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INCOME DIVERSIFICATION AND ITS EFFECT ON FINANCIAL PERFORMANCE OF LISTED BANKS IN KENYA

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DECLARATION

I declare that this work has not been previously submitted and approved for the award of a degree by this or any other University. To the best of my knowledge and belief, the Research Project contains no material previously published or written by another person except where due reference is made in the Research Project itself.

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This Research Project has been submitted for examination with my approval as the Supervisor.

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ABSTRACT

This study aims to investigate the effect of income diversification on bank performance during the period 2012-2018. Financial performance was evaluated based on bank profitability and solvency. A descriptive research design was used. Secondary data was collected from the Central Bank Website, the NSE and the respective websites of the banks. The fixed effect and random effects models for panel data were used to study the relationship. The Herfindahl-Hirshman Index was used as a measure for income diversification. Profitability was measured by ROA and ROE. Solvency was measured by capital adequacy and asset quality. The statistical significance of each independent variable was tested by performing a t-test at 5% level of significance. The explanatory variable explanatory power was evaluated using the coefficient of determination, R^2. Based on the fixed effect models, income diversification has a negative impact on profitability measured by both ROA and ROE. The effect is significant for ROA but is insignificant on ROE. As for solvency, random effect models reveal that income diversification has a positive effect on bank solvency as measures by capital adequacy and asset quality. The effect is significant for capital adequacy but is insignificant for asset quality. The study concluded that income diversification has a negative effect on probability and a positive effect on solvency. It is therefore recommended for banks to commit their resources to expand their non-interest income revenue streams if they want to improve their solvency levels. However, it should be done with caution as it may be at the expense of profitability.

ABBREVIATIONS

ROA - Return on Assets

ROE - Return on Equity

MPT - Modern Portfolio Theory

RBT - Return Based Theory

FEM - Fixed Effect Methodology

GMM - Generalised Method of Moments

HHI - Herfindahl Hirschman index

CHAPTER ONE

INTRODUCTION

1.1 Background to the study

The banking sector plays a very important role within a financial system. Banking Institutions act as intermediaries between suppliers and receivers of funds and supplement capital flows from surplus to deficit economic units. The main source of income that banks have mostly relied on has been interest income, which is compensation for the lending services. However, over the years, different economies and regimes have experienced a shift from concentration on traditional lending activities to non-lending ones that generate different forms of income. These include fees, service charges, trading revenues among others. (Stiroh, 2004) highlighted that the US Banking industry as early as 2001 had non-interest income accounting for 43% of banking revenue. (Chiorazzo , Carlo , & Francesca , 2008) also mention that since the 1990s, the Italian banking industry had experienced a shift to non-interest income for the banking sector. In their study of the German banking industry (Ramona & Kick, 2009) highlight that the ratio of non-interest income to interest income had increased from 12%-26% during the period 1975-2007. Europe, in 1998, recorded 41% as the share of non-interest income in their revenues.

In addition, recent global financial sector liberalization the past two decades has led banks to shift their traditional interest-based activities to non-interest activities. The Second Banking Directive of 1989 allowed European commercial banks to pursue functional diversification across activities such as commercial banking, investment banking, insurance and other financial services. Another movement of financial deregulation occurred in the U.S. with a series of measures after 1980 that culminated in the Gramm-Leach-Bliley Act (GLBA) of 1999, also known as the Financial Services Modernization Act (Berger, Iftekhar, & Mingming, 2010). This legislation removed barriers that prevented U.S. banks from consolidating commercial, insurance, and investment banking activities. These moves have consequentially encouraged the increased income diversification across the world.

Diversification in banking takes different forms. The basic dimensions are the diversification of income sources and broadening within loan portfolio. The loan portfolio is diversified by lending to different industries or sectors. More specifically, revenue diversification takes the form of interest and non -interest income. Any form of diversification of revenue sources should reduce total risk, stabilize operating income (Busch & Kick, 2009).

Revenue diversification is a strategy that has spread the world over (Gurbuz, 2013); (Senyo, Olivia, & Musah, 2015). As the banks continue to exist in an environment of economic liberalization and rapid policy changes, they continue to face stiff competition and uncertainty in terms of their ability to maintain profitability and stability. This study aims at assessing whether this income diversification is beneficial to bank performance.

1.1.1 Income diversification

(Ebrahim & Iftekar, 2008) defined income diversification as the growth into new income earning financial products and services other than the traditional banking services. This involves the shift of reliance from the interest income sources associated with traditional banking activities to innovative non-interest income earning activities. Banks would increase the share of fees, net trading profits and other non-interest income within net operating income.

In finance theory, diversification of income sources in a bank should lead to a lower risk level and a higher financial performance. Since service fees, net trading profits and other non-interest income are uncorrelated or imperfectly correlated with net interest income, diversification of income sources should make net operating income of a bank more stable (Markowitz, 1952) .

Diversification is also observed to reduce the shocks to net-interest margins arising from adverse changes in lending rates (Lin, Chung, Hsiehming, & Wu, 2012). (Chiorazzo , Carlo , & Francesca , 2008), also identified that the economies of scale and scope brought about by branching into different revenue activities improved bank efficiency. (Lepetit, Emmanuelle, Philippe, & Amine, 2008), found that diversification of banks lowered the rates of lending, concluding that income diversification influences the interest rate margins and loan pricing.

However, activity diversification could lead to increased costs due to agency problems, increased cost of complexity, and the potential for riskier behaviour by bank managers operating with increased leverage.

Income diversification has been largely measured by the HHI index, which verifies and estimates the level of diversity and concentration of the different sources of income. A high HHI means that a firm is highly concentrated and focuses on one income stream to generate revenue. A low HHI index, however, shows that a firm is diversified and focuses on more than one income stream. The entropy index has also been used to measure revenue diversification (Huichen & Liyang, 2014).

1.1.2 Financial Performance

Financial performance is the capability to operate profitably, efficiently and effectively, while being able to withstand environmental threats and exploiting the existing opportunities and ability to grow (Poole & Stoner, 2003). It can also be defined as the degree to which a business can utilize its assets to realize increased revenues and turnovers.

Financial performance is measured periodically and is essential in evaluating the overall financial health of the firm while at the same time enabling comparison between different firms either in the same industry or in a different one. Financial performance measures are grouped into five classes; liquidity measures; profitability measures; solvency measures; efficiency measures and leverage measures. Liquidity measures incorporate the current portion of working capital and evaluate the ability of the firm to meet all its short-term obligations. Profitability measures evaluate the firm's ability to make revenue over and above its expenses. Solvency measures investigate the long-term debt against the assets and equity to determine a firm's financial stability. Efficiency measures evaluate how well the firm is using its resources. Finally, leverage measures compare the costs and benefits from the two sources of funding; equity and debt. They measure the increasing power a firm can get from borrowing.

(Poole & Stoner, 2003) argue that there exist different techniques of measuring financial performance, and because of this, no single financial performance measure should be considered solely.

Given this argument, this study will consider profitability and solvency as measures of financial performance. Profitability will be measured in terms of Return on Equity (ROE) and Return on Assets (ROA). ROE measures return to shareholders' equity while ROA measures how well the firm is using its assets to generate revenue.

Banks are required to maintain certain ratios to ensure they have a healthy level of solvency. In this study, solvency will be looked at by two ratios; capital adequacy and asset quality. Capital adequacy is the ratio of total equity to total risk adjusted assets. Asset quality is studied as the ratio of non-performing loans to total loans.

1.1.3 Income Diversification and Financial performance

The relationship between diversification and financial performance is not simple and straightforward. Modern portfolio theory suggests that diversification by use of uncorrelated assets should achieve profit maximization and minimization of risk (Markowitz, 1952).

The agency theory suggests that there is a relationship between diversification and performance that depends on the principal-agent relationship (Jensen & Meckling, 1976).

The resource-based theory suggests that the firm's competitive advantage hence performance depends on the resources it has. If it has resources that support efficient diversification, then it will experience improved performance.

Empirical studies on one hand show that diversification into non-interest income could improve bank performance by the way of improving profitability and enhancing banking solvency. For example, studies such as (Stiroh, 2004b), (Meslier, Ruth, & Amine, 2014) (Berger, Iftekhar, & Mingming, 2010), and (Maudos, 2017) report a negative impact of diversification on bank profitability. On the other hand, authors such (Elsas, Andreas, & Holzhäuser)and (Sanya & Wolfe, 2011) find a positive association between non-interest income and profitability.

1.1.4 The Kenyan Banking Industry

The Kenyan Banking industry could be described as fairly stable and developed with 43 banking institutions (42 commercial banks and 1 mortgage finance company), 9 representative offices of foreign banks, 13 Microfinance Banks (MFBs), 3 Credit Reference Bureaus (CRBs), 19 Money Remittance Providers (MRPs), 8 non-operating bank holding companies and 73 foreign exchange (forex) bureaus (Central Bank of Kenya, 2017). The industry has grown tremendously throughout the years with remarkable increments in terms of assets, deposit base, profitability, networks and product offerings. Over the past 10years, assets have grown from Kshs.1.183trillion in 2008 to Kshs.3.695trillion in 2018 while deposits grew from Kshs.864 billion to Kshs.2.9trillion during the same period. Net profits have also grown to Kshs.133.2 billion form Kshs.43.3 million the past 10 years. The industry has also maintained stability when it comes to risk.

According to the Central bank supervisory report,2017 the banking industry-maintained liquidity and capital adequacy ratios at 18.8% and 43.7% respectively which are above the industry minimums of 14.5 as the capital adequacy minimum and 20% as the liquidity minimum. The sector is fairly diversified with the banks having a country wide branch network and presence in the East African region (Odongo & Dinah, 2014).

With regard to interest income versus non-interest income, (Central Bank of Kenya, 2017) recorded that the share of non-interest income stood at 36.65% an improvement from 31.97% as a sum of the share of Fees and Commission for Loans and Advances, Other Fees and Commission Income Interest on Government Securities Interest on Placement. This was against 54.43% share of net interest income.

Figure one records that the industry had continuously relied heavily on interest income but the increase in share of non-interest income observed in 2017 shows that non-interest income could be grown.

In 2016, the government in the effort to regulate the banking industry implemented an interest rate cap on lending rates.

2017 was the first-year post interest cap and although the banking sector was able to remain stable, the level of interest income reduced to Kshs.264 billion from Kshs.298billion and its share reduced from 59.40% to 54.43% in just one year. This source of income is volatile and heavily dependent on interest rates that are exogenous to them. Consequentially, banks may need to explore other sources of income that are less correlated to normal business operations.

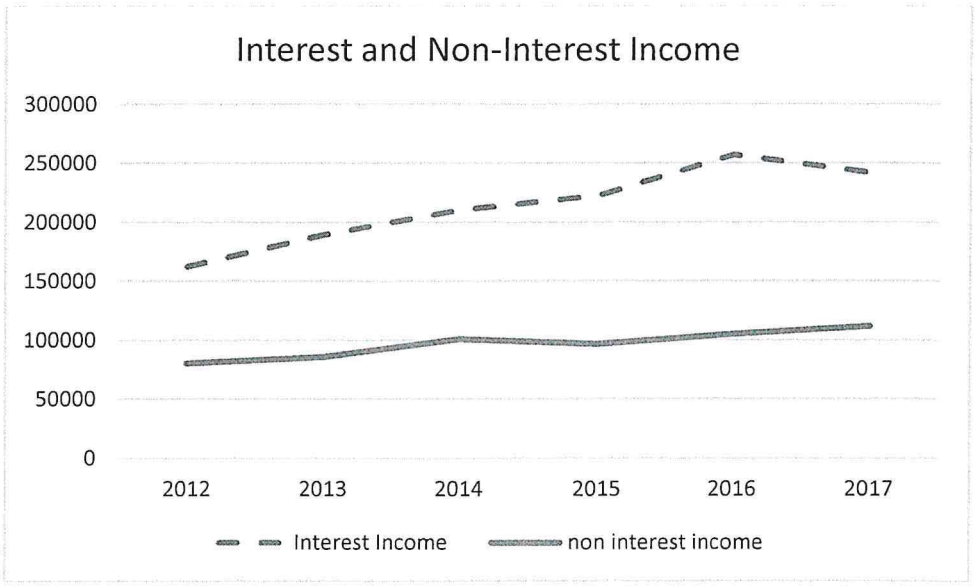

Figure 1 *Interest and Non-Interest Income.*

1.2 Problem Statement

In general, there is the expectation that an increased share of noninterest income in a bank will decrease the volatility of its profits, since income from services and fees does not usually depend as much on the business environment as interest income does. Theory is in support of bank diversification where modern portfolio theory suggests that diversification by use of uncorrelated assets should achieve profit maximization and minimization of risk (Markowitz, 1952). On the other hand, if the diversified activity is inherently riskier than the traditional banking business, the costs of diversification may outweigh the benefits, then banks may become riskier and their overall performance may deteriorate (Boyd & Runkle, 1993)

Commercial banks across the world have turned to non-interest diversification to compensate for the diminishing incomes received from the traditional interest-based banking revenue streams. (Busch & Kick, 2009) notes that banks have resorted to non-traditional banking business to maintain or improve their profitability. As a result, the study of income diversification in the banking industry has received more attention over the years. These studies, however, give no consensus on the effect of revenue diversification on bank performance.

Studies conducted in the developing economies differ greatly. (Stiroh, 2004); (De Young & Rice, 2004); (Stiroh and Rumble, 2006), indicate a worse risk-return trade-off for U.S.A commercial banks venturing into income source diversification. (Berger, Iftekhar, & Mingming, 2010); (Li & Yu, 2013) indicate that income diversification affects bank performance negatively for Chinese banks. (Lee, Hsieh, & Yang, 2014) studied 22 Asian countries and concluded that non-interest activities do not affect profitability. (Chiorazzo , Carlo , & Francesca , 2008), (Baele, De Jonghe, & Vennet, 2007), and (Staikouras & Wood, 2003) show that income source diversification increases risk-return trade-off for European banks. (Lepetit, Emmanuelle, Philippe, & Amine, 2008) find the shift to non-interest income for European Banks form 22 countries involves higher risk. These findings differ because of different factors: different populations of interest; different measurement of the variables in question; different time periods; and different methodologies used.

An analysis of the following studies shows that the benefits of revenue diversification in the Kenyan context highlight that there is no consensus.

(Kiweu, 2012) in his study concluded that diversification has little to no profitability benefits and that these benefits are not able to offset the increased risk associated with non- interest income.

(Teimet, Ochieng, & Aywa, 2011) in their study concluded that interest income and non-interest income were positively related, and the shift had a positive effect on bank performance. (Muthoni, 2012) in her study of 15 commercial banks between 2007-2011 had concluded that income diversification had positive effect on performance. (Mulwa & Kosgei, 2016) in their study of income, asset and geographical diversification concluded that asset and income diversification have a negative effect on performance as opposed to geographical diversification that improves performance.

The lack of consensus among the various scholars was reason enough to conduct more analysis on the area of study. This study also seeks to contribute to the scarce empirical evidence available for developing economies unlike the developed economies. Moreover, most of the local studies focus on profitability as a measure of bank performance. This study on the other hand also studies financial stability as a measure of performance. The data also allows for differentiating the several components of non-interest income which will give insight on which non-interest revenue stream has the most diversification benefits.

1.3 Research Objectives

1.3.1 General Objective

The general objective of this study is to establish the effect of income diversification on financial performance in Listed Banks in Kenya.

1.3.2 Specific Objectives.

- To determine the effect of income diversification on the profitability of Kenyan listed banks.
- To determine the effect of income diversification on the solvency of Kenyan listed banks.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This section tackles both the theoretical and empirical literature that underpins this study. Three theories are mentioned under the theoretical framework; Modern Portfolio Theory, The Resource Based Theory and the Agency Theory.

2.2Theoretical Literature

2.2.1 Modern Portfolio Theory.

This is an improvement on the traditional investment models started by (Markowitz, 1952). The theory focuses on how investors being able to maximize return at a certain level of risk. Using a unique set of assets within the portfolio in different proportion, investors can minimize portfolio risk at the level of their expected return. Traditional investment theories focus on analysing the risk/return relationship of every individual asset within the portfolio. However, MPT is interested in assessing how the price of each individual asset changes relative to how every other asset in the portfolio changes in price (Elton, Gruber, & Blake, 1997). Portfolio theory moves from the characteristic analysis of single investments in a portfolio to establishing statistical correlation between the individual investments which make up the portfolio.

Modern portfolio theory is important in this study because by the diversification of their revenues, banks are able to optimize the expected return of their portfolio for a certain level of risk or minimize risk at a certain level of expected return by carefully selecting the dimensions of interest and non-interest income. Non-interest income is expected to be negatively correlated to interest income because they are generated from activities that are non-core as opposed to interest income. Therefore, portfolio risk is intended to reduce by holding income combinations that are not positively correlated.

2.2.2 Resource Based Theory

RBT is a strategic management theory put forward by (Wernerfelt, 1984) whose main idea is that the competitive advantage possessed by a firm is based on the resources it already owns and controls. It adopts two assumptions in analysing sources of firm competitive advantage.

The first assumption is that the organizations within an industry or sector are heterogeneous given the bundle of resources they own. The second assumption is that this heterogeneity may persist because these resources are not perfectly mobile across firms. This is a necessary condition for a resource package to produce advantage because it is argued that "if all firms in a market have the same stock of resources, no strategy is available to one firm that would also not be available to all other firms (Peteraf & Barney, 2003).

Firms in an industry perform differently because of the differentials in the levels of efficiencies derived from the resources that these firms hold individually. These unique levels of efficiencies are what enable firms to convey more prominent advantages to their clients for a given cost. This, however, does not mean that the competitive advantages persist. According to (Barney, 1991), a firm's resource must, in addition, be valuable, rare, and imperfectly imitable and substitutable in order to be source of a sustained competitive advantage.

The RBT is relevant to this study because, the decision to diversify or not and the extent of the diversification is a matter of strategy of a commercial bank. Banks are looking to diversify away their unique risk, while hedging against the risks that face the banking industry in general. The resources that banks possess will dictate what diversification measures are taken and how successful diversification will be. If the resources are unique and not imitable by other banks, then the bank will have sustainable competitive advantage that they can use to successfully expand into other markets from a position of strength.

2.2.3 Agency Theory

(Jensen & Meckling, 1976), portrayed the firm as a black box, which operates to maximise its value and profitability. The maximization of the wealth can be achieved through proper coordination and teamwork among the parties involved in the firm.

The parties involved are; the shareholders who are the principals and the managers who are the agents. The shareholders and managers do not always agree and may have some conflict of interest regarding how the firm is being run. In that case, some agency problems arise.

As indicated by (Chowdhury, 2004), there are a couple of factors that aggravate the agency relationship. These include; separation of the ownership from control, differences in risk attitudes between the principal and agents, short period involvement of the agents in the organization, and the prevalence of information asymmetry within the firm. The separation of ownership from control in large organizations leads to loss of proper monitoring of agents by owners.

This means that agents can use firm property for personal benefit. If the owners and agents are not able to reconcile their risk appetites, this may affect how the firm takes up investment activities. The managers usually work for the company only for a limited amount of time. Shareholders, however, are inseparable parts of the organization.

This means that the managers work for their good during the time they are there and then flow to different firm. The managers take care of the organization and are always informed of all that is going on internally. Moreover, since they are responsible for informing the owners, they may manipulate the information for their own selfish gain.

With regard to diversification, chief executive officers with more wealth tied up in firm equities engaged in business activities aimed at more diversification. This is because, their interest in the firm pushes them to explore different options that would increase company returns. However, this assertion was disputed by (Lemmon & Lins, 2003) who found evidence of less diversification in firms with higher managerial equity ownership. (Stulz, 1990) also concluded that managers derive benefit from managing a highly diversified firm especially because they experience more prestige and improved career prospects.

This model is important for this study because revenue diversification decisions are dependent on the agency relationship. Bank managers may decide to diversify bank income because it satisfies their own personal needs and may not be what the shareholders want.

On the other hand, managers may fail to effectively manage revenue diversification because it only maximizes the shareholders' wealth and has no benefit to them. As a result, how income diversification in banks affects financial performance will depend on the manifestation of the agency relationship.

2.3 Factors affecting Bank Performance.

This section will discuss other factors other than income diversification that influence bank profitability and stability.

2.3.1 Size of the Bank

Researchers have related a bank's performance to its size, which is often measured in terms of assets. These results have been conflicting where while other studies show that increased size is positively related to performance, others conclude that size, either has no significant effect on bank performance or it affects performance negatively. (Goddard, Molyneux, & and Wilson, 2004) found that there is a significant and positive relationship between the bank's size and its financial performance. They attributed this to the fact that it is cheaper for larger banks to raise capital and therefore these banks record higher profitability ratios.

(Bikker & Hu, 2002) in their study also concur that better performance of larger banks is due to the lower costs they incur while raising capital.

(Mohamed & Naceur, 2010) who studied the impact of macroeconomic environment, financial structure and bank specific characteristics on the profitability of Tunisian banks from 1980-2000 concluded that size has a negative effect on firm performance. These results are consistent with those of (Košak & Čok, 2008) who estimated that size affected performance negatively due to the diseconomies of scale experienced during periods of rapid growth.

(Heffernan & Fu, 2008)used system GMM to study the profitability of different Chinese banks from 1999-2006 and found that bank size had no statistically significant influence on bank performance. Their findings are in conformity with the outcomes of (Goddard, Molyneux, & and Wilson, 2004) and (Athanasoglou, Brissimis, & Delis, 2008).

2.3.2 Capital Adequacy

Capital adequacy is a ratio of total equity (total shareholders fund) to total bank assets or a ratio of capital reserves to total bank assets. It is expected that banks that have a high capital adequacy ratio will remain stable during times of financial crisis. (Onuonga, 2014), in her study of the performance of the leading six commercial banks in Kenya found out that capital adequacy had a positive impact of bank performance. The study states that well capitalized banks can access more funds at a cheaper cost hence able to lend at low interest rates. This also reduces their need for external funding therefore leading to increased profits.

(Staikouras & Wood, 2003), also claim that, "there exists a positive link between a greater equity and financial performance among EU commercial banks". This is also the case in the Bangladesh banking industry where (Fadzlan & Muzafar, 2009) concluded that higher levels of capital led to improved financial performance.

2.3.3 Asset Quality

This is the ratio of non-performing loans to total loans and reflects the health of the loan portfolio. Koch (1995) argues that an alternative measure of credit risk or asset quality is the ratio of loan loss reserve to gross loans. According to (Achou & Tenguh, 2008) non-performing loans (NPL) have an inverse relationship with profitability. Hence, they suggested that it is of crucial importance that banks practice prudent credit risk management in the so as to protect investors' interests. (Kosmidou K. , 2008) applied a linear regression model on Greece 23 commercial banks data for 1990 to 2002, using ROA and the ratio of loan loss reserve to gross loans to represent profitability and asset quality respectively. They concluded that there exists a negative significant effect of asset quality on firm performance. This is expected because increased credit risk will lead to reduced financial performance.

2.3.4. Liquidity

The ratio of total loans and total assets is used to represent liquidity in banks as shown by studies conducted by (Sufian & Habibullah, 2009). Liquidity risk occurs when banks are not able to finance increases in loan demand or accommodate a decrease in their deposit levels. It is expected that high liquidity levels lead to improved financial performance.

Since loans hold the greater expected return compared to other asset classes, an increase in the loan to total asset ratio would lead to an improvement in bank performance.

2.3.5 GDP

GDP measures the overall health of the economy and consequentially influences the performance of the different firms operational in the said economy, especially commercial banks. The intuition is that with economic growth, business environment is improved and barriers to entry are lowered which then leads to high competition which causes profitability to reduce (Tan & Floros, 2012). On the other hand, increasing GDP suggests an improvement in the general income in an economy and thus profit enhancing (Kosmidou, 2008). Increased money in circulation means that there are increased transactions through the banks which increases their profitability. Researchers who also established a positive impact of GDP growth on bank performance include (Pervan, Višić, & Barnjak, 2015) and (Sufian & Habibullah, 2009).

2.3.6 Inflation

Inflation can either be anticipated or unexpected. If it's anticipated, bank management will have a chance to adjust interest rates appropriately which enhances profitability (Perry, 1992). The above positive link is supported by (Guru, 2002), who studied profitability determinants in the Malaysian banking sector from 1986-1995. On the other hand, unexpected inflation causes cash flow problems to borrowers leading to abrupt abrogation of loan arrangements negatively affecting bank profitability. (Pervan, Pelivan, & and Arnerić, 2015) in their study of profit persistence and factors determining bank profitability in Croatia found out that inflation had a negative influence on bank performance.

2.3 Empirical Literature

While a plethora of studies have focused on the diversification of the loan portfolio, diversification in income sources, specifically interest income and non-interest income has received attention in academic research.

It is believed that revenue coming from different business lines should be able to reduce the bankruptcy or the overall risk by stabilizing operating income especially when the income streams are imperfectly (Berger, Iftekhar, & Mingming, 2010). However, the existing empirical literature on diversification shows mixed evidence about the impact of revenue diversification on bank performance.

(Saunders & Walters, 1994) review examines the effect of non-bank activities on risk reduction. They document no agreement among the reviewed research on the effect of bank holding diversification on the reduction of risk. (Rabia & Waheed, 2019) also highlight that there is no consensus among researchers on the impact of revenue diversification in banking.

Several studies give evidence of revenue diversification benefits on profitability. (Elsas, Andreas, & Holzhäuser), using panel data from nine countries (Australia, Canada, France, Germany, Italy, UK, US, Spain and Switzerland) over the years 1996-2008 test how revenue diversification affects bank value. Based on a comprehensive framework for measuring bank performance, they find that diversification increases bank profitability and in turn market valuations.

(Ramona & Kick, 2009), analysed the determinants of non-interest income and its impact on financial performance and the risk profile of German banks between 1995 and 2007. They found empirical evidence that for all German universal banks risk-adjusted returns on equity and total assets are positively affected by higher fee income activities.

(Sanya & Wolfe, 2011) Using a panel dataset of 322 listed banks across 22 emerging economies found that revenue diversification and profitability are positively related. (Saunders, Schmid, & Ingo, 2014) established that bank revenue diversification causes higher profits and less insolvency risk for US banks. Drawing on a data set covering nearly a million, quarterly observations on more than 12,000 US banks find no evidence that the shift in the bank business model towards non-interest income harms bank profitability. On the contrary, they conclude that non-traditional banking activities are associated with higher profitability.

On the other hand, a parallel set of literature discusses the negative trade-off between diversification and profitability.

(De Young & Roland, 2001) provide three reasons why non-interest income may increase volatility. First, revenues from fee-based activities might be more volatile than interest income because the customer-bank relationship is stronger in the traditional lending business, that is for many of the new fee-based activities switching to another bank for the customers is easy. Second, expanding into fee-based services can considerably increase fixed costs (e.g. by investments in technology and human resources) whereas, if a lending relationship is already established, the only cost of an additional loan are the bank's interest expenses. Third, in contrast to the lending business, fee-based activities require less regulatory capital, which suggests a higher degree of financial leverage and therefore leads to higher earnings volatility.

(Stiroh, 2004) studies the potential diversification benefits of the increased shift to non-traditional business activities for the US Banking industry between the periods 1984-2001. The study looks at the overall volatility of the noninterest income, its correlation to net interest income and its effect on profits. The study finds that noninterest income is relatively more volatile compared to net interest income during the study period. This therefore means that it has negative effects on profitability.

Non-interest income is also observed to have a negative effect on profitability. Similarly, (Mercieca, Schaeck, & Simon, 2007) investigated small European credit institutions over the period 1997–2003 and found no direct diversification benefits but rather an inverse association between non-interest income and bank performance.

The study confirmed that small European banks entered lines of business that they had insufficient expertise or experience in. (Berger, Iftekhar, & Mingming, 2010), examined an unbalanced panel of 88 Chinese banks over the period 1996–2006 and found that diversification resulted in reduced profits and higher costs. (Li & Zhang, 2013) used Chinese banks data over the period 1986–2008 and concluded that a rise in non-interest income has diversification benefits. However, as non-interest income has higher instability and cyclicality than net interest income, relying more on non-interest income may aggravate the risk/return trade-off. (Lee, Hsieh, & Yang, 2014), with reference to the banks of 22 Asian countries, concluded that non-interest activities do not increase profitability.

(Köhler, 2013) studied the effect of income diversification on the riskiness of the German banking system between 2002 and 2010. Using linear and quantile regression estimators, the study revealed that the impact of non-interest income on risk significantly differs depending on the bank's business model. Risk as measured by the Z-Score and risk adjusted capital adequacy was observed to be affected positively by an increase in the share of non-interest income. It was especially significant in the savings and cooperative banks compared to the retail and investment banks.

It is important to mention the studies conducted on the Kenyan context with regards to income diversification. (Kiweu, 2012) used a sample consisting of 35 commercial banks in Kenya from 2000 – 2012 to investigate how income diversification and focus impact on the bank's performance (as measured by ROA and ROE). The study used OLS regression and concluded that income diversification from traditional banking has a few benefits, if any, to be expected. The importance of the growth of non-intermediation income did not appear to entirely neutralize the raise in risk that originates from non-intermediation activities. The findings showed that non-interest and interest income were positively correlated, and thus suggesting that non-interest earning may be an inappropriate substitute to steady the total income.

(Hassan, 2017), studied the impact of income diversification on listed banks financial performance in Kenya. The study was conducted with bank data covering 2012-2016 and an OLS model was used to explain the relationship. HHI index was used as the measure for diversification and return on assets (ROA) was a proxy for profitability. The results indicated that income diversification has a negative implication on bank profitability and is a costly affair.

(Muthoni, 2012), investigated the effects of income source diversification on financial performance of commercial banks in Kenya. The study utilized a sample of 15 commercial banks in Kenya and data between 2007 and 2011. The OLS regression revealed a positive relationship between bank performance and income diversification. The study also suggested that intermediation income, non-intermediation income, fees on loans and advances and commission, foreign exchange trading earnings, other fees and commissions, and other earnings have a positive effect on bank's financial performance.

2.5 Summary of the Literature Review

From the above literature, the effect of income diversification on bank performance lacks consensus.

A closer and more detailed analysis of the various studies would reveal that the different methodologies, data sets, variables of choice for independent and dependent variables, countries of choice are varied and therefore, different conclusions would be expected.

While most previous work on bank diversification have been dedicated to U.S. and European banking industries, few studies have been done to analyse the relationship between the changing structure of bank income and bank performance in emerging economies and developing countries like Kenya. The studies conducted came up with different conclusions meaning that there is still room for more research for comparison purposes.

The studies conducted for the Kenyan banking industry have mainly applied the use of OLS Regression to conduct the study on the bank panel data therefore providing a methodology gap. OLS multiple regression, however, is not efficient given panel data. This study will explore better analysis methods for more robust results.

How income diversification affects bank risk, specifically its solvency is also a research gap that this study hopes to fill.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter explains the population of the study, gives a description of the variables and the empirical models applied to evaluate the effect of the income diversification on financial performance.

3.2 Research Design

Research design is defined as the linkage and organization of situations for gathering and exploration of gathered data in a manner that intents at achieving the study goals. This study made use of a descriptive research design. It was used justified by its ability to enable researcher to establish the phenomenon under study without any manipulation. As argued by Polit and Beck (2003), descriptive research design allows for determination of current situation of a phenomenon without manipulation.

3.3 Theoretical Framework

The study discussed the impact of income diversification on financial performance in listed banks in Kenya. Factors that influence bank performance which include bank size, capital adequacy, asset quality, asset growth, liquidity, and GDP were controlled for. Three sets of theories were employed in this study. These theories are modern portfolio theory; agency theory and resource-based theory. Modern portfolio theory forecasts that increased diversification of bank revenues will have a positive impact on bank profitability and stability. The agency theory predicts that the success of income diversification will depend on the relationship between the owners and the managers. Alternatively, the resource-based theory suggests that banks that have acquired and developed resources are able to successfully diversify their activities and income streams.

Establishing the link that exists between commercial bank revenue diversification and profitability will enable policy makers to formulate policies that will enhance profitability and stability of commercial banks.

3.4 Data Collection

Balance sheet and net income information was obtained from the banks' published financial statements and the Central Bank of Kenya website. The data set provides a detailed breakdown of annual data from the 10 listed banks that make up our sample. The study was limited to a time scope of seven years from 2012 to 2018 which was considered adequate to determine the effect of income diversification on financial performance and was a period of quick growth in non-interest income in banks along with significant regulatory changes, the interest rate cap in 2016, that affected the income of Kenyan banks. The macroeconomic data on inflation and GDP was also collected from the Central Bank website.

3.5 Population and Sample

The study population consists of the 12 banks listed in the Nairobi Securities Exchange as at June 2019. The study sample was selected based on two main criteria; banks must have all the data for all the years in question and that the net interest income and non-interest income must be non-negative.

The first criterion is set to confine the panel regressions on banks with enough observations. It was also done to ensure we avoid the econometric problems that arise from incomplete panels with non-randomly missing data as argued by Baltagi (2005). Meanwhile, the second criterion ensures that the diversification measures, particularly the HHI index and income shares are bounded from 0 to 1. This leads us to a final sample of 10 banks.

3.4 Definition of variables

3.4.1 Diversification measures

For the measurement of income diversification in banks, it is assumed that total operating income is made up of two main sources; Net interest Income and Non-Interest income represented by the variables II and NNI respectively.

$$II = Interest\ Income - Interest\ Expenses \quad (1)$$

$$NNI = Trading\ Income + Fee\ Based\ Income + Other\ Non - Interest\ Income \quad (2)$$

$$\text{Total Operating Income}(TI) = Interest\ Income\ (II) + Non\ Interest\ IncomeNNI \quad (3)$$

We use gross values for non-interest income because no expenses are directly attributable to these activities are specified in the income statements. This definition of total operating income is consistent with the studies of Stiroh (2004b), Stiroh and Rumble (2006) and Chiorazzo , Carlo , & Francesca (2008)

To show the share of interest income and non-interest income to total income as well as the various components of non-interest income to total operating income, the following measures were used;

$$\text{SNII} = \frac{NNI}{TI} \quad (4)$$

$$\text{SII} = \frac{II}{TI} \quad (5)$$

Where:

SNNI is the percentage share of non-interest income in total operating income

SII is the percentage share of interest income in total operating income.

Disaggregating non-interest income into its components, we arrive at

$$FEE = \frac{Fee\ based\ Income}{(NI+NII)} \quad (6)$$

$$TRAD = \frac{Trading\ Income}{(NI+NII)} \quad (7)$$

$$OTHER = \frac{Other\ Non-Interest\ Income}{(NI+NNI)} \quad (8)$$

Where:

FEE is the share of fee-based income in operating income

TRAD is the share of trading income in operating income

OTHER is the share of other non-interest income in operating income

The Herfindahl Hirschman index is a measure that has been widely used to measure income diversification. As in Chiorazzo, Carlo and Francesca (2008), Stiroh and Rumble (2006), Sanya and Wolfe (2011), the index shows how focused or specialized the banks income generating activities are. The sum of squared revenue is subtracted from 1 so that the measure increases with the level of diversification. As DIV increases, the bank is more concentrated, and they are focused on one income source. The smaller DIV is, the more diversified a bank is. **DIV**, is computed as

$$DIV = 1 - (SNII^2 + SNI^2) \quad (9)$$

DIV shows the dis aggregation of total operating income into interest income and non-interest income.

Non-interest income is heterogenous and diagnosing each component reveals different levels of diversification. A new measure of diversification considering the components is **DIV1** computed as

$$DIV1 = 1 - (SNI^2 + FEE^2 + TRAD^2 + OTHER^2) \quad (10)$$

DIV1 is a measure of diversification based on the breakdown of non-interest income into its three components; fee income, trading income and other non-interest income. This is consistent with Crouzille (2014), Chiorazzo, Carlo and Francesca (2008).

The restriction that confines interest income and non-interest income as positive numbers means that both **DIV** and **DIV1** range between 0 and 1.

3.4.2 Profitability and Solvency measures

3.4.2.1 Profitability

As profitability measures, Return on Equity (ROE) and Return on Asset (ROA) are computed as

$$ROA_{it} = \frac{Net\ income\ After\ Tax}{Average\ Assets} \quad (11)$$

$$ROE_{it} = \frac{Net\ income\ After\ Tax}{Shareholders' Equity} \quad (12)$$

3.4.2.2 Solvency

Capital adequacy and asset quality are the ratios used to represent bank solvency. Their notations are EQUITY and LOAN respectively. As earlier discussed, capital adequacy represents the banks financial leverage and asset quality represents the health of the loan book.

$$EQUITY_{i,t} = \frac{TOTAL\ EQUITY_{i,t}}{TOTAL\ ASSETS\ i,t} \quad (12)$$

$$LOAN_{i,t} = \frac{NON-PERFORMING\ LOANS_{i,t}}{TOTAL\ LOANS_{i,t}} \quad (13)$$

Where **EQUITY** $_{i,t}$ and **LOAN** $_{i,t}$ indicate capital adequacy and asset quality respectively.

3.5 Model Specifications and Testing Procedures

3.5.1 Testing Procedures

Given panel data, it is important to establish whether there is correlation between unobserved heterogeneity and the independent variables. The use of Ordinary Least Square methods given dynamic panel data may give inappropriate results due to the potential bias caused by omitted heterogeneity and the problem of endogeneity Stiroh and Rumble, (2006).

The Fixed effect model and the random effect model have been advocated for use when dealing with panel data. When using fixed effects, we assume that something within the individual may impact or bias the predictor or outcome variables and we need to control for this. FE removes the effect of those time-invariant characteristics and therefore ensures that the error term and predictor variables remain uncorrelated. It is important to mention that these individual characteristics need to be unique to each entity and uncorrelated with each other.

The rationale behind random effects model is that, unlike the fixed effects model, the variation across entities is assumed to be random and uncorrelated with the predictor or independent variables included in the model. If these unobserved individual effects are correlated to the independent variables, the random effects model is used.

To determine the nature of the relationship between unobserved heterogeneity and the independent variables, the Hausman test is conducted. If the correlation between the unobserved heterogeneity is zero then the fixed effect methodology is applicable otherwise, the random effect methodology suffices. The null

$$E[unobserved\ heterogeneity/Independent\ variables] = 0$$

is tested to establish this correlation. If rejected, fixed effect is used as opposed to random effects.

3.5.2 Model Specifications

3.5.2.1 Profitability

This model aims to establish the effect of income diversification on profitability

$$Y_{i,t} = k + \beta_1 DIV_{i,t} + \delta_1 LASSETS_{i,t} + \delta_2 LOAN_{i,t} + \delta_3 EQUITY_{i,t} + \delta_4 LIQUIDITY_{i,t} + \delta_5 LDLR_{i,t} + \delta_6 GDPGROWTH_{i,t} + \delta_7 INFLATION_{i,t} + \varepsilon_{i,t} \quad (14)$$

$\boldsymbol{Y_{i,t}}$ represents profitability (ROA and ROE)

$\boldsymbol{\beta_1}$ = Effect of income diversification on profitability and solvency as specified by Chiorazzo, Carlo and Francesca (2008), Stiroh & Rumble (2006). Positive values of $\boldsymbol{\beta_1}$ indicate that income diversification improved profitability and solvency.

$\boldsymbol{\delta_1 - \delta_5}$ represent the coefficients to the bank specific exogenous variables.

$\boldsymbol{\delta_6 - \delta_7}$ represent macroeconomic factor coefficients.

To capture effects of both bank-specific exogenous variables and macroeconomic variables, the following control variables are used:

LASSETS- This variable is computed as the natural logarithm of year- end total Assets Stiroh (2004); Stiroh and Rumble (2006), Chiorazzo, Carlo and Francesca (2008), It controls for bank size. Studies have mixed results with regards to the effect of size on profitability sue to the presence of economies and diseconomies of scale within the banking sector. There could be an intermediate link between size and profitability.

LOAN- This is measured by the ratio of non-performing loans to total loans and represents the banks' credit risk. A lower ratio shows a healthy loan portfolio and it is expected to impact positively on bank profitability and stability Sangmi & Nazir (2010).

EQUITY- This is the ratio of shareholders' equity and total assets, also referred to as the Capital Adequacy ratio as used by Mercieca, Schaeck and Simon, (2007); Sanya and Wolfe (2011); Stiroh and Rumble (2006); Chiorazzo, Carlo and Francesca (2008) and (Stiroh, 2004b).

This represents financial leverage and is our proxy for the bank managers' risk aversion. Financial leverage is expected to affect profitability positively.

LIQUIDITY- This is the ratio of total loans to total assets. Some of the studies that have used this ratio to represent bank liquidity include: Sufian and Habibullah, (2009) and Bourke, (1989). A higher ratio shows that the bank has more of its assets in loans. This implies a high credit risk exposure which implies a higher rate of interest to be charged hence high profits earned.

GDPGROWTH- This is the gross domestic product growth rate. This variable controls for macroeconomic fluctuations and overall performance of the economy. It is expected that when the economy is doing well, banks experienced improved profitability and stability.

INFLATION- inflation is a measure of macroeconomic stability. High inflation rates threaten household and individual liquidity therefore reducing the ability to pay back loans. This affects interest income which therefore could affect profitability negatively.

3.5.2.2 Solvency

This model aims to establish the effect of income diversification on solvency.

$$S_{i,t} = k + \beta_1 DIV_{i,t} + \delta_1 LASSETS_{i,t} + \delta_2 ROA_{i,t} + \delta_3 ROE + \delta_4 LIQUIDITY_{i,t} + \delta_5 LDLR_{i,t} + \delta_6 GDPGROWTH_{i,t} + \delta_7 INFLATION_{i,t} + \varepsilon_{i,t} \quad (15)$$

$\boldsymbol{S_{i,t}}$ represents solvency (EQUITY and LOAN) of bank i in time t as the dependent variable in equation (16).

K is a constant representing the intercept.

$\boldsymbol{\beta_1}$ represents the impact of income diversification between interest and non-interest income on bank solvency. Positive values of β_1 indicate that income diversification improved solvency.

$\boldsymbol{\delta_1 - \delta_5}$ represent the coefficients to the bank specific exogenous variables used as control variables.

$\boldsymbol{\delta_6 - \delta_7}$ represent macroeconomic factor coefficients.

3.5.2.3 Significance tests.

The statistical significance of each independent variable explaining profitability and solvency will be tested using student t-test at 5% level of significance where the P-Values will be observed. If greater than the significance level, the explanatory variable is significant and vice versa.

3.5.3.4 Robustness Check.

As mentioned above, DIV1 as a measure of diversification allows us to diagnose and breakdown non-interest income into its components to reveal more effects of diversification. The probability and solvency models are therefore represented as follows

$$Y_{i,t} = k + \beta_1 DIV1_{i,t} + \delta_1 LASSETS_{i,t} + \delta_2 LOAN_{i,t} + \delta_3 EQUITY_{i,t} + \delta_4 LIQUIDITY_{i,t} + \delta_5 LDLR_{i,t} + \delta_6 GDPGROWTH_{i,t} + \delta_7 INFLATION_{i,t} + \varepsilon_{i,t} \quad (16)$$

$$S_{i,t} = k + \beta_1 DIV1_{i,t} + \delta_1 LASSETS_{i,t} + \delta_2 ROA_{i,t} + \delta_3 ROE + \delta_4 LIQUIDITY_{i,t} + \delta_5 LDLR_{i,t} + \delta_6 GDPGROWTH_{i,t} + \delta_7 INFLATION_{i,t} + \varepsilon_{i,t} \quad (17)$$

where

β_1 represents the impact of income diversification between interest and the different components of non-interest income on bank profitability and solvency. Positive values of β_1 indicate that income diversification improved profitability and solvency.

CHAPTER FOUR

EMPIRICAL RESULTS AND DISCUSSION

4.1 Introduction.

This chapter presents the findings of the study. This includes the summary statistics, Fixed and Random Effects estimation results and diagnostic tests.

4.2 Descriptive statistics

Figure 2 presents the summary statistics. It is observed that within the study period, listed banks in Kenya have their income concentrated in interest income with a share of 67.89% of the total operating income compared to non-interest income with an average share of 32%. This is expected since that has been their source of income over the years.

Within the different non-interest income revenue streams, banks are observed to have trading income with the highest share of 15.29% compared to fees and commissions and other income with 11% and 5% respectively. The HHI index represented by both DIV and DIV1 average at 0.41 and 0.47 respectively. This shows that listed banks are reasonably diversified with their operating income sourced from different revenue streams. However, since both measures are less than 0.5, it means that most of their income is still coming from one stream; interest income.

ROA and ROE average at 2.7% and 18.81% which is expected since the banks have experienced good performance through-out the study period. Capital adequacy (EQUITY) averages at 14.72% which is consistent with the minimum requirement of 14% for capital adequacy. Asset quality (LOAN) averages at 6.7% which shows that the banks have managed to control their credit risk levels. Liquidity averages at 61% meaning that banks in Kenya have more than half of their assets in the loan portfolio.

GDP growth during the study period was observed to average at 13.6% while inflation was observed to average at 7%.

Variable	Mean	standard Deviation	MAX	MIN
II	18,347,335.00	11,682,264.86	48,830,536.00	697,232.00
NNI	9,144,442.53	6,308,488.44	23,938,000.00	234,877.00
TI	27,491,777.53	17,593,544.99	69,476,000.00	980,981.00
SII	0.6789	0.0840	0.8935	0.4643
SNII	0.3211	0.0840	0.5357	0.1065
SFEES	0.1100	0.0779	0.3536	0.0007
STRAD	0.1529	0.0600	0.2738	0.0407
SOTHER	0.0583	0.0713	0.2685	0.0003
ROA	0.0277	0.0138	0.0610	0.0000
ROE	0.1881	0.0644	0.3814	0.0039
EQUITY	0.1472	0.0482	0.1958	0.0001
LOAN	0.0670	0.1544	0.9595	0.0095
LIQUIDITY	0.6120	0.0787	0.8350	0.4368
LASSETS	19.9190	2.1826	26.5066	17.5280
GDPGROWTH	0.136	0.029	0.170	0.077
INFLATION	0.076	0.028	0.143	0.056
DIV	0.416	0.079	0.499	0.029
DIV1	0.477	0.108	0.627	0.040

Figure 2 Descriptive Statistics

4.3 Estimation results and discussion

Determining the extent to which bank profitability and solvency depends on income diversification was the key objective of this study. A more comprehensive model specification to test further this link, was guided by the summary statistics in the previous sub-section.

4.3.1 Profitability

4.3.1.1 ROA

According to the Hausman test, fixed effect model was appropriate for ROA as a measure of profitability. Figure 3 shows the regression results when ROA measures profitability. In model 1, income diversification is observed to have a negative insignificant effect on profitability. After controlling for bank specific factors, its effect is still insignificant but when controlled for both bank and macroeconomic factors, the effect is now significant.

This supports Stiroh and Rumble (2006) and Mercieca, Schaeck and Simon (2007) who found no benefits of income diversification to profitability.

This also confirms the studies by Kwena (2015) and Hassan (2017) for Kenyan banks that also concluded that income diversification has negative impact on ROA.

Capital adequacy (EQUITY) and bank size were significant in explaining ROA in both model 2 and 3. Asset quality (LOAN) and Liquidity in both model 2 and 3 and GDP growth and inflation in model 3 were not significant in explaining ROA. Model 3 is the most parsimonious with the highest R-squared of 77.4%.

Figure 3 Regression of ROA with Fixed Effect Model

ROA						
	MODEL 1		**MODEL 2**		**MODEL 3**	
	Coefficient	**p-value**	**Coefficient**	**p-value**	**Coefficient**	**p-value**
DIV	*-0.023614*	*0.529*	*-0.040615*	*0.052*	-0.0428965	0.040
EQUITY			*0.186*	*0.000*	0.186493	0.000
LOAN			*-0.006929*	*0.293*	-0.0060155	0.360
LIQUIDITY			*0.0067792*	*0.698*	0.0098438	0.572
LASSETS			*-0.019*	*0.000*	-0.0158745	0.000
GDP GROWTH					0.0256371	0.318
INFLATION					0.0455638	0.159
R Squared	0.0068		*0.7609*		0.774	
F Test	F (9,59) 2.75		F (9,55) 13.01		F (9,53) 10.46	
	Prob>F=0.0095		Prob>F= 0.000		Prob>F= 0.000	
Hausman test	$\chi2(7) = 49.55$					
	Prob>chi2=0.000					

4.3.1.2 ROE

The Hausman test also determined that the fixed effects model would be appropriate for ROE as a measure of profitability. Figure 4 shows the regression results when ROE measures profitability. Model 1,2 and 3 all reveal that income diversification has a negative but insignificant effect on ROE. This confirms the results of Berger, Iftekhar, and Mingming (2010) who found no benefit is income diversification to bank profitability.

Bank size is observed to be significant in explaining ROE in model 2 and 3 while all the other control variables are insignificant in explaining ROE. Model 3 is the most parsimonious with an R-Squared of 51.92%.

Figure 4 Regression with ROE using the Random effects model

ROE						
	MODEL 1		MODEL 2		MODEL 3	
	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value
DIV	-0.188839	0.228	-0.185202	0.146	-0.2004809	0.113
EQUITY			*-0.005064*	*0.968*	-0.0009243	0.994
LOAN			*-0.051*	*0.207*	-0.0460138	0.253
LIQUIDITY			*0.0323296*	*0.763*	0.0504035	0.636
LASSETS			*-0.117979*	*0.000*	-0.0968082	0.000
GDP GROWTH					0.1365472	0.384
INFLATION					0.3177393	0.109
R Squared	0.0246		*0.4882*		0.5192	
F Test	F(5,59) 5.30		*F(9,55) 12.71*		F (9,53) 10.02	
	Prob>F= 0.000		Prob>F= 0.000		Prob>F= 0.000	
Hausman test	$\chi2(7) = 118.11$					
	Prob>chi2=0.000					

4.3.2 Solvency

4.3.2.1 Capital Adequacy (EQUITY)

The Hausman test established that the random effects model would be appropriate in studying the effect of income diversification on solvency measured by capital adequacy. Figure 5 shows the regression results.

Income diversification has a positive and significant effect on bank solvency. This means that non-interest income improves bank stability. Model 1 indicates that income diversification has a positive insignificant impact on capital adequacy but when controlled for both bank specific factors in model 2 and both bank specific and macroeconomic factors in model 3, the effect is now significant. This confirms the study by (Saunders, Schmid, & Ingo, 2014) who found that off balance sheet revenue streams improve bank solvency.

ROA has a positive and significant effect on capital adequacy. This means that improved profitability improves bank capital by 5.27 units. ROE has a negative and significant effect on capital adequacy meaning that improved profitability causes capital adequacy to reduce by 0.08 units. Liquidity has a positive but insignificant effect on capital adequacy. This means that liquidity is not important in determining bank solvency but the ability to meet depositors' obligations ensures the bank remains stable.

Bank size has a negative and insignificant effect on capital adequacy meaning that larger banks in Kenya are relatively less stable compared to smaller ones.

GDP growth and inflation are observed to have insignificant negative and positive effects on capital adequacy respectively.

Model 3 is the most parsimonious with a very high R squared of 98.58%.

Figure 5 Regression for EQUITY using random effects model

EQUITY						
	MODEL 1		MODEL 2		MODEL 3	
	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value
DIV	0.112714	0.286	*0.01331*	*0.001*	0.041477	*0.002*
ROA			*5.27907*	*0.00*	5.280268	*0.00*
ROE			*-0.85405*	*0.00*	-0.860735	*0.00*
LIQUIDITY			*0.00263*	*0.805*	0.000243	*0.982*
LASSETS			*-0.00057*	*0.275*	-0.000488	*0.352*
GDP GROWTH					-0.012586	*0.582*
INFLATION					0.030384	*0.257*
R Squared	0.0072		0.9851		0.9855	
Wald	1.14		4328.97		4307.46	
	p value = 0.2862		p value = 0.000		p value=0.0000	
Hausman test	$\chi2(7) = 3.80$					
	Prob>chi2=0.8029					

4.3.2.2 Asset Quality (LOAN)

The Hausman test determined that the random effects test would be appropriate in evaluating the effect of income diversification on solvency measured by loan quality. Figure 6 shows the regression results. Income diversification is observed to have a positive but insignificant effect on asset quality for models 1, 2 and 3. This could be the case because as banks concentrate more on non-interest income revenue streams, the chances of them having a large and significant amount of non-performing loans is reduced. Consequentially, bank solvency is improved. However, it is not significant in determining asset quality.

ROA is observed to affect asset quality negatively and significantly. ROE is observed to affect asset quality positively but insignificantly.

Liquidity is observed to affect asset quality negatively and significantly. Bank size also affects asset quality negatively but insignificantly. This could be the case because larger banks take on more loans and would therefore have more non-performing loans. GDP growth has a negative and insignificant effect on loan adequacy. Inflation is observed to have a positive insignificant effect on solvency. Model 3 is the most parsimonious model with an R squared of 28.33%.

Figure 6 Regression for LOAN using Random Effects model

LOAN						
	MODEL 1		MODEL 2		MODEL 3	
	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value
DIV	0.305806	0.369	*0.45267*	*0.164*	0.429556	*0.19*
ROA			*-5.52442*	*0.005*	-5.468724	*0.006*
ROE			*0.4353*	*0.34*	0.370151	*0.444*
LIQUIDITY			*-0.8514*	*0.001*	-0.882657	*0.001*
LASSETS			*-0.02084*	*0.154*	-0.019778	*0.18*
GDP GROWTH				*0.019*	-0.393401	*0.45*
INFLATION					0.294868	*0.632*
R Squared	0.0222		0.2734		0.2833	
Wald	0.81		22.55		22.94	
	p value=0.3691		p value =0.0004		p value=0.0017	
Hausman test	$\chi2(7)$ =1.98					
	Prob>chi2=0.9609					

4.4 Robustness check.

As mentioned before, DIV1, a measure of income diversification, which considers the different components on non-interest income, namely, trading income, fees and commissions income and other income introduces new dynamics of diversification that may not have been captured by DIV. DIV1 is therefore used in place of DIV in the models and its effect on profitability and solvency observed.

4.4.1 Profitability.

For both ROA and ROE, the fixed effects model was the most appropriate model according to the Hausman test. Income diversification measured by DIV1 is now observed to have a negative and insignificant effect on ROA as opposed to DIV which had a negative significant effect. ROE, however, remains to be affected negatively and insignificantly by DIV1 as was also the case with DIV.

This shows that income diversification has a general negative effect on bank profitability. Figures 7 and 8 show the regression results.

4.4.2 Solvency

For both EQUITY and LOAN, the random effects model was the most appropriate model according to the Hausman test. Income diversification as measured by DIV1 was observed to have a positive and significant effect on capital adequacy as was the case with DIV.

DIV1 was also observed to have a positive and insignificant effect on asset quality as was the case with DIV. This therefore confirms that income diversification has a positive effect on bank solvency. Table 9 and 10 indicate the regression results of EQUITY and LOAN respectively.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATION

5.1 Introduction

This study analyses the effect of income diversification on the profitability and solvency of Kenyan Listed banks. This relationship is studied by specifying a framework that uses both bank specific and macroeconomic factors. The study utilizes balanced panel data of listed Kenyan commercial banks spanning from 2012-2018.

5.2 Summary of findings

Based on fixed effect models, income diversification has a negative impact on profitability measured by both ROA and ROE. The effect is significant for ROA but is insignificant on ROE. As for solvency, random effect models reveal that income diversification has a positive effect on bank solvency as measures by capital adequacy and asset quality. The effect is significant for capital adequacy but is insignificant for asset quality.

The results from ROA and ROE reveal that there is no financial benefit from the income diversification being adopted by banks. For ROA, it reveals that the banks have not been efficient in utilizing their assets to generate income as they diversify. For ROE, it shows that income diversification contributes negatively to the creation of shareholder value.

The results for capital adequacy and asset quality reveal that income diversification improves the solvency levels within listed Kenyan banks. Diversification has a positive and significant effect on capital adequacy while its effect on asset quality is still positive but is insignificant. This is in support of finance theory that implies that increased diversification of one's revenue portfolio should essentially lead to a lower risk level.

5.3 Policy recommendations

The results have implications for both bank management and bank regulators. The study reveals that banks should not explore alternative income sources if their aim is to improve profitability.

The results show significant negative effects of the bank profitability. However, to improve their solvency levels, they need to explore their non-interest income. This therefore means that the regulators need to promote the diversification of bank income sources to ensure they can maintain stability within the Kenyan banking system.

5.4 Limitations of the Study

The study was conducted on the listed banks in Kenya as opposed to conducting it on all the banks within the Kenyan Banking system. This means that the results could not be generalized on the whole banking system and is not applicable to other financial firms. While it can offer important insights to other financial institutions, such conclusions should be approached with care given the variations in the way banks operate and the way other financial institutions operate. To take care of this limitation, it may be significant to carry this study on other financial firms.

5.5 Suggestions for further Research

Based on the findings, it suggested that future studies could investigate the correlation between diversification of income and financial performance using a combined methodology where data is collected from both secondary and primary sources. This format may help to address issues that the secondary data has not accurately captured and therefore providing a better and clear idea on the issue studied. This study offers appropriate insight on the effects of diversification of income on the financial performance of the listed commercial banks which are conventional banks; future research could be carried on the effects of diversification of income on the financial performance of Islamic Banks in Kenya.

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APPENDIX

Figure 7 Regression with ROA and DIV1 using Fixed Effects model

ROA						
	MODEL 1		MODEL 2		MODEL 3	
	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value
DIV1	-0.017521	0.502	-0.0245591	0.104	-0.0261856	0.082
EQUITY			0.1827884	0	0.1833438	0
LOAN			*-0.006814*	*0.316*	-0.0058395	0.389
LIQUIDITY			*0.007*	*0.694*	0.0103496	0.568
LASSETS			*-0.019261*	*0*	-0.0163254	0.000
GDP GROWTH					0.0260534	0.316
INFLATION					0.0444239	0.174
R Squared	0.0077		*0.7559*		0.7687	
F Test	F(9,59) 2.71		*F(9,55) 12.46*		F (9,53) 9.97	
	Prob>F= 0.0103		Prob>F= 0.000		Prob>F= 0.000	
Hausman test	$\chi2(7) = 88.23$					
	Prob>chi2=0.000					

Figure 8 Regression with ROE and DIV1 using Fixed Effects model

ROE						
	MODEL 1		MODEL 2		MODEL 3	
	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value
DIV1	-0.0901896	0.409	-0.1184444	0.197	-0.1291109	0.156
EQUITY			-0.017408	0.889	-0.0140514	0.909
LOAN			*-0.049483*	*0.233*	-0.0441103	0.285
LIQUIDITY			*0.037*	*0.737*	0.0559928	0.611
LASSETS			*-0.119516*	*0*	-0.0987615	0.000
GDP GROWTH					0.1388591	0.378
INFLATION					0.3132497	0.116
R Squared	0.0116		*0.4839*		0.5146	
F Test	F(9,59) 5.21		*F(9,55) 12.44*		F (9,53) 9.79	
	Prob>F= 0.000		Prob>F= 0.000		Prob>F= 0.000	
Hausman test	$\chi2(7) = 73.18$					
	Prob>chi2=0.000					

Figure 9 Regression with EQUITY and DIV1 using Random Effects model

EQUITY						
	MODEL 1		MODEL 2		MODEL 3	
	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value
DIV1	0.065232	0.362	*0.02013*	*0.034*	0.019456	*0.041*
ROA			*5.29455*	*0.000*	5.295771	*0.000*
ROE			*-0.85639*	*0.000*	-0.863345	*0.000*
LIQUIDITY			*0.00104*	*0.925*	-0.001414	*0.9*
LASSETS			*-0.00044*	*0.421*	0.000556	*0.517*
GDP GROWTH					-0.013466	*0.57*
INFLATION					*0.03163*	*0.256*
R Squared	0.0001		0.9839		0.9843	
Wald	0.83		3988.53		3970.59	
	p value = 0.3618		p value=0.0000		p value=0.0000	
Hausman test	$\chi2(7)$ =2.37					
	Prob>chi2=0.9364					

Figure 10 Regression with LOAN and DIV1 using Random Effects model

LOAN						
	MODEL 1		MODEL 2		MODEL 3	
	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value
DIV1	0.257311	0.269	*0.39257*	*0.076*	0.376571	*0.091*
ROA			*-5.465*	*0.005*	-5.416231	*0.006*
ROE			*0.41284*	*0.36*	0.350534	*0.464*
LIQUIDITY			*-0.87059*	*0.001*	-0.899987	*0.001*
LASSETS			*-0.01986*	*0.171*	-0.018874	*0.198*
GDP GROWTH					-0.387265	*0.453*
INFLATION					0.287375	*0.638*
R Squared	0.0365		0.297		0.3061	
Wald	1.22		24.14		24.46	
	p value = 0.2691		p value =0.0002		p value=0.0009	
Hausman test	$\chi2(7)$ =3.39					
	Prob>chi2=0.8470					

Declaration and Approval

I declare that this work has not been previously submitted and approved for the award of a Degree by this or any University. To the best of my knowledge and belief, the research proposal contains no material previously published or written by another person except where due reference is made in the research proposal itself.

Admission No: 088072

Sign: _____ Date: _____

I certify that this work is being submitted for examination with my approval

Sign: _____ Date: _____