BANK SPECIFIC FACETS, MARKET CONCENTRATION AND EARNINGS VOLATILITY OF COMMERCIAL BANKS IN KENYA

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Bank Specific Facets, Market Concentration and Earnings Volatility of Commercial Banks in Kenya

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DECLARATION

This thesis is my original work and has not been presented for a degree in any other University.

Signature…… Date……

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This thesis has been submitted for examination with our approval as University Supervisors

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DEDICATION

Much appreciation goes to my supervisors, family, and all the individuals for their emotional support and financial backing during the study.

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ACRONYMS AND ABBREVIATIONS

ASEAN	Association of South East Asian Nations
CA	Current Assets
CBK	Central Bank of Kenya
CEE	Central and Eastern European
CL	Current Liabilities
DEA	Data envelopment analysis
ES	Efficient Structure
ESS	Efficient Structure Scale-Efficiency
ESX	Efficient Structure X-Efficiency
EU15	European Union 15
EU	European Union
FGLS	Feasible Generalized Least Squares
GCC	Gulf Cooperation Council
GMM	Generalized Method of Moments
LLC	Levin Li Chu

OIC	Organization of Islamic Countries
OLS	Ordinary Least Squares
REMM	Resourceful, Evaluative, Maximizing Model
ROA	Return on assets
ROE	Return on Equity
ROI	Return on investment
RMP	Relative-Market Power
UK	United Kingdom
US	United States

DEFINITION OF OPERATIONAL TERMS

Asset Quality A measure of capital adequacy requirement that lies within the scope of regulation and measure capability bank solvency through the ratio of capital to risk weighted assets (Kadioglu & Ocal, 2017). It also refers to the price worth of loan assets and investments held by the bank and is denoted by the ratio of provision for loan loss to loans (Ajekwe, Ibiamke and Silas, 2017)

Earning volatility A short – term phenomenon indicated by the frequent upward and downward changes in a firm's earnings (Ghosh, Khatun & Tarafdar, 2018). But in the long- run, earnings tend to fluctuate around a mean figure (earnings volatility).

Financial leverage This is as ratio of total debt to total assets (Ilyukhin, 2018) or the quantity of the owner's equity in the book in relation to the assets held by the bank as denoted by the ratio of equity to an asset (Prabowo et al., 2018).

Firm size The total quantity of assets held by the bank as measured by the natural log of the bank's assets (Elyasiani & Jia, 2019)

Income diversification The ability of the bank to generate revenues from non–core business activities (non–interest income) as opposed to the main revenue-generating activity (interest income) as indicated by the ratio of non-interest income (commission, fees and exchange incomes) to total bank's income (Busch and Kick, 2018).

Liquidity	The funding levels relating to the maturity conversion of deposits to loans as denoted by the ratio of current assets (loans and advances) to current liabilities (deposits) (Titko, Skvarciany and Jurevičienė, 2018)
Market concentration	The share of the individual's bank total assets in the market, as measured by the weighted ratio of market share of assets, deposits, equity, deposit and loan accounts. (Kasman and Kirbas –Kasman,2016)

ABSTRACT

The financial system in Kenya is bank based and therefore volatility in earnings can cause instability in the banking and financial industry with drastic consequences on the economy due to the bank failures and related contagion effect. Since, the banking sector reports have indicated failures over the last decade; this provides a rich background for examining earnings volatility in Kenya. Previous studies have addressed individual constructs such as income diversification in isolation hence due to a dearth of conceptual and contextual gaps such as differences in the nature of banking from conventional to Islamic banks and the use of different measures of study variables; the study evaluated the effects of bank specific facets and market concentration on earnings volatility among commercial banks in Kenya. The specific objectives included; to examine the effect of firm size, financial leverage liquidity, asset quality, income diversification and market concentration on the earnings volatility of commercial banks in Kenya. The study was underpinned by the efficient structure hypothesis, relative market power hypothesis, competition–stability theory, competition fragility theory and agency theory. The target population included all the 37 commercial banks licensed by the CBK for the period 2009-2021 and consistently reported earnings during the study period. The study employed an explanatory design and used panel regression analysis based on the secondary data. Collected data was collated and entered into statistical software (eViews) and analysed descriptively and inferentially. Panel regressions were conducted at significance levels of 0.05 with results being presented in graphical and tabular formats. The results showed that firm size, financial leverage, liquidity, asset quality and market concentration were statistically significant while income diversification was not statistically significant. The study findings therefore concluded that bank specific facets but for income diversification have a significant effect on the earnings volatility of commercial banks in Kenya The recommendations are; banks should improve on loan quality by reducing agency problems through credit referencing, improved oversight of the bigger banks, revenue diversification, and independent risk management practices such as internal audits.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Earnings volatility is a phenomenon that is indicated by the frequent upward and downward changes in a firm's earnings (Ghosh, Khatun &Tarafdar, 2018). Banks usually sustain the expected short – run profitability but in the long- run, profitability tends to fluctuate around a mean figure (earnings volatility). Earnings volatility in the banking sector occurs through the discount rate or the expected cash flows (Shahchera and Noorbakhsh, 2017). Excess volatility in bank earnings can result in unstable capital structures and may lead to uncertainty about the level of equity capital and can result in a deterioration of banks' soundness (De Haan& Poghosyan, 2015).

Further, earnings volatility is predictive of financial crises, and therefore, increased earnings volatility can lead to deterioration in the assets, thus influencing the stability of banks, while extreme volatility might negatively impact capital structure (Chukwuani, 2021).

1.1.1 Global Perspective of Volatility in Bank Earnings

Volatility in bank earnings can result in unstable capital structures and may introduce uncertainty on the level of equity capital and result in a deterioration of banks' stability (De Haan& Poghosyan, 2018). Earnings volatility as a phenomenon in the banking sector occurs through the discount rate or the expected cash flows (Shahchera and Noorbakhsh, 2017), and is predictive of financial crises, and therefore, increased earnings volatility can lead to asset deterioration, thus influencing the stability of banks, while extreme volatility might negatively impact capital structure (Chukwuani, 2021).

Shehzad, Scholtens & De Haan (2019) carried out a cross-county evaluation of the impact of bank size on income volatility in 65 developed and developing

countries using a mixed-panel approach. The study observed that smaller banks in emerging countries tend to show higher earnings volatility than their larger counterparts. For European banks, the evidence is mixed. Some find that increased reliance on non-interest income has stabilized profits (Chiarozzo et al., 2019). However, Lepetit et al. (2019) show that expanding into non-interest income activities raises volatility and insolvency risk. This positive link with risk is most clear for small banks and is essentially driven by commission and fee activities.

Barros et al., (2007) examined the volatility of earnings of the commercial banking sector in the EU utilizing a mixed logit model. The findings indicated that smaller-sized banks with higher loan intensity tend to have a higher probability of higher earnings. In a cross-country study on banks across 124 countries, Bitar, Madies and Taramasco (2017) compared the financial characteristics of both conventional and Islamic banks. The findings indicated that Islamic banks experience higher levels of earning volatility when compared to US and European banks.

Allen et al., (2017) examined the banking sector of the Central and Eastern European (CEE) countries using a panel dataset. The study observed that the banks in these countries still experience earnings volatility with parent banks having significantly lower earnings and solvency than domestic and foreign-owned banks

In Bangladesh, Ghosh, Khatun and Tarafdar (2018) examined the earning volatility of the Banking sector and the findings indicated that earning volatility is positively correlated with long-term bankruptcy.

1.1.2 Regional Perspective of Earnings Volatility

In Africa, among the Tunisian Banks, it was observed that firm characteristics explain the differences in earnings (Naceur, 2021). In Nigeria, Ajekwe, Ibiamke and Silas (2017), observed that earnings volatility is linked to loan loss provision of the commercial banks listed in the Nigerian Stock Exchange

while the volatility in earnings positively correlated with bank size with loan loss provision tending to increase the earnings volatility (Chukwuani,2021).

Commercial banks in the East African Community (EAC) region are expanding with significant contributions to the economic development of the region. Cross-border expansion of banking started in the early 2000 with Kenyan banks establishing branches in other east African states. According to the Central Bank of Kenya report of 2013, Kenya had 11 commercial banks with cross border banking interests in the other EAC member states as at end of December 2013. This regional expansion has had implications on the commercial banks earnings.

1.1.3 Earnings Volatility of Commercial Banks in Kenya

Within the Kenyan context, a study on the impact of income diversification among commercial banking industry in Kenya observed that many commercial banks in Kenya are diversifying their income sources; however, the findings indicated that income diversification does not impact the earnings volatility (Kiweu, 2012).

The CBK indicated that 39 commercial banking institutions were licensed to operate in Kenya and the sector recorded significant improvements in performance during the period however earnings of the commercial banks in Kenya are still moderate with several banks declaring losses (Oloo, 2011).

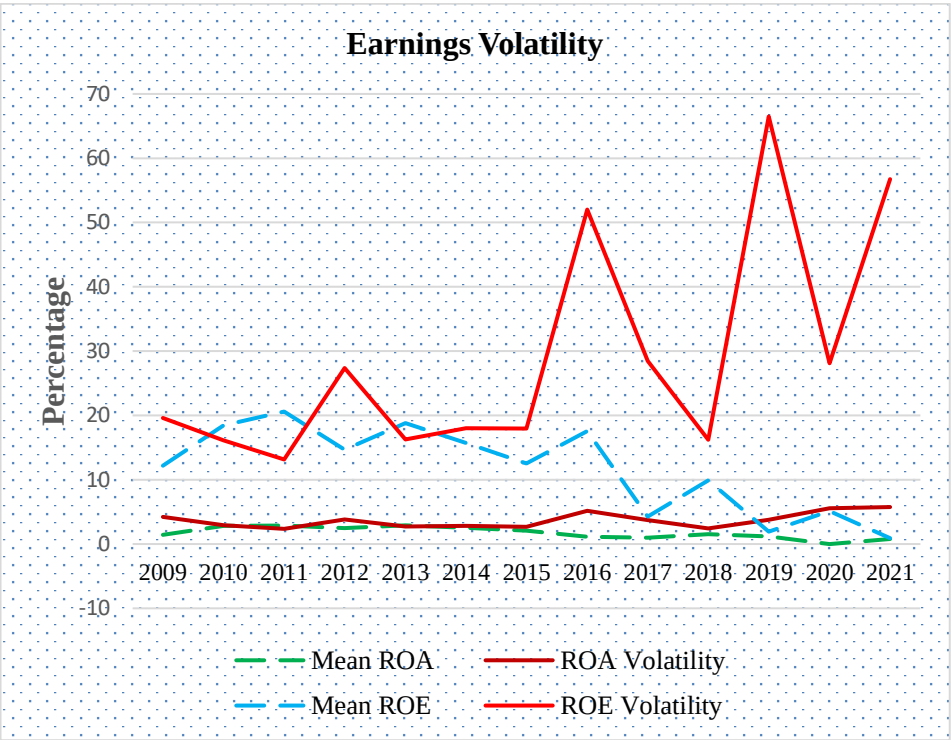

Figure 1.1: Earnings Volatility

The variability in ROA and ROE (earnings volatility) as measured by the standard deviation is considerably higher than the mean ROA and mean ROE figures in all study periods indicating that bank earnings are displaying high levels of volatility.

1.2 Statement of the Problem

The capital markets in sub – Saharan African countries are inefficient and therefore, the commercial banking sector in developing countries play a significant role to a nation's growth and development (Chukwuani, 2021). However, volatility of earnings in the banking and financial industry depicts the risks of the banking sector that might lead to bank failures and contagion (Delis, Staikouras & Varlagas, 2019).

The banking supervision reports indicate that there have been several cases of failure of commercial banks in Kenya due inconsistencies inn earnings; Dubai Bank was placed under receivership in August 2015, followed by Imperial

Bank in October 2015 and Chase Bank in April 2016. In 2018, the National Bank of Kenya and Jamii Bora Bank faced significant challenges and were acquired later by Kenya Commercial Banks and Cooperative Bank of Kenya respectively, while in 2019, Spire Bank underwent turbulent waters. Between 2020 and 2022, Mayfair Bank was acquired by Egyptian Commercial International Bank after undergoing difficulties in its operations (Nationmedia.com 2022).

The studies on earnings volatility of the banking sector in a different context such as the EU and the US have been extensively analysed in the literature (Shehzad, Scholtens & De Haan, 2008; Chiarozzo et al., 2008; Barros et al., 2007; Bitar, Madies and Taramasco, 2017; Allen et al., 2017) among others. With the sub- Saharan context, Naceur (2021); Ajekwe, Ibiamke and Silas (2017); Chukwuani (2021); Kiweu (2012) have examined earnings volatility in banking sector in Tunisia, Nigeria, Ghana and Kenya respectively. The aforementioned studies indicate the presence of the significant volatility in earnings of commercial banks. In general, there have been limited studies on the volatility of the earnings of the banking sector in Kenya (Gwatiringa, 2020).

The studies examining the effect of size on earnings volatility of banking industry have reported a non-linear relationship (De Haan& Poghosyan, 2012), while De Haan and Poghosyan (2018) and Elyasiani and Jia (2019) observed a negative relationship. Studies have reported no direct linkage between income diversification and earnings volatility (Curi, Lozano-Vivas & Zelenyuk, 2018) or direct association with earning volatility for European banks (Chiarozzo et al., 2019) but the evidence is mixed.

The leverage ratio has been negatively associated with earnings volatility (Barth and Miller, 2018; Kasman and Kasman (2016) or positively linked to earnings volatility (Budi and Tn, 2018). Liquidity management has been linked to earning volatility (Iqbal et al., 2018) either positively Pakistan (Khasharmeh, 2018; Muriithi and Waweru, 2017) or negatively (Hakimi & Zaghdoudi, 2017). Asset quality has been positively linked to earning volatility (Ajekwe, Ibiamke

and Silas, 2017; Kolapo, Ayeni and Oke, 2012) or negatively associated with volatility (Hosna, Manzura and Juanjuan, 2009; Capraru and Ihnatov, 2018). Market concentration has been directly linked to earnings volatility (Shehzad, Scholtens and De Haan, 2009; Rumler and Waschiczek, 2016) and indirectly linked to volatility (Bhatti and Hussain, 2010; Chirwa, 2018).

Since, the banking sector reports have indicated four bank failures (Dubai Bank, Imperial Bank, Chase Bank and Spire Bank) over the last decade this provides a rich background for examining earnings volatility in Kenya, moreover previous studies in the Kenyan context have addressed individual constructs such as income diversification in isolation (Kiweu, 2012). In light of the aforementioned gaps the study evaluated the bank specific facets, market concentration and their effect on earnings volatility of commercial banks in Kenya.

1.3 Research Objective

The study examined bank specific facets, market concentration and their effect on earnings volatility of commercial banks in Kenya. The study had the following objectives;

1. To evaluate the effect of firm size on the earnings volatility of commercial banks in Kenya.
2. To examine the effect of financial leverage on the earnings volatility of commercial banks in Kenya.
3. To assess the effect of liquidity on earnings volatility of commercial banks in Kenya
4. To determine the effect of asset quality on earnings volatility of commercial banks in Kenya.
5. To evaluate the effect of income diversification on earnings volatility of commercial banks in Kenya.
6. To assess the effect of market concentration on earnings volatility of commercial banks in Kenya.

1.4 Research Hypotheses

1. H_O: Firm size has no significant effect on the earnings volatility of commercial banks in Kenya.
2. H_O: Financial leverage has no significant effect on the earnings volatility of commercial banks in Kenya.
3. H_O: Liquidity has no significant effect on the earnings volatility of commercial banks in Kenya.
4. H_O: Asset quality has no significant effect on the earnings volatility of commercial banks in Kenya.
5. H_O: Income diversification has no significant effect on the earnings volatility of commercial banks in Kenya.
6. H_O: Market concentration has no significant effect on earnings volatility of commercial banks in Kenya.

1.5 Significance of the Study

1.5.1 The Kenyan Citizens

The findings are relevant to Kenyan citizens as the first stakeholder who will most likely be affected by turbulence in the banking sector. The findings would provide the citizen with information and knowledge on the state of stability of the banking system and that they can optimally select the soundest banks for their banking needs.

1.5.2 Management of Banks

The management of these banks is the person of interest because of their day–to–day decisions which influence the soundness of the whole banking industry in Kenya. The management would benefit from the knowledge generated from the study as it will enable them to make the most optimal operational decisions that have long-term effects on the individual bank as well as the whole industry.

1.5.3 Owners of Banks

The ownership of the banks is the main important shareholder and stakeholder of the banks and thus, their investments will be affected by any market turbulence. The study will provide the owner with critical information on the state of the stability of the banking system in Kenya.

1.5.4 Investors

The investors and the capital merchants being the industry stakeholders stand to benefit from the study as they can discern the state and soundness of the industry and thus aid in making important investment decisions.

1.5.5 Industry Regulator

The industry regulator being the other important stakeholder in the commercial activities of these banks will benefit from the information generated from the study as part of the ongoing efforts to understand the soundness and stability of the banking industry. The government is an important stakeholder in terms of policy generation and stands to benefit from the study in terms of information on the soundness and stability of the banking industry.

1.5.6 Scholars and Researchers

Scholars and researchers stand to benefit from the information generated by the study as an advancement of the knowledge generated and the repository of available information on the banking industry in Kenya.

1.6 Scope of the Study

This study examined the trend in the performance of banks using the panel regression statistical technique as it allowed temporal and spatial comparisons**.** The data analysis followed several basic statistical techniques such as means and standard deviations. Panel regression method was utilized to conduct the hypotheses testing.

The study was limited in scope to the studies on banking in the region, particularly in Kenya. Due to this limitation, the study widely examined several studies done in different contexts to resolve the insufficiency of the information.

Finally, the study relied on publicly available information from the central bank supervisory reports. The use of secondary data in research is acceptable depending on the source of the data and information and in this case, the data obtained was reliable.

1.7 Limitations of the Study

This study was limited to the consistency and reliability of the publicly available data used. Any discrepancy in the data was assumed to have an inconsequential effect on the findings.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This study presents a review of literature beginning with theoretical literature, empirical literature and a conceptual framework which borrows from empirical literature to define independent and dependent variables.

2.2 Theoretical Framework

A theoretical framework is a series of postulations that presents the hypothetical components without detailing the completeness of a theory (Garrison, 2000). The study was underpinned by; relative market power hypothesis, efficient structure hypothesis, competition-stability theory, competition-fragility theory, agency theory and resource dependency theory.

2.2.1 Relative Market Power Hypothesis

The relative market power hypothesis was proposed by Markham (1965) who postulated that when there are numerous firms in the marketplace and none of them is controlling a significant share of the appropriately defined market, then competitive pricing will exist and on the contrary, if few firms exist in the marketplace, then pricing will be uncompetitive. Demsetz (1973) alluded to the fact that concentration and market power in an industry mean the same thing. Thus, concentration/ market power tends to result in higher prices and profits but incidentally, greater efficiencies lead to higher profits and result in higher concentration/market power.

Heggestad (1977) observed that banks with monopolistic power may forego potential profits for safer portfolios than banks in competitive markets. Essentially, this means that earnings from monopolies may not exceed those in competitive markets but then monopoly profits may be more secure. This implies that firms with market power tend to have less volatility in profits. In

support, Rhoades (1985) observed that firms with a high market share tend to enjoy a unique form of market power derived from their characteristics and product differentiation attributes. This implies that market power is a unique firm attribute derived from its unique market capabilities.

The relative-market power hypothesis (RMP) postulates that companies that differentiate its products tend to accrue larger market shares and exert their market power in product pricing, thus earn superior profits (Berger, 1995; Shepherd 1982). Market power is linked to efficiency and stability of the banking sector in developing countries where the banking industry is the main credit provider. Thus, banks with larger market power have higher profit efficiency levels but endure significant cost efficiency losses, but are relatively more stability.

Concentration and market share are regressed on the efficiency measures to test the efficient-structure condition that efficiency creates greater concentration or market share (Berger, 1995; Berger and Hannan, 1997). market structure is associated with market power, and firms may take some of the benefits of this power as a more relaxed environment in which there is less pressure to maximise efficiency (Al-Muharrami & Matthews, 2019).Reducing the cost efficiency in delivering financial services result from growth strategies which are outweighed by advantages derived from diversification in revenues and higher profit efficiencies.

Berger and Hannan (1998) posited that cost efficiency is negatively affected by market structure due to the fact that in concentrated market, firms are not cost – minimizers due to; expenditures relating to the development and maintenance of monopoly power, deficient profit-maximization behaviour, deficient managerial effort, and/or inefficient management. As new growth opportunities are identified and established across international borders, banks tend to expand the range of their operations and activities to gain more market power (Ariss, 2010). Banks with more loan market power will charge higher rates to loan customers and make it harder for borrowers to repay loans, thereby

exacerbating their moral hazard incentives to shift into riskier projects and possibly resulting in a riskier set of bank clients due to adverse selection considerations (Ariss, 2010).

Market power allows some banks to influence (output) prices, and thus these banks set prices above marginal cost to maximize profits. The producer extract rents then at the expense of consumer social welfare. Extraction of rents in a monopolistic market enables the firm to utilize their market power thus introducing inefficiency in the resource allocation rather than profit maximization since the managerial subjective objective cost of optimizing profit might outweigh the marginal gains (Koetter & Vins, 2019).

A greater market power lowers the managerial effort of optimizing operational efficiency. Competitive banks operating in a higher concentrated market set prices above marginal costs, resulting in a net loss in social welfare. Further, inefficient managers are not incentivized to work as hard to control costs and may pursue other goals than profit maximization. Under a non-competitive scenario, the management allocates resources to the development and maintenance of market power, and in the process reduce cost efficiencies and in turn increase the costs (Ariss, 2010).

Uncompetitive banks can exercise monopoly power and are inefficient than competitive banks. Market power is detrimental to the welfare of consumers and organizational growth as it reduces the quality of service, cost efficiency and, innovation. Small banks tend to maximise social welfare since their higher volumes of credit are produced at the lowest cost possible (Ariss, 2010). Firms with market power tend to reduce the problem of information asymmetry and develop new business relationships with individual firm's thereby increasing access to finance to new entrepreneurial firms.

When loans are supplied to nascent firms with little credit history, the funding cost would be lower than in under a competitive environment. Also, by reducing information asymmetry, incumbent banks are more incentivized to screen borrowers and differentiate between low and high-quality debtors. Thus,

market power improves the quality of loan while resulting in bank stability (Ariss, 2010)

Concentrated banking sector reduces incentives on higher risk levels. Based on this perspective, bigger banks in concentrated markets attain market power and superior earnings, thus discouraging firms from engaging in more risky operations and hence improving bank stability (Tran, Nguyen & Nguyen, 2022). Schaeck, Cihak, and Wolfe (2006) present that more competitive banking systems are more stable than monopolistic systems because of a lower likelihood of bank failure and a longer time to crisis.

Loan market channel is as important channel and that allows banks with larger loan market power to charge higher interest rates and in turn, make it difficult for borrowers to repay loans, thereby exacerbating the moral hazard thus resulting in a riskier clientele due to considerations in adverse selection Beck, De Jonghe & Schepens, 2013).

The hypothesis is relevant in explaining how market power impacts earnings volatility. For instance, Shehzad, Scholtens and De Haan (2019) examined the impact of market power as measured by the bank size and the study observed that bank size is an important determinant of earning volatility in emerging economies; however, size does not matter in developed countries. Clarke, Davies & Waterson (1984) empirically evaluated the impact of the market power and efficient structure hypothesis on industry earnings and there is little conclusive support to justify both hypotheses in within-industry effect but in some industries both efficient and market power work simultaneously to determine industry earnings.

2.2.2 Efficient Structure Hypothesis

As proposed by Demsetz (1973), the efficient structure posits that under market competition, efficient firms tend to be competitive and grow, and become larger, obtaining larger market share, and earn superior profits. Consequently, market becomes more concentrated. The hypothesis posits that efficient banks

tend to lead to more firm concentration; thus, any anti-concentration policy measures distort economy. Under the Efficient Structure (ES) Hypothesis, efficient banks survive competition and gain market share at the cost of less-efficient compatriots (Demsetz, 1973). Therefore, bank efficiency drives the degree of market power and efficient firms grow and become larger, obtaining market share, and earning higher profits (Demsetz, 1973).

Thus, efficient banks can increase their market share due to their higher earnings. Consequently, the degree of concentration increases "automatically." Smirlock (1985) and Evanoff and Fortier (1988) argue that higher profits in concentrated markets could be the result of greater productive efficiency of firms with larger market shares. The efficient–structure hypothesis indicates further that superior management or production technologies tend to lower the firm's operating cost and therefore the firm endures higher profits. The hypothesis also assumes that a large market share may result in higher profits (Berger, 1995).

The efficiency structure hypothesis postulates that firm performance is positively related to its efficiency because concentration develops from the competition based on cost efficiencies which increase profits through price reduction and expansion of market share. Thus, more efficient firms can gain market share because of the prevailing market structures. That is, increased profits are assumed to accrue to more efficient firms because they are more efficient and not because of collusive activities (Molyneux and Forbes, 1995).

The EH emphasizes superior efficiency thus justifying firm’s earnings (Samad, 2019). ES hypothesis takes the efficiency factor into account and states that the firms with superior efficiency improve their market shares and become more profitable (Ahamed, 2012).

Depending on the type of efficiency, the ES hypothesis has two different forms; the X-efficiency form and the Scale Efficiency form. In the X-efficiency form, efficient firms have a superior ability in cost minimization at any given output levels, thus encounter lower costs, increase larger market share and earn

superior profits. The ESX hypothesis implies that firms experience lower costs and thus higher profits because of superior management or production technologies. ESX is a measure of managerial cost efficiency where firms with superior management have lower costs and therefore higher profits (Chortareas, Garza-Garcia & Girardone, 2011).

In the Scale Efficiency form, efficient firms are superior in cost minimization at higher scale economies, thus encounter reducing costs per unit due to larger market share and earn superior profits because of achieving scale-efficiencies that are below the minimum average-cost point (Al-Muharrami & Matthews, 2019). The ESS hypothesis emphasizes that firms producing at more efficient scales achieve lower unit costs and higher unit profits. ESS is a measure of scale efficiency and refers to firms that have equally exceptional managerial techniques and technologies to operate at a more efficient scale than others (Chortareas, Garza-Garcia &Girardone, 2011).

Efficiency firms tend to survive competitive pressure, but the resulting firm concentration erodes firm efficiency levels. Under ES hypothesis where efficient firms dominate in concentrated market, the market price is lower (Homma, Tsutsui & Uchida, 2017). Thus, a highly efficient firm tend to maximize profit by maintaining its pricing and size policy or price reduction and expanded operations. The efficient structure hypothesis explains the positive relationship between profits and concentration. Further, X-efficiency posits that firms with superior managerial capability or production technologies enjoy lower costs and earn higher profits. By extension, those more efficient firms will gain greater market shares, which may result in a more concentrated market (Clarke, Davies & Waterson, 1984).

In this context, efficiency influences the level of profit and market structure. The scale efficiency argument contends that firms may have comparable quality of management and technology, but certain firms produce comparatively at a more efficient scale, thus earns higher unit profit from the low unit costs. Such firms tend to acquire larger market shares, which may

result in higher levels of concentration. In this scenario, efficiency through an indirect process drives both profit and market structure (Bello and Isola, 2014). ES hypothesis predicts that in concentrated markets, competitive pricing exists. Concentration provokes a low degree of competition, leading to market inefficiency as illustrated in profits and cost (Homma, Tsutsui & Uchida, 2014). Superior performance endogenously determines the market structure, thus indicating that higher efficiency lead to concentration and superior earnings.

Staikouras and Koutsomanoli-Fillipaki (2006) illustrated that if the bank has a relatively low cost of production structure, it can adopt two different strategies. The first option is to maximise profits by maintaining the present levels of prices and company size. The second alternative is to maximise profits by reducing prices and expanding the size of the company. If the bank chooses the second option, the most efficient banks tend to gain market share and bank efficiency ramps up market concentration without necessarily reducing the competitiveness. Market structure is therefore shaped endogenously by banks' performance so that concentration results from scale economies and superior efficiency (Vesala 1995) and such banks earn Ricardian rent (Smirlock, 1985).

Recent research testing the market power hypothesis has expanded to various regions in the world including developing nations. The X-efficiency is positively related to bank profits in the U.S. context (Chortareas, Garza-Garcia &Girardone, 2011). The ES hypothesis predicts not only that efficient firms grow, but also that the growth of efficient firms makes the market more concentrated (Homma, Tsutsui & Uchida, 2014). Efficiency affects the firms' performance (Samad, 2019). There is increased emphasis on the use of efficiency as a measure to examine the economies of scale, economies of scope and both economies of scale and scope accounting for risk and policy implications.

2.2.3 Competition – Stability Hypothesis

The theory was proposed by Mishkin (2019) based on the assumption that banks in concentrated systems tend to receive larger subsidies through implicit 'too-big' or 'too important to fail' policies that intensify risk-taking incentives and hence increase banking system fragility. The reduction in competitive pressure in concentrated markets may result in a lessened effort by managers to maximize operating efficiency. Thus, in addition to the traditionally recognized higher prices and reduced output from market power, there may also be higher costs per unit of output in concentrated markets because of slack management (Berger & Hannan, 1998).

The competition-stability posited that competitiveness promotes stability of financial and banking sector. Thus, competition and concentration coexist simultaneously and induce stability or fragility. Boyd and Nicolo (2020) posit that banks with high market power reduce competitiveness in the loan market encouraging high-interest rates which in turn leads to default risk. The effects of concentration on efficiency can be well be isolated from confounding influences of inter-industry differences in products, technologies, and external competition. Concentrated markets exhibit lower cost efficiency (Berger & Hannan, 1998).

The higher prices in concentrated markets bring about a restriction of output relative to the competitive levels and thereby misallocate resources. The social cost of this misallocation has been approximated by the familiar welfare triangle, which represents the difference between the loss in consumer surplus and the gain in producer surplus occasioned by non-competitive pricing (Berger & Hannan, 1998). Further, having large banks in a concentrated banking system could also increase the contagion risk, resulting in a positive link between concentration and systemic fragility. Advocates of the competition - stability argue that (i) relative to diffuse banking systems, concentrated banking systems generally have fewer banks and (ii) policy

markets are more concerned about bank failures when there are only a few banks (Beck, 2019).

Advocates of the concentration–stability view argue that concentrated markets tend to be more stable for one of the following reasons. First, the charter value hypothesis maintains that a bank's charter is more valuable when the bank operates in a less competitive environment with high expected future profits. Banks in more concentrated markets will therefore engage less in excessively risky lending. Second, in more concentrated markets, banks become informed about a larger proportion of borrowers. As a result, they make more informed decisions and are less exposed to credit risk (Marquez, 2002).

Third, when the failure of a bank threatens the stability of the system, banks in more concentrated markets may find it easier to reach an agreement to rescue the troubled bank to prevent contagion. In more diffuse markets, an agreement is less likely to be reached because of a coordination problem. Hence, contagion is less likely to occur in more concentrated markets (Sáez and Shi, 2018). Finally, some argue that it is easier to monitor a system with only a few large banks than one with many small banks (Ijtsma, Spierdijk & Shaffer, 2017).

The competition–stability strand of the literature contends that financial instability increases as the degree of competitiveness is lessened. Banks with market power will charge higher interest rates on business loans and earn more rents (Berger, Klapper& Turk-Ariss, 2019). Under this hypothesis, competitive and/or less concentrated banking industry tend to more stable. Boyd and Nicolo (2020) claim that excessive competition in the banking market drives the banks to lower the loan interest rate which reduces moral hazard and adverse selection problems of the banks, reduces their default risk, and enhances financial stability. An increase in competition when new players enter the market can result in better banking stability (Bustaman et al., 2017).

Competitive environment tends to increases incentive for banks to maintain higher capital, which in turn increases bank stability. Higher capitalization

enables higher efficient loan monitoring and improved credit risk management (Allen, Carletti & Marquez, 2011). Higher competitive reduces the credit levels, and this decreases market power to create new relationships with borrowers, relationships that could create future surpluses (Horvath, Seidler & Weill, 2016).

Competition would realize the efficiency advantages of banks. Such that higher market concentration leads to anticompetitive deposit pricing behaviour (Al Arif & Awwaliyah, 2019). Increased competition drives banking institutions to accelerate the consolidation process to protect their market power, which again raises concerns of increasing the number of large banks, and the level of concentration. The incidence of numerous financial crises in both matured and emerging economies in the last three decades and the resulting regulatory failures to bring the banking system into discipline have raised concerns among policymakers and scholars regarding the subsequent effect of competition on financial stability in the banking system (Noman, Gee and Isa, 2017)

The relevance of the hypothesis is highlighted by Kasman and Kirbas-Kasman (2022) who observed that bank stability supports the competition-stability hypothesis in that bank size and concentration negatively causes earnings volatility, suggesting that larger banks and more concentrated banking market decrease earnings volatility.

2.2.4 Competition – Fragility Hypothesis

The competition-fragility view, referred to as the franchise value hypothesis as first proposed by Marcus (1984) postulates that competition results in fragility in the banking sector. The hypothesis posits that competition in the financial markets erodes market power, lowers capital buffer and profit margin and results in reduced franchise value that incentivises risk-taking strategies. Thus, large banks are dominant in uncompetitive markets because they benefit from scale and scope economies, and are able to diversify their portfolios when compared to smaller banks (Diamond &Dybvig, 1983).

The concentration–fragility theory postulates that greater concentration results in higher market power thus banks will raise their lending rates and, consequently make the banking sector riskier (Keeley, 1990). The doctrine of "too big to fail" implies that regulators are concerned with bank failures. Thus, large banks are more likely to be guaranteed, and this generates a moral hazard problem, which ramps up risk-taking behaviour and fragility. Moreover, contagion risk is increased in concentrated banking sector (Mishkin, 2019).

The charter value view of banking sees banking as a selection in asset risk portfolio. Bank owners, however, shift risks to depositors in a world of limited liability (Beck, 2019). In addition, in a more competitive environment, banks earn fewer informational rents; reduce their incentives to properly screen borrowers, again increasing the risk of fragility (Allen and Gale, 2018). Proponents of the concentration–fragility view, on the other hand, argue that banking market concentration is detrimental to financial stability. First, if the level of competition decreases with the degree of market concentration, banks in more concentrated markets can charge higher loan rates. This aggravates moral hazard problems on the part of borrowers, who will be induced to invest in more risky projects. As a result, the riskiness of the bank's asset portfolio increases (Boyd and De Nicoló, 2005; De Nicoló and Lucchetta, 2019).

Second, banks in concentrated markets are more likely to be too-big-to-fail, which gives rise to a moral hazard problem on the part of bank managers (Mishkin, 2019). Third, the ex-ante risk of financial contagion is higher in more concentrated markets, since the probability that a particular bank is large enough to impact the rest of the system increases with the degree of market concentration (Nier et al., 2007).

Finally, some argue that the supervision of concentrated banking markets is more difficult because banks in such markets tend to be larger and more complex than their counterparts operating in more diffuse markets (De Nicoló, 2004; Beck et al., 2006). Zaman and Zephirin (2018) observed that large and profitable banks with considerable market power in developed economies have

lower charter value and increased insolvency risk. The minimum capital requirements arise because of the concerns of the regulatory agencies about the negative externalities of bank failure (Rime, 2019).

Studies have argued that large–sized banks tend to lead to higher risk levels and therefore the concept of too big to fail brings an understanding of the importance of financial stability during periods of financial difficulty, their excessive financial instability has to be bailed out (Shapiro, 2020). Therefore, the systemic risk posed by large-sized banks will worsen the risk-taking incentives for the shareholders, and in case of failure, shareholders will not bear all the costs (Alexander *et al.*, 2006).

As concentration can reduce risk and improve earnings, banks with higher capital are incentivized to protect their equity by taking less risk. Furthermore, higher concentration and capital build-ups might effectively establish entry barriers for market participants, further improving the earnings of the incumbent banks (Tran, Nguyen & Nguyen, 2022). Increasing capital may reduce the stability of banking systems. More capital can increase investment risk and instability (Mehran & Thakor, 2011). In a highly competitive market, the entrance of new players will result in a decrease in interest rates and interest margins. Some banks may even earn negative margins hence decreasing their profit level and diminishing their reserve for non-performing loans. As a consequence, the risk of bank failure increases (Bustaman et al., 2017).

Large banks in concentrated markets receive subsidies from policymakers through 'too-big-to-fail' or 'too-important-to-fail' schemes which alter their risk-taking motives and induce them to take extra risk, thus intensifying their fragility. Stricter capital requirements are essential in ensuring that banks can obtain adequate liquidity and sustain unplanned losses (Tran, Nguyen & Nguyen, 2022).

Although concentration is not a decent measure of competition, a higher concentration can, to some extent, infer higher market power and less competition; thus, banks do not have to keep high capital. As capital increases,

banks in a concentrated market should have more incentives to protect the capital and involve fewer risk-taking activities (equity-at-risk effect) (Mehran & Thakor, 2011). Market competition can affect a bank's interest margin which is part of the bank's profits (Bustaman et al., 2017). Martinez-Miera and Repullo (2010) noted that an increase in banking competition will result in fluctuations in interest margin. This can affect the stability of the banks towards the two dimensions of the relationship between bank competition and stability in different directions.

The relevance of the hypothesis to the study is highlighted by Beck, De Jonghe and Schepens (2022) who observed that increases in competition impact banks' risk-taking incentives, resulting in homogeneity in revenue structures and generous deposit insurance. This essentially means that competition tends to increase the likelihood of fragility in the banking sector and from the uniformity in the revenue structures, there is bound to generate the focus on deposit insurance to pre-empt any impending fragility.

2.2.5 Agency Theory

The theory was advanced by Jensen and Meckling, (1976) as a dominant framework underpinning corporate governance. Agency theory was advanced to address the growing concern in the firm where the management is perceived to be engaged in building an empire while having a general disregard for the shareholder interest. Thus, the theory seeks to prescribe how the principal controls the agent by curbing managerial self-interest and opportunism (Daily *et al.*, 2021).

Agency theory is founded on several assumptions about the human person itself and this significantly contributed to its development (Davis *et al.*, 1997). The theory was originally believed to have been based on the economic model of man, however, Jensen and Meckling, (1976) argued that the theory was founded on the Resourceful, Evaluative, Maximizing Model (REMM) which closely models human action in totality and tend to reflect the spectrum of

human behaviour which cover the economic model of man (Jensen *et al.,* 1994).

Diversification may benefit managers because of the power and prestige associated with managing a larger firm [Jensen (1986), because managerial compensation is related to firm size [Jensen & Murphy, 1990), diversification helps make the manager indispensable to the firm (Denis, Denis & Sarin, 1997).

Due to this situation, the modern firm is reduced to a nexus of contracts between parties involved and the separation of control and ownership (Jensen *et al.,* 1976). The modern corporation as used in agency theory is founded in the advancement that occurred in the mid-20th Century, where the firms grew in size and complexity and requires the injection of external capital. This, combined with an increased evolution of the financial market, introduced limits to managerial wealth and the need for an efficient risk allocation mechanism (Demsetz*et al.*, 1997), meaning that companies had diffused ownership from different shareholders.

The theory was later expanded in the 1980s to cover matters relating to managerial capitalism where the firm's management is considered as agents of the principal shareholders of the company (Zajac *et al.,* 2018). Accordingly, Prendergast, (2019) notes the imperfect contracting which obscures the observation of true effort and as such causes the hidden action of asymmetry in information distribution which encourages moral hazard.

The charter value view of banking sees banking as choosing the risk of its asset portfolio. Bank owners, however, have incentives to shift risks to depositors, as in a world of limited liability they only participate in the upside part of this risk-taking (Beck, 2019). In addition, in a more competitive environment, banks earn fewer informational rents from their relationship with borrowers, reducing their incentives to properly screen borrowers, again increasing the risk of fragility (Allen and Gale, 2018). Models that would predict deregulation would lead to more entry with the resultant increase in fragility.

Through this alignment in approach, the market reacted positively, and with time the agency theory was institutionalized in corporate governance issues, media, research and business education (Shapiro, 2020). Thus, the two views grew into closely related directions of research; the practice-oriented positive agency and the complex principal-agent axis (Shapiro 2020). They, however, have a common objective of primacy of the shareholder, where the principal is the residual claimant and principal stakeholder.

Tourish *et al.,* (2010) treat the views as equals and therefore questioned the differences between these two models. Their arguments are founded on the fact that the REMM, although acceptance of wealth may not be the only single goal, and therefore the agent may substitute goods for monetary rewards (Baker *et al.,* 1988). The situation where the shareholders are willing to shoulder the risk but lack the time and interest to participate in the management (Brealey *et al.,* 2019), saw the creation of a contractual relationship where an agent manages the risk and controls the firm, while the principal is the risk bearer, owner and the residual claimant as managers, after reaching a certain mandatory profit level, pursue other objectives than pure profit maximization such as empire-building (Koetter & Vins, 2019).

Given this arrangement where ownership and control are separated and the differing risk profiles of the parties, it is therefore not to be expected that risk-averse managers will act in the interest of principals. According to Bonazzi and Islam (2007), the three managerial challenges that introduce a conflict of interest include; the differential risk exposure, the choice of effort, and the differential time horizon. The agency problem, therefore, assumes the divergent goals of the collaborating parties, that is, the manager and the residual claimant (Hendriksen, 2021), which inevitably leads to the increased incentive for moral hazard and opportunistic behaviour (Demsetz*et al.,* 1985).

At the core of agency theory is the moral hazard which denotes hidden action or opportunistic behaviour (Hendriksen, 2021). While hidden action connotes the information asymmetry between the agent and the principal, opportunistic

behaviour denotes the human inclination, and moral hazard is the combination of the definitions given by both the two terms and tends to describe the apparent conflict of interest (Hendriksen, 2021) and refers to the agent's actual actions during contractual relations. Adverse selection is similar to moral hazard but focuses on the pre-contractual areas where opportunistic behaviour is prevalent.

Thus, a self-interested agent will shirk the contractual obligations and act not following the principal's interest (Hendriksen 2021). Moral hazard is associated with the administration of the contract as provided for in contracting, transacting, and informational costs which may be referred to as agency costs (Gomez-Mejia *et al.*, 2020). The amount of costs involved depend on the principal's ability to find appropriate mechanisms that can help reduce information asymmetries and may include the measurement of managerial performance, determination of the effectiveness of managerial incentives, implementation of policies and regulations that will limit undesired behaviours and/or moral hazard (Zajac & Westphal, 1994).

It is practically impossible to achieve zero agency costs but the marginal costs involved will, in the long – term be less than the benefits of perfect alignment (Jensen and Meckling 1976) but these costs can be minimised through monitoring and incentives (Shapiro, 2020). It is empirically impossible to accurately calculate the agency costs, but the conceptual presence of these costs is what leads to the prescriptive measures (Daily *et al.*, 2021).

The willingness of the principal of the banking sector to absorb higher risk is worsened, by the shortcomings that deposits are insured (DI). This presence of deposit insurance tends to reduce the interest of financiers and depositors in monitoring the management, thereby lessening the likelihood of asset expropriation at the expense of taxpayers and depositors (Hellman *et al.*, 2021).

Thus, debt holders can effectively hold a put option on their deposits, and exercise their put option when asset prices are low. Income diversification may increase agency problems between corporate insiders and small shareholders,

and dilutes the comparative advantages of bank management by making managers operate outside their expertise. In addition, it may increase the volatility of revenues, therefore profit and can exaggerate costs and consequences for banks that try unsuccessfully to enter a new sector of an increasingly competitive market (Moudud-Ul-Huq, 2019).

Shareholder primacy may indeed conflict with the role of the owners of the banking firms. Adams *et al.,* (2021) argue that any stakeholders of a banking corporation should be prepared well in advance as his/her shareholding will extend beyond the normal roles of shareholding, in those other stakeholders such as the creditors, the depositors, and the government are all interested in the financial well-being of the firm and the overall financial system. Thus, the wealth maximization model inherently conflicts with a supposedly fundamental view of the stakeholder, a situation which leads to increased risk-taking (Tourish *et al.*, 2010).

The most recent developments in the theory have sought to extend the application and its domains by seeking to include the provision of private information to an array of agents and principals with different objectives (Eldenburg and Krishnan, 2021). The optimality of monitoring and controlling the selection aspect of the agency theory provides a basis from which various stakeholders including managers and owners with specific models for contractual agreements in different situations and in that case, avail control mechanism for each unique case. The theory has also been criticized for not ignoring the impact of work culture and ethics in its foundations. Different nationalities and communities hold different work cultures and ethics which may preclude the assumption of including shirking attitudes, work aversion and self–interest behaviours into the theoretical premises. Further, the emergence of empirical research has re-evaluated the different concerns and enhanced the existing knowledge (Demski *et al.*, 2019).

The fundamental prescriptions of the theory also regard the firm's board composition and the degree of insider vs. outsider directorship (Bonazzi *et al.,*

2007). This has sought to provide for an objective view of the principal–agent relationships (Bonazzi *et al.*, 2007), and to ensure a reduction in the conflict of interest between the parties (Raheja, 2020). Inside directors may be more inclined to side with the firm's top manager and this may undermine monitoring effectiveness in that insiders will be unable to make objective decisions (Chhaochharia and Grinstein, 2019). Thus, outside directors help to diminish the private benefits of managerial independence and thus improve monitoring ability (Raheja 2020).

Board effectiveness is also influenced by the board size (Linck *et al.*, 2019). Thus, optimal board size is more of a trade-off between the resources and knowledge from larger boards with more effectiveness in communication and coordination from smaller boards (De Andres & Vallelado, 2019). Further, managerial influence and free-riding are minimal in smaller boards (Mak & Li, 2019) while larger boards are less inclined to handle the risks involved and less aligned with shareholders (Raheja 2020).

2.3 Empirical Review

Several authors have examined the volatility in earnings of commercial banks in several contexts including the US (Kasman & Kasman, 2016; Jin, Kanagaretnam & Liu, 2018), the UK (Moutsianas & Kosmidou, 2016), Europe (Bitar, Madies & Taramasco, 2017), Turkey (Kasman & Kirbas-Kasman, 2016), Indonesia (Damayanty & Murwaningsari, 2020), Iran (Shahchera & Noorbakhsh, 2017), Pakistan (Ismail et al., 2018), Bangladesh (Ghosh, Khatun &Tarafdar, 2018) and Nigeria (Chukwuani, 2021) among others. These studies show that earnings volatility in commercial banks is attributable to several factors including income diversification (DeYoung & Roland, 2016), size (De Haan& Poghosyan, 2015; Chukwuani, 2021); market concentration (Kasman and Kirbas-Kasman, 2016) and other internal facets such a loan loss provision (Chukwuani, 2021; Damayanty & Murwaningsari, 2020) among other factors.

2.3.1 Firm Size and Earnings Volatility

Empirical studies have examined the effect of firm size on earnings volatility from varied perspectives based on the existence of linkages between firm size and income volatility. The first line of studies used the dynamic view of earnings and linked bank size to income volatility in the UK (Moutsianas & Kosmidou, 2016), the US (De Haan & Poghosyan, 2018), Iran (Elyasiani & Jia, 2019) among others. The studies used panel regression techniques on different classes of banks; investment banks in UK and Commercial bank holding companies in the US and came up with contrasting findings. Size plays a crucial role; while small and midsize banks experience cost-scale economies, the largest universal banks do not. Larger banks do not benefit substantially from economies of scale or product diversification (Curi, Lozano-Vivas & Zelenyuk, 2018).

De Haan and Poghosyan (2019) evaluated the effect of bank size on earnings volatility using quarterly data of bank holding companies in the US. The findings indicated that bank size is non-linearly related to earnings volatility with the size threshold of US$5 billion assets. Within the same context, De Haan and Poghosyan (2018) examined the impact of bank size and the degree of market concentration on the earnings volatility of commercial banks in the US. The findings indicated that the firm size is negatively linked to earning volatility which decreases with market concentration. Elyasiani and Jia (2019) examined the impact of the financial crisis on the earnings volatility of commercial banks in the US. The findings indicated that bank size increases the earnings volatility of big banks but has no effect on small banks. These findings indicate the direct linear relationship between bank size and earnings volatility and therefore supports the study proportion that bank size is directly related to earnings volatility.

De Haan and Poghosyan (2018) evaluated the impact of the bank size and the degree of market concentration on the earnings volatility of commercial banking in the US. The study observed that firm size is linked to earning

volatility. Moutsianas and Kosmidou (2016) examined the effects of bank size on the volatility of the earnings of investment banks in the UK, the study utilized panel data analysis on 52 investment banks and the findings indicated that earnings volatility is correlated to bank size. Kasman and Kirbas-Kasman (2016) evaluated the linkages between bank size, concentration, and earnings volatility of the commercial banking industry in Turkey using the Granger-causality test. The findings indicated that firm size negatively correlated with earnings volatility. These findings indicate the indirect linear non- relationship between bank size and earnings volatility and therefore does not support the study proportion that bank size is directly related to earnings volatility.

Within the UK context, Moutsianas and Kosmidou (2016) evaluated the effects of firm size on the volatility of the earnings of investment banks in the UK. The findings indicated that earnings volatility is inversely correlated to bank size. Shehzad, Scholtens and De Haan (2018) examined the impact of bank size on the earnings volatility of banks in developed and developing economies using panel regression. The findings indicated that in the wake of financial crises, large banks face lower earnings volatility than small banks. In a study on Iranian Commercial Banks, Shahchera and Noorbakhsh (2017) observed that earnings volatility negatively relates to size, therefore, bigger banks experience lower volatility in earnings when compared to smaller banks. These findings indicate the indirect linear non- relationship between bank size and earnings volatility and therefore does not support the study proportion that bank size is directly related to earnings volatility.

De Haan and Poghosyan (2019) evaluated the effect of size on earnings volatility using quarterly data of bank holding companies in the US. The findings indicated that earnings volatility is non-linearly related to bank size with the size threshold of US$5 billion assets. The study reported contrasting findings in that bank size is an important determinant of earning volatility in emerging market economies but bank size does not have an effect in developed countries.

Lee and Hsieh (2022) examined the impact of bank size on the earnings volatility of commercial banks in 42 Asian countries using the Generalized Method of Moments technique for dynamic data panels. The findings showed that investment banks have the lowest income volatility while commercial banks have the highest volatility in earnings and that bank size in low–income countries have a positive effect on earnings volatility than their counterparts in higher–income countries. In a study on Iranian Commercial Banks, Shahchera and Noorbakhsh (2017), observed that bank size is negatively related to earnings volatility; therefore, larger banks have lower earnings volatility compared to smaller banks. These findings indicate the indirect linear non-relationship between bank size and earnings volatility and therefore does not support the study proportion that bank size is directly related to earnings volatility.

In a study on Indonesian commercial banks after the Asian Financial crisis, Williams (2022) observed that the bank size as measured by the bank capital holding was positively associated with income volatility. Sun, Liu and Cao (2011) examined the effect of the bank's fair value on the income volatility of listed banks in China. The authors observed that the banks' fair value has a significant impact and induces income volatility for the listed banks, an effect that exceeds the changes in the historical cost. The increase in size has a positive effect on earnings; however, banks that become extremely large experience negative side effects due to bureaucracy and other reasons. Hence, the size-earnings relationship should be non-linear (Alexiou &Sofoklis, 2018). These findings portrays the indirect linear non- relationship between bank size and earnings volatility and therefore does not support the study proportion that bank size is directly related to earnings volatility.

Chukwuani (2021) examined the impact of bank size on the volatility of earnings among Nigeria's commercial banks. The study findings indicate that bank size positively correlated with earnings volatility. Kasman and Kirbas-Kasman (2016) evaluated the linkages between earnings volatility, concentration and bank size of the Turkish banking sector using the Granger-

causality test. The findings indicated that firm size negatively correlated with earnings volatility. These findings indicate the indirect linear non- relationship between bank size and earnings volatility and therefore does not support the study proportion that bank size is directly related to earnings volatility.

Ahamed (2019) examined the impact of the banks' size on the earnings of the Bangladesh banking market using panel regression techniques. The findings indicated that bank size has a significant positive effect on earnings. Abbas, Iqbal & Aziz (2019) comparatively examined the effect of bank size on the earnings of commercial banks of Asian developed economies and the US banking industry using panel regression modelling. The findings indicated that bank size has a negative effect on the earnings of commercial banks in Asian developed countries and the US commercial banking industry. These findings show the indirect linear non- relationship between bank size and earnings volatility and therefore does not support the study proportion that bank size is directly related to earnings volatility.

The second line of studies used the static view of earnings which takes the term earnings and link between bank size and earnings of the sector. Boahene, Dasah and Agyei (2019) examined the impact of bank size on earnings in Ghana using panel data regression. Budi and Tn, (2018) evaluated the bank size on the performance of listed commercial banks in Indonesia stock exchange using regression analysis. In Turkey, Ahmet and Hasan (2011) evaluated the impact of bank size on the earnings of commercial banks. The findings indicated that size has a positive effect on the earnings of the banks. In a study on bank-specific variables, Chen et al., (2018) observed a significant positive effect of bank size on bank – earnings.

The studies indicate mixed effects on income volatility; non-linear effects (De Haan& Poghosyan, 2019), negative effects (De Haan& Poghosyan, 2015; Moutsianas & Kosmidou, 2016) and positive effects (Elyasiani& Jia, 2019). Whereas, the positive effects increase volatility, inverse and negative effects tend to reduce volatility. On the static measure of earnings, the studies indicate

that the bank size positively correlates with earnings such that an increase in the bank assets tends to increase the earnings measures of return on equity. The interpretation is that in general increase in assets tends to increase earnings, thus reducing the volatility in the earnings. The studies therefore affirm the positive effect on earnings measures but a negative effect on earnings volatility depending on the size of the banks as affirmed by De Haan and Poghosyan (2019).

The foregone review shows the empirical gaps in studies on the performance of commercial banks in Kenya. First, most empirical studies in developed economies of the European Union and emerging markets such as Malaysia and Philippines and Tunisia have shown that banks specific facets explain the substantial variation of earnings in the country's banking sector (Naceur, 2021). The review of the literature reveals the existence of many gaps of knowledge in respect of the factors affecting bank earnings, particularly in the context of Kenya

Vong and Chan, (2018) asserted that the firm-specific factors are drawn from the management decisions and thus they can be considered to be proxies to the measures of the managerial decisions. Among Greek banks, firm size positively and significantly determines firm performance (Kosmidou, 2019). Dalla, (2016) concluded that bank size explains the level of asset quality in commercial banks in Kenya.

2.3.2 Financial Leverage and Earnings Volatility

The empirical studies examining the effect of leverage on the earnings volatility of the banking industry have used different context measures, methodologies and perspectives based on the existence of linkages between leverage and income volatility. The studies have operationalized financial leverage in various ways such as capital adequacy measures (Million, Matewos and Sujata, 2015; Acosta Smith, Grill and Lang, 2018), risk-based capital ratios or capital–to–asset ratios (Goddard, Molyeux & Wilson, 2004; Abbas & Ali, 2020; Tan and Floros, 2011), non-risk-based capital ratio or equity- to - asset

ratio (Prabowo et al., 2018). These measures are more or less similar to the capital adequacy ratio uses being the ratio of capital to the total risk-weighted assets as opposed to equity–to–total assets as used by most studies.

The studies linking leverage ratio to earnings volatility have been carried out in various contexts. For instance, Barth and Miller (2018) examined the effect of the leverage ratio on the earnings volatility of US commercial banks. The findings indicated that lagged leverage ratio is negatively associated with earnings volatility with ensuring effect on bank crisis. Acosta Smith, Grill and Lang (2018) examined the impact of the leverage ratio of 655 EU banks using panel regression analysis. The study observed that the leverage ratio reduces earning volatility and lowers the probability of failure. Kasman and Kasman (2016) examined the earnings volatility of commercial banks in Turkey. The findings showed that highly capitalized banks tend to have lower earnings volatility in comparison to their compatriots who are less capitalized. These findings indicate the direct relationship between capitalization and earnings volatility and therefore support the study proportion that capitalization is directly related to earnings volatility.

The other studies linking leverage to earnings either indicates positive or negative impacts or has no effect on bank earnings. For instance, Budi and Tn, (2018) evaluated the leverage ratio on the earnings of listed commercial banks in Indonesia stock exchange using regression analysis. Prabowo et al., (2018) examined the effect of leverage on the earnings of commercial banks in Indonesia using regression analysis. Poudel (2019) examined the impact of leverage on the earnings of commercial banks in Nepal using panel regression. Abbas and Ali (2020) examined the influence of different levels of capital ratios on the earnings of large US commercial banks using the two-step GMM method. Though the studies used different methodologies, the findings converged and reported that leverage has a positive effect on the earnings of banks. In essence, a positive effect on earnings indicates that earnings are less volatile and this would signify a negative effect on earnings volatility.

The other set of studies reporting the negative effects of leverage on earnings include Million, Matewos and Sujata (2018) who examined the effect of leverage on the earnings of commercial banks in Ethiopia using panel regression. The study used capital adequacy to measure leverage and the findings indicated that leverage ratios have a negative impact on earnings. Hosna, Manzura and Juanjuan (2018) evaluated the impact of the leverage ratio as measured by the capital adequacy on the earnings of commercial banks in Sweden. The findings showed that leverage has a significant negative effect on the earnings of commercial banks. These studies concluded that leverage as measured by the capital adequacy ratio has a negative effect on earnings which would translate to higher earnings volatility because of the inverse relationship.

In Austria, Rumler and Waschiczek (2016) examined how financial structure affects earnings of the commercial banks using dynamic panel regression methods. The findings indicated that the bank's financial structure impacts positively on its earnings volatility. Poudel (2019) examined the impact of asset quality on the earnings of commercial banks in Nepal using regression analysis. These studies used the leverage measure of the ratio of equity to asset ratio and reported a significant negative effect on the earnings while Chen et al., (2018) observed a positive effect of leverage on the earnings of commercial banks in Taiwan. These findings indicate the direct relationship between leveraging ratios and earnings volatility and therefore support the study proportion that leveraging ratios is directly related to earnings volatility.

However, in China, Tan and Floros (2011) examined the state of earnings in Chinese state banks using the GMM method. The study used the leverage measure of non-risk-based capital ratios, that is the equity-to-asset ratio and the findings showed that the leverage ratio has no effect the earnings. The studies reporting a negative effect of leverage measure of equity–to–asset ratio on earnings would translate to higher earnings volatility because of the inverse relationship. These studies observed that due to bank deregulation, the equity-to – asset ratio has a negative effect on earnings volatility for the private

commercial banks, while heavily regulated banking industry in China do not indicate any relationship between leverage ratios and earnings volatility.

Abbas, Iqbal & Aziz (2019) comparatively examined the effect of leverage on the earnings of commercial banks of Asian developed economies and the US banking industry using panel regression modelling. The study measured leverage as a non-risk-based capital ratio and the findings indicated that capitalization has a positive influence on the earnings of commercial banks in the Asian developed countries and the US commercial banking industry. These findings indicate the direct relationship between capitalization and earnings volatility and therefore support the study proportion that capitalization is directly related to earnings volatility.

Goddard, Molyeux and Wilson (2018) examined the impact of the leverage measure of the capital-to-asset ratio as a determinant of the earnings of European banks. The findings showed a positive relationship between the capital-to-asset ratio and earnings. Pfeifer et al., (2017) examined the impact of the introduction of the leverage ratio under the Basel II framework. The study reported that leverage is significantly associated with capital and both are closely linked to bank earnings. These studies show that capital – to – asset ratio associates positively with earnings and thus indicated a direct relationship which translates to reduced earnings volatility.

Ahamed (2019) examined the impact of bank capitalization on the earnings of the Bangladesh banking market using panel regression techniques. The findings indicated that capitalization has a significant positive effect on earnings. Abbas, Iqbal & Aziz (2019) comparatively examined the effect of capitalization on the earnings of commercial banks of Asian developed economies and the US banking industry using panel regression modelling. The findings indicated that capitalization influences the earnings of commercial banks in both Asian developed economies and US commercial banks. These findings indicate the direct relationship between capitalization and earnings

volatility and therefore support the study proportion that capitalization is directly related to earnings volatility.

Islam and Nishiyama (2016) examined the impact of capitalization ratios on the earnings of South Asian commercial banks. The findings observed that capitalization has a positive impact on bank earnings. Tran et al., (2016) evaluated the impact of capitalization on the performance of commercial banks and conclude that capitalization and performance hold a non-linear relationship, such that capitalization inversely correlates with the earnings of larger banks while being directly and positively related to earnings in smaller banks. In a study carried out on the capitalization and earnings of commercial banks in Asian countries, Lee and Hsieh (2022) used regression analysis to evaluate the relationship. The findings indicated that capitalization is positively correlated with bank earnings. These findings indicate the direct relationship between capitalization and earnings volatility and therefore support the study proportion that capitalization is directly related to earnings volatility.

The findings provide a clear illustration that leverage has varied effects on earnings volatility. The capitalization ratio (Budi and Tn, 2018; Prabowo et al., 2018; Abbas & Ali, 2020) has a negative effect on earnings volatility thus it reduces volatility while the capital adequacy ratios (Million, Matewos and Sujata, 2015; Hosna, Manzura & Juanjuan, 2018) has a positive effect on earnings volatility thus it would increase volatility in earnings, while the equity- to – total asset ratio has a positive effect on earnings volatility that it would increase volatility. These findings provide a contrasting view on the nature of the relationship between capitalization and earnings volatility and therefore provide support to the study proportion that capitalization is directly related to earnings volatility.

2.3.3 Liquidity and Earnings Volatility

The studies evaluating the effect of liquidity on earnings volatility are few and include the study by Chen et al., (2018) which evaluated the impact of liquidity risk on earnings volatility of commercial banks in Taiwan. The findings

indicated that liquidity risk as measured by the ratio of risky liquid assets to total assets has a significant positive effect on earnings volatility. Iqbal et al., (2018) examined the impact of liquidity risk on the banking sector in Pakistan using regression analysis. The findings indicate that liquidity risk is linked to earning volatility. These studies in different context have convergence in findings indicating that liquidity risk has a positive effect on earnings volatility thus increase in liquidity risk increase earnings volatility.

In Pakistan, Khan and Ali (2016) examined the relationship between liquidity risk and earnings in commercial banks in Pakistan. Khasharmeh (2018) examined the impact of liquidity on the earnings of Islamic banks in Bahrain. In Africa, Muriithi and Waweru (2017) examined the effect of liquidity risk on the financial performance of commercial banks in Kenya. These findings indicated liquidity was positively related to bank volatility while Gwatiringa (2020) evaluated the earnings volatility of the banking sector in Zimbabwe. The findings indicated that the liquidity measure of loans to total deposits has a significant positive effect on earnings volatility. The positive effect on earnings implies a direct relationship and therefore stability in the earnings and thus signifies reduce earnings volatility.

In related studies, numerous empirical studies have examined the impact of liquidity ratio on bank earnings. Whereas many studies found a direct positive relationship between a bank's liquidity ratio and earnings volatility (Hakimi & Zaghdoudi, 2017; Titko, Skvarciany & Jurevičienė, 2015; Khati, 2020; Khan and Ali, 2016; Khasharmeh, 2018; Rijal, 2019; Budi and Tn, 2018; Prabowo et al., 2018; Muriithi & Waweru 2017) among others. However, the counterarguments that excess liquidity is accompanied by high storage costs and lower returns suggest that while liquid assets could decrease liquidity risk, they could carry high costs that positively influences on earnings volatility (Mamatzakis & Bermpei, 2014).

The other set of studies has linked liquidity risk to earnings with numerous authors reporting that negative effect on earnings due to the misallocation of

resources (Hakimi & Zaghdoudi, 2017). The liquidity measures include funding liquidity risk (Marozva, 2018), a risky asset to total asset (Chowdhury & Zaman, 2018), and credit risk (JaraBertin et al., 2014; Parvin, 2021) among other measures. Mohammad et al., (2020) comparatively evaluated the liquidity risk of both conventional and hybrid banks in Pakistan and findings indicated that Islamic banks are more exposed to liquidity risk than conventional and hybrid banks. Tan and Floros (2011) examined the earnings volatility in Chinese state banks using the GMM method. The findings indicated that liquidity risk is linearly related to volatility in earnings. JaraBertin et al., (2014) also confirm the negative relationship as they find that earnings volatility negatively relates to credit risk, liquidity risk and operational inefficiencies. The study observed that liquidity has a significant negative effect on earnings volatility. The indicative inverse relationship between liquidity risk and earnings implies the likelihood of variability in the profits and thus liquidity risk tends to increase the earnings volatility.

In sub-Saharan Africa, Hakimi and Zaghdoudi (2017) examined the relationship between liquidity risk and variability in earnings of commercial banks in Tunisia while Marozva (2018) examined the relationship between liquidity risk and earnings volatility for South African Banks using Autoregressive Distributed Lag (ARDL) method. Alemu (2018) examined the performance of commercial banks in Ethiopia and established that liquidity negatively impacted earnings. The studies that used the liquidity measures of loans to current liabilities (deposits) have tended to report positive effects on variability in earnings despite the varied contexts and the use of panel regression analysis as the main analytical tool.

In Kenya, Musiega et al., (2017) and Muriithi and Waweru (2017) examined the impact of liquidity risk on the variability in earnings of the commercial banks. The findings indicated that liquidity risk has a positive effect on earnings volatility. These studies from varied contexts have convergence in the findings that liquidity, as measured by funding risk, credit risks and the ratio of risk assets to total assets has a significant negative effect on the volatility

measures. This then would translate to an inverse relationship between and would indicate a positive effect on earnings volatility as the liquidity risk would increase the volatility in earnings.

On the converse, Ali and Jameel (2019) examined the role of liquidity management in the earnings of commercial banks listed in the Iraq Stock Exchange, while Shrestha (2018) examined the liquidity and its associated impacts on earnings volatility in Nepal. The findings indicated that liquidity management does not significantly impact on earnings volatility. Empirical literature reveals that there are mixed results of both negative and positive relationships between liquidity risk and the earnings volatility, with studies reporting contrasting relationship between liquidity risk and earnings volatility.

Abbas, Iqbal & Aziz (2019) comparatively examined the effect of bank liquidity levels on the earnings volatility of commercial banks of Asian developed economies and the US banking industry using panel regression modelling. The study used Liquid Assets to Total Assets as a measure for liquidity levels and the findings indicated that bank liquidity level has a positive effect on earnings volatility of the commercial banks in Asian developed economies but has negative effect on the US commercial banking industry. Ahamed (2019) examined the impact of liquidity on the earnings of the Bangladesh banking market using panel regression techniques. The findings indicated that liquidity has a significant positive effect on earnings volatility.

Islam and Nishiyama (2016) examined the influence of liquidity, as measured by total loans to total deposit ratio on earnings using panel regression. The findings observed that liquidity has a positive impact on earnings volatility. Tran et al., (2016) evaluated the effect of the liquidity levels and observed that banks which create higher liquidity tend to earn lower profits, thus, liquidity management is needed to earn higher profits. Goddard et al., (2022) examined the relationship between liquidity and bank performance and the study observed a negative relationship between liquidity and performance. Banks

which hold a higher amount of liquid assets generate greater volatility in earnings, thus highly liquid assets reduce the illiquidity and financing costs of banks.

The studies report contrasting effects on income volatility; positive effects of liquidity risk (Chen et al., 2018; Iqbal et al., 2015; Khasharmeh, 2018; Gwatiringa, 2020), negative effects of liquidity ratio (Hakimi & Zaghdoudi, 2017; Titko, Skvarciany & Jurevičienė, 2015; Khati, 2020; Khan and Ali, 2016; Khasharmeh, 2018; Rijal, 2019) among others), the negative effects of loan to current liabilities (deposits) (Prabowo et al., 2018; Budi and Tn, 2018). Whereas the positive effects increase volatility, negative effects tend to reduce volatility. The interpretation is that a general increase in risky assets tends to increase the volatility in earnings.

2.3.4 Asset Quality and Earnings Volatility

The empirical studies detailed the effect of asset quality on earnings volatility in varied contexts using similar measures of asset quality that is the loan loss provision. In Indonesia, Damayanty and Murwaningsari (2020) examined the earnings volatility of the listed commercial banks. Abebaw and Depaack (2011) examined the effect of asset quality on the income volatility of commercial banks in Ethiopia. In Nigeria, Ajekwe, Ibiamke and Silas, (2017) observed that loan loss provision is associated with earnings volatility of the commercial banks listed in the Nigerian Stock Exchange. The studies reported that increase in loan loss provision increases the earnings volatility.

Within the same context, Kolapo, Ayeni and Oke (2019) evaluated the effect of asset quality on the earnings volatility of commercial banks in Nigeria using panel data. These findings indicated that asset quality has a statistically significant positive impact on earnings volatility. The findings show that loan loss provision as the measure of the asset quality has a positive effect on earnings volatility and this direct relationship indicates that an increase in the loan loss provision has a commensurate increase in earnings volatility. In a study on the Indonesian listed banking industry, Damayanty and

Murwaningsari (2020) examined the earnings volatility of commercial banks. The study findings indicated that earnings volatility significantly correlates with loan provisions.

The related studies examine the effect of asset quality on the earnings of commercial banks and have contrasting findings. For instance, the studies carried out in developed economies show that asset quality has a positive impact on bank earnings. Abbas and Ali (2020) examined the influence of different levels of asset quality on the earnings of large US commercial banks using the two-step GMM method. Titko, Skvarciany and Jurevičienė (2018) examined the determinants of bank earnings in Lithuania and Estonia using regression analysis. Both studies reported similar positive effects of asset quality on earnings although the latter used the measure of provisions to total assets while the former used loan loss allowances to gross loans measure. The indications from these findings are that asset quality has a negative effect in that increase in asset quality tends to stabilize earnings and thus reduce the earnings volatility

The other set of studies reported a negative effect of asset quality measures on earnings. Hosna, Manzura and Juanjuan (2018) examined the impact of asset quality on the earnings of commercial banks in Sweden. The study observed that asset quality directly impacts bank earnings while Capraru and Ihnatov (2018) examined the determinants of bank earnings of the EU15 banking system using cross-country panel data. Both studies used the asset quality measure of non – performing loans and the findings showed that asset quality measure has a negative effect on earnings volatility.

In Nepal, Gnawali (2018) examined the impact of the quality of assets on the earnings of commercial banks using the ratio of non – performing loans as a measure of asset quality. Abubakar (2018) used the same measure of loan loss provision to evaluate the performance of Malaysian banks. In a study carried out on commercial banks in Middle Eastern Countries, El-Chaarani and El-Abiad (2019) examined the impact of earnings on earnings quality. Islam and

Nishiyama (2016) examined the influence of asset quality, as measured by non-performing loans to total loans ratio on the earnings of South Asian commercial banks using panel regression. The findings observed that non – performing loan ratio has a negative impact on earnings volatility.

In Ethiopia, Ayele (2019); Million, Matewos and Sujata (2018) and Elshaday, Kenenisa & Mohammed (2018) examined the effect of asset quality on the earnings of commercial banks while in Nigeria, Ogboi and Unuafe (2022) examined the impact of asset quality on the earnings of commercial banks in Nigeria using a panel regression. The studies reported a negative effect of loan loss provisions on earnings and this implies an inverted relationship between the variables. The inverse relation translates to variations in the earnings which translate to an increase in earnings volatility.

Abbas, Iqbal & Aziz (2019) comparatively examined the effect of credit risk on the earnings of commercial banks of Asian developed economies and the US banking industry using panel regression modelling. The study measured credit risk as the ratio of Loan Loss Provisions to Risky Loans Ratio and the findings indicated that credit risk has a positive influence on the earnings of the commercial banks in the Asian developed countries and the US commercial banking industry.

Ozili (2018) evaluated the impact of credit risk on the earnings of commercial banks in Nigeria. Based on regression analysis, the study observed that credit risk has no significant effect on bank earnings. Leventis, Dimitropoulos and Anandarajan (2011) examined the quality of assets of listed commercial banks in the Eurozone economy. The findings indicated that loan loss provisions have a significant negative effect on earnings. Larger banks tend to have scope economies in terms of loan facilities (Zaman, 2011); however, this component adversely affects earnings (Vong& Chan, 2018).

The empirical results shows that credit risk influences the portfolio of loans, and a decrease in the quality of lending causes an increase in the non-performing loans and earnings of banks. Dietrich and Wanzenried (2011)

evaluated the effect of asset quality on the earnings of commercial banks in Germany. The study measured asset quality using credit risk and based on regression analysis, the findings indicated that credit risk has a significant negative relationship with bank earnings. Ongore and Kusa (2013) examined the influence of asset quality on the earnings of commercial banks in Kenya. The study measured asset quality using credit risk and based on regression analysis, the findings indicated that credit risk has a significant negative relationship with bank earnings.

2.3.5 Income Diversification and Earnings Volatility

The empirical studies examining the status of income diversification show that income diversification in the banking industry varies in different contexts. For instance, in Africa, Damankah, Anku-Tsede & Amankwaa (2018) examined the income sources of the commercial banks in Ghana. The findings indicated that interest income constitutes the largest proportion of the bank earnings; however, non–interest income is gaining prominence. Among US bank holding companies. Tran (2020) examined the association between liquidity creation and income diversification using panel data. The findings indicated that liquidity creation is negatively associated with income diversification. Further, large banks tend to be more diversified than their smaller compatriots. In India, Trivedi (2018) carried out a comparative analysis of income diversification among banks in India and the findings indicated that private and foreign banks are more successful in income diversification strategies than the public sector banks.

The studies on US commercial banking industry include DeYoung and Roland (2016) whose findings indicated that earnings volatility is attributable to income diversification as the banks tilt their product mix toward fee-based activities and away from traditional lending activities. Jin, Kanagaretnam & Liu (2018) examined the impact of the ratio of deposits to liabilities on the earnings volatility among US companies. The study findings indicated that the core deposit to liabilities ratio is negatively associated with earnings volatility.

In Pakistan, Ismail et al., (2018) examined the earnings volatility of commercial banking sector in Pakistan. The finding indicated that income diversification positively impacts on earnings volatility.

Next, the studies examining the effect of income diversification on earnings volatility are in various contexts using similar measures of income diversification that is the ratio of non-interest income (commission, fees and exchange incomes) to total bank's income. Busch and Kick (2018) examined the impact of interest income on the earnings volatility of different types of banks in Germany. The findings indicate that interest income positively affects earnings volatility. Further, commercial banks face higher volatility in earnings due to their diversification efforts than cooperative and savings banks. In Indonesia, Damayanty and Murwaningsari (2020) examined the earnings volatility of the listed commercial banks.

In Pakistan, Ismail et al., (2018) examined the earnings volatility of commercial banks in Pakistan. Kiweu (2019) examined the impact of income diversification among commercial banks in Kenya. The studies reported that income diversification has a significant positive effect on earnings volatility. However, in Australia, Edirisuriya, Gunasekarage & Dempsey (2018) examined the impact of income diversification on risk–return profiles and volatility in earnings. The findings indicated that income diversification does not have any significant impact on earnings but rather, the banks have improved their risk–return profiles due to diversification.

Based on a survey of US commercial banks, DeYoung and Roland (2011) examined the effect of income diversification on earnings volatility using panel data regression. The study observed that these banks have various mixes of financial services products and that fee-based activities tend to increase the bank’s revenue volatility. Vallascas, Crepi and Hagendorff (2011), examined the impact of income diversification on the volatility in earnings of Italian banks during the financial crisis. Studies on the impact of revenue diversification have been carried on the US banking sector and these studies

have shown that revenue diversification has no significant benefits on earnings or earnings volatility (Curi, Lozano-Vivas & Zelenyuk, 2018). This is attributable to the fact that fee-based activities increase the volatility of bank income and that any net interest revenues and non-interest revenues are increasingly correlated.

Brunnermeier, Dong & Palia (2020) examined the impact of non-interest income on earnings volatility of US commercial banks using the difference-in-difference approach. Al-Tarawneh, Abu Khalaf and Al Assaf (2017) investigated the impact of noninterest income on the performance of banks in Jordan using panel regression analysis. The findings showed that highly diversified banks experienced increased volatility in earnings during the financial crisis. The study findings indicated that higher non-interest income tends to increase the earnings volatility of these banks.

In a study carried out in India, Trivedi (2018) carried out a comparative analysis of income diversification among banks in India using multiple regression analysis. In Tanzania, Mndeme (2018), examined the effect of the non-interest income on the earnings of commercial banks. The findings observed that non–interest income has a significant effect on the volatility of earnings among these commercial banks. Abebe (2014) examined the performance of commercial banks in Nigeria and income diversification had a negative effect on earnings volatility. The findings indicated that income diversification was negatively associated with volatility in earnings.

The set of studies detailing the effect of income diversification on earning volatility has been detailed by numerous studies. Al-Tarawneh, Abu Khalaf and Al Assaf (2017) evaluated the impact of income diversification on earnings among Jordanian banks. The findings indicated that non – interest income has a significant positive effect on the earnings of these commercial banks in Jordan. Mamatzakis & Bermpei (2014) examined the performance of the investment banks in Switzerland using stochastic frontier analysis and observed that non-interest fee – income has a positive impact on the earnings

of the investment banks. The studies were done in emerging and developing country contexts and indicate that income diversification has a direct association between income diversification and earnings and thus the indications that income diversification stabilizes earnings and reduces volatility in income.

The findings from the studies seem to indicate that income diversification has a positive effect on earnings volatility; however, the effect could be affected by the country context. The findings indicate that the effect could be related to the country–specific effects (Edirisuriya, Gunasekarage& Dempsey, 2018) or the industry effect (Al-Tarawneh, Abu Khalaf and Al Assaf, 2017; Mamatzakis & Bermpei, 2014). Non-interest income-generating activities constitute an increasingly important revenue source for many emerging banking markets (Kasman & Kasman, 2016). Income diversification tends to spread out risk among the interest-based or non-interest-based income thus reducing the overall risk involved in banking operations (Ismail et al., 2018).

Abbas et al., (2021) examined the impact of income diversification profit efficiencies of US banks using a two-step system GMM approach. The findings indicated that income diversification has a significantly positive effect on profit efficiency. Baele et al., (2007) analysed the impact of revenue diversification on bank performance of commercial banks in the Eurozone using panel regression analysis. The findings indicated that income diversification as measured by the ratio of non-interest income has a positive effect on the performance of these commercial banks. Rossi, Schwaiger, & Winkler (2018) evaluated the impact of the income diversification and earnings of Austrian banks using panel regression. The study observed a positive association between income diversification and the earnings of Austrian banks.

Elsas et al., (2010) examined the impact of non-interest income on the performance of commercial banks in the US and UK. The study reported that non-interest income has a positive effect on bank performance. In a study carried out in emerging economies, Sanya and Wolfe (2011) examined the

impact of non–interest income on bank performance using panel regression analysis. The study observed that non-interest income has a positive impact on banks' performance. Li and Zhang (2022) found that banks benefit from diversifying earnings, but earning diversification increases the risk of certain kinds of investments by the banks. Meslier, Tacneng, and Tarazi (2014) analysed the commercial banks of the Philippines covering the period from 1999 to 2005 to show that income diversification has a positive impact on banks' earnings

AlKhouri and Arouri (2019) evaluated the effect of revenue diversification on the performance and stability of conventional and Islamic banking systems in the Gulf Cooperation Council (GCC) countries. The study used the Generalized Method of Moments and compared the impact of revenue diversification based on the non–interest income. The finding indicated that non-interest income diversification has a negative impact on banks' performance.

Lepetit et al., (2019) investigated the link between product diversification and earnings volatility of the European banking industry using regression analysis. The findings indicated that banks expanding into non-interest income activities tend to present a higher risk (earnings volatility) than their comparison banks whose income is largely loan portfolio. Further, earnings volatility is linked to non–interest income elements made up of commission and fee activities which are more prevalent in small banks than large banks. However, a higher share of trading activities does not relate to higher earnings volatility.

Chiorazzo, Milani and Salvini (2019) examined the linkages between non-interest revenues (income diversification) and earnings of Italian banks using regression analysis. The findings indicated that income diversification increases risk-adjusted returns and that the relationship is stronger among large banks. Small banks gain from increasing the income (non-interest revenues) diversification based on the ability to generate non-interest income. However,

there are limits to the impact of income diversification depending on the bank size.

Hayden, Porath and Westernhagen (2007) examined the impact of diversification on the earnings of German banks. The findings indicated that portfolio diversification tends to reduce the banks' earnings and that the effect of diversification depends strongly on the risk level. Hayden et al., (2016) examined the impact of diversification on the earnings of German banks. The findings indicated that portfolio diversification has unique performance benefits since each type of diversification tends to reduce the banks' earnings and that the effect of diversification depends strongly on the risk level.

Bustaman et al., (2017) examined the impact of portfolio diversification strategy on banking stability in the banking industry of four ASEAN-4 countries (Indonesia, Malaysia, Thailand and the Philippines) using panel regression techniques. The finding indicates that pure fee-based income products help banks to increase earnings volatility even though an increase in trading activities tends to reduce stability. Edirisuriya, Gunasekarage and Dempsey (2018) examined the impact of income diversification on the bank performance of listed banks in South Asian countries. The findings indicated that these banks tend to diversify into non-interest income sources but this does not result in improved market performance.

Several studies have approached the issue from a generalized perspective, for instance, García-Herrero *et al.,* (2018) focused on capitalization and efficiency using regression models. Jaffar &Manarvi (2011) focused on earnings ability, Claessens& Van Horen (2019) evaluated the effect of asset quality, and Vong& Chan, (2018) focused on loss provision as a measure for asset quality. Kolapo *et al.,* (2019) used an exploratory study and found that poor asset quality impacts negatively the performance of the Nigerian Banks

A comparative study on banks in Pakistan indicated liquidity position and asset quality influences bank earnings (Jaffar &Manarvi, 2011). Kosmidou *et al.,* (2020) considered the capital strength of the UK banks while Lin and Zhang

(2018) used panel studies to examine the earnings of Chinese commercial banks while Kalemli-Ozcan, Sorensen & Yesiltas (2019) compared the leverage ratios of both financial and non-financial banks of the US banks before the crisis and established that an increase in leverage ratios of investment banks and financial firms. Further, Jha & Hui (2019) showed that the capitalization of Nepalese banks significantly impacts performance. Among Greek banks, Kosmidou (2019) indicated that cost-to-income ratios and capitalization impact the earnings of commercial banks.

2.3.6 Market Concentration and Earnings Volatility

Empirical studies examining the effect of market concentration on earnings volatility are drawn from different measures such as Lerner's concentration index, market share and Herfindahl-Hirschman index among others. Smolo, Ibrahim and Dewandaru (2020) examined the effect of bank concentration on the earnings volatility of commercial banks in the organization of Islamic countries (OIC) using the generalized method of moments (GMM) estimator. The findings indicated that bank concentration has a linear relationship with earnings volatility and that the relationship depends on the measurement used as a proxy for bank concentration. Shehzad, Scholtens and De Haan (2018) examined the impact of market concentration on earnings volatility during banks using panel regression. The findings indicated that less concentrated banking systems face reduced earnings volatility.

In Austria, Rumler and Waschiczek (2016) examined how financial structure affects earnings of the commercial banks using dynamic panel regression methods. The study findings indicated that higher market concentration in the banking sector had a positive effect on bank earnings. Capraru and Ihnatov (2018) examined the determinants of bank earnings in the EU15 banking system and the findings showed that market concentration had a negative influence on the measures of banks' earnings. Ariss (2010) investigated the impact of the different degrees of market power on the cost and profit efficiency levels of banks across developing countries. The findings indicated

that an increase in the degree of market power leads to greater bank stability and enhanced profit efficiency

Abreu and Mendes (2011) examine the performance of commercial banks in Portugal, Spain, France and Germany and the findings showed that equity-to-assets ratios positively determine earnings. Tan and Floros (2011) examined the state of earnings in Chinese state banks using the GMM method. The findings showed that market concentration has a significant negative effect with bank earnings. Etale, Bingilar & Ifurueze (2016) examined the impact of market concentration on the earnings of the banking sector in Nigeria. The study measured market share using deposits and loans and the findings indicated that market share positively correlated with earnings.

Kasman and Kirbas-Kasman (2016) evaluated the linkages between earnings volatility, concentration and bank size of the Turkish banking sector using the Granger-causality test. The findings indicated that concentration and firm size negatively correlated with earnings volatility. Chen et al., (2018) evaluated the impact of market concentration on the earnings of commercial banks in Taiwan. The findings indicate that concentration is significantly negatively correlated with earnings. Genchev (2019) examined the effect of market concentration on the earnings of commercial banks in Bulgaria. The study measured concentration using market share and the finding showed that market share has a significant positive effect on the earnings of the commercial banks.

Al Arif and Awwaliyah (2019) examined the impact of market concentration on the earnings of the banking sector in Indonesia. The study measured market share using market share and concentration ratio and the findings indicated that market concentration does not have any effect on earnings. Ahamed (2019) examined the impact of the market concentration on the earnings of the Bangladesh banking industry using panel regression techniques. The findings indicated that concentration has a significant positive effect on earnings. Zhang et al., (2022) examined the impact of the market concentration on the earnings of commercial banks in Singapore using panel regression techniques. The

findings indicated that market concentration is negatively linked to bank performance.

Tran, Nguyen & Nguyen (2022) examined the effect of market concentration on bank performance using a database drawn from 133 emerging economies. The study measured market concentration as the proportion of total assets of the three largest banks divided by the total assets of all commercial banks in a country. The findings indicated that banks operating in more concentrated banking markets tend to outperform their compatriots in less concentrated markets. Bustaman et al., (2017) examined the impact of portfolio diversification strategy on banking stability in the banking industry of four ASEAN-4 countries (Indonesia, Malaysia, Thailand and the Philippines) using panel regression techniques. The finding indicates that an increase in market power tends to increase banking stability.

Belayneh (2011) examined the impact of market concentration on the earnings of commercial banks in Ethiopia using panel regression. The estimation results of his study show that all bank-specific determinants, except saving deposits, significantly affect commercial banks' earnings in Ethiopia. Market concentration is also a significant determining factor of earnings and earnings.

In a study carried out in Nigeria, Bello and Isola (2014) examined the impact of market concentration on bank earnings using panel regression. The study measured market concentration using market share and Herfindahl-Hirschman index and the findings indicated that market concentration measures positively correlated with earnings. Bhatti and Hussain (2010) examined the relationship between market concentration and performance in the Pakistani banking sector using panel regression techniques. The findings indicated that market concentration was positively related to earnings and therefore, market concentration determines earnings. Chirwa (2018) investigated the relationship between market concentration and earnings of commercial banks in Malawi using error-correction models. The findings indicate that market concentration has a long-run relationship with earnings.

The empirical literature has indicated that the banks' specific factors have focused on the impact of internal factors on earnings (Jha & Hui, 2012; Jaffar & Manarvi, 2011), performance while others have measured the variability in the performance measures as earnings volatility (Kosmidou *et al.,* 2012. Chan et al., (2018) found that market share is positively related to earnings when efficiency is controlled for concentration is usually negatively related to profit.

2.4 Conceptual Framework

A conceptual framework defines the research problem and guides the subsequent discussions on the research topic. It provides an approach to the strategies to be used by the study (Depoy & Gitlin, 2011).

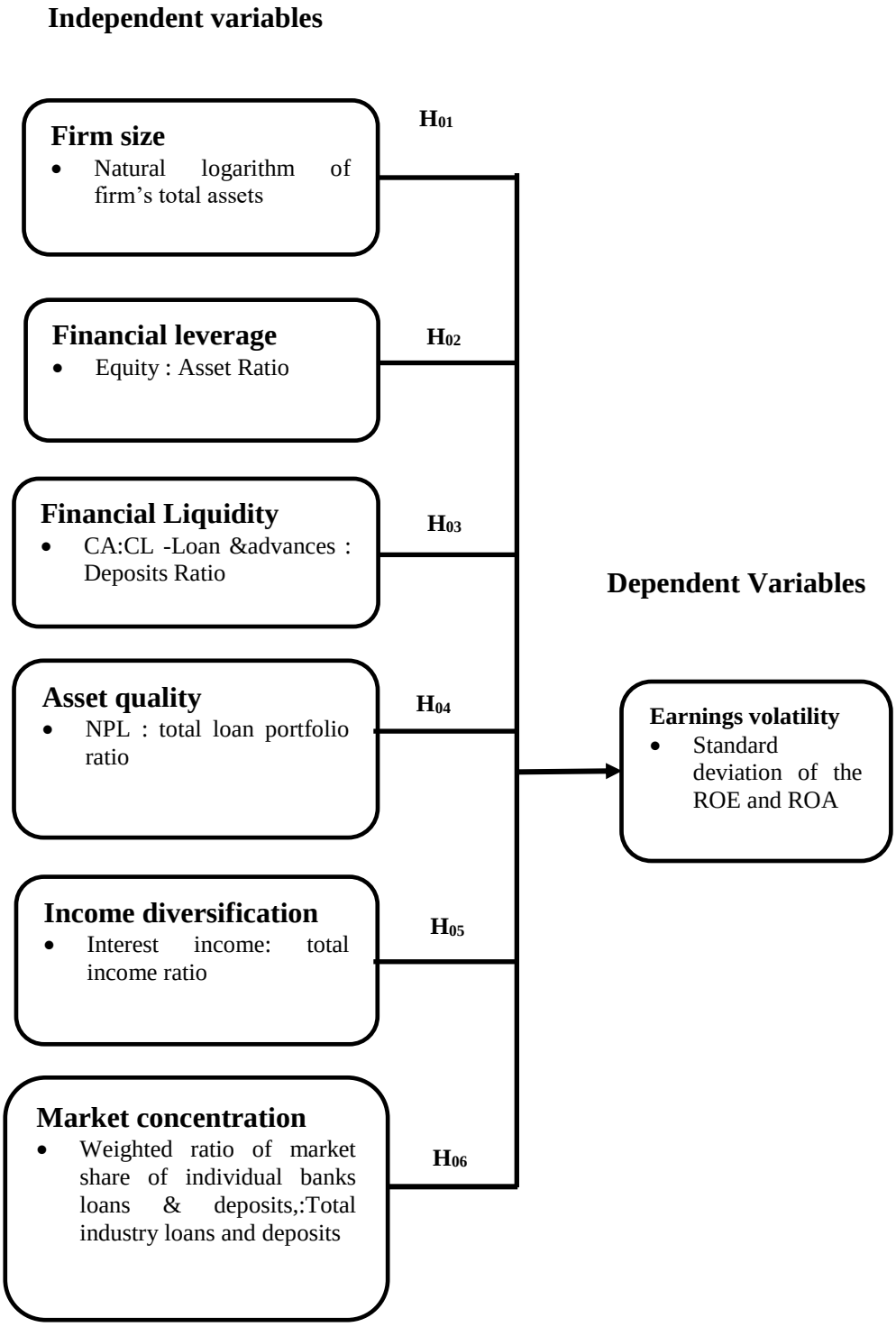

Figure 2.1: Conceptual Framework

As illustrated by the conceptual framework, the independent variable constructs comprising firm size, financial leverage, liquidity, asset quality and income diversification has a direct relationship with the dependent variable earnings volatility. It is expected that any increase in firm size introduces change to earnings either positively or negatively thereby introducing the volatility component. Similarly, financial leverage is expected to affect earnings either positively or negative and thus any change in leverage components is expected to change earnings levels thereby introducing volatility in earnings. Liquidity management is expected to have an effect either positively or negatively on the earnings and thus any change in liquidity elements is expected to positively or negatively change earnings thereby introducing volatility in earnings. Asset quality is postulated to have either positive or negative effect on earnings, thereby introducing the volatility component to the earnings. It is expected that any changes in income stream between interest and non- interest income introduces corresponding changes to earnings either positively or negatively thereby introducing the volatility component to the earnings.

2.5 Critique of Literature

Earnings volatility has been examined in various context such as the Eurozone (Barros et al., 2007), emerging economies (Shehzad, Scholtens & De Haan, 2019), Asian context (Khatun and Tarafdar, 2018; Shahchera and Noorbakhsh, 2017) and sub – Saharan African context (Ajekwe, Ibiamke and Silas, 2017; Chukwuani, 2021).There are contextual differences in the nature of banking from conventional banking and Islamic banks (Bitar, Madies and Taramasco, 2017), firm characteristics (Naceur, 2021) such as loan loss provisioning (Ajekwe, Ibiamke and Silas, 2017), firm size (Chukwuani, 2021), income diversification (Kiweu, 2012). These studies have been carried in various contexts such as developed countries like US (De Haan & Poghosyan, 2018), UK (Moutsianas & Kosmidou, 2016), Iran (Elyasiani & Jia, 2019, Shahchera and Noorbakhsh, 2017), Turkiye (Ahmet and Hasan, 2011; Kasman and Kirbas-Kasman, 2016), China (Sun, Liu and Cao, 2011) and Asian developing

countries (Abbas, Iqbal & Aziz, 2019; Shehzad, Scholtens and De Haan, 2018) Indonesia (Williams, 2022), Bangladesh (Ahamed 2019) and Sub – Saharan African countries of Nigeria (Chukwuani, 2021), Ghana (Boahene, Dasah and Agyei, 2019). The findings seem to contrast with the type of the bank with investment banks having non – linear relationship (Curi, Lozano-Vivas & Zelenyuk, 2018) from the commercial banks (De Haan and Poghosyan, 2019; Lee and Hsieh, 2022) and bank holding firms (De Haan and Poghosyan, 2019). These studies show contrasting effects from non – linear effects (De Haan & Poghosyan, 2019) to positive association (Elyasiani and Jia, 2019; Moutsianas and Kosmidou, 2016) and negative association (De Haan and Poghosyan, 2019; De Haan and Poghosyan, 2018; Kasman and Kirbas-Kasman, 2016; Shahchera and Noorbakhsh, 2017; Lee and Hsieh, 2022) among other studies. Considering the contextual differences in the effects of firm size on volatility from the aforementioned studies, the study sought to ascertain the nature of the relationship between firm size and earnings volatility in commercial banks in Kenya.

The studies examining the influence of financial leverage on earning volatility have approached it from three perspectives using the different measures that include; capital adequacy measures (Million, Matewos and Sujata, 2015; Acosta Smith, Grill and Lang, 2018), risk-based capital ratios or capital–to–asset ratios (Goddard, Molyeux & Wilson, 2004; Abbas & Ali, 2020; Tan and Floros, 2011), non-risk-based capital ratio or equity- to - asset ratio (Prabowo et al., 2018) and leveraged ratios (Barth and Miller, 2018; Acosta Smith, Grill and Lang, 2018). The studies based on the leveraged ratio measures indicate a negative relationship to earnings volatility (Budi and Tn, 2018; Prabowo et al., 2018; Poudel, 2019) while the studies using capital adequacy levels (Million, Matewos and Sujata, 2018; Hosna, Manzura and Juanjuan, 2018) observed an inverse relationship with earnings volatility. Further, the use of non-risk-based capital ratios as a measure for leverage indicate contrasting findings which Tan and Floros (2011) observing negative effects while Abbas, Iqbal & Aziz (2019) reporting a positive effects. The use of capitalization measures (capital-to-asset ratio) is directly linked to earnings volatility (Goddard, Molyeux and Wilson,

2018; Ahamed, 2019; Islam and Nishiyama, 2016; Lee and Hsieh, 2022). These studies have been carried out in various context such as US (Barth and Miller, 2018; Abbas and Ali, 2020), EU (Acosta Smith, Grill and Lang, 2018; Goddard, Molyeux and Wilson, 2018), Turkiye (Kasman and Kasman, 2016), Indonesia (Budi and Tn, 2018; Prabowo et al., 2018), Sweden (Hosna, Manzura and Juanjuan, 2018), Taiwan (Chen et al., 2018), China (Tan and Floros, 2011), Nepal (Poudel, 2019) and Ethiopia (Million, Matewos and Sujata, 2018) among others. Considering the contextual differences in the use of different measures of financial leverage and differential effects on earnings volatility from the aforementioned studies, the study sought to ascertain the nature of the relationship between financial leverage and earnings volatility in commercial banks in Kenya.

The studies examining effects of liquidity management on earnings volatility have largely drawn from two streams based on the type of measures either liquidity risk or liquidity ratios. Several studies have used liquidity risk (Chen et al., 2018; Khan and Ali, 2016; Iqbal et al., 2018) have observed contrasting findings which are either positive effect on volatility (Chen et al., 2018; Muriithi and Waweru, 2017) or negative effects (Kanagaretnam and Liu 2018). In related studies, numerous empirical studies have examined the impact of liquidity ratio on bank earnings. The liquidity measures include liquidity risk (Marozva, 2018), a risky asset to total asset (Chowdhury & Zaman, 2018), and credit risk (JaraBertin et al., 2014; Parvin, 2021) among other measures. Whereas many studies found a direct positive relationship between a bank's liquidity ratio and earnings volatility (Hakimi & Zaghdoudi, 2017; Titko, Skvarciany & Jurevičienė, 2015; Khati, 2020; Khan and Ali, 2016; Khasharmeh, 2018; Rijal, 2019; Budi and Tn, 2018; Prabowo et al., 2018; Muriithi & Waweru 2017) among others. However, the counter arguments that excess liquidity is accompanied by high storage costs and lower returns suggest that while liquid assets could decrease liquidity risk, they could carry high costs that positively influences on earnings volatility (Mamatzakis & Bermpei, 2014). These studies have been in different context such as Asia (Chen et al., 2018; Khan and Ali, 2016; Tan and Floros, 2011; Shrestha, 2018; Abbas, Iqbal

& Aziz, 2019; Ahamed, 2019), US (Kanagaretnam and Liu, 2018), Middle East (Iqbal et al., 2018; Khasharmeh, 2018) and sub – Saharan Africa (Hakimi and Zaghdoudi, 2017; Marozva, 2018) and Kenya (Musiega et al., 2017; Muriithi and Waweru, 2017, Gwatiringa, 2020). Considering the contextual differences in the use of different measures of liquidity management and differential effects on earnings volatility from the aforementioned studies, the study sought to ascertain the nature of the relationship between liquidity and earnings volatility in commercial banks in Kenya.

The empirical studies on the influence of asset quality on earnings volatility have used several measures of asset quality such as loan loss provision (Ajekwe, Ibiamke and Silas, 2017; Kolapo, Ayeni and Oke, 2019; Damayanty and Murwaningsari, 2020) and credit risk (Dietrich and Wanzenried, 2011) among other measures. The studies reported contrasting findings with several studies reporting positive effects of loan loss provision (Damayanty and Murwaningsari, 2020; Abebaw and Depaack, 2011; Ajekwe, Ibiamke and Silas, 2017; Kolapo, Ayeni and Oke, 2019; Abbas and Ali, 2020; Titko, Skvarciany and Jurevičienė, 2018) and negative effects of loan loss provisioning (Hosna, Manzura and Juanjuan, 2018; Capraru and Ihnatov, 2018). The studies in developed economies in US (Abbas, Iqbal & Aziz, 2019), Eurozone economies (Leventis, Dimitropoulos and Anandarajan, 2011), Germany (Dietrich and Wanzenried, 2011), Malaysia (Abubakar, 2018) and developing countries in Indonesia (Damayanty and Murwaningsari, 2020). The studies in the sub – Saharan African context include those done in Ethiopia, (Abebaw and Depaack, 2011 Ayele, 2019; Million, Matewos and Sujata, 2018 and Elshaday, Kenenisa & Mohammed, 2018), Nigeria (Ajekwe, Ibiamke and Silas, 2017; Ogboi and Unuafe, 2022) and Kenya (Ongore and Kusa, 2013). Considering the contextual differences in the use of different measures of asset quality and differential effects on earnings volatility from the aforementioned studies, the study sought to ascertain the nature of the relationship between asset quality and earnings volatility in commercial banks in Kenya.

The empirical studies on the influence of income diversification have mainly focused on the ratio of non – interest income to total income ratio (DeYoung and Roland, 2016; Busch and Kick, 2018). The studies have been done in developed economies such as US (DeYoung and Roland, 2016; Brunnermeier, Dong & Palia, 2020), Germany (Busch and Kick, 2018), Australia (Edirisuriya, Gunasekarage & Dempsey, 2018), Switzerland (Mamatzakis & Bermpei, 2014), Italy (Vallascas, Crepi and Hagendorff (2011), Austria (Rossi, Schwaiger, & Winkler, 2018) among others and developing economies such as India (Trivedi, 2018), Pakistan (Ismail et al., 2018), Jordan (Al-Tarawneh, Abu Khalaf and Al Assaf, 2017) among others. In sub – Saharan Africa (Damankah, Anku-Tsede & Amankwaa (2018), Tanzania (Mndeme 2018) and Nigeria (Abebe, 2014). The effects have been largely non – linear (Lepetit et al., 2019; Bustaman et al., 2017; Edirisuriya, Gunasekarage and Dempsey, 2018), linear effects (Tarawneh, Abu Khalaf and Al Assaf, 2017 ; Al-Tarawneh, Abu Khalaf and Al Assaf, 2017; Mamatzakis & Bermpei , 2014; Baele et al., 2007; Brunnermeier, Dong & Palia, 2020). The findings indicate that the effect could be related to the country–specific effects (Edirisuriya, Gunasekarage & Dempsey, 2018) or the industry effect (Al-Tarawneh, Abu Khalaf and Al Assaf, 2017; Mamatzakis & Bermpei, 2014). Considering the contextual differences and differential effects on earnings volatility from the aforementioned studies, the study sought to ascertain the nature of the relationship between income diversification and earnings volatility in commercial banks in Kenya.

The empirical studies on market concentration on earnings volatility used the concentration measures such as market share (Genchev, 2019; Al Arif and Awwaliyah, 2019; Bello and Isola, 2014), market concentration based on Herfindahl-Hirschman index (Tran, Nguyen & Nguyen (2022) and Lerner's concentration index (Ariss, 2010; Bustaman et al., 2017). These studies have observed differential effects on earnings volatility that are either linear relationship (Smolo, Ibrahim and Dewandaru, 2020; Rumler and Waschiczek, 2016; Bustaman et al., 2017) or non- linear (Shehzad, Scholtens and De Haan, 2018; Tan and Floros, 2011; Kasman and Kirbas-Kasman, 2016; Chen et al.,

2018; Zhang et al., 2022). The studies have been contextualized to different countries that are developed economies in Eurozone (Abreu and Mendes, 2011), Austria (Rumler and Waschiczek, 2016), Turkiye (Kasman and Kirbas-Kasman, 2016), Singapore (Zhang et al., 2022), Bulgaria (Genchev, 2019), Indonesia (Al Arif and Awwaliyah (2019), and developing economies such as Bangladesh (Ahamed, 2019) and Pakistan (Bhatti and Hussain, 2010) among others. The studies in the sub – Saharan context include Nigeria, (Bello and Isola, 2014; Etale, Bingilar & Ifurueze, 2016), Malawi (Chirwa, 2018), and Ethiopia (Belayneh, 2011). The empirical literature has indicated that the banks' specific factors have focused on the impact of internal factors on earnings (Jha & Hui, 2012; Jaffar & Manarvi, 2011), performance while others have measured the variability in the performance measures as earnings volatility (Kosmidou *et al.,* 2012. Chan et al., (2018) found that market share is positively related to earnings when efficiency is controlled for concentration which is usually negatively related to profit. Considering the contextual differences and differential effects on earnings volatility from the aforementioned studies, the study sought to ascertain the nature of the relationship between market concentration and earnings volatility in commercial banks in Kenya.

2.6 Summary of the Literature and Gaps

Due to the variation of the environment and data included in the analysis, the results of various studies differ significantly. However, studies identified that these internal facets influence bank earnings. The factors include bank size, good asset quality, a higher proportion of equity, capital-to-asset ratio; income diversification and market concentration are generally associated with earnings volatility. Greater provisions for loan losses, higher liquidity, and more reliance on debt have been lower indicative of lower bank profit. Chan et al., (2018) found a positive and significant relationship between concentration and earnings.

Moreover, the literature review also reveals the existence of controversial conclusions that results from different studies made so far. Furthermore, so far as the review of the literature discloses, very scanty work has been done to identify the determinants of earnings of banks in Sub Sahara Africa in general and Kenya in particular. The study of Damena (2011) examined the determinants of commercial banks' earnings in Ethiopia. Bhatti (2010) showed that there is a negative relationship between market share and earnings. Mirzaei et al., (2022) found that the relationship between market share and earnings was only proved in the banking industry in developing countries but not in developed countries.

In other instances, if the asset quality is as exemplified by lower loan rates, Popov & Ongena (2011) assert that the phenomenon leads to excessive firm leverage. This is attributable to the fact that the loan portfolio appears to correlate with leverage (Kiema & Jokivuolle, 2014). When banks shift their activities to non-interest income products, especially fee-based income products, it decreases the interest margin hence, stabilizing bank profits and banking stability, bank returns and banking stability will increase when a bank diversifies its credit portfolios diversification into non-traditional banking products which will increase bank returns and reduce bank risks thereby, boosting bank performance (Bustaman et al., 2017).

Table 2.1: Summary of Literature and Research Gaps

	Findings	Limitations	Gap
Moutsianas & Kosmidou, (2016)	Bank size is linked to earnings volatility in the UK banks	The findings were contextualized to a developed economy with well – established financial markets	Anchoring studies on earnings volatility a developing country context.
De Haan & Poghosyan, (2018)	Bank size is non-linearly related to earnings volatility with the size threshold of US$5 billion assets.	The findings were contextualized to a developed economy with well – established financial markets	Anchoring studies on earnings volatility a developing country context.
Elyasiani and Jia (2019)	Bank size increases the earnings volatility of big banks but has no effect on small banks	The findings were contextualized to a developed economy with well – established financial markets	The findings only proved associations, not causality.
Kasman and Kirbas-Kasman (2016)	Bank size negatively correlated with earnings volatility of Turkiye Commercial banks	The findings were contextualized to a developed economy with well – established financial markets	The findings only proved associations, not causality.
Moutsianas and Kosmidou (2016)	Earnings volatility is inversely correlated to bank size	The findings were contextual to investments banks in developed economies	The findings only proved associations, not causality.
Shahchera and Noorbakhsh (2017),	Earnings volatility negatively relates to size	The findings were contextual to banks in MENA countries	The sample used was limiting and thus is insufficient in generalization.
Barth and Miller (2018)	Lagged leverage ratio is negatively associated with earnings volatility	The findings were contextualized to a developed economy with well – established financial markets	The findings only proved associations, not causality.
Acosta Smith, Grill and Lang (2018)	Leverage ratio reduces earning volatility	The findings were contextualized to a developed economy with well – established financial markets	The findings only proved associations, not causality
Kasman and Kasman (2016)	highly capitalized banks tend to have lower earnings volatility in comparison to their compatriots who are less capitalized	The findings were contextualized to a developed economy with well – established financial markets	Anchoring studies linking capitalization to earnings volatility a developing country context.
Prabowo et al., (2018)	Leverage has a positive effect on the earnings of banks.	The findings were contextualized to a developed	Anchoring studies linking capitalization to

	Findings	Limitations	Gap
		economy with well – established financial markets	earnings volatility a developing country context.
Million, Matewos and Sujata (2018)	Leverage ratios have a negative impact on earnings	The findings were contextualized to a sub – Saharan Africa economy with underdeveloped financial markets	Anchoring studies linking capitalization to earnings volatility a developing country context.
Chen et al., (2018)	Leverage has a significant negative effect on the earnings	The findings were contextualized to a developed economy with well – established financial markets	The findings only proved associations, not causality.
Chen et al., (2018)	Liquidity has a significant positive effect on earnings volatility	The findings were contextualized to a developed economy with well – established financial markets	Anchoring studies linking capitalization to earnings volatility a developing country context.
Iqbal et al., (2018)	Liquidity is linked to earning volatility	The findings were contextual to banks in MENA countries	Anchoring studies linking liquidity risk to earnings volatility a developing country context.
Gwatiringa (2020)	Liquidity was positively related to bank volatility	The findings were contextualized to a sub – Saharan Africa economy with underdeveloped financial markets	The findings only proved associations, not causality.
Abbas, Iqbal & Aziz (2019)	Liquidity level has a positive effect on earnings volatility	The findings were contextualized to a developed economy with well – established financial markets	Anchoring studies linking liquidity risk to earnings volatility a developing country context.
Ahamed (2019)	Liquidity has a significant positive effect on earnings volatility.	The findings were contextual to banks in MENA countries	Anchoring studies linking liquidity risk to earnings volatility a developing country context.
Hosna, Manzura and Juanjuan (2018)	Asset quality directly impacts bank earnings	The findings were contextualized to a developed economy with well – established financial markets	Anchoring studies linking asset quality to earnings volatility a developing country context.
Capraru and Ihnatov (2018)	Asset quality measure has a negative effect on earnings volatility	The findings were contextualized to a developed economy with well	Anchoring studies linking asset quality to earnings volatility a

Findings	Limitations	Gap
	– established financial markets	developing country context.

Source: Research Reviews (2023)

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This section details information regarding the study design, study population, techniques for sampling, methods of data collection and analysis procedure.

3.2 Research Philosophy

The philosophical foundation underpinning the study was positivism (Saunders, Lewis & Thornhill, 2018). Positivism premises that knowledge is based on facts and that there is an objective reality that can be expressed numerically with a predictive power (Dudovskiy, 2016). Under this paradigm, knowledge is based on values of facts and reasons, gathered through direct observations and experience, and measured empirically using quantitative methods, theoretical models that can be developed are generalizable to explain cause and effect relationships (Saunders et al., 2018).

The study was guided by the positivist research philosophy because the study hypothesized and deduced the observations. The researcher was objective and separated from the study, only seeking to verify propositions through empirical testing of hypothesized relationships. The study investigated the theoretical bases in testing the study variables bank specific facets ; size, leverage, liquidity, asset quality, income diversification and market concentration on earnings volatility of commercial banks in Kenya.

3.3 Research Design

The study used an explanatory design which involved a panel data approach. The study was explanatory as it sought to establish causal relationships between the variables and attempted to explain the reasons for the phenomenon being observed (Saunders *et al.,* 2018).

The explanatory research design is used to examine causal relationships between the variables (Saunders *et al*., 2018) and attempts to explain the reasons for the phenomenon being observed (Khaldi, 2017). The study used explanatory design to examine the effect of market concentration and bank specific facets on earning volatility of commercial banks in Kenya.

3.4 Target Population

The target population comprised all 39 operational commercial banks (Appendix I) in Kenya for the period 2009-2021. The time element was important because a bank presents financial information based on past performance; this temporal element was accounted for by using time series analysis.

3.5 Sample and Sampling Technique

The study employed all the 37 banks (Appendix 1) which formed the target group for the study eliminating two banks (which had been on operation for less than five years). The sample frame for the study comprised of all banks which had been registered by the CBK and had been operational since 2009. The number is 37 banks inclusive of the mergers (NIC Bank and Commercial Bank of Africa to form National Commercial Bank of Africa.

3.6 Measurement of Variables

Measurement of the variables involved the identification and the definition of the variables to be measured and the development of an operational definition of the concept in questions (Depoy & Gitlin, 2011). The study used the following measurements which were drawn from past studies as shown in Table 3.1 below.

Table 3.1: Measurement of Variable

Variable	Measure	Measurement	Empirical Studies
Dependent	Earnings Volatility	Standard deviation of the ROE and ROA	Shahchera and Noorbakhsh (2017).
Independent	Firm's Size	Natural logarithm of firm's total assets	Kunt and Huizinga (2011), Soedarmono et al., (2013)
	Financial leverage	Ratio of Equity to Assets	Shijaku (2017), Budi & TN, (2018).
	Liquidity	Ratio of current assets (Loans) to current liabilities (Deposits)	Demirguc-Kunt and Huizinga (2010), Gwatiringa (2020)
	Assets quality	Ratio of non-performing loans to total loan portfolio	Shahchera and Noorbakhsh (2017). Lee et al., (2014)
	Income diversification	Ratio of non- interest income to total income	Shahchera and Noorbakhsh (2017). Alhassan et al., (2014).
	Market concentration	Weighted ratio of individual banks deposits and loans to total industry deposits and loans	(CBK, 2022)

3.7 Model Specification

To test for the influence of independent variables (firm size, financial leverage, liquidity, asset quality, income diversification and market concentration) on the dependent variable, a multiple regression model was fitted. The model sought to estimate the combined influence of the independent variables on Earnings volatility of commercial banks in Kenya. The multiple regression model was given by the equation below

$$EV_{it} = \beta_0 + \beta_1 X_{1it}$$

$$+\beta_2 X_{2it} + \beta_3 X_{3it} + \beta_4 X_{4it} + \beta_5 X_{5it} + \beta_6 X_{6it} + \varepsilon_{it}$$

Where:

Where: $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6$ are the regression coefficients of the predictors in the model.

β_0 −The intercept of the equation (Constant term)

EV_{it} – Earnings volatility of bank I in period t

X_{1it} – Size of bank I in period t

X_{2it} – Financial leverage of bank I in period t

X_{3it} – Liquidity of bank I in period t

X_{4it} – Asset quality of bank I in period t

X_{5it} – Income diversification of bank I in period t

X_{6it} – market concentration of bank I in period t

εit – The error term

3.8 Research Instruments

The data collection procedure involved secondary data collection which was obtained from the central bank of Kenya supervisory reports on summary financial reports of these commercial banks. The study used a documentary review approach to collect the data from the CBK supervision financial reports of 37 operational commercial banks for 13 consecutive financial years from 2009-2021.

3.9 Data Analysis Procedures

On completion of the data collection process, data was entered in the Microsoft Access application which was later exported to E- Views for analysis.

3.9.1 Descriptive Statistics

The study used descriptive analysis to transform the elementary data and describe the basic characteristics of the data. The study analysed the data descriptively by using the measures of central tendency such as the means, and standard deviation statistics. In analysing the volatility in the earnings, the study employed 6-year rolling windows of standard deviation of return on assets, while using the natural log of the asset base and logarithm for all the other variables; financial leverage, liquidity, asset quality, income diversification and market concentration. Once the descriptive analysis had been completed, the output was presented in tabular format.

3.9.2 Diagnostic Tests

The study carried out a set of assumption about how a data set was produced by an underlying data generating process in the classical linear regression model. The tests included, no perfect collinearity, unit-dimensionality, specification of the relationship between the variables, data independence, normally distributed and homoscedastic (Wooldridge, 2018). Since the state of the relationship was deterministic, the study used the following test; unit root testing, autocorrelation, normality, heteroskedasticity and specification tests.

3.9.2.1 Normality Test

The normality assumption also plays a crucial role in the validity of inference procedures, specification tests, and forecasting. In the panel-data literature, the consequences of non-normal error components for the performance of several tests (Alejo et al., 2018). The natural concern of panel-data models is in the identification of which error component (if not both) is the source of non-normalities.

The use of skewness and excess kurtosis in each component separately or jointly can be seen as extending the famous Jarque–Bera tests for simple panel-data models. The skewness and kurtosis of the error components in linear panel-data random-effects models allows one to evaluate each error component's third and fourth moments. This can be used as an alternative to the Jarque–Bera test in panel-data models (Alejo et al., 2018).

3.9.2.2 Unit Root Test

The null hypothesis is that the series contains a unit root, and the alternative is that the series is stationary. The stationarity of the values in a series was examined through Levin Li Chu (LLC) and Breitung unit root testing which are more appropriate for pool panel data. The commonly used unit root tests like the Dickey±Fuller (DF), augmented Dickey±Fuller (ADF) and Phillips±Perron (PP) tests lack power in distinguishing the unit root null from stationary alternatives (Maddala & Wu,2019).

Breitung (2000) develops a modified version of the LLC test which does not include the deterministic terms (i.e. the fixed effects and/or a deterministic trend), and which standardises the residuals from the auxiliary regression in a more sophisticated fashion. Under LLC and Breitung approaches, only evidence against the non-stationary null in one series is required before the joint null will be rejected.

3.9.2.3 Autocorrelation

Cross-sectional and serial correlations pose significant problems in the error terms of panel regression models. Accordingly, there are two approaches to deal with these problems. The first approach is the use the ordinary least squares (OLS) estimator but with a robust standard error that is robust to serial correlations but the application of clustered standard errors may give rise to conservative confidence intervals (Bai, Choi & Liao, 2021).

The second approach involves the use the feasible GLS (FGLS) estimator that is more efficient than the ordinary least squares (OLS) in the presence of heteroskedasticity, serial and cross-sectional correlations as it takes into account, cross-sectional and serial correlations in the estimation and clustering problems in fixed effects panel and multilevel models. Empirical evidence supports the use of FGLS estimation in solving the heteroscedasticity and autocorrelation in the data (Khaoula& Moez, 2019).

3.9.2.4 Heteroscedasticity

Heteroskedasticity pose significant problems in the error terms of panel regression models. Accordingly, there are two approaches to deal with these problems. The first approach is the use the ordinary least squares (OLS) estimator but with a robust standard error that is robust to heteroscedastic but the application of clustered standard errors may give rise to conservative confidence intervals (Bai, Choi & Liao, 2021).

The second approach is the use the feasible GLS (FGLS) estimator which is more efficient than the ordinary least squares (OLS) in the presence of

heteroskedasticity, serial and cross-sectional correlations as it takes into account, heteroskedasticity, and cross-sectional and serial correlations in the estimation and clustering problems in fixed effects panel and multilevel models. Empirical evidence supports the use of FGLS estimation in solving the heteroscedasticity and autocorrelation in the data (Khaoula& Moez, 2019).

3.9.2.5 Hausman Test

OLS with pooled cross sectional and time-series specification assumes that all the variables have the same behaviour with respect to the explanatory variables. There are two assessment techniques that are often used in GLS method for the panel data analysis, namely the fixed effects model and the random effects model. According to Wagner (2020) the difference between the fixed effects and the random effects model is based on whether the effects of time-invariant are linked to the explanatory variables. If time-invariant in the regression model is correlated to independent variables, it is the case of the fixed effects model, and vice versa, if time-invariant does not correlate to independent variables, it is the case of the random effects model.

The hypothesis usually considered in the Hausman test is:
H_0: Random-effects model is appropriate
H_1: Fixed effects model is appropriate
A test of significance ($p<0.05$) implies that we reject the null hypothesis.

3.9.3 Inferential Statistics

The study carried out panel regression analysis as the data encompassed both observations of cross-sectional and time-series data over the period of time (Brooks, 2014). Further, panel data has advantages of providing more informative data which captures individual variability and dynamic adjustment (Vong & Chan, 2018).The study used 37 operational banks by redacting a number of banks that had failed, placed under statutory management or acquired. Since there were size observations per bank, and a total of 37 banks,

the data series included 13 years (2009 – 2021) for each of the 37 operating banks which would total 481 firm-year observations.

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSION

4.1 Introduction

The section presents the data analysed as per the objectives of the study. It begins with the analysis of the indicators of the study using descriptive statistics then structures the presentation and discussions as per the objectives.

4.2 Descriptive Statistics

The study first reported the data descriptive statistics for the study variables as derived from the data. The descriptive statistics contained measures of central tendencies (means and standard deviation statistics) and the data from the analysis is presented in Table 4.1.

Table 4.1: Descriptive Analysis

Variable	Mean	Standard Deviation	Maximum	Minimum
Leverage	0.16263	0.08215	0.91420	0.01838
Liquidity	0.80447	0.26729	1.92251	0.02529
Firm size	24.3427	1.39224	27.50025	20.0120
Asset Quality	0.18552	0.18616	2.12698	0.00090
Market concentration	2.56947	3.27745	14.52000	0.01000
Income diversification	0.25619	0.12937	0.94980	0.02410

The statistics in Table 4.1 depicts the descriptive statistics of the study variables. The average leverage was 0.16263 (SD = 0.08215) and the maximum leverage was at 0.91420 while the minimum was 0.01838. The indications are that the firm's equity makes up an average of 16 per cent of the assets and this implies that the banks hold huge amounts of assets in comparison to equity stock. The overall cost of equity in the banking sector does not change (Kiema & Jokivuolle, 2014), therefore, it can be inferred that some commercial banks may not be able to generate excess returns over the

cost of equity. In developed countries, a study showed that listed European banks are more efficient but less profitable (Iannotta *et al.,* 2007).

The average liquidity value was 0.80447 (SD = 0.26729) with the highest leverage ratio being 1.92251 and the lowest leverage ratio at 0.02529. This indicates that loan accounts on average make up four-fifths of all the current liabilities (customer deposit). The literature indicates that liquidity influences the capitalization and earnings potential of the banks and may result in collapse or liquidation (Arif & Nauman, 2019). According to the Basel Committee, the active management of liquidity risk requires a balancing act of holding a considerable amount of liquid assets and seeking sustainability in performance (Marozva, 2018).

The firm size values show that the average firm size was 24.34274 (SD = 1.4365) which is about 37.318 billion shillings in assets while the largest at 27.50025 which is about 877.418 billion shillings in assets, the least firm's size at 20.0120 or about 49.546 billion shillings in Assets. These statistics shows the huge differences between large and small banks. Mathuva, (2018) affirmed that the firm size determines the amount of earnings by commercial banks in Kenya. Larger banks in Kenya tend to have larger branch networks with Equity and Kenya Commercial Banks having the largest networks (CBK, 2016). That is why, Berger & Di Patti, (2006) avow that banks with state wide branching are more profit efficient than their compatriots with a limited branch network. Coincidentally, a study by Mathuva, (2018) also affirmed that asset growth among the commercial banks in Kenya significantly and positively correlates with earnings, such that banks with a larger asset base (i.e. its size) reports higher profits.

The asset quality values show that the average quality of the assets was 0.18552 (SD = 0.18616), with the maximum at 2.12698 and the least quality at 0.00090. These statistics indicate that the ratio of non-performing loans for the last 13 years averages 19.18 per cent with some vulnerable banks which were being acquired (East African Building Society later became United Bank of Africa)

having as high as 2.5 times non-performing loans in their loan account. In other instances, if the asset quality is as exemplified by lower loan rates, Popov and Ongena (2011) assert that the phenomenon leads to excessive firm leverage. In these aspects, large-sized banks have bigger loan portfolios attributed to the collateral capacities (Zaman, 2011). The loan portfolio of commercial banks appears to be similar and correlate with leverage (Kiema & Jokivuolle, 2014).

The statistical values on income diversification indicate that the average value for income diversification stood at 0.25619 (SD = 0.12937), with the most diversified income at 0.4980 and the least diversified income at 0.02410. These statistics indicate that on average the banks in Kenya generate 25.62 per cent from non–interest income which includes trading income, and exchange income among other sources.

Based on the weighted values of the different market indices from the Central Bank of Kenya, the market index concentration values indicate that the average concentration size was 2.56947 % (SD = 3.27745), while the highly concentrated institution had a market index size of 14.52 per cent while the least concentrated bank had a market index size of 0.01%.

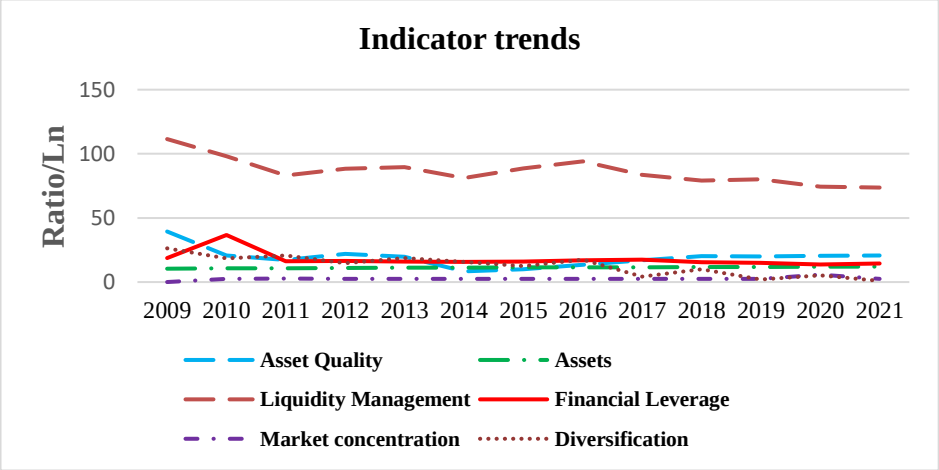

Figure 4.1: Indicator Trends

4.2 Diagnostic Tests

4.2.1 Unit Root Test

Table 4.2: Unit Root Testing

Variable	Lags	Levin Li Chu (LLC) test		Breitung test	
		T	p-value	λ	p-value
Firm size	0	-8.744	0.000	2.049	0.978
	1	-17.768	0.000	-2.885	0.002
	2	-22.603	0.000	-6.024	0.000
Leverage management	0	-11.052	0.000	-1.192	0.116
	1	-24.441	0.000	-4.480	0.000
	2	-31.674	0.000	-6.690	0.000
Liquidity management	0	-12.666	0.000	0.459	0.677
	1	-19.868	0.000	-5.093	0.000
	2	-23.486	0.000	-7.725	0.000
Asset quality	0	-5.629	0.000	-2.610	0.000
	1	-14.808	0.000	-7.718	0.000
	2	-20.691	0.000	-14.76	0.000
Income diversification	0	-17.044	0.000	-6.227	0.000
	1	-25.058	0.000	-10.71	0.000
	2	-25.664	0.000	-9.137	0.000
Market concentration	0	-9.225	0.000	0.0567	0.000
	1	-17.356	0.000	-2.086	0.000
	2	-24.715	0.000	-6.113	0.000

Based on the results from Table 4.3, the Levin–Lin–Chu bias-adjusted t statistic for all the variables at 0 lags is significant at all the usual testing levels. Therefore, the study rejected the null hypothesis and concluded that the series is stationary.

4.2.2 Normality Test

Table 4.3: Normality Test

Variable	Kurtosis	Skewness	Jacque-Bera	p-value
Leverage	9.618	0.2818	908.23	0.000
Liquidity	15.150	-2.004	369.8	0.000
Firm size	2.244	0.165	14.000	0.000
Asset Quality	8.431	-1.00	690.21	0.000
Market concentration	2.051	0.186	21.375	0.000
Income diversification	3.702	-0.404	23.620	0.000

The results in Table 4.2 shows that the Jacque – Bera test on residuals is significant therefore, the null hypothesis that the residuals are normally distributed is rejected. This implies that there is a violation of the normal distribution and therefore the study used a feasible generalized least squares method to control for non-normality.

4.2.3 Heteroscedasticity Test

Montes-Rojas and Sosa-Escudero (2011) indicated that non-normalities severely affect the performance of the panel-heteroskedasticity tests. Since the heteroscedasticity test is subject to the non-normality in the data, the study used feasible generalized least squares (FGLS) method to control for autocorrelation as well as heteroscedasticity (Khaoula& Moez, 2019)

4.2.4 Hausman Specification Test

Table 4.4: Hausman Specification Test for Firm Size

Test cross-section random effects			
Test Summary	Chi-Sq. Statistic	d.f.	p-value
Cross-section random	12.210	1	0.005
Cross-section random effects test comparisons:			
Variable	**Fixed**	**Random**	**Var (Diff.)**	**p-value**
Firm size	0.018630	0.021350	0.000020	0.005

The statistical value in Table 4.4 shows the Hausman specification test for effects of firm size and the $\chi 2 = 12.210$, ($p < 0.05$). Therefore, the null

hypothesis that the random effect model is appropriate is rejected and the conclusion is that the fixed effects model was considered the appropriate model.

Table 4.5: Hausman Specification Test for Financial Leverage

Test cross-section random effects				
Test Summary		**Chi-Sq. Statistic**	**d.f.**	**p-value**
Cross-section random		0.0069	1	0.934
Cross-section random effects test comparisons:				
Variable	**Fixed**	**Random**	**Var (Diff.)**	**p-value**
Financial leverage	0.010539	0.008146	0.000034	0.934

The statistical value in Table 4.5 shows the Hausman specification test for the effect of financial leverage and the results shows $\chi 2 = 0.0069$, ($p > 0.05$). Therefore, the null hypothesis that the random effect model is appropriate is not rejected and the conclusion is that the random effect model was more appropriate. Based on this conclusion, the study applied the random effects model in the panel regression analysis.

Table 4.6: Hausman Specification Test for Liquidity Management

Test cross-section random effects				
Test Summary		**Chi-Sq. Statistic**	**d.f.**	**Prob.**
Cross-section random		0.431	1	0.511
Cross-section random effects test comparisons:				
Variable	**Fixed**	**Random**	**Var (Diff.)**	**Prob.**
Liquidity manager	-0.001062	-0.003265	0.000004	0.511

The statistical value in Table 4.6 shows the Hausman specification test for the effects of liquidity and the results indicates $\chi 2 = 0.431$, ($p > 0.05$). Therefore, the null hypothesis that the random effect model is appropriate is not rejected and the conclusion is that the random effects model is the more appropriate model. Based on this conclusion, the study applied the random effects model in the panel regression analysis.

Table 4.7: Hausman Specification Test for Asset Quality

Test cross-section random effects				
Test Summary		**Chi-Sq. Statistic**	**d.f.**	**p-value**
Cross-section random		0.647	1	0.427
Cross-section random effects test comparisons:				
Variable	**Fixed**	**Random**	**Var (Diff.)**	**p-value**
Asset Quality	-0.151629	-0.152720	0.000018	0.427

The statistical value in Table 4.7 shows the Hausman specification test for the effects of asset quality and the results indicated $\chi 2 = 0.647$, ($p > 0.05$). Therefore, the null hypothesis that the random effect model is appropriate is not rejected and the conclusion is that the random effects model was appropriate. Based on this conclusion, the study applied the random effects model in the panel regression analysis.

Table 4.8: Hausman Specification Test for Income Diversification

Test cross-section random effects				
Test Summary		**Chi-Sq. Statistic**	**d.f.**	**p-value**
Cross-section random		0.791	1	0.374
Cross-section random effects test comparisons:				
Variable	**Fixed**	**Random**	**Var (Diff.)**	**p-value**
Income diversification	0.010630	0.011350	0.000120	0.374

The statistical value in Table 4.8 shows the the Hausman specification test for the effects of income diversification and the results indicated $\chi 2 = 0.791$ ($p > 0.05$). Therefore, the null hypothesis that the random effect model is appropriate is not rejected and the conclusion is that the random effects model was appropriate. Based on this conclusion, the study applied the random effects model in the panel regression analysis.

Table 4.9: Hausman Specification Test for Effects of Bank Specific Facets

Test cross-section random effects				
Test Summary		**Chi-Sq. Statistic**	**d.f.**	**p-value**
Cross-section random		20.452	5	0.010
Cross-section random effects test comparisons:				
Variable	**Fixed**	**Random**	**Var (Diff.)**	**p-value**
Leverage	0.010539	0.008146	0.000034	0.6818
Liquidity	-0.001062	-0.003265	0.000004	0.2740
Firm size	0.018630	0.021350	0.000020	0.5468
Asset Quality	-0.151629	-0.152720	0.000018	0.7972
Income diversification	0.050289	0.056120	0.000028	0.4190

The statistical value in Table 4.9 shows the Hausman specification test for the effects of the bank specific facets and the results indicated $\chi 2 = 20.452$, ($p < 0.05$). Therefore, the null hypothesis that the random effect model was considered a more appropriate model was rejected. Hence the fixed effects model was considered the appropriate model.

4.3 Test of Hypotheses

4.3.1 Hypothesis One

The study sought to evaluate the effect of firm size on the earnings volatility of commercial banks in Kenya and tested the H_{01}: Firm size has no significant effect on the earnings volatility of commercial banks in Kenya. The hypothesis testing took the following format as illustrated in Table 4.10.

Table 4.10: Effect of Firm Size on Earnings Volatility

Dependent Variable: Earnings volatility			**Sample: 2009 2021**	
Method: Panel EGLS (Cross-section weights)				
Cross-sections included: 37			Periods included: 13	
Total panel (balanced) observations: 481				
Linear estimation after one-step weighting matrix				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
Constant	-0.343056	0.067633	-5.072282	0.0000
Firm Size (x_1)	0.019190	0.002778	6.908140	0.0000
Effects Specification				
Cross-section fixed (dummy variables)				
Weighted Statistics				
R-squared	**0.441952**	**Mean dependent var**		**0.306491**
Adjusted R-squared	0.395345	S.D. dependent var		0.198370
S.E. of regression	0.158963	Sum squared resid		11.49753
F-statistic	9.482666	Durbin-Watson stat		0.772941
Prob(F-statistic)	0.000000			
Unweighted Statistics				
R-squared	0.405849	Mean dependent var		0.124076
Sum squared resid	16.87656	Durbin-Watson stat		0.519617

Table 4.10 shows the F - statistic = 9.4827, p = 0.000, which means that the model was statistically significant. This indicates that firm size explains about 44.19 per cent volatility ($R^2 = 0.4419$) in earnings. The beta coefficients: firm size, $\beta_1 = 0.0192$ (t = 6.9081, p = 0.00) was less than 0.05 significant levels. This indicates that firm size has a significant positive effect on earnings volatility. Thus, the equation predicting the effect of firm size on earnings volatility takes the form; Y = -0.3431 + 0.0192 (firm size). The above regression model has two implications; first, holding the firm size at zero, the volatility in earnings of the commercial banks in Kenya would be -0.3431 units; second, a unit change in firm size results in 0.0192-unit changes in volatility in earnings. This finding indicates that the firm size has a significant effect on the volatility of earnings of commercial banks in Kenya.

Based on this finding, the study rejected H_{01} and concluded that firm size has a positive effect on the earnings volatility of commercial banks in Kenya. The finding is explained by several bases namely, theoretical foundation and

empirical studies. The basis for explaining the hypothesis is drawn from empirical studies on the effects of firm size.

The positive effect of the size on earnings volatility occurs in the following ways. This phenomenon is attributable to four components; economies of scale derived from the use of assets, economies of scope which results in loan and product diversification, market power which hampers small banks from market entry (Kosmidou *et al.*, 2007) and efficiency of use of assets such as branch networks (Berger & Di Patti, 2006). Bank size generally captures potential economies or diseconomies of scale in the banking industry. On t one hand, a bank of large size should reduce costs because of economies of scale and scope (Akhavein, Berger and Humphrey, 1997; Goddard, Molyneux and Wilson, 2018).

In terms of the effect of size on earnings, empirical studies show that firm size in the banking industry has divergent findings with authors (Kosmidou, 2008; Sufian& Noor 2012; Bakar & Tahir, 2009; Eelderink, 2014; Anbar &Alper, 2011) indicating that firm the size significantly determines its earnings while (Athanasoglou *et al.*, 2019) hold the contrary opinion that firm size has no effect. Other views suggesting large – size banks, the firm size impacts bank earnings negatively but positively for smaller banks (Vong& Chan, 2018) while in Islamic banks, the firm's asset base significantly impacts its earnings (Masood & Ashraf, 2012; Anbar &Alper, 2011).

Large banks tend to enjoy better economies of scale relative to smaller banks hence reducing costs which in turn convert into comparatively higher profits. All size-related factors favour large banks to take advantage of registering a relatively higher efficiency index compared to smaller banks (Chen et al., 2018). Large banks are in a position to pay the best management team on the market whose greater effectiveness concerning smaller banks allows them to minimize operation and other costs resulting in higher margins (Oloo, 2011).

The Economies of scale offer low-cost advantages to large companies (Prabowo et al., 2018; Regehr and Sengupta, 2016). Higher efficiency by large

banks is attained through the larger asset base which tends to be less risk-averse and therefore diversify more easily compared to smaller banks (Kosmidou, 2019). Further, larger–sized banks have significant scale economies arising from cost reduction or savings or scope economies derived from product and loan diversification (Kosmidou *et al.,* 2020). The presence of larger banks in concentrated banking markets tends to decrease fragility by providing higher capital buffers that protect these markets against external shocks.

Firm size also accounts for size-related economies and diseconomies of scope and scale, however, size alone as a variable does not guarantee the earning of higher returns. This study indicated two scenarios, either scale and/or scope economies for smaller banks or diseconomies for their larger counterparts (Kosmidou *et al.,* 2020). Empirical evidence from Macau, China indicated that show that large-sized banks report a significantly lower ROA than their smaller compatriots (Vong& Chan, 2018). Larger companies, which typically offer many different products, can leverage their distribution systems to get most products to more people in the most efficient way. Furthermore, large banks are generally able to secure financing for their operations at a lower cost than their smaller competitors (Alexiou &Sofoklis, 2018).

Concerning the economies of scale, cost differences positively relate to bank earnings (Tsuma & Gichinga, 2016), while increased product diversification reduces credit risk and leads to higher returns. Therefore, in developing markets, firms make cost savings when they pursue growth strategies. The impact of firm size on profits is non–linear and is only positive within a certain range, beyond which, it turns negative due to organizational bureaucracy (Athanasoglou *et al.,* 2020). Large banks tend to have more diversification opportunities and this allows them to maintain (or even increase) returns while lowering risk.

Further, firm size in the banking industry is more concerned with the potential scale economies or diseconomies arising from cost differences and risk and product diversification (Athanasoglou *et al.,* 2006). Larger banks typically tend

to offer differentiated products and thus can leverage their networks by tapping into larger markets more efficiently. Furthermore, these large compatriots secure their finance for their operations more efficiently than their smaller competitors *(*Alexiou &Sofoklis, 2018). Evidence from past studies shows that large-sized banks are more efficient than their smaller counterparts, and thus they can benefit from scale economies. Furthermore, earnings can be further enhanced by emulating best practices in the technological and managerial realms (Goddard, Molyneux and Wilson, 2018).

Theoretically, the efficient structure hypothesis predicts that large banks are more efficient probably due to economies of scale. Long-term credit banks are more efficient, probably because they are less dependent on deposit funding; and banks affiliated with a financial holding company are less efficient, probably because of their complex and hierarchical organizational structure. Thus, efficient banks grow more (Homma, Tsutsui & Uchida, 2014). Similarly, the most efficient banks can also exploit better management and can benefit from economies of scale (Casu & Girardone, 2006). Banks have achieved higher efficiency through rationalization processes and cost-cutting. However, the most cost-efficient banks have also tried to boost earnings and have expanded by acquiring less efficient banks (Homma, Tsutsui & Uchida, 2014).

Efficient firms obtain large market shares and earn high profits to induce a causal association between size and earnings. Firms offering products that offer customers greater value enjoy gains in market share. Better-managed firms that have a competitive advantage grow faster than rival firms. Firms with superior skill and foresight gain market share through lower prices or better products (Etale, Bingilar & Ifurueze, 2016).

Superior management causes firms to operate at a higher level of effectiveness and efficiency including the capability to design and execute better strategies and plans, better control of costs, maintain efficient operations, have innovative products and market strategies, meet customer needs better than competitors as well as the ability to achieve higher productivity through training and

motivation of employees (Etale, Bingilar & Ifurueze, 2016). The quality of management is an important part of the market share effect because superior management causes banks to operate at a higher level of effectiveness and efficiency in managing the deposit portfolio and loan volume which in turn will boost earnings (Etale, Bingilar & Ifurueze, 2016).

The concentration–stability viewpoint indicates that larger banks in concentrated banking sectors enhance financial stability through several channels. First, larger banks tend to enjoy higher earnings and market power, allowing healthier "capital buffers," thus making them less vulnerable to liquidity and macroeconomic shocks. Second, larger banks have more conditions to boost their charter value, dissuading bank executives from taking excessive risks. Third, the supervision of fewer larger banks in a highly concentrated market is an effective intervention by supervisory authorities and, as a result, a lower danger of system-wide contagion. Fourth, larger banks can diversify loan portfolio risks more economically and geographically through cross-border activity due to greater economies of scale and scope (Tran, Nguyen & Nguyen, 2022).

Larger-sized banks tend to take excessive risks which might be caused by their desire to expand to retain control over the market. This increased risk may be due to the consolidation exercises carried out by some foreign banks through mergers and acquisitions of troubled banks (Bustaman et al., 2017). It is a situation where large banks, play a decisive role, in one or another way, they prevail over smaller banks. Efficiency affects the firms' performance. Based on the efficient structure hypothesis, if a firm enjoys a higher degree of efficiency than its competitors, the firm can maximize profits and increase its size and market share.

Concentration in the banking industry means the concentration of funds in a small number of large and major banks. Being developed by the same laws as the concentration of industry inevitably leads to monopoly (Staroselskaja 2011). Larger banks in more concentrated areas can attain more market power

and healthier earnings, discouraging banks from engaging in more risky operations and improving financial stability (Tran, Nguyen & Nguyen, 2022).

4.3.2 Hypothesis Two

The study sought to examine the impact of financial leverage on the earnings volatility of commercial banks in Kenya and tested the H_{02}: Financial leverage has no significant effect on the earnings volatility of commercial banks in Kenya. The hypothesis testing took the following format as illustrated in Table 4.11.

Table 4.11: Effect of Financial Leverage on Earnings Volatility

Dependent Variable: Earnings volatility			**Sample: 2009 2021**	
Method: Panel EGLS (Cross-section weights)				
Cross-sections included: 37			Periods included: 13	
Total panel (balanced) observations: 481				
Linear estimation after one-step weighting matrix				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
Constant	0.081034	0.014787	5.480173	0.0000
Financial leverage (x_2)	0.052458	0.017967	2.919672	0.0037
Effects Specification				
Cross-section fixed (dummy variables)				
Weighted Statistics				
R-squared	0.417983	Mean dependent var		0.312880
Adjusted R-squared	0.369375	S.D. dependent var		0.194008
S.E. of regression	0.156916	Sum squared resid		11.20328
F-statistic	8.599051	Durbin-Watson stat		0.863495
Prob(F-statistic)	0.000000			
Unweighted Statistics				
R-squared	0.404352	Mean dependent var		0.124076
Sum squared resid	16.91909	Durbin-Watson stat		0.508462

Table 4.11 shows that the F - statistic = 8.5990, p = 0.000, which means that the model was statistically significant. This indicates that financial leverage explains about 41.7 per cent volatility (R^2 = 0.4179) in earnings. The beta coefficients: financial leverage, β_1 = 0.0525 (t = 2.9197, p = 0.00) is less than 0.05 significant levels. This indicates that financial leverage has a significant effect on earnings volatility. Thus, the equation predicting the effect of

financial leverage on earnings volatility takes the form; Y = 0.0810 + 0.0525 (financial leverage). The above regression model has two implications; first, holding the financial leverage at zero, the volatility in earnings of the commercial banks in Kenya would be 0.0810 units; second, a unit change in financial leverage results in 0.0525-unit changes in volatility in earnings.

Based on this finding, the study rejected H_{02} and concluded that financial leverage has a significant effect on the earnings volatility of commercial banks in Kenya. The finding is explained by several bases namely, theoretical foundation and empirical studies. The basis for explaining the hypothesis is drawn from empirical studies on the effects of leverage. The empirical studies linking leverage to earnings volatility (Budi and Tn, 2018; Prabowo et al., 2018; Abbas & Ali, 2020), earnings (Budi and Tn, 2018; Poudel, 2012; Million, Matewos and Sujata, 2015; Hosna, Manzura and Juanjuan, 2018) and equity – to – asset ratios (Abbas and Ali, 2020).

Berger & Di Patti, (2006) asserted that high leverage performs several critical functions including moderation of management–shareholder conflict; the amount of risk to be absorbed; determination of liquidation conditions; and the firm's dividend policy. But the industry use of debt is set at certain levels; therefore, it does not impact their ability to borrow more, in that when they borrow, there's a likelihood of higher risks. Further, the authors suggested that high leverage levels lead to a reduction in agency costs while increasing firm value by realigning the firm's management towards the principals' interest.

Higher leverage tends to result in lowered efficiency; therefore large banks tend to efficiently use borrowed funds in comparison to their smaller compatriots (Berger & Di Patti, 2006). This is because significantly higher leverage may result in lower efficiency due to the trade-off between reduced costs of outside equity with increased costs of debt (Berger & Di Patti, 2006). Further, leverage is associated with profit efficiency, but the authors caution that the relationship may be reversed by higher levels of leverage associated with agency costs of outside debt.

Capitalization (ETA) has been demonstrated to be an important factor in explaining the earnings of financial institutions. A lower capital ratio suggests a relatively risky position; one might expect a negative coefficient on this variable (Berger, 1995). However, there are five reasons to believe that higher capitalization should foster earnings. First, banks with higher capital ratios engage in prudent lending. Second, banks with more capital should be able to lower their funding cost because a large share of capital is an important signal of creditworthiness (Molyneux, 1993).

Third, a well-capitalized bank needs to borrow less to support a given level of assets. This can be important in emerging countries when the ability to borrow is more subject to stops. Fourth, capital can be considered a cushion to raise the share of risky assets, such as loans. When market conditions allow a bank to make additional loans with a beneficial return, this should imply higher earnings. Finally, a capital increase may raise expected earnings by reducing the expected cost of financial distress including bankruptcy (Berger, 1995).

4.3.3 Hypothesis Three

The study sought to assess the effect of liquidity on the earnings volatility of commercial banks in Kenya and tested the H_{03}: Liquidity has no significant effect on the earnings volatility of commercial banks in Kenya. The hypothesis testing took the following format as illustrated in Table 4.12.

Table 4.12: Effect of Liquidity Management on Earnings Volatility

Dependent Variable: Earnings volatility			**Sample: 2009 2021**	
Method: Panel EGLS (Cross-section weights)				
Cross-sections included: 37			Periods included: 13	
Total panel (balanced) observations: 481				
Linear estimation after one-step weighting matrix				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
Constant	0.124893	0.001541	81.06576	0.0000
Liquidity (x_3)	0.006698	0.010565	0.633927	0.5264
Effects Specification				
Cross-section fixed (dummy variables)				
Weighted Statistics				
R-squared	0.411126	Mean dependent var		0.450351
Adjusted R-squared	0.361945	S.D. dependent var		0.309013
S.E. of regression	0.193733	Sum squared resid		17.07720
F-statistic	8.359500	Durbin-Watson stat		0.876077
Prob (F-statistic)	0.000000			
Unweighted Statistics				
R-squared	0.396160	Mean dependent var		0.124076
Sum squared resid	17.15177	Durbin-Watson stat		0.510495

Table 4.12 shows that the F - statistic = 8.359, p = 0.000, which means that the model was statistically significant. This indicates that liquidity explains about 41.11 per cent volatility (R^2 = 0.4111) in earnings. However, the beta coefficients: liquidity management, $\beta_1 = 0.0067$ (t = 0.6339, p = 0.52) is greater than 0.05 significant levels. This finding indicates that liquidity has no significant effect on earnings volatility.

Based on this finding, the study failed to reject H_{03} and concluded that liquidity has no significant effect on the earnings volatility of commercial banks in Kenya.

The impact of the liquidity occurs through the liquidity risk which determines other risks such as credit risk and performance in general. Thus, there is a negative relationship between liquidity risk and bank performance (Cucinelli, 2013). The risk arises also arises from the inability of the management to adequately cover the liquidity needs and therefore failure to anticipate and plan for changes in funding sources and cash needs. These instances also may arise from delays in loan repayments which has a cumulative effect. Liquidity risk

is negatively related to bank performance in a market-based financial system; however, it does not affect bank performance in a bank-based financial system (Chen et al., 2018).

Arif & Nauman Anees (2019) observed that liquidity risk negatively affects banks earnings of banks in Pakistan. JaraBertin et al., (2014) also confirmed the negative relationship as they find that bank performance negatively relates to credit risk, liquidity risk and operational inefficiencies. The impact of the liquidity risk relates to the relationship between the bank's asset and liability structures which are closely connected, especially concerning borrower defaults and fund withdrawals. Thus, the relationship determined the lending and funding business that can be conducted through off-balance sheet items (Imbierowicz & Rauch, 2014). Higher credit risk accompanies higher liquidity risk through depositor demand (Imbierowicz & Rauch, 2014).

Liquidity risk concerns the ability of a bank to anticipate changes in funding sources. This could have serious consequences on a bank's capacity to meet its obligations when they fall due. Effective liquidity management seeks to ensure that, even under adverse conditions, a bank will have access to the funds necessary to fulfil customer needs, maturing liabilities and capital requirements for operational purposes. The other significant way in which liquidity risk impacts earnings is through insufficient funding which, either increases in liabilities or conversion of assets at a reasonable cost (Chen et al., 2018). Besides, banks depend heavily on external funding and face more severe liquidity problems.

Studies in developed economies indicated that liquidity levels negatively correlate with the earnings of European domestic banks while positively relating to the performance of their foreign counterparts (Pasiouras & Kosmidou, 2007). Kosmidou, (2019) reported that liquidity negatively correlated with the earnings of the Greek banks. Empirical studies show that liquidity levels correlate negatively with earnings (Arif & Nauman, 2012; Marozva, 2018). Francis, (2022) observed that liquidity has a negative effect

on the earnings of banks in Sub – Saharan Africa, while Qin and Dickson (2019) observed that liquidity levels negatively affect the bank earnings in Tanzania. Pasiouras & Kosmidou (2007) affirmed that liquidity levels negatively correlate with the earnings of European domestic banks, but positively relate to firm performance in the case of foreign banks liquidity performance.

Several studies show that leverage negatively relates to ROA (Eelderink, 2014; Athanasoglou, Brissimis & Delis, 2019). Sufian & Noor, (2019) reported that banks with lower leverage tend to generally report higher ROA, with a corresponding lower return on equity (ROE). The effect arises because lower leverage would free up more assets for the generation of profits, while higher leverage takes out liquid assets from the production systems. Further, leverage is seen to increase profit efficiency thus higher leverage is associated with higher profit efficiency (Berger & Di Patti, 2006). But the authors caution that the relationship may be reversed by higher levels of leverage associated with agency costs of outside debt. In other instances, leverage positively correlated with the performance of the Greek banks (Kosmidou, 2019).

The effect of the liquidity levels on performance draws from the risk related to liquidity which arises from the mature origination of long–term loans from short–term deposits. These liquidity risks are either funding risks related to the organizational inability to efficiently meet the planned and arising immediate cashflows and collateral needs, while the market risk is the organizational inadequacy to meet the market depth (Vodova, 2011). The provision for loan loss affects the bank's earnings since they represent an intermediate cost (Quagliariello, 2007) and affect the earnings of the sector (Vong& Chan, 2018). Bank loans are considered as assets that generate income; however, the quality of the loan portfolio is a component that directly determines its earnings. Thus, banks accumulate losses from loan delinquency (Dang, 2011).

Empirical evidence suggests that liquidity has a significant impact on the profits earned by banking firms (Liargovas & Skandalis, 2019). The effect of

liquidity of commercial banks in the UK seems to vary with the earnings measure, such that liquidity negatively relates to ROA (Kosmidou *et al.*, 2020). A study on commercial banks in Sub-Saharan Africa showed that several local-incorporate banks had failed due to illiquidity (Brownbridge, 1998). However, some of the risk management structures being implemented by commercial banks (Arif & Nauman, 2019) have institutionalized mechanisms for the management and mitigation of liquidity risk. This would indicate that the ability of a banking firm is underscored by the existence of a highly liquid asset and its transferability (Nazir, 2010).

Changes in credit risk may reflect changes in the health of a bank's portfolio (Cooper, Jackson and Patterson, 2021), which may affect the performance of the institution. Duca and McLaughlin (1990), among others, conclude that variations in bank earnings are largely attributable to variations in credit risk. Since inverse exposure to credit risk is normally associated with decreased firm earnings. This triggers discussion concerning not the volume but the quality of loans made. In this direction, Miller and Noulas (1997) suggest that financial institutions being more exposed to high-risk loans increase the accumulation of unpaid loans and decreases earnings.

Liquidity arising from the possible inability of banks to accommodate decreases in liabilities or to fund increases on the assets side of the balance sheet is considered an important determinant of bank earnings. A larger share of loans to total assets should imply more interest revenue because of higher risk. Thus, one would expect a positive relationship between liquidity and earnings (Bourke, 1989). Graham and Bordeleau (2010) argue that earnings is improved for banks that hold some liquid assets, however, there is a point at which holding further liquid assets diminishes a bank's earnings.

4.3.4 Hypothesis Four

The study sought to determine the effect of asset quality on the earnings volatility of commercial banks in Kenya and tested the H_{04}: Asset quality has

no significant effect on the earnings volatility of commercial banks in Kenya. The hypothesis testing took the following format as illustrated in Table 4.13.

Table 4.13: Effect of Asset Quality on Earnings Volatility

Dependent Variable: Earnings volatility			**Sample: 2009 2021**	
Method: Panel EGLS (Cross-section weights)				
Cross-sections included: 37			Periods included: 13	
Total panel (balanced) observations: 481				
Linear estimation after one-step weighting matrix				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
Constant	0.146674	0.007328	20.01573	0.0000
Asset Quality (x_4)	0.026128	0.008277	3.156817	0.0017
Effects Specification				
Cross-section fixed (dummy variables)				
Weighted Statistics				
R-squared	0.425768	Mean dependent var		0.243940
Adjusted R-squared	0.377810	S.D. dependent var		0.178215
S.E. of regression	0.142627	Sum squared resid		9.255785
F-statistic	8.877957	Durbin-Watson stat		0.677830
Prob(F-statistic)	0.000000			
Unweighted Statistics				
R-squared	0.409509	Mean dependent var		0.124076
Sum squared resid	16.77259	Durbin-Watson stat		0.522376

Table 4.13 shows that the F - statistic = 8.877, p = 0.000, which means that the model was statistically significant. This indicates that asset quality explains about 42.5 per cent volatility ($R^2 = 0.4257$) in earnings. The beta coefficients: asset quality, $\beta_1 = 0.0261$ (t = 3.1568, p = 0.00) is less than 0.05 significant levels. This indicates that asset quality has a significant positive effect on earnings volatility. Thus, the equation predicting the effect of asset quality on earnings volatility takes the form; Y = 0.1466 + 0.0261(asset quality). The above regression model has two implications; first, holding asset quality at zero, the volatility in earnings of the commercial banks in Kenya would be 0.1466 units; second, a unit change in asset quality results in 0.0261-unit changes in volatility in earnings. This finding indicates that asset quality has a significant positive effect on the volatility of earnings of commercial banks in Kenya.

Based on this finding, the study rejected H_{04} and concluded that asset quality has a significant positive effect on the earnings volatility of commercial banks in Kenya. The finding is explained by several bases namely, theoretical foundation and empirical studies. The higher the credit risk assumed by a bank, the higher the accumulation of defaulted loans. In turn, the higher the level of loans in default, the greater the negative impact on bank earnings (Alexiou & Sofoklis, 2018). Quality assets are a key feature of a commercial bank; therefore, bad quality assets can prompt a bank rating downgrade and it becomes more difficult to earn depositors' trust, such banks can therefore only attract deposits by having a higher deposit rate.

Asset quality will not only influence the operating costs of banks but will also affect the interest costs of the banks as well as their operating performance (Abata, 2014). Evidence from Islamic banks indicates that asset quality negatively correlates with bank earnings i.e., ROE (Masood & Ashraf, 2019) with a consequent negative impact. Similarly, Nazir, (2010) revealed that a higher credit portfolio coupled with a weak asset quality negatively impacts the earnings of commercial banks in India and in the Nigerian Banking industry (Ezeoha, 2011) and in the Malaysian Banking sector (Wasiuzzaman & Tarmizi, 2010). However, in Tanzania, asset quality positively impacts bank earnings (Qin & Dickson, 2019) while in Spain, the loan loss provision ratio determines bank earnings (Trujillo-Ponce, 2013).

Typically, lower loan quality would translate to the devotion of more resources to loan monitoring and credit underwriting, thereby increasing bank costs (Trujillo-Ponce, 2013). This loan attribute is dependent on the management behaviour which is defined by the ownership structure, whereby, government ownership sometimes connotes worse asset quality in comparison to privately-owned counterparts (Iannotta *et al.*, 2007). Further, credit risk is attributed to the lower asset quality in government-controlled banks (Zhu & Yang, 2016).

Non-performing loans (NPL) have an inverse relationship with banks' earnings. Hence, it's crucial that banks practice prudent credit risk management

and safeguard the assets of the banks and protect the investors' interests (Abata, 2014). Poor asset quality tends to reduce earnings by limiting the pool of loanable resources; therefore, asset quality is represented by non-performing loans (García-Herrero *et al.,* 2018). Severe loan losses tend to depress the firms earnings in the sector (Abata, 2014). However, previous studies show that asset quality is negatively correlated with earnings (Kosmidou, 2008; Olweny & Sipho, 2011).

The ratio of provisions or allowance for loan losses to total net loans is an important determinant of earnings in the Banking industry. As this ratio rises, exposure to credit risk increases along with the possibility of bank failure. The extent to which a bank is preparing for loan losses is indicated by the build-up in its loan–loss reserves (allowance for loan losses) through annual charges against current income (Alexiou &Sofoklis, 2018).

Low liquidity levels and poor asset quality are major causes of bank failures (Jha & Hui, 2019). Thus, poor asset quality hampers banks' ability to advance credit which is a source of income for commercial banks, thus, adversely impacting their performance (Kolapo, Ayeni & Oke, 2019). Sufian and Chong (2019) reported that credit risk in the Philippines negatively impacts the earnings of commercial banks. This finding finds support from other extant literature with many indicating a negative impact. In Europe, public sector banks underperforming than both mutual and private banks because of poor loan quality (Iannotta, Nocera & Sironi, 2007).

Market power would improve loan portfolio quality and lead to greater bank stability. As banks appropriate informational rents from developing relationships with borrowers, they may have an incentive to limit their risk exposure (Ariss, 2010). Banks with more loan market power will charge higher rates to loan customers and make it harder for borrowers to repay loans, thereby exacerbating their moral hazard incentives to shift into riskier projects and possibly resulting in a riskier set of bank clients due to adverse selection considerations. It is thus possible that highly concentrated banking markets are

more prone to financial instability, and the case is more pronounced if the institutions believe that they are too big to fail and are more likely to be explicitly or implicitly protected by the government safety net (Ariss, 2010). loan market power may result in riskier loan portfolios, banks may protect their overall franchise value using other means, such as increasing their equity capital or engaging in other risk-mitigating techniques. This deterioration in bank asset quality affects its operating and financial performance as well as the general soundness of the financial system (Abata, 2014).

4.3.5 Hypothesis Five

The study sought to evaluate the effect of income diversification on the earnings volatility of commercial banks in Kenya and tested the H_{05}: Income diversification has no significant effect on the earnings volatility of commercial banks in Kenya. The hypothesis testing took the following format as illustrated in Table 4.14.

Table 4.14: Effect of Income Diversification on Earnings Volatility

Dependent Variable: Earnings volatility			**Sample: 2009 2021**	
Method: Panel EGLS (Cross-section weights)				
Cross-sections included: 37			Periods included: 13	
Total panel (balanced) observations: 481				
Linear estimation after one-step weighting matrix				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
Constant	0.123981	0.002616	47.39947	0.0000
Income diversification (x_5)	-0.000148	0.003827	-0.038647	0.9692
Effects Specification				
Cross-section fixed (dummy variables)				
Weighted Statistics				
R-squared	0.408622	Mean dependent var		0.445903
Adjusted R-squared	0.359233	S.D. dependent var		0.295272
S.E. of regression	0.193469	Sum squared resid		17.03074
F-statistic	8.273423	Durbin-Watson stat		0.873895
Prob(F-statistic)	0.000000			
Unweighted Statistics				
R-squared	0.396194	Mean dependent var		0.124076
Sum squared resid	17.15079	Durbin-Watson stat		0.510334

Table 4.14 shows that the F - statistic = 8.273, p = 0.000, which means that the model was statistically significant. This indicates that income diversification explains about 40.86 per cent volatility (R^2 = 0.4086) in earnings. However, the beta coefficients: income diversification, β_1 = 0.0001 (t = -0.0386, p = 0.97 is greater than 0.05 significant levels. This finding indicates that income diversification has no significant effect on earnings volatility.

Based on this finding, the study failed to reject H_{04} and concluded that income diversification has no significant effect on the earnings volatility of commercial banks in Kenya. The finding is explained by several bases namely, theoretical foundation and empirical studies. This effect of income diversification is mainly driven by efficiencies in the generation of non-interest income. Thus, higher fee-income ratio improves the efficiencies to earn lower fees than for banks with higher levels of non-interest income (Mamatzakis & Bermpei, 2014).

Diversification may increase the volatility of revenues; therefore profit (Berger et al., 2010) can exaggerate costs and consequences for banks that try unsuccessfully to enter a new sector of an increasingly competitive market (Abbas & Ali, 2020). The shift towards a product mix dominated by fee-based activities tend to increase the bank's revenue volatility, its degree of operating and financial leverage, and the level of its earnings all increase (Chiorazzo, Milani & Salvini, 2019).

Financial institutions that derive a higher proportion of their income from non-interest sources, such as fee-based services, tend to report a lower level of earnings (Canals, 1993). The impact of the non–interest income is related to volatility in earnings through the substitution of traditional operations with fee-income activities and lower efficiency in the loan portfolio (Mamatzakis & Bermpei, 2014). Revenues generated from new business units have significantly contributed to improving bank performance (Wu et al., 2007).

There are three arguments against the effect of income diversification. First, a fee-based relationship may drive away clients more than a loan-based

relationship. Despite the greater sensitivity to movements in interest rates and economic downturns, traditional lending activities generate stable revenue over time and thus switching costs and information costs make it costly for either borrowers or lenders to walk away from a lending relationship. Second, the shift from interest to non-interest income may require heavy fixed investments in technology and human resources, as a consequence, an increase in operating leverage and earnings volatility. Lastly, many fee-based activities can be performed holding little or no regulatory capital and this suggests a higher degree of financial leverage and, as a consequence, earnings volatility (DeYoung & Rice, 2018).

The non-interest income influences the bank earnings with the degree of differential products of rival firms influencing competition and their performance (Rinkevičiūtė & Martinkutė-Kaulienė, 2014). When banks are more diversified, they can generate more income resources, thereby reducing their dependency on interest income which is easily affected by the adverse macroeconomic environment. Jiang et al., (2021) show that diversified banks in Hong Kong appear to be more profitable. However, fee-income-generating businesses exert a negative impact on banks' earnings (Gischer and Juttner, 2018; Demirguc and Huizinga, 2019). They attribute such a finding to the fact that those fee-income generating businesses, such as trades in currencies and derivatives, and credit card provisions, are subject to more intense competition, especially on an international basis than those traditional interest income activities.

Income diversification among the banks is desirable from both efficiency and risk management. The joint production of a wide range of financial services should increase a bank’s efficiency, thanks to economies of scope (Chiorazzo, Milani & Salvini, 2019). Thus, generally speaking, diversification across new types of services should enhance earnings. Diversification of income sources that is, the shift from interest to non-interest income—should reduce total risk, since activities that generate non-interest income are thought of as uncorrelated, or, at least, imperfectly correlated, with those that produce

interest income, diversification should stabilize operating income and give rise to a more stable stream of profits (Chiorazzo, Milani & Salvini, 2019).

Diversification tends to reduce bank risk and improve performance (Berger et al., 2010). Revenue diversification reduces bank risk. First, portfolio credits generate more stable income than non-traditional products because maintaining costs and enhancing portfolios of existing borrowers are cheaper for banks. In contrast, switching costs for borrowers to move to other banks are higher. This offers a tendency for lending relationships to be maintained beyond the short term. Second, a bank's operating leverage will increase when it expands its business to non-traditional products (Hayden, Porath &Westernhagen, 2007).

This is because the bank will need to hire well-trained officers to sell the products. In comparison, a bank need not hire new officers to increase its credit portfolio from existing borrowers. Thus, the only cost incurred is the interest expense paid to depositors which reduces the bank's operating leverage. Third, no additional capital is required to increase a bank's non-traditional activities hence, increasing returns on equity (Bustaman et al., 2017).

At the aggregate level, a decreasing volatility of the net interest income provides a greater benefit than a positive impact of diversification from non-interest income. Accordingly, this results in a lower volatility of net operating profits. The bank's dependence on income drawn from non-traditional activities has also resulted in higher risk and lower risk-adjusted profits (Bustaman et al., 2017).

4.3.6 Hypothesis Six

The study sought to assess the effect of market concentration on earnings volatility of commercial banks in Kenya and tested the H_{06}: Market concentration has no significant effect on earnings volatility of commercial banks in Kenya. The hypothesis testing took the following format as illustrated in Table 4.15.

Table 4.15: Effect of Market Concentration on Earnings Volatility

Dependent Variable: Earnings volatility			Sample: 2009 2021	
Method: Panel EGLS (Cross-section weights)				
Cross-sections included: 37			Periods included: 13	
Total panel (balanced) observations: 481				
Linear estimation after one-step weighting matrix				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
Constant	0.564123	0.103374	-3.075466	0.0000
Market concentration	0.484302	0.153220	1.287844	0.0000
Effects Specification				
Cross-section fixed (dummy variables)				
Weighted Statistics				
R-squared	0.380551	Mean dependent var	0.162401	
Adjusted R-squared	0.326137	S.D. dependent var	0.162087	
S.E. of regression	0.110442	Sum squared resid	6.451423	
F-statistic	6.225420	Durbin-Watson stat	0.826716	
Prob(F-statistic)	0.000000			

Table 4.15 shows that the F - statistic = 6.2254, p = 0.000, which means that the model was statistically significant. This indicates that market concentration explains about 38 per cent volatility (R^2 = 38) in earnings. The beta coefficients, β_6 = 0.4843 (p = 0.000) is less than 0.05 significant levels. This indicates that market concentration has a significant positive effect on earnings volatility.

Therefore, the findings indicate that market concentration has a significant effect on the volatility of earnings of commercial banks in Kenya. Based on this finding, the study rejected H_{06} and concluded that market concentration has a significant effect on earnings volatility of commercial banks in Kenya. The finding is explained by several bases namely, theoretical foundation and empirical studies.

Banking business emphasizes the benefits of a highly concentrated banking market as follows: first, the increasing concentration in the banking market

may help the banking firms to improve their efficiency level. Second, a less concentrated banking market with many small banks is more disposed to banking crises compared to the concentrated banking sector with few large banks. Third, the banking system with fewer large banks is less fragile compared to the banking system with many small banks because large banks can diversify better compared to small banks. Fourth, banking firms in highly concentrated markets can gain higher profits, therefore lower bank fragility. Fifth, it is easy to monitor a few large banks compared to many smaller banks; therefore, the probability of bank failure is less in a more concentrated banking system (Mohammed, Ismail & Muhammad, 2018).

Evidence supports the efficient-structure hypothesis for banks located in countries with low market concentration (Chan et al., 2018). Higher market concentration leads to banks adopting a diversification strategy, increasing sector stability. As banks are larger and more diversified, they could have more incentives to engage in risky activities (Tran, Nguyen & Nguyen, 2022). Market concentration is not a random event but rather the result of firms with superior efficiency obtaining a large market share (Bhatti & Hussain, 2010). Market share reflects the current competitive position that a firm attains in the marketplace, so firms with high market shares are considered to better satisfy customers' needs and, therefore, enjoy a competitive advantage against their smaller competitors (Genchev, 2020).

Concentration in the banking industry can generate market power allowing banks to earn monopolistic profits by offering lower deposit rates and charging higher loan rates. This reflects the setting of prices less favourable to consumers in more concentrated markets as a result of collusion or other forms of non-competitive behaviour. The more concentrated the market, the less the degree of competition. The smaller the number of firms and the more concentrated the market structure, the greater the probability that firms in the market will achieve a joint price-output configuration that approaches the monopolistic solution (Ahamed, 2020).

Market concentration might affect stability differently in less developed markets due to varying governance, institutional quality, and regulatory monitoring (Claessens & Yurtoglu, 2013). As concentration can reduce risk and improve earnings, banks with higher capital are incentivized to protect their equity by taking less risk. Furthermore, higher concentration and capital build-ups might effectively establish entry barriers for market participants, further improving the earnings of the incumbent banks (Tran, Nguyen & Nguyen, 2022).

Market concentration emerges from the competition where firms with low-cost structures increase profits by reducing prices and expanding market share. A positive relationship between firm profits and market structure is attributed to the gains made in market share of more efficient firms. In turn, these gains lead to increased market concentration. That is, increased profits are assumed to accrue to more efficient firms because they are more efficient and not because of collusive activities (Bello and Isola, 2014)

Concentration in the banking industry means the concentration of funds in a small number of large and major banks. The concentration of bank capital leads to competition in the banking industry where large banks have a decisive advantage over smaller ones (Rinkevičiūtė & Martinkutė-Kaulienė, 2014). Thus, an industry's structure arises because of superior operating efficiency by particular firms (Allen et al., 2020). Most efficient banks tend to increase their market share and therefore can exploit market power. Therefore, higher profits in concentrated markets could arise from greater productive efficiency (Casu & Girardone, 2006).

The nature of competition in the industry from its structural characteristics such as concentration, firm's market share, number of firms and condition of entry. Hence, the existence an association between competition and the structure of an industry (Mohammed, Ismail & Muhammad, 2018). Firms with low-cost structures increase profits by reducing prices and expanding market shares. Therefore, a positive relationship between firm profits and market structure

exists because of gains made in market share by more efficient firms. In turn, these gains lead to increased market concentration. This suggests that increased profits accrue to firms with greater efficiency (Allen et al., 2020).

The positive relationship between market share and earnings may be a direct result of the stability in the economics and competitive environment. Higher effectiveness and efficiency include the capability to design and execute better strategies and plans, better control of cost, maintain efficient operations, have innovative products and market strategies, meet customer needs better than competitors as well as ability to achieve higher productivity through training and motivation of employees (Etale, Bingilar & Ifurueze, 2016).

Theoretically, the efficient structure hypothesis predicts that under the pressure of market competition, efficient firms win the competition and grow, so that they become larger, obtain greater market share, and earn higher profits. As a result, the market becomes more concentrated (Homma, Tsutsui & Uchida, 2014). The efficient structure theory explains the positive relationship between concentration and earnings as an indirect consequence of efficiency more concentrated sector favours bank earnings motivated by the benefits of greater market power, which reflects the setting of prices that are less favourable to consumers (lower deposit rates, higher loan rates) as a result of competitive imperfections in these markets (monopoly profits)(Genchev, 2020).

Market concentration can reduce risk and improve earnings; banks with higher capital have more incentive to protect their equity by operating at lower risk levels. Although concentration is not a decent measure of competition, a higher concentration can, to some extent, infer higher market power and less competition; thus, banks do not have to keep high capital. As capital increases, banks in a concentrated market should have more incentives to protect the capital and involve fewer risk-taking activities (equity-at-risk effect). Market share and concentration are not proxies of market power, but the proxy of firms' efficiency (Al Arif &Awwaliyah, 2019). Tajgardoon et al., (2020) show that

the efficient structure is one of the essential elements of earnings (Tran, Nguyen & Nguyen, 2022).

4.3.7 Effect of Banks specific facets and market concentration on Earnings Volatility of commercial Banks.

Table 4.16: Effect of Bank Specific Facets and Market Concentration on Earnings Volatility

Dependent Variable: Earnings volatility			**Sample: 2009 2021**
Method: Panel EGLS (Cross-section weights)			
Cross-sections included: 37			Periods included: 13
Total panel (balanced) observations: 481			
Linear estimation after one-step weighting matrix			
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
Constant	-0.664187	0.109323	-6.075466	0.0000
Financial leverage(X_2)	-0.052320	0.021985	-2.379769	0.0177
Liquidity (X_3)	0.055129	0.022060	2.499074	0.0128
Firm size (X_1)	0.033204	0.004529	7.331425	0.0000
Assetquality (X_4)	0.050989	0.010182	5.007818	0.0000
Income diversification (X_5)	-0.010192	0.008581	-1.187759	0.2356
Market concentration ((X_6)	0.423802	0.194420	2.179828	
Effects Specification				
Cross-section fixed (dummy variables)				
Weighted Statistics				
R-squared	0.510994	Mean dependent var	0.197691	
Adjusted R-squared	0.458247	S.D. dependent var	0.167144	
S.E. of regression	0.122257	Sum squared resid	6.651353	
F-statistic	9.687680	Durbin-Watson stat	0.776820	
Prob(F-statistic)	0.000000			
Unweighted Statistics				
R-squared	0.466900	Mean dependent var	0.124076	
Sum squared resid	15.14243	Durbin-Watson stat	0.558403	

Table 4.16 shows that the F - statistic = 9.6876, p = 0.000, hence the model was statistically significant. This indicates that bank specific facets and market concentration explains about 51.09 per cent volatility (R^2 = 0.5109) in earnings. The beta coefficients: constant, β0= -0.6642 (p = 0.000); firm size (x_1) β1= 0.0332 (p = 0.000); financial leverage(x_2), β_2 = 0.0523 (p = 0.017); liquidity(x_3), β_3 = 0.0551 (p = 0.012); asset quality(x_4), β_4 = 0.0510 (p = 0.000); market concentration(x_6), β_6 = 0.4238 (p = 0.029) were statistically significant.

While income diversification(x_5) β_5=-0.01 (p=0.2356) was not statistically significant.

Thus, the regression equation that the predicts earnings volatility is given by

$EV = -0.6642 + 0.0332 X_1 + 0.0523 X_2 + 0.0551 X_3 + 0.0510 X_4 - 0.01 X_5 + 0.4238 X_6$.

Table 4.17: Summary of Hypothesis Testing

Hypothesis	Results	Conclusion
1. H_O: Firm size has no significant effect on the earnings volatility of commercial banks in Kenya.	Rejected	Firm size has a significant positive effect on the earnings volatility of commercial banks in Kenya
2. H_O: Financial leverage has no significant effect on the earnings volatility of commercial banks in Kenya.	Rejected	Financial leverage has a significant positive effect on the earnings volatility of commercial banks in Kenya
3. H_O: Liquidity has no significant effect on the earnings volatility of commercial banks in Kenya.	Not Rejected	Liquidity has no significant effect on the earnings volatility of commercial banks in Kenya..
4. H_O: Asset quality has no significant effect on the earnings volatility of commercial banks in Kenya.	Rejected	Asset quality has a significant positive effect on the earnings volatility of commercial banks in Kenya.
5. H_O: Income diversification has no significant effect on the earnings volatility of commercial banks in Kenya	Not Rejected	Income diversification has no significant effect on the earnings volatility of commercial banks in Kenya
6. H_O: Market concentration has no significant effect relationship between firm internal facets and earnings volatility of commercial banks in Kenya	Rejected	Market concentration has a significant positive effect on earnings volatility of commercial banks in Kenya

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Introduction

The section presents the summary of the findings, conclusions and recommendations for both policy and management.

5.2 Summary

The study had six objectives in total and these included: establishing the effect of firm size, financial leverage, liquidity levels, asset quality, income diversification and market concentration on the volatility of earnings of commercial Banks in Kenya. This study found that firm size, financial leverage, asset quality, income diversification and market concentration influence earnings volatility of commercial banks in Kenya. While every factor studied portrayed significant effect on the earnings volatility except liquidity, a joint effect of the variables indicated significant effect to a greater extent

5.2.1 Effect of Firm Size

Firm size has a positive effect on the earnings volatility of the commercial banks, an affirmation that large banks in assets in Kenya tend to have superior performance. This effect is attributable to several factors which include; market power which allows for large banks to be operationally efficient and thus are cost-efficient, second, have higher scale and scope economies through the fixed cost allocation and third, other efficiency gains from specialization. This finding provides empirical evidence for the concept of economies of scale which states that large firms tend to derive efficiencies from their operational process by reducing the cost of serving a customer due to increasing returns to scale as the number of customers increases.

5.2.2 Effect of Financial Leverage

As indicated by the state of the banks, leverage is being used appropriately in the banking industry in Kenya. Generally, high leverage ratios would signify that the banks have more liabilities than the assets and thus hinder lending in that banks use financial assets to lend which by nature are of the same nature. For the commercial banks in Kenya, the leverage ratios indicate that liabilities are four-fifths the total assets signifying a manageable level.

Higher leverage ratios might be indicative of changes in earnings because of increases in interest incomes but this improved performance would come with the cost of improving screening and monitoring of credit risk. This implies that levels of leverage are maintained because relatively high ratios would result in improved earnings, and owners would demand more earnings from the firm which in turn pressurizes the top management team to increase their use of leverage.

5.2.3 Effect of Liquidity

Liquidity has no significant effect on the earnings volatility of commercial banks in Kenya. Probably, the required levels of liquidity by the regulatory authorities could have a counter effect on the firms who react by reducing the returns on saving with a complementary increase in the lending rate. The mismatch would result in net positive returns from loans because of the low rate of saving with a correspondingly higher return on lending. This is further strengthened by the significant negative association between liquidity and leverage indicating that high leverage would have a corresponding reduction in liquidity. This could be attributable to the fact that a very high ratio of loans to the asset will reduce liquidity, leading to a liquidity gap that arises from non-performing loans which exacerbate liquidity risk leading to reduced bank earnings.

5.2.4 Effect of Asset Quality

Asset quality has a significant effect on the earnings volatility of commercial banks in Kenya. Thus, higher asset quality would translate to lower profits in that banks increase their loan portfolio and therefore incur a higher financing requirement due to the high level of provisions. The main concern surrounding asset quality is the risk posed by non-performing loans such as in developing economies which are bank reliant, there is a greater credit risk arising from loans used to fund the economic sectors. But in developing economies which have well-developed capital markets, the credit risk are diminished because banks serve as secondary vehicles for capital.

5.2.5 Effect of Income Diversification

Income diversification does not affect earnings volatility probably because the banks in Kenya are still seeking ways to diversify their income sources. Diversification benefits appear to be greatest for banks with moderate levels of downside risk and when the banks' monitoring incentives need strengthening. Specialised banks with low exposure to downside risk have only minor incentives to diversify since diversification might increase their probability of failure, which is considered to be low at present. For diversified banks with sufficiently high downside risk, diversification can increase the probability of default since a diversified bank is exposed to more sectors than a specialised one and a downturn in one sector is enough to make a bank fail. Furthermore, banks which expand into new economic sectors or geographical regions have less expertise and, therefore, lower monitoring effectiveness in these areas.

5.2.6 Effect of Market Concentration.

Market concentration has significant effect on the earnings volatility of commercial banks in Kenya. Higher concentration and capital might effectively establish barriers for new entries, further improving the earnings and lowering the risk-taking activities of the incumbent banks. Higher concentration might allow better and more efficient monitoring of bank

operations, which might prove convenient and meaningful in developing countries without adequate institutions. Furthermore, bank capital is an essential source of financing in less developed markets, so banks in such markets should be more concerned about protecting this funding source

5.3 Conclusion

The study findings conclude that bank specific facets have a significant effect on the earnings volatility of commercial banks in Kenya. Different determinants of earnings are specific to the country context and bank context and thus the managerial decisions in the study context refer to asset quality, liquidity income diversification and leverage while industry structure factors such as firm size and market concentration influences the earnings volatility of banks.

Firm size significantly determines the performance of commercial banks in Sub- Saharan Africa, therefore larger banks earn superior profits while small banks eke out profits. Firm size may be a significant component of returns on investment but on the other hand the adage 'too big to fail' should be considered in that the 2009 global crisis afflicted large banks more significantly. To the same extent, large-sized banks tend to have significantly higher agency costs due to their supervision. Comparatively small-sized banks can also make significant profits depending on their operations strategies as exemplified by the Victoria Commercial Bank which had comparatively similar average ROA to large peers.

Asset quality affects the performance of a bank due to these banks must ensure that lending policy is excellent to tackle moral hazards and information asymmetry from the customers. Asset quality is a significant component of earnings as it may serve as a measure of the efficiency with which the banks generate profits in that the higher the asset quality indicator the more adverse the banks are afflicted by the loan loss provision.

Financial leverage has a significant effect on earnings volatility and higher leverage ratios tend to reduce earnings volatility. Because leverage levels have a significant effect on earnings, the study concludes leverage effects earnings through the increase in assets which then reduces the changes.

Liquidity has no effect on earnings volatility due to the fact that loan to liabilities ratios impacts majorly on equity ratios. Because of this aspect, liquidity management does not relate to liability component in the firm's financial performance.

Income diversification has an effect on earnings volatility due to the fact that the quantity of the non – core business operations in the firm impacts on the ratio of non-interest income to total income, therefore the income diversification has no effect on earnings volatility.

Market concentration has positive effect on earnings volatility which occurs through the market power of the firm. Large firms tend have bigger market power and this enables the banks to grow assets and benefit from the market power. Therefore, this aspect positively contributes to positive change in earnings thus resulting in earnings volatility.

5.4 Recommendation

5.4.1 Managerial Recommendations

First, firm size has a positive effect on earnings and therefore the regulatory environment should be improved to reduce managerial opportunisms' that is present in large firms. Large firms tend to have larger managerial scope thus; there is a likelihood of managerial opportunism arising because of lesser supervision.

Secondly, financial leverage has an effect on earnings volatility, therefore the banks must balance out its leveraging needs and the earnings in order to manage the negative impact of leveraging assets to ramp up earnings.

Thirdly, liquidity has no effect on earnings volatility and since liquidity is an internal indicator of sustainability in performance, the management of these banks must safeguard the interest of both customers and shareholders. The New Basel III framework advocates for the active management of liquidity risk and thus banks must balance out the requirement of liquid assets with earnings.

Fourth, an increase in asset quality should prompt reviews, at both bank and industry levels, over the risk asset management practices. As seen in the performance reports, most banks have instituted independent risk management practices such as internal audits but still, there is a significant cause of loss provisions associated with the implementation of monitoring regimes.

Since income diversification has an effect on earnings volatility, there is the need for the banks to diversify their revenue bases by seeking more revenue bases through acquisitions, mergers and other significant efforts.

5.4.2 Policy Recommendations

The findings have some policy implications for the banking sector in Kenya and sub - Sahara Africa and other developing countries which have bank-based economies. Bank-based economies tend to rely on the sound function of the banks and such instability tends to have a multiplier effect on other economic sectors.

Tightening the licensing procedures that would preclude entities from seeing shorted gains. This would limit individuals and corporates from entry into the banking sector without due diligence.

5.5 Contributions to Knowledge

The study contributed to the knowledge by investigating the effect of two industry specific variables combined with bank specific variables on volatility of earnings given that banks in Kenya have continuously reported inconsistencies in their earnings. It managed to capture the critical firm facets related to the managerial decisions that influence the earnings volatility of

commercial banks in Kenya. The exploration of the linkage between bank specific facets, market concentration and earnings volatility in commercial banks particularly in developing countries provides not only significant contribution to finance literature but also enables managers to properly manage the factors for their banks to compete in the fast changing business environment.

The study can be considered to be a descriptive study and thus sets out a baseline for other studies which may concern volatility in earnings of these commercial banks in Kenya.

5.6 Suggestion for Further Studies

The focus of the current study was on internal influences of earnings in commercial banks and based on the results other studies can focus on the external influences and seek to measure and compare the most important aspects of the commercial banks in Kenya.

Future studies should apply different research instruments like interview guide, focus group discussions to involve respondents in discussions in order to generate detailed information which would help in bringing out better strategies for stabilizing commercial banks earnings in Kenya. The conceptual model of this study can also be enhanced by considering other aspects of external environmental factors since the current study limited itself to market concentration.

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APPENDICES

Appendix I: List of Commercial Banks in Kenya

Large-Size Banks	Small-Size Banks
1. KCB Bank Kenya	1. African Banking Corporation
2. Equity Bank (Kenya)	2. Gulf African Bank
3. Co-operative Bank of Kenya	3. Guardian Bank
4. Standard Chartered Bank Kenya	4. Guaranty Trust Bank - Kenya
5. Barclays Bank of Kenya	5. First Community Bank
6. National Commercial Bank of Africa	6. Victoria Commercial Bank
7. Diamond Trust Bank Kenya	7. Credit Bank
8. Stanbic Bank Kenya	8. Paramount Bank
Medium-size banks	9. M-Oriental Bank
1) Citibank N.A Kenya	10. Development Bank of Kenya
2) I & M Bank	11. SBM Bank (Kenya)
3) Bank of Baroda (K)	12. Access Bank
4) Bank of India (K)	13. Consolidated Bank of Kenya
5) Prime Bank	14. Sidian Bank
6) Ecobank Kenya	15. Kingdom Bank
7) National Bank of Kenya	16. Family Bank
8) Habib Bank A.G Zurich	17. UBA Kenya Bank
9) Housing Finance	18. Middle East Bank (K)
10) Bank of Africa Kenya	19. Spire Bank
Other banks	**Newly established banks**
Mayfair Bank	Dubai International Bank

Source: CBK supervision reports (2021).

Appendix II: Financial Information ROE

Name	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009
KCB Bank Kenya Ltd	0.3271	0.212	0.3583	0.3209	0.3087	0.3517	0.2899	0.3099	0.2844	0.2977	0.334	0.2823	0.2866
Equity Bank Kenya Ltd	0.3857	0.1639	0.3715	0.4024	0.3729	0.4352	0.4719	0.4938	0.3597	0.3764	0.3454	0.329	0.2387
Co-operative Bank of Kenya Ltd	0.2247	0.1981	0.2637	0.2574	0.2419	0.3002	0.2854	0.2955	0.3003	0.3305	0.2941	0.0277	0.2314
Standard Chartered Bank Kenya Ltd	0.2314	0.1397	0.2688	0.2522	0.2133	0.2907	0.2193	0.3535	0.3696	0.3764	0.4011	0.3794	0.4871
Barclays Bank of Kenya Ltd	0.2709	0.1846	0.269	0.2362	0.2297	0.248	0.304	0.3226	0.3683	0.4401	0.4111	0.3424	0.3718
Diamond Trust Bank Kenya Ltd	0.0767	0.073	0.1784	0.1942	0.1913	0.2436	0.3107	0.2446	0.2998	0.3139	0.3134	0.3565	0.2609
Stanbic Bank Kenya Ltd	0.2057	0.149	0.2116	0.2543	0.1694	0.2285	0.2505	0.2774	0.3134	0.2603	0.3082	0.2097	0.1637
I & M Bank Ltd	0.2039	0.1966	0.2555	0.2276	0.2146	0.3304	0.3195	0.3552	0.2952	0.2846	0.3217	0.2314	0.2362
Commercial Bank of Africa Ltd	0.2139	0.0966	0.1338	0.2355	0.2277	0.2764	0.2076	0.2532	0.3247	0.3434	0.3004	0.3606	0.2796
NIC Bank PLC	0.2139	0.0966	0.1338	0.1922	0.1961	0.1957	0.2366	0.2689	0.2961	0.2862	0.3395	0.306	0.2376
Citibank N.A. Kenya	0.2591	0.2476	0.2965	0.2907	0.3159	0.3074	0.2874	0.2258	0.3122	0.4168	0.3175	0.2235	2.8366
Bank of Baroda (Kenya) Ltd	0.2318	0.2171	0.2383	0.2527	0.2823	0.2725	0.2205	0.2731	0.331	0.2895	0.3396	0.3853	0.283
Bank of India	0.1667	0.1531	0.1802	0.1856	0.2301	0.2291	0.2046	0.2114	0.2463	0.1494	0.2887	0.3596	0.2943
Prime Bank Ltd	0.1033	0.0743	0.1004	0.0906	0.1379	0.2156	0.2972	0.2971	0.3255	0.2781	0.2888	0.1975	0.184
SBM Bank Kenya Ltd	0.0264	0.0696	0.1498	0.1378	-0.2246	3.0101	-0.1587	0.1738	0.224	0.0861	0.2965	0.4707	0.1061
National Bank of Kenya Ltd	0.0848	0.0262	-0.0702	0.0847	0.105	0.0147	-0.1543	0.1925	0.1502	0.1098	0.2337	0.2717	0.273
Victoria Commercial Bank Ltd	0.0747	0.0712	0.1052	0.0948	0.1513	0.1573	0.1928	0.2208	0.2318	0.2412	0.2162	0.282	0.231
Family Bank Ltd.	0.2074	0.1007	0.109	0.0367	-0.1181	0.0502	0.2417	0.2465	0.2946	0.1735	0.1572	0.1602	0.1851
Habib Bank AG Zurich	0.1629	0.1408	0.1252	0.1182	0.1439	0.2098	0.2375	0.2867	0.2572	0.2693	0.1982	0.2218	0.2568
Guardian Bank Ltd	0.0452	0.0272	0.0914	0.1361	0.096	0.1364	0.1658	0.2154	0.257	0.1829	0.1594	0.1181	0.0263
Credit Bank Ltd	0.0616	0.0025	0.1	0.116	0.0672	0.0642	-0.1286	-0.0781	0.0582	0.0687	0.0535	0.0359	0.0838
Guaranty Trust Bank Ltd	0.0925	0.0537	0.0558	0.0363	0.028	0.0788	0.0692	0.0959	0.0678	0.139	0.2021	0.113	0.0192

Gulf African Bank Ltd	0.1255	0.1112	0.047	0.0654	0.0575	0.1723	0.2819	0.1954	0.1616	0.2396	0.1178	0.0384	-0.1409
Bank of Africa (K) Ltd	0.0516	-0.1255	-0.6852	0.0311	0.0041	-0.0019	-0.1688	0.0258	0.1572	0.1269	0.1187	0.1643	0.1035
Development Bank of Kenya Ltd	0.017	0.005	0.2878	0.0588	0.0198	0.0327	0.0626	0.1151	0.1504	0.0636	0.1008	0.1585	0.1379
African Banking Corporation Ltd	0.0321	0.0385	0.0445	0.0443	0.0642	0.0741	0.1251	0.1216	0.2359	0.2637	0.3029	0.2943	0.2245
Paramount Bank Ltd	0.0743	0.0508	0.0482	0.0894	0.0545	0.0639	0.11	0.0994	0.0805	0.0792	0.1099	0.358	0.0797
Ecobank Kenya Ltd	0.0952	0.0008	0.0371	0.0213	-0.2227	-0.3954	0.0123	-0.0637	-0.3631	-0.7673	0.0703	0.0376	-0.5358
M-Oriental Commercial Bank Ltd	0.0215	0.014	0.0212	0.0344	0.0383	0.0123	0.0188	0.0526	0.1168	0.0823	0.1493	0.1608	0.0348
UBA Kenya Bank Ltd	-1.6792	0.0248	0.0471	0.0109	0.0065	0.0233	-0.2717	-0.2906	-0.2625	-0.3256	-0.2514	-0.1552	-0.2139
Middle East Bank (K) Ltd	0.1079	0.0824	0.0516	0.0004	-0.0353	-0.0847	0.034	0.0616	0.0689	0.0418	0.0841	0.2006	0.0487
Transnational Bank Ltd	0.0594	-1.4225	-0.0309	-0.0511	0.0253	0.0772	0.124	0.0997	0.1204	0.1756	0.1692	0.1032	0.0664
First Community Bank Ltd	0.244	0.116	0.1269	-0.219	0.1264	-0.0263	0.0068	0.0672	0.1653	0.2727	0.1334	-0.2832	-0.2293
Spire Bank Ltd	-2.8232	0.6907	0.8214	0.2985	-1.3266	-0.7535	-0.3166	-0.3991	0.1109	-0.9086	0.0591	-0.0375	0.1055
Consolidated Bank of Kenya Ltd	-0.1866	-0.1426	-0.2585	-0.3799	-0.411	-0.1974	0.0303	-0.1747	-0.1143	0.1118	0.1718	0.1747	0.1262
Jamii Bora Bank Ltd	0.2718	-0.0954	-3.7572	-0.2168	-0.2206	-0.1365	0.0114	0.0309	0.04	0.0253	-0.0242	-0.0824	-0.0222
HFC Ltd	-0.0831	-0.1168	-0.0026	-0.0431	0.0394	0.1478	0.1911	0.2047	0.2135	0.1753	0.2043	0.1311	0.0867
Sidian Bank Ltd	0.1475	0.0255	0.0161	-0.1392	-0.1836	0.016	0.1355	0.2998	0.2982	0.2004	0.1923	0.0959	-0.2611

Source: Central Bank Supervision Reports (2009, … , 2021)

ROA

Name	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009
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Bank of India	0.1667	0.1531	0.1802	0.1856	0.2301	0.2291	0.2046	0.2114	0.2463	0.1494	0.2887	0.3596	0.2943
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Family Bank Ltd.	0.2074	0.1007	0.109	0.0367	-0.1181	0.0502	0.2417	0.2465	0.2946	0.1735	0.1572	0.1602	0.1851
Habib Bank AG Zurich	0.1629	0.1408	0.1252	0.1182	0.1439	0.2098	0.2375	0.2867	0.2572	0.2693	0.1982	0.2218	0.2568
Guardian Bank Ltd	0.0452	0.0272	0.0914	0.1361	0.096	0.1364	0.1658	0.2154	0.257	0.1829	0.1594	0.1181	0.0263
Credit Bank Ltd	0.0616	0.0025	0.1	0.116	0.0672	0.0642	-0.1286	-0.0781	0.0582	0.0687	0.0535	0.0359	0.0838
Guaranty Trust Bank Ltd	0.0925	0.0537	0.0558	0.0363	0.028	0.0788	0.0692	0.0959	0.0678	0.139	0.2021	0.113	0.0192
Gulf African Bank Ltd	0.1255	0.1112	0.047	0.0654	0.0575	0.1723	0.2819	0.1954	0.1616	0.2396	0.1178	0.0384	-0.1409
Bank of Africa (K) Ltd	0.0516	-0.1255	-0.6852	0.0311	0.0041	-0.0019	-0.1688	0.0258	0.1572	0.1269	0.1187	0.1643	0.1035

Development Bank of Kenya Ltd	0.017	0.005	0.2878	0.0588	0.0198	0.0327	0.0626	0.1151	0.1504	0.0636	0.1008	0.1585	0.1379
African Banking Corporation Ltd	0.0321	0.0385	0.0445	0.0443	0.0642	0.0741	0.1251	0.1216	0.2359	0.2637	0.3029	0.2943	0.2245
Paramount Bank Ltd	0.0743	0.0508	0.0482	0.0894	0.0545	0.0639	0.11	0.0994	0.0805	0.0792	0.1099	0.358	0.0797
Ecobank Kenya Ltd	0.0952	0.0008	0.0371	0.0213	-0.2227	-0.3954	0.0123	-0.0637	-0.3631	-0.7673	0.0703	0.0376	-0.5358
M-Oriental Commercial Bank Ltd	0.0215	0.014	0.0212	0.0344	0.0383	0.0123	0.0188	0.0526	0.1168	0.0823	0.1493	0.1608	0.0348
UBA Kenya Bank Ltd	-1.6792	0.0248	0.0471	0.0109	0.0065	0.0233	-0.2717	-0.2906	-0.2625	-0.3256	-0.2514	-0.1552	-0.2139
Middle East Bank (K) Ltd	0.1079	0.0824	0.0516	0.0004	-0.0353	-0.0847	0.034	0.0616	0.0689	0.0418	0.0841	0.2006	0.0487
Transnational Bank Ltd	0.0594	-1.4225	-0.0309	-0.0511	0.0253	0.0772	0.124	0.0997	0.1204	0.1756	0.1692	0.1032	0.0664
First Community Bank Ltd	0.244	0.116	0.1269	-0.219	0.1264	-0.0263	0.0068	0.0672	0.1653	0.2727	0.1334	-0.2832	-0.2293
Spire Bank Ltd	-2.8232	0.6907	0.8214	0.2985	-1.3266	-0.7535	-0.3166	-0.3991	0.1109	-0.9086	0.0591	-0.0375	0.1055

Consolidated Bank of Kenya Ltd	-0.1866	-0.1426	-0.2585	-0.3799	-0.411	-0.1974	0.0303	-0.1747	-0.1143	0.1118	0.1718	0.1747	0.1262
Jamii Bora Bank Ltd	0.2718	-0.0954	-3.7572	-0.2168	-0.2206	-0.1365	0.0114	0.0309	0.04	0.0253	-0.0242	-0.0824	-0.0222
HFC Ltd	-0.0831	-0.1168	-0.0026	-0.0431	0.0394	0.1478	0.1911	0.2047	0.2135	0.1753	0.2043	0.1311	0.0867
Sidian Bank Ltd	0.1475	0.0255	0.0161	-0.1392	-0.1836	0.016	0.1355	0.2998	0.2982	0.2004	0.1923	0.0959	-0.2611

Source: Central Bank Supervision Reports (2009, … , 2021)

Asset Quality-Ratio of nonperforming loans to total loan portfolio

Name	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009
KCB Bank Kenya Ltd	0.1577	0.1226	0.0743	0.0691	0.083	0.076	0.0595	0.0519	0.2146	0.1885	0.1827	0.2158	0.1281
Equity Bank Kenya Ltd	0.0843	0.1204	0.0901	0.0739	0.0666	0.0699	0.0298	0.0387	0.2193	0.2105	0.1396	0.2094	0.2563
Co-operative Bank of Kenya Ltd	0.1296	0.1685	0.1107	0.1124	0.1086	0.0467	0.0385	0.044	0.1838	0.1813	0.1424	0.1449	0.1619
Standard Chartered Bank Kenya Ltd	0.1574	0.1463	0.1388	0.1627	0.1264	0.1135	0.1196	0.0835	0.167	0.1539	0.1005	0.1134	0.1228
Barclays Bank of Kenya Ltd	0.0773	0.0744	0.0658	0.0744	0.0712	0.0651	0.0358	0.0355	0.2104	0.2054	0.2104	0.2295	0.1763
Diamond Trust Bank Kenya Ltd	0.158	0.119	0.083	0.0725	0.0759	0.039	0.0285	0.0126	0.1832	0.1659	0.1135	0.1478	0.1455
Stanbic Bank Kenya Ltd	0.112	0.1418	0.1181	0.107	0.0765	0.0592	0.0469	0.0375	0.2275	0.2252	0.1343	0.1088	0.1208
I & M Bank Ltd	0.1075	0.1256	0.123	0.1462	0.1391	0.0486	0.0486	0.021	0.1973	0.1807	0.1658	0.1841	0.1702
Commercial Bank of Africa Ltd	0.1600	0.1386	0.1249	0.0784	0.0729	0.0709	0.0439	0.0407	0.1141	0.1214	0.0958	0.1077	0.1027
NIC Bank PLC	0.1600	0.1386	0.1249	0.0784	0.112	0.1124	0.1186	0.0609	0.1675	0.1623	0.1171	0.1517	0.1455

Citibank N.A. Kenya	0.019	0.0282	0.0412	0.03	0.0453	0.0285	0.0639	0.0359	0.3526	0.3847	0.3494	0.3269	0.3211
Bank of Baroda (Kenya) Ltd	0.1047	0.124	0.0836	0.0899	0.0607	0.0891	0.0733	0.0367	0.177	0.1469	0.1163	0.1296	0.1117
Bank of India	0.0278	0.0475	0.0891	0.0703	0.0209	0.0141	0.0203	0.0057	0.2174	0.2182	0.1885	0.1676	0.1545
Prime Bank Ltd	0.1093	0.1086	0.117	0.0739	0.0566	0.0462	0.0238	0.019	0.1221	0.1039	0.0883	0.0885	0.0965
SBM Bank Kenya Ltd	0.3435	0.4414	0.5502	0.6911	0.5864	0.5629	0.0602	0.0775	0.1162	0.1063	0.0867	0.1045	0.0929
National Bank of Kenya Ltd	0.335	0.3536	0.4149	0.4758	0.4058	0.437	0.1615	0.1063	0.1322	0.1743	0.1735	0.19	0.169
Victoria Commercial Bank Ltd	0.1388	0.066	0.0491	0.0305	0.0009	0.001	0.0478	0.0312	0.2543	0.267	0.1633	0.2158	0.2185
Family Bank Ltd.	0.1504	0.1488	0.1516	0.1731	0.202	0.1312	0.0606	0.0717	0.1627	0.1875	0.1217	0.1898	0.1654
Habib Bank AG Zurich	0.1162	0.1221	0.1124	0.0901	0.1042	0.0295	0.0218	0.0244	0.2117	0.188	0.1533	0.1539	0.1536
Guardian Bank Ltd	0.164	0.1277	0.0954	0.0988	0.1089	0.0819	0.1037	0.0764	0.1336	0.1175	0.1027	0.136	0.1516
Credit Bank Ltd	0.2824	0.1152	0.1008	0.0828	0.0862	0.0809	0.0697	0.0995	0.2175	0.2485	0.1977	0.2803	0.2521
Guaranty Trust Bank Ltd	0.1379	0.208	0.1847	0.1893	0.1034	0.0741	0.0444	0.0367	0.2245	0.1136	0.0964	0.0967	0.0952
Gulf African Bank Ltd	0.1611	0.1757	0.147	0.1089	0.0974	0.0969	0.0881	0.0734	0.2057	0.1268	0.1072	0.1412	0.1717
Bank of Africa (K) Ltd	0.3171	0.3977	0.3991	0.3622	0.3147	0.288	0.2372	0.0615	0.1307	0.1016	0.0971	0.096	0.1375

Development Bank of Kenya Ltd	0.2931	0.337	0.3409	0.287	0.2157	0.2573	0.2056	0.1417	0.1845	0.1973	0.2048	0.3294	0.5653
African Banking Corporation Ltd	0.1972	0.156	0.1768	0.2273	0.2159	0.1891	0.1723	0.0655	0.1115	0.1078	0.1004	0.1602	0.16
Paramount Bank Ltd	0.1913	0.1707	0.176	0.1732	0.1226	0.1246	0.1257	0.1973	0.178	0.1818	0.1649	0.2156	0.201
Ecobank Kenya Ltd	0.1612	0.1628	0.1983	0.2167	0.3862	0.1956	0.0791	0.102	0.2003	0.2037	0.1233	0.1672	0.1409
M-Oriental Commercial Bank Ltd	0.2682	0.234	0.1893	0.0964	0.1045	0.1204	0.1489	0.1087	0.2447	0.237	0.2235	0.2967	0.4095
UBA Kenya Bank Ltd	0.4779	0.4075	0.2299	0.1276	0.0459	0.0221	0.0208	0.0662	0.4265	0.9047	0.5383	0.7594	5.2698
Middle East Bank (K) Ltd	0.0788	0.1034	0.1414	0.4005	0.4436	0.2972	0.2726	0.3001	0.3119	0.2762	0.2713	0.3898	0.5655
Transnational Bank Ltd	0.0646	0.0457	0.3003	0.242	0.2166	0.1268	0.0999	0.08	0.2516	0.2739	0.2618	0.4998	0.8174
First Community Bank Ltd	0.2882	0.3608	0.3971	0.4621	0.4001	0.3231	0.2408	0.152	0.1148	0.1141	0.0868	0.1007	0.182
Spire Bank Ltd	0.7598	0.7084	0.5147	0.4397	0.3421	0.1589	0.3258	0.2621	0.0878	0.0423	0.0811	0.1008	0.1956
Consolidated Bank of Kenya Ltd	0.2751	0.2405	0.2948	0.2532	0.2511	0.1975	0.1928	0.2611	0.072	0.0879	0.0771	0.1119	0.1516

Jamii Bora Bank Ltd	0.7445	0.762	0.565	0.6962	0.2121	0.204	0.0723	0.0931	0.4081	1.0923	0.634	0.4248	2.0258
HFC Ltd	0.2205	0.2581	0.2688	0.2709	0.156	0.1091	0.075	0.09	0.1502	0.1819	0.162	0.1998	0.2357
Sidian Bank Ltd	0.1183	0.1145	0.2056	0.2085	0.2105	0.1697	0.1207	0.0692	0.1984	0.2134	0.1917	0.2011	0.241

Source: Central Bank Supervision Reports (2009 ….. 2021)

Firm size/Asset Base in Millions Shillings

Name	**2021**	**2020**	**2019**	**2018**	**2017**	**2016**	**2015**	**2014**	**2013**	**2012**	**2011**	**2010**	**2009**
KCB Bank Kenya Ltd	826,395	758,345	674,301.72	621,722.88	555,630.00	504,777.67	467,741.00	376,969.00	323,312.00	304,112.00	282,494.00	223,025.00	172,384.00
Equity Bank Kenya Ltd	877,415	667,650	507,525.24	438,508.78	406,402.00	379,749.00	341,329.00	277,116.00	238,194.00	215,829.00	176,911.00	133,890.00	96,512.00
Co-operative Bank of Kenya Ltd	540,387	496,823	449,616.47	408,303.62	382,830.00	349,997.76	339,550.00	282,689.00	228,874.00	199,663.00	167,772.00	153,894.00	110,531.00
Standard Chartered Bank Kenya Ltd	335,111	325,873	302,295.90	284,691.00	285,125.00	250,274.11	234,131.00	222,636.00	220,524.00	195,493.00	164,182.00	143,880.00	123,909.00

Barclays Bank of Kenya Ltd	428,746	377,936	374,109.20	325,362.74	271,682.00	259,498.22	241,153.00	226,043.00	207,010.00	185,102.00	167,305.00	172,691.00	165,151.00
Diamond Trust Bank Kenya Ltd	326,377	312,189	287,250.60	281,515.70	270,082.00	244,123.82	198,484.00	141,176.00	114,136.00	94,512.00	77,453.00	58,606.00	47,147.00
Stanbic Bank Kenya Ltd	319,199	318,986	292,705.14	280,953.01	239,408.00	204,895.16	198,578.00	171,347.00	170,726.00	133,378.00	140,087.00	107,139.00	97,337.00
I & M Bank Ltd	307,802	283,569	254,252.17	229,161.13	183,953.00	164,116.12	147,846.00	137,299.00	110,316.00	91,520.00	76,903.00	62,552.00	44,009.00
Commercial Bank of Africa Ltd	546,734	491,614	464,890.69	232,317.12	229,525.00	210,877.93	190,948.00	175,809.00	124,882.00	100,456.00	83,283.00	63,592.00	57,593.00
NIC Bank PLC	546,734	491,614	464,890.69	195,054.63	192,817.00	161,847.35	156,762.00	137,087.00	112,917.00	101,772.00	73,581.00	54,776.00	44,655.00
Citibank N.A. Kenya	130,940	106,454	96,570.19	85,638.69	98,232.00	103,323.54	88,147.00	79,398.00	71,243.00	69,580.00	74,646.00	62,070.00	51,372.00
Bank of Baroda (Kenya) Ltd	180,381	166,313	143,311.34	123,014.40	96,132.00	82,907.48	68,178.00	61,945.00	52,022.00	46,138.00	36,701.00	32,332.00	21,940.00
Bank of India	86,867	75,129	62,543.24	62,689.13	56,631.00	47,815.08	42,163.00	34,370.00	30,721.00	24,877.00	23,352.00	16,671.00	15,395.00
Prime Bank Ltd	126,482	116,204	108,785.53	98,534.46	76,438.00	65,338.22	65,001.00	54,918.00	49,461.00	43,463.00	35,185.00	32,444.00	23,700.00
SBM Bank Kenya Ltd	81,958	79,190	72,519.36	70,647.74	11,745.00	9,697.20	15,025.00	16,515.00	12,779.00	11,772.00	10,789.00	8,209.00	5,499.00
National Bank of Kenya Ltd	146,543	126,842	112,028.75	115,143.44	109,942.00	115,114.37	125,295.00	122,865.00	92,493.00	67,155.00	68,665.00	60,027.00	51,404.00
Victoria Commercial Bank Ltd	43,471	37,890	36,072.41	32,336.96	25,985.00	22,403.48	20,020.00	17,244.00	13,644.00	10,323.00	7,645.00	6,215.00	5,130.00
Family Bank Ltd.	111,683	90,591	78,857.13	66,909.84	69,051.00	69,432.37	81,190.00	61,813.00	43,501.00	30,985.00	26,002.00	20,188.00	13,306.00

Habib Bank AG Zurich	28,554	27,212	24,823.46	21,520.67	18,708.00	17,032.99	14,440.00	12,147.00	11,009.00	9,702.00	8,722.00	8,127.00	7,339.00
Guardian Bank Ltd	17,736	16,858	16,386.45	16,185.96	15,803.00	14,705.35	14,609.00	14,571.00	12,835.00	11,745.00	8,836.00	8,031.00	6,778.00
Credit Bank Ltd	25,893	23,145	21,540.74	17,805.42	14,465.00	12,201.97	10,287.00	8,865.00	7,309.00	6,407.00	5,394.00	4,530.00	3,665.00
Guaranty Trust Bank Ltd	34,301	31,267	29,082.40	25,323.37	27,628.00	29,619.07	29,374.00	32,992.00	25,638.00	17,150.00	14,630.00	14,112.00	12,279.00
Gulf African Bank Ltd	37,678	37,653	35,122.98	33,325.58	31,316.00	27,156.26	24,714.00	19,754.00	16,054.00	13,562.00	12,915.00	9,594.00	7,749.00
Bank of Africa (K) Ltd	43,350	44,917	43,996.12	49,080.86	54,191.00	55,995.67	69,280.00	62,212.00	52,683.00	48,958.00	38,734.00	26,699.00	16,920.00
Development Bank of Kenya Ltd	17,289	17,222	15,358.07	15,323.11	16,320.00	16,418.38	16,943.00	16,954.00	15,581.00	13,417.00	11,253.00	10,650.00	8,136.00
African Banking Corporation Ltd	36,341	32,643	28,680.49	27,212.71	24,804.00	22,422.35	22,058.00	21,439.00	19,639.00	19,071.00	12,507.00	10,267.00	8,841.00
Paramount Bank Ltd	12,448	11,378	10,443.30	9,887.41	9,541.00	9,426.93	10,526.00	10,402.00	8,029.00	7,255.00	4,727.00	4,420.00	3,100.00
Ecobank Kenya Ltd	103,388	94,428	75,377.85	54,463.88	53,456.00	47,123.84	52,427.00	45,934.00	36,907.00	31,771.00	27,210.00	26,892.00	13,949.00
M-Oriental Commercial Bank Ltd	13,657	12,985	12,393.78	10,515.02	10,577.00	9,920.25	8,496.00	7,858.00	7,007.00	6,220.00	5,030.00	4,558.00	3,052.00
UBA Kenya Bank Ltd	13,598	18,743	16,088.32	15,332.12	6,505.00	5,601.28	7,781.00	4,756.00	3,710.00	2,924.00	3,206.00	2,363.00	1,216.00
Middle East Bank (K) Ltd	11,186	11,022	8,466.28	5,360.86	5,121.00	5,233.52	5,678.00	5,937.00	5,766.00	5,870.00	4,636.00	4,018.00	3,141.00
Transnational Bank Ltd	13,211	10,147	9,317.70	10,235.52	10,295.00	10,464.50	10,533.00	10,240.00	9,658.00	8,801.00	7,287.00	4,762.00	3,364.00

First Community Bank Ltd	24,701	21,947	18,762.84	17,880.46	17,360.00	14,962.09	14,613.00	15,278.00	11,305.00	9,959.00	8,740.00	6,380.00	4,452.00
Spire Bank Ltd	3,855	5,114	6,860.30	9,223.08	11,148.00	12,534.00	14,470.00	16,589.00	15,562.00	14,109.00	12,927.00	10,399.00	4,466.00
Consolidated Bank of Kenya Ltd	14,283	12,886	11,865.61	12,887.33	13,456.00	13,917.90	14,136.00	15,077.00	16,779.00	18,001.00	15,318.00	10,479.00	6,899.00
Jamii Bora Bank Ltd	31,691	30,612	8,584.54	10,004.86	12,851.00	15,724.25	16,782.00	13,118.00	7,010.00	3,480.00	2,070.00	1,723.00	491
HFC Ltd	52,098	54,478	57,083.28	57,083.28	62,127.00	68,084.93	68,809.00	60,491.00	46,755.00	40,686.00	31,972.00	29,326.00	18,281.00
Sidian Bank Ltd	41,410	33,500	26,451.64	25,329.17	19,302.00	20,875.50	19,107.00	15,799.00	13,199.00	9,546.00	9,319.00	7,670.00	7,136.00

Source: Central Bank Supervision Reports (2009, … , 2021)

Equity in Million Shillings

Name	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009
KCB Bank Kenya Ltd	123,823	111,271	92,607.63	97,788.95	88,991.00	80,989.89	80,886.00	72,165.00	62,391.00	52,926.00	42,163.00	28,308.00	22,398.00
Equity Bank Kenya Ltd	106,400	86,697	69,914.37	60,586.57	61,906.00	52,341.04	47,440.00	40,733.00	50,687.00	42,672.00	35,047.00	20,202.00	23,337.00
Co-operative Bank of Kenya Ltd	94,920	85,597	77,087.99	68,319.02	68,227.00	60,045.83	49,311.00	42,351.00	35,652.00	28,967.00	20,972.00	20,210.00	16,103.00
Standard Chartered Bank Kenya Ltd	52,479	50,219	47,221.51	45,336.28	44,584.00	43,904.78	40,914.00	40,450.00	36,030.00	30,603.00	20,571.00	31,465.00	13,807.00
Barclays Bank of Kenya Ltd	54,353	44,969	44,079.41	43,393.44	43,559.00	42,094.71	39,716.00	38,111.00	32,371.00	29,583.00	29,223.00	8,057.00	24,210.00
Diamond Trust Bank Kenya Ltd	57,567	54,032	52,001.38	47,712.84	43,004.00	36,431.81	22,708.00	25,784.00	18,568.00	14,878.00	10,366.00	10,035.00	6,263.00
Stanbic Bank Kenya Ltd	46,512	41,857	38,939.84	34,590.72	33,051.00	30,237.50	28,251.00	26,644.00	22,353.00	18,101.00	10,150.00	12,980.00	8,143.00
I & M Bank Ltd	51,920	52,324	47,015.14	38,338.59	35,024.00	26,186.68	26,187.00	21,814.00	20,525.00	16,591.00	13,856.00	7,474.00	7,419.00
Commercial Bank of Africa Ltd	78,643	72,028	69,416.26	33,774.92	31,571.00	27,470.17	29,996.00	17,857.00	13,749.00	11,641.00	9,935.00	7,896.00	6,323.00
NIC Bank PLC	78,643	72,028	69,416.26	31,116.60	28,938.00	30,288.26	26,454.00	22,618.00	17,631.00	15,065.00	9,900.00	12,882.00	6,434.00
Citibank N.A. Kenya	22,536	22,134	19,046.57	19,409.58	20,177.00	19,628.61	19,407.00	18,359.00	15,964.00	17,346.00	15,122.00	4,744.00	1,077.00
Bank of Baroda (Kenya) Ltd	28,832	26,677	22,942.66	20,414.83	17,900.00	14,224.91	11,273.00	9,867.00	7,569.00	5,758.00	4,936.00	2,756.00	2,565.00
Bank of India	20,708	17,853	15,532.47	13,191.38	11,625.00	9,536.34	7,183.00	6,075.00	5,087.00	4,063.00	3,378.00	3,898.00	2,069.00

Prime Bank Ltd	28,111	24,902	24,455.36	23,038.97	14,338.00	10,833.99	8,725.00	7,735.00	5,816.00	4,175.00	3,742.00	801	3,065.00
SBM Bank Kenya Ltd	8,596	8,871	7,877.18	6,937.51	1,607.00	-755.78	1,745.00	1,715.00	1,411.00	1,185.00	1,017.00	9,930.00	490
National Bank of Kenya Ltd	16,365	11,936	11,704.53	6,935.72	7,048.00	10,996.08	10,914.00	12,114.00	11,848.00	10,450.00	10,456.00	1,103.00	7,908.00
Victoria Commercial Bank Ltd	6,988	6,745	6,356.49	5,962.90	5,612.00	5,060.04	3,512.00	2,876.00	2,528.00	2,036.00	1,525.00	3,127.00	935
Family Bank Ltd.	15,164	13,162	12,408.20	11,426.45	11,608.00	12,618.88	11,927.00	10,621.00	5,968.00	4,860.00	3,324.00	1,118.00	1,853.00
Habib Bank AG Zurich	3,327	3,204	3,077.32	3,038.75	2,842.00	2,964.98	2,147.00	2,243.00	1,843.00	1,530.00	1,280.00	948	958
Guardian Bank Ltd	2,989	2,834	2,740.81	2,557.15	2,375.00	2,214.59	1,984.00	1,755.00	1,494.00	1,219.00	1,065.00	948	873
Credit Bank Ltd	3,328	3,218	3,000.43	2,863.03	2,665.00	2,459.57	1,392.00	1,152.00	1,238.00	1,179.00	958	1,336.00	728
Guaranty Trust Bank Ltd	9,747	9,189	8,807.74	8,453.01	8,609.00	8,366.45	7,906.00	7,165.00	6,091.00	2,504.00	1,536.00	1,224.00	1,198.00
Gulf African Bank Ltd	5,473	5,029	4,634.96	4,467.96	4,419.00	4,375.71	3,877.00	3,147.00	2,686.00	1,561.00	1,319.00	2,945.00	1,150.00
Bank of Africa (K) Ltd	5,621	5,419	4,275.76	6,736.18	8,468.00	8,417.99	8,496.00	7,913.00	6,539.00	5,010.00	4,672.00	1,489.00	2,511.00
Development Bank of Kenya Ltd	3,823	3,823	3,950.44	2,871.32	2,930.00	2,903.34	2,844.00	2,764.00	1,822.00	1,634.00	1,562.00	1,631.00	1,363.00
African Banking Corporation Ltd	3,920	3,816	3,689.48	3,556.82	3,160.00	2,996.76	2,837.00	2,623.00	2,450.00	2,112.00	1,702.00	785	1,145.00
Paramount Bank Ltd	2,059	1,911	1,778.22	1,687.27	1,760.00	1,644.21	1,536.00	1,378.00	1,230.00	1,136.00	1,026.00	5,004.00	527
Ecobank Kenya Ltd	6,426	7,070	6,567.80	6,408.30	6,439.00	7,307.24	7,561.00	7,828.00	3,390.00	1,999.00	1,726.00	1,138.00	2,148.00

M-Oriental Commercial Bank Ltd	3,118	3,071	3,043.17	3,065.12	3,028.00	2,931.49	2,240.00	1,596.00	1,524.00	1,385.00	1,290.00	889	948
UBA Kenya Bank Ltd	823	2,257	2,241.81	2,174.22	2,162.00	2,143.39	1,119.00	1,139.00	1,059.00	1,219.00	728	1,027.00	996
Middle East Bank (K) Ltd	1,400	1,274	1,155.78	1,157.88	1,162.00	1,192.11	1,263.00	1,234.00	1,175.00	1,124.00	1,100.00	1,541.00	904
Transnational Bank Ltd	1,549	1,413	1,817.76	1,928.59	2,132.00	2,073.41	2,033.00	1,915.00	1,869.00	1,834.00	1,743.00	1,453.00	1,325.00
First Community Bank Ltd	2,467	2,051	1,462.03	1,271.10	1,709.00	1,557.41	1,613.00	1,518.00	1,210.00	1,078.00	837	906	663
Spire Bank Ltd	413	-1,820	-551.99	-1,029.95	1,188.00	1,544.00	2,069.00	1,155.00	1,371.00	722	1,204.00	1,477.00	730
Consolidated Bank of Kenya Ltd	1,533	1,837	1,999.78	925.36	1,068.00	1,403.07	1,615.00	1,568.00	1,242.00	1,574.00	1,435.00	1,020.00	927
Jamii Bora Bank Ltd	1,884	1,300	304.32	1,768.71	3,454.00	3,590.08	3,163.00	3,105.00	2,251.00	2,093.00	1,527.00	4,270.00	315
HFC Ltd	7,866	8,247	9,164.96	9,164.96	9,963.00	9,774.97	9,090.00	6,276.00	5,682.00	5,146.00	4,782.00	1,158.00	4,084.00
Sidian Bank Ltd	4,746	4,080	4,017.98	4,037.13	3,447.00	3,868.79	3,837.00	2,432.00	1,868.00	1,527.00	1,331.00	28,308.00	1,107.00

Source: Central Bank Supervision Reports (2009, … , 2021)

Deposits in Million Kshs

Name	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009
KCB Bank Kenya Ltd	634,258	591,067	536,830	486,613.00	445,398.00	386,611.00	347,702.00	276,750.00	237,213.00	223,493.00	210,174.00	163,189.00	137,968.00
Equity Bank Kenya Ltd	652,204	502,423	381,138	341,782.00	298,703.00	277,274.67	236,610.00	202,485.00	158,527.00	140,286.00	140,286.00	95,204.00	65,825.00
Co-operative Bank of Kenya Ltd	399,441	370,085	330,113	304,593.00	285,990.00	259,471.75	263,709.00	216,174.00	174,776.00	162,267.00	162,267.00	124,012.00	91,553.00
Standard Chartered Bank Kenya Ltd	265,852	256,951	236,461	220,784.00	226,051.00	186,598.23	172,036.00	154,067.00	154,720.00	140,525.00	140,525.00	100,504.00	86,774.00
Barclays Bank of Kenya Ltd	275,546	257,706	242,375	213,033.00	189,305.00	178,447.78	165,359.00	164,779.00	151,122.00	137,915.00	137,915.00	123,826.00	125,869.00
Diamond Trust Bank Kenya Ltd	237,455	235,048	221,038	224,440.00	209,254.00	169,599.90	148,537.00	101,594.00	84,672.00	72,505.00	72,505.00	44,904.00	36,274.00
Stanbic Bank Kenya Ltd	242,384	233,493	205,516	212,282.00	178,696.00	121,989.23	108,130.00	96,830.00	95,708.00	75,633.00	75,633.00	72,778.00	55,786.00
I & M Bank Ltd	235,557	219,167	195,841	177,250.00	134,247.00	103,740.63	103,741.00	86,621.00	74,494.00	65,640.00	65,640.00	45,995.00	34,799.00
Commercial Bank of Africa Ltd	443,820	394,813	360,305	186,521.00	186,444.00	159,284.81	126,229.00	122,044.00	90,993.00	79,996.00	79,996.00	53,195.00	44,273.00
NIC Bank PLC	443,820	394,813	360,305	145,220.00	142,006.00	104,160.20	105,194.00	92,791.00	84,236.00	77,466.00	77,466.00	45,318.00	36,977.00
Citibank N.A. Kenya	103,206	81,190	65,335	57,761.00	65,461.00	62,485.52	62,022.00	51,150.00	43,762.00	44,012.00	44,012.00	38,215.00	33,247.00

Bank of Baroda (Kenya) Ltd	149,920	138,406	119,341	102,007.00	77,694.00	64,873.60	52,929.00	48,683.00	41,877.00	38,382.00	38,382.00	25,600.00	18,634.00
Bank of India	65,776	56,912	46,755	49,256.00	44,825.00	26,726.39	24,613.00	24,668.00	22,778.00	18,282.00	18,282.00	16,076.00	13,005.00
Prime Bank Ltd	97,222	88,594	81,345	71,467.00	58,951.00	49,312.80	50,819.00	44,940.00	40,562.00	36,715.00	36,715.00	25,512.00	19,184.00
SBM Bank Kenya Ltd	61,503	57,094	50,573	51,044.00	6,842.00	9,400.67	10,403.00	13,559.00	11,263.00	10,527.00	10,527.00	7,204.00	4,888.00
National Bank of Kenya Ltd	124,113	112,672	97,079	105,244.00	100,165.00	96,966.52	110,622.00	104,734.00	77,993.00	55,191.00	55,191.00	47,805.00	41,995.00
Victoria Commercial Bank Ltd	34,048	28,806	27,350	24,339.00	18,886.00	15,695.95	14,024.00	12,289.00	9,044.00	7,561.00	7,561.00	4,935.00	4,073.00
Family Bank Ltd.	84,712	70,577	58,332	48,806.00	47,627.00	41,473.32	62,731.00	47,186.00	34,615.00	24,630.00	24,630.00	15,731.00	10,490.00
Habib Bank AG Zurich	24,583	22,082	20,532	16,390.00	13,808.00	11,772.94	6,861.00	8,948.00	8,336.00	7,748.00	7,748.00	6,672.00	5,839.00
Guardian Bank Ltd	14,348	13,238	13,078	13,336.00	13,120.00	12,313.03	12,495.00	12,643.00	11,181.00	10,374.00	10,374.00	6,971.00	5,760.00
Credit Bank Ltd	20,365	18,149	17,347	14,392.00	11,485.00	9,135.30	7,267.00	7,213.00	5,512.00	4,781.00	4,781.00	3,528.00	2,793.00
Guaranty Trust Bank Ltd	22,315	21,316	18,932	16,760.00	16,601.00	16,561.68	15,490.00	17,734.00	18,447.00	13,747.00	13,747.00	11,590.00	9,986.00
Gulf African Bank Ltd	29,171	29,972	27,818	26,689.00	26,105.00	21,754.94	19,024.00	15,795.00	12,970.00	11,684.00	11,684.00	8,163.00	6,425.00
Bank of Africa (K) Ltd	27,796	27,977	33,329	30,181.00	33,335.00	34,463.71	47,488.00	41,671.00	36,740.00	35,100.00	35,100.00	19,784.00	12,405.00
Development Bank of Kenya Ltd	8,937	8,279	6,029	6,822.00	7,665.00	5,788.51	9,665.00	8,465.00	8,419.00	6,953.00	6,953.00	4,105.00	2,411.00
African Banking	31,449	28,082	22,981	21,974.00	20,104.00	16,078.45	15,774.00	16,050.00	15,905.00	15,255.00	15,255.00	8,353.00	7,208.00

Corporation Ltd													
Paramount Bank Ltd	10,197	9,265	8,479	8,126.00	7,729.00	7,667.90	8,067.00	8,048.00	6,601.00	6,084.00	6,084.00	3,562.00	2,547.00
Ecobank Kenya Ltd	94,549	85,021	66,321	47,188.00	45,856.00	32,242.99	34,479.00	32,414.00	25,351.00	21,475.00	21,475.00	16,494.00	10,819.00
M-Oriental Commercial Bank Ltd	10,343	9,749	9,188	7,405.00	7,463.00	6,936.72	6,218.00	6,231.00	5,377.00	4,806.00	4,806.00	3,266.00	2,012.00
UBA Kenya Bank Ltd	12,240	15,544	13,600	12,964.00	4,194.00	1,947.36	4,137.00	3,576.00	2,483.00	1,343.00	1,343.00	1,168.00	189
Middle East Bank (K) Ltd	9,565	9,605	7,138	4,147.00	3,908.00	3,996.06	4,099.00	4,127.00	3,649.00	3,907.00	3,907.00	2,537.00	1,749.00
Transnational Bank Ltd	10,899	7,826	7,100	8,083.00	7,950.00	8,000.00	7,593.00	7,666.00	7,181.00	6,535.00	6,535.00	3,037.00	1,857.00
First Community Bank Ltd	21,513	19,038	16,285	15,541.00	14,783.00	12,655.46	12,350.00	13,339.00	9,932.00	8,833.00	8,833.00	5,611.00	3,642.00
Spire Bank Ltd	1,781	4,793	4,553	7,090.00	6,822.00	8,345.00	10,378.00	14,306.00	13,856.00	12,963.00	12,963.00	8,037.00	3,522.00
Consolidated Bank of Kenya Ltd	11,386	9,287	8,796	8,824.00	8,855.00	9,491.80	9,996.00	10,642.00	11,711.00	13,325.00	13,325.00	8,008.00	4,882.00
Jamii Bora Bank Ltd	6,380	5,081	4,795	4,787.00	5,612.00	8,095.10	10,946.00	8,485.00	3,421.00	1,213.00	1,213.00	532	155
HFC Ltd	38,395	41,196	38,004	35,445.00	36,981.00	38,155.86	41,888.00	36,310.00	26,589.00	22,968.00	22,968.00	15,945.00	12,235.00
Sidian Bank Ltd	27,576	23,770	18,014	20,525.00	14,140.00	13,685.09	13,380.00	12,065.00	9,165.00	6,650.00	6,650.00	5,454.00	4,436.00

Source: Central Bank Supervision Reports (2009, … , 2021)

Market concentration-weighted ratio of bank deposits /total industry deposits

Name	**2021**	**2020**	**2019**	**2018**	**2017**	**2016**	**2015**	**2014**	**2013**	**2012**	2011	2010	**2009**
KCB Bank Kenya Ltd	13.81	14.05	13.89	14.4	14.14	14.1	14.1	12.69	12.83	13.54	14.52	13.98	13.27
Equity Bank Kenya Ltd	13.57	11.75	10.24	9.73	9.93	10	9.44	8.7	9.79	10.06	9.98	9.09	7.37
Co-operative Bank of Kenya Ltd	9.42	9.56	9.65	9.44	9.85	9.9	9.83	8.91	8.61	8.74	8.41	8.95	8.63
Standard Chartered Bank Kenya Ltd	5.7	6.1	6.37	6.6	7.11	7	7	7.19	8.09	8.29	7.74	8.02	8.57
Barclays Bank of Kenya Ltd	6.37	6.23	6.8	6.68	6.57	7	6.94	7.27	7.65	8.08	8.9	10.72	12.58
Diamond Trust Bank Kenya Ltd	5.64	6	6.34	6.55	6.72	6.4	5.32	4.63	4.26	4.1	3.77	3.36	3.77
Stanbic Bank Kenya Ltd	5.22	5.53	5.64	5.88	5.62	5.1	4.92	4.92	5.43	5.01	5.1	5.31	6.29
I & M Bank Ltd	5.31	5.63	5.65	5.32	4.78	4.2	4.37	4.1	4.19	4.08	4.09	4.07	3.38
Commercial Bank of Africa Ltd	5.41	4.9	5.6	5.66	6.04	5.9	5.58	5.12	4.4	4.08	3.98	3.6	4.27
NIC Bank PLC	4.3	4.8	4.5	4.41	4.62	4.5	4.5	4.24	4.17	4.32	3.7	3.27	3.76
Citibank N.A. Kenya	2.3	2.2	2.12	2.15	2.56	2.8	2.84	2.76	2.83	3.42	3.96	3.84	3.38
Bank of Baroda (Kenya) Ltd	3.14	3.21	3.11	2.92	2.56	2.4	2.04	1.99	1.93	1.92	1.83	1.91	1.57
Bank of India	1.72	1.64	1.56	1.6	1.55	1.3	1.16	1.11	1.15	1.08	1.17	1.16	1.06
Prime Bank Ltd	2.43	2.44	2.59	2.56	2.01	1.8	1.82	1.72	1.74	1.71	1.64	1.16	1.71
SBM Bank Kenya Ltd	1.21	1.31	1.32	1.37	0.25	0.5	0.49	0.48	0.46	0.48	0.5	0.45	0.45
National Bank of Kenya Ltd	2.31	2.17	2.19	2.24	2.37	2.9	3.42	3.6	3.39	3	3.59	3.72	3.27

Victoria Commercial Bank Ltd	0.74	0.74	0.78	0.77	0.71	0.7	0.59	0.54	0.51	0.48	0.4	0.39	0.41
Family Bank Ltd.	1.81	1.68	1.66	1.56	1.71	1.9	2.36	2.06	1.62	1.42	1.34	1.26	1.02
Habib Bank AG Zurich	0.46	0.47	0.5	0.47	0.45	0.5	0.36	0.4	0.42	0.43	0.44	0.48	0.47
Guardian Bank Ltd	0.31	0.32	0.36	0.38	0.4	0.4	0.43	0.45	0.46	0.48	0.44	0.46	0.54
Credit Bank Ltd	0.41	0.42	0.44	0.41	0.38	0.4	0.28	0.27	0.28	0.29	0.28	0.28	0.27
Guaranty Trust Bank Ltd	0.71	0.74	0.77	0.77	0.85	0.9	0.97	1.07	1.09	0.74	0.69	0.76	0.9
Gulf African Bank Ltd	0.62	0.68	0.71	0.73	0.77	0.8	0.72	0.64	0.62	0.56	0.6	0.56	0.63
Bank of Africa (K) Ltd	0.65	0.72	0.78	0.99	1.25	1.4	1.81	1.77	1.77	1.83	1.7	1.42	1.24
Development Bank of Kenya Ltd	0.3	0.33	0.34	0.32	0.37	0.4	0.46	0.48	0.47	0.47	0.46	0.5	0.5
African Banking Corporation Ltd	0.57	0.58	0.57	0.59	0.59	0.6	0.59	0.63	0.7	0.76	0.63	0.63	0.64
Paramount Bank Ltd	0.22	0.22	0.23	0.24	0.25	0.3	0.3	0.31	0.3	0.32	0.28	0.28	0.22
Ecobank Kenya Ltd	1.49	1.55	1.42	1.19	1.27	1.2	1.42	1.46	1.15	1.06	1.02	1.59	0.98
M-Oriental Commercial Bank Ltd	0.26	0.28	0.31	0.3	0.32	0.3	0.3	0.28	0.29	0.31	0.31	0.32	0.21
UBA Kenya Bank Ltd	0.19	0.33	0.34	0.35	0.21	0.2	0.2	0.18	0.17	0.18	0.16	0.19	0.04
Middle East Bank (K) Ltd	0.18	0.2	0.18	0.14	0.14	0.2	0.19	0.2	0.22	0.26	0.26	0.27	0.21
Transnational Bank Ltd	0.21	0.18	0.21	0.25	0.28	0.3	0.33	0.34	0.39	0.42	0.44	0.37	0.22
First Community Bank Ltd	0.38	0.37	0.34	0.35	0.39	0.4	0.4	0.45	0.4	0.41	0.41	0.35	0.33
Spire Bank Ltd	0.05	0	0.05	0.09	0.23	0.3	0.4	0.45	0.53	0.52	0.57	0.53	0.35
Consolidated Bank of Kenya Ltd	0.22	0.23	0.25	0.23	0.26	0.3	0.37	0.41	0.5	0.66	0.68	0.61	0.51

Jamii Bora Bank Ltd	0.29	0.28	0.12	0.21	0.35	0.4	0.5	0.47	0.32	0.27	0.24	0.21	0.03
HFC Ltd	0.86	1	1.14	1.23	1.43	1.6	1.76	1.56	1.46	1.49	1.48	1.54	1.53
Sidian Bank Ltd	0.6	0.56	0.53	0.59	0.49	0.6	0.6	0.51	0.47	0.42	0.47	0.45	0.54

Source: Central Bank Supervision Reports (2009, … , 2021)

Diversification index-Non interest income/total income

Name	**2021**	**2020**	**2019**	**2018**	**2017**	**2016**	**2015**	**2014**	**2013**	**2012**	**2011**	**2010**	**2009**
KCB Bank Kenya Ltd	0.1734	0.2105	0.2714	0.3199	0.3222	0.3231	0.3343	0.3796	0.3418	0.3377	0.4015	0.3593	0.3596
Equity Bank Kenya Ltd	0.1601	0.1405	0.1862	0.2694	0.3031	0.0949	0.1047	0.1015	0.1015	0.0876	0.1265	0.1231	0.131
Co-operative Bank of Kenya Ltd	0.3212	0.3253	0.3546	0.2952	0.3245	0.4185	0.4564	0.4039	0.431	0.4289	0.3518	0.3936	0.398
Standard Chartered Bank Kenya Ltd	0.228	0.1945	0.2121	0.2209	0.2009	0.1933	0.1908	0.1828	0.1898	0.1952	0.2167	0.2448	0.2451
Barclays Bank of Kenya Ltd	0.3042	0.314	0.3136	0.3061	0.2795	0.2951	0.3072	0.307	0.3245	0.3384	0.3798	0.4699	0.3687
Diamond Trust Bank Kenya Ltd	0.2286	0.2321	0.2142	0.1972	0.1989	0.1963	0.2278	0.2246	0.231	0.2495	0.2868	0.3706	0.3055
Stanbic Bank Kenya Ltd	0.2233	0.2409	0.2767	0.273	0.2705	0.211	0.451	0.4984	0.4559	0.3931	0.356	0.4329	0.3046

I & M Bank Ltd	0.1744	0.1976	0.1918	0.2059	0.1601	0.1363	0.1486	0.1647	0.1759	0.2023	0.1878	0.1981	0.2068
Commercial Bank of Africa Ltd	0.1473	-0.1442	0.3351	0.2366	0.2738	0.2436	0.2888	0.3049	0.3027	0.3406	0.3519	0.3836	0.3715
NIC Bank PLC	0.1473	-0.1442	0.3351	0.2366	0.2738	0.2436	0.2888	0.3049	0.3027	0.3406	0.3519	0.3836	0.3715
Citibank N.A. Kenya	0.2233	0.2409	0.2767	0.273	0.2705	0.211	0.451	0.4984	0.4559	0.3931	0.356	0.4329	0.3046
Bank of Baroda (Kenya) Ltd	0.0837	0.0684	0.0773	0.0627	0.0979	0.0993	0.1114	0.1264	0.1211	0.1918	0.1429	0.1953	0.1983
Bank of India	0.0837	0.0684	0.0773	0.0627	0.0979	0.0993	0.1114	0.1264	0.1211	0.1918	0.1429	0.1953	0.1983
Prime Bank Ltd	0.083	0.0897	0.1122	0.1269	0.1237	0.1163	0.1176	0.1119	0.1175	0.1167	0.1073	0.1062	0.1269
SBM Bank Kenya Ltd	0.2852	0.1248	0.1869	0.2296	0.1924	0.2566	0.3627	0.3747	0.2888	0.2705	0.3663	0.4255	0.3957
National Bank of Kenya Ltd	0.1938	0.2139	0.2495	0.2483	0.124	0.1674	0.2495	0.2387	0.2217	0.2195	0.2234	0.2389	0.2888
Victoria Commercial Bank Ltd	0.1489	0.1263	0.1231	0.1285	0.1252	0.1256	0.1307	0.1374	0.1638	0.1657	0.2039	0.2067	0.2729
Family Bank Ltd.	0.2048	0.2012	0.2713	0.2993	0.289	0.1951	0.2786	0.3051	0.2768	0.2846	0.3613	0.4629	0.3521
Habib Bank AG Zurich	0.0853	0.083	0.4562	0.4862	0.2599	0.2481	0.251	0.2543	0.2421	0.2283	0.2472	0.23	0.2354
Guardian Bank Ltd	0.1143	0.1132	0.0718	0.0595	0.0972	0.2071	0.1727	0.1715	0.1665	0.1701	0.1816	0.1683	0.1659
Credit Bank Ltd	0.43	0.3737	0.4862	0.4562	0.4173	0.2599	0.2128	0.2	0.2013	0.2472	0.3471	0.3894	0.3924

Guaranty Trust Bank Ltd	0.1038	0.1151	0.1365	0.1147	0.1033	0.1092	0.1117	0.1206	0.1192	0.1271	0.1386	0.1638	0.1727
Gulf African Bank Ltd	0.24	0.2486	0.2795	0.2587	0.2576	0.1625	0.1539	0.146	0.1633	0.1587	0.186	0.1874	0.1861
Bank of Africa (K) Ltd	0.2706	0.3398	0.3472	0.3453	0.1891	0.4276	0.2033	0.2155	0.2529	0.2545	0.2443	0.2298	0.2706
Development Bank of Kenya Ltd	0.1304	0.2217	0.2329	0.2109	0.2129	0.2056	0.1902	0.1908	0.2013	0.1835	0.1824	0.1809	0.1771
African Banking Corporation Ltd	0.2923	0.264	0.2726	0.3128	0.3244	0.3331	0.2059	0.2011	0.1994	0.2347	0.2423	0.2522	0.2519
Paramount Bank Ltd	0.0871	0.2097	0.141	0.1571	0.1279	0.1657	0.114	0.1641	0.1204	0.2631	0.2476	0.0241	0.1764
Ecobank Kenya Ltd	0.4342	0.1971	0.3019	0.383	0.2448	0.775	0.4346	0.5404	0.448	0.9498	0.6441	0.5096	0.4773
M-Oriental Commercial Bank Ltd	0.1241	0.1406	0.1869	0.136	0.1333	0.1484	0.138	0.1426	0.1336	0.1031	0.1443	0.1999	0.1316
UBA Kenya Bank Ltd	0.2493	0.2622	0.2048	0.1586	0.5387	0.5657	0.6833	0.7371	0.5065	0.5295	0.5472	0.5938	0.6104
Middle East Bank (K) Ltd	0.2339	0.314	0.2862	0.1247	0.1935	0.1515	0.1264	0.1764	0.2198	0.1316	0.138	0.1426	0.1336
Transnational Bank Ltd	0.506	0.3048	0.3087	0.298	0.2522	0.1765	0.1737	0.171	0.1851	0.2257	0.2185	0.2404	0.2329

First Community Bank Ltd	0.2541	0.3154	0.3683	0.3898	0.3763	0.3063	0.219	0.3068	0.2352	0.2996	0.2992	0.2894	0.2736
Spire Bank Ltd	-0.6925	0.4124	0.4836	0.4124	0.4836	0.4373	0.23	0.3408	0.232	0.0535	0.474	0.6689	0.6426
Consolidated Bank of Kenya Ltd	0.2721	0.3123	0.3968	0.3169	0.3937	0.2824	0.2372	0.2606	0.2555	0.3635	0.3183	0.3388	0.3609
Jamii Bora Bank Ltd	0.0317	0.0615	0.9491	0.1427	0.5526	0.2862	0.3559	0.4438	-0.7762	-0.3158	0.2489	0.2027	0.2904
HFC Ltd	0.103	0.1013	-0.0753	-0.396	-0.1608	-0.1952	-0.0497	-0.0869	-0.1686	-0.1704	-0.1811	-0.2217	-0.2465
Sidian Bank Ltd	0.4563	0.5495	0.5219	0.4444	0.3421	0.212	0.2529	0.2495	0.2557	0.2606	0.275	0.2671	0.2633

Earnings volatility-Standard deviation of return on Equity

Name	**2021**	**2020**	**2019**	**2018**	**2017**	**2016**	**2015**	**2014**	**2013**	**2012**	**2011**	**2010**	**2009**
KCB Bank Kenya Ltd	0.077055	0.076006	0.025845	0.02216	0.03168	0.031534	0.01342	0.012754	0.025673	0.026545	0.028688	0.003041	0.095533
Equity Bank Kenya Ltd	0.12416	0.129701	0.01745	0.031165	0.050049	0.02961	0.071939	0.07308	0.015515	0.024072	0.057457	0.063852	0.079567
Co-operative Bank of Kenya Ltd	0.032995	0.036193	0.011219	0.030197	0.030305	0.007562	0.007605	0.018974	0.019474	0.165319	0.13928	0.144038	0.077133
Standard Chartered	0.066426	0.070236	0.028487	0.0387	0.043059	0.067146	0.082522	0.011761	0.016576	0.013478	0.056959	0.076155	0.162367

Bank Kenya Ltd													
Barclays Bank of Kenya Ltd	0.049286	0.042548	0.021066	0.009277	0.038711	0.038831	0.033088	0.059231	0.03612	0.050176	0.034469	0.020789	0.123933
Diamond Trust Bank Kenya Ltd	0.059813	0.065889	0.008411	0.029394	0.059853	0.038455	0.035438	0.036625	0.008	0.024741	0.047877	0.067599	0.086967
Stanbic Bank Kenya Ltd	0.034565	0.052962	0.04245	0.043525	0.04194	0.024491	0.03156	0.027105	0.029272	0.049256	0.073822	0.032527	0.054567
I & M Bank Ltd	0.032107	0.029464	0.020897	0.063438	0.063943	0.018295	0.03018	0.038072	0.019109	0.045389	0.050806	0.003394	0.078733
Commercial Bank of Africa Ltd	0.059943	0.071903	0.056599	0.026158	0.035377	0.035002	0.059025	0.047606	0.021561	0.031008	0.042067	0.057276	0.0932
NIC Bank PLC	0.059943	0.04819	0.034898	0.002146	0.023499	0.036684	0.029786	0.013767	0.02835	0.026942	0.051937	0.048366	0.0792
Citibank N.A. Kenya	0.025568	0.026716	0.013197	0.01282	0.014632	0.042531	0.044487	0.095644	0.05892	0.096662	1.482284	1.847741	0.945533
Bank of Baroda (Kenya) Ltd	0.010861	0.017908	0.022433	0.015079	0.033215	0.030197	0.055271	0.029843	0.02679	0.047917	0.051247	0.072337	0.094333
Bank of India	0.01355	0.017416	0.027384	0.025408	0.014442	0.012648	0.022372	0.049078	0.071405	0.106939	0.039417	0.046174	0.0981
Prime Bank Ltd	0.015972	0.013184	0.024965	0.063113	0.079658	0.047083	0.016368	0.023855	0.02486	0.049911	0.05701	0.009546	0.061333
SBM Bank Kenya Ltd	0.062618	0.043258	0.21278	1.772227	1.848825	1.741477	0.207981	0.069795	0.106881	0.192584	0.18236	0.257811	0.035367
National Bank of Kenya Ltd	0.078264	0.078219	0.095831	0.047375	0.131625	0.173419	0.1892	0.041354	0.063187	0.084663	0.022324	0.000919	0.091

Victoria Commercial Bank Ltd	0.018702	0.01742	0.03007 1	0.03448 3	0.02243	0.03182 4	0.02010 8	0.01021	0.01262 7	0.03321 5	0.03452	0.03606 2	0.077
Family Bank Ltd.	0.059353	0.03956 5	0.11602 1	0.09351 5	0.18002 5	0.11197 4	0.02925 5	0.06097 5	0.07506 6	0.00867 5	0.01531 6	0.01760 7	0.0617
Habib Bank AG Zurich	0.018943	0.01157	0.01328 6	0.04724 7	0.04808 2	0.03894 8	0.02476 2	0.01482 9	0.03804 1	0.03621 3	0.02948 4	0.02474 9	0.0856
Guardian Bank Ltd	0.033116	0.05474	0.02458 7	0.02323 9	0.03504 4	0.03992 8	0.04565 8	0.03714 3	0.05093 9	0.03280 5	0.06812 8	0.06491 2	0.008767
Credit Bank Ltd	0.049115	0.06143 4	0.02487 7	0.02907 9	0.11218 9	0.09997 6	0.09662 8	0.08189 2	0.00778 2	0.01641 5	0.02422 9	0.03387	0.027933
Guaranty Trust Bank Ltd	0.02182	0.010704	0.01427 1	0.02725 1	0.02698 8	0.01352 4	0.01583 5	0.03586 2	0.06719 1	0.04581 9	0.09146	0.06632 7	0.0064
Gulf African Bank Ltd	0.04181	0.03306	0.00923 1	0.06412 1	0.11221	0.05777 5	0.06204 4	0.03911 5	0.06169 5	0.10134 2	0.13252 6	0.12678 4	0.046967
Bank of Africa (K) Ltd	0.3846	0.37658	0.40598 6	0.01757 8	0.09813 8	0.10527 1	0.16401 8	0.06880 6	0.02028	0.02430 8	0.03164 1	0.04299 2	0.0345
Development Bank of Kenya Ltd	0.159923	0.150173	0.14479 1	0.01986 9	0.02195 5	0.04171 3	0.04418	0.04365 1	0.04354 7	0.04781 8	0.02924 1	0.01456 6	0.045967
African Banking Corporation Ltd	0.006201	0.00340 8	0.01143 2	0.01517 7	0.03268	0.02848 8	0.06500 4	0.07531	0.03366 1	0.02060 3	0.04299 7	0.04935 6	0.074833
Paramount Bank Ltd	0.014377	0.023073	0.02219 3	0.01805 8	0.02970 4	0.02414 5	0.01494 3	0.01130 6	0.01736 2	0.15287 6	0.15270 7	0.19678 8	0.026567
Ecobank Kenya Ltd	0.047618	0.018201	0.14564 9	0.20936 4	0.20464 2	0.21680 3	0.19847	0.35309 8	0.41888 5	0.47443 1	0.34088 5	0.40545 5	0.1786
M-Oriental Commercial Bank Ltd	0.004246	0.01034 6	0.00896 2	0.01402 2	0.01353 1	0.02163 6	0.04978	0.03213	0.03350 5	0.04239 4	0.06966 4	0.08909 5	0.0116

UBA Kenya Bank Ltd	0.990305	0.018262	0.022279	0.008712	0.165682	0.176028	0.014326	0.031613	0.040022	0.085436	0.048488	0.041507	0.0713
Middle East Bank (K) Ltd	0.028192	0.041421	0.04368	0.042733	0.059627	0.077734	0.018408	0.014022	0.021427	0.082238	0.079476	0.10741	0.016233
Transnational Bank Ltd	0.830736	0.797673	0.039588	0.064539	0.049372	0.023406	0.013114	0.039235	0.030192	0.040081	0.052087	0.026022	0.022133
First Community Bank Ltd	0.070964	0.196634	0.199561	0.173086	0.08033	0.04741	0.079994	0.102785	0.07298	0.289248	0.226573	0.038113	0.076433
Spire Bank Ltd	2.067514	0.27213	1.12014	0.824227	0.506528	0.232123	0.273759	0.50975	0.57424	0.533009	0.072954	0.101116	0.035167
Consolidated Bank of Kenya Ltd	0.058507	0.118661	0.080583	0.115397	0.220688	0.125424	0.105343	0.151025	0.150872	0.035508	0.027203	0.034295	0.042067
Jamii Bora Bank Ltd	2.227721	2.079982	2.042955	0.047496	0.117453	0.09154	0.014612	0.007419	0.033635	0.053909	0.034194	0.042568	0.0074
HFC Ltd	0.058676	0.057899	0.041252	0.095742	0.078143	0.029714	0.011285	0.020004	0.019937	0.036862	0.059385	0.031396	0.0289
Sidian Bank Ltd	0.073301	0.092496	0.104857	0.1048	0.161217	0.142488	0.0944	0.056932	0.058942	0.058136	0.238856	0.252437	0.087033