bank Ltd	0.40	0.40	0.39	0.41	0.39	0.40
Imperial Bank Ltd	0.46	0.43	0.45	0.42	0.41	0.43
Kenya Commercial Bank	0.49	0.49	0.48	0.49	0.48	0.49
K-Rep Bank Ltd	0.35	0.42	0.41	0.43	0.40	0.40
Middle East Bank	0.41	0.44	0.42	0.47	0.45	0.44
National Bank of Kenya	0.40	0.38	0.47	0.48	0.48	0.44
NIC Bank Ltd	0.36	0.39	0.42	0.46	0.46	0.42
Oriental Commercial Bank	0.24	0.48	0.20	0.46	0.50	0.37
Paramount Universal Bank	0.30	0.49	0.49	0.43	0.40	0.42
Prime Bank Ltd	0.46	0.45	0.43	0.41	0.43	0.42
Southern Credit Bank	0.46	0.44	0.45	0.47	0.41	0.45
Standard Chartered Bank	0.47	0.46	0.48	0.47	0.47	0.47
Trans-National Bank	0.44	0.48	0.47	0.45	0.42	0.45
Victoria Commercial Bank	0.43	0.42	0.42	0.37	0.34	0.40
First Community Bank	0.00	0.00	0.00	0.33	0.41	0.37
Gulf African Bank	0.00	0.00	0.00	0.48	0.35	0.42

Source: Research data and CBK (2005-2009)

Table 4.6: Regression of Diversification (HHI) Level and Net Operating Income (NOI)

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
.406	.165	.142	3843.70622

Predictors: (Constant), diversification (HHI) level

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Regression	107891238.410	1	107891238.410	7.303	.010
Residual	546640868.333	37	14774077.523		
Total	654532106.744	38			

Predictors: (Constant) HHI

Dependent Variable: NOI

Coefficients

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Constant	-10137.458	4659.452		-2.176	.036
HHI	29358.604	10864.069	.406	2.702	.010

Dependent Variable: NOI
Source: Research data

Table 4.7: Results of Regressed Degree of HHI and Earnings before Interest and Tax (EBIT) Correlation Coefficient

R	R Square	Adjusted R Square	Std. Error of the Estimate
.378	.143	.120	1459.01875

Predictors: (Constant), HHI

ANOVA

	Sum of Squares	d.f	Mean Square	F	Sig.
Regression	13118562.061	1	13118562.061	6.163	.018
Residual	78763221.706	37	2128735.722		
Total	91881783.768	38			

Predictors: (Constant), HHI

Dependent Variable: EBIT

Coefficients

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Constant	-3512.357	1768.665		-1.986	.054
HHI	10237.300	4123.853	.378	2.482	.018

Dependent Variable: EBIT

Source: Research data

Table 4.8: Results of Regressed Degree of HHI and Return on Assets (ROA)

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
.062	.004	-.023	2.49079

Predictors: (Constant), HHI

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Regression	.888	1	.888	.143	.707
Residual	229.549	37	6.204		
Total	230.437	38			

Predictors: (Constant), HHI.

Dependent Variable: ROA

Coefficients

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Constant	.686	3.019		.227	.822
HHI	2.664	7.040	.062	.378	.707

Dependent Variable: ROA

Source: Research data

Table 4.9: Results of Regressed Degree of Diversification and Return on Equity (ROE)

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
.075	.006	-.021	15.66437

Predictors: (Constant), HHI

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Regression	51.662	1	51.662	.211	.649

Residual	9078.777	37	245.372		
Total	9130.439	38			

Predictors: (Constant), HHI

Dependent Variable: ROE

Coefficients

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Constant	7.068	18.989		.372	.712
Div	20.315	44.275	.075	.459	.649

Dependent Variable: Return on Equity (ROE)

Source: Research data