BANK-SPECIFIC CHARACTERISTICS, BANK CONCENTRATION AND FINANCIAL DISTRESS OF COMMERCIAL BANKS IN KENYA

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ABSTRACT

Empirical evidence on the banking industry in Kenya indicates that local banks have been prone to financial distress. Commercial banks in Kenya have been experiencing cycles in Financial Distress and though such cycles have been precipitated by Bank-Specific Characteristics in other countries. It is still a challenge for empirical investigation as to know whether Bank-Specific Characteristics significantly affect Financial Distress in Kenya's banking industry. Subsequently, the basis of this research was to evaluate the connection between Bank-Specific Characteristics and Financial Distress of commercial banks in Kenya. Explicitly, the research was informed by determining the moderating effect of bank concentration on the connection between bank-specific characteristics and financial distress of commercial banks in Kenya. The Gambler's ruin theory, Wrecker's theory, Agency theory and Institutional theory provided theoretical anchorage to the research. Positivism research philosophy and causal research design were adopted for the study. The research was a census of all the 36 fully operational commercial banks in Kenya for the period 2011 through 2019. Secondary data was utilized in this study. Data sources included: websites of the CBK and individual Commercial Banks, audited financial statements and Annual supervision reports. Data analysis entailed use of descriptive and inferential statistics where the latter involved dynamic panel logistic regression analysis. Diagnostic tests undertaken in the study included: model specification, stationarity, autocorrelation, and multicollinearity tests. Hypotheses were tested at a significance level of 0.05. Data was displayed through frequency tables and graphs. Based on the dynamic panel Logistic regression analysis, the research revealed that Bank Concentration had a significant moderating effect on the connection between Bank Characteristics and Zmijewski Score (p=0.0003). The study recommended that CBK should take into account bank concentration when designing policies and strategies for commercial banks. Specifically, regulators of commercial banks should consider the level of bank concentration in a particular market and how it can affect the relationship between different bank-specific characteristics and financial distress. This could involve measures such as encouraging competition among banks, regulating mergers and acquisitions, and promoting diversity in the banking sector to mitigate the negative impact of bank concentration on financial stability.

Keywords: Bank Concentration, Bank Size, Deposit Mobilization, Profitability Growth, Income Diversification, Bank Specific Characteristics and Financial Distress.

INTRODUCTION

A financially distressed bank faces both direct and indirect costs, such as legal fees, administrative costs and less visible opportunity costs that could cause increased interest rates as the depositors would want higher returns due to the perceived risk in the banking activities, thus increasing financial loss (Poledna et al., 2015; Egan, Hortaçsu, & Matvos, 2017; Oluwakayode 2017). Rowland and Tesar (2004) also proposed that the operating environment of the banking framework led to the limited diversification that made the banks susceptible to exogenous shocks. Barako, Hancock, and Izan (2013) alluded that if borrowers and savers had an effective way of converging and accessing information, then the intermediating role of financial institution would significantly diminish.

The concept of financial distress has been studied extensively and captured in several publications. In the United States, there has been a growing literature on banking crisis since the great recession. Zhang, Xie, Lu, and Zhang (2014) stated that most of the large commercial banks came close to failing or failed because of trading behavior and lending practices. Laeven and Valencia (2018) posited that the financial distress or failures among financial institutions in the U.S triggered a sharp contraction in both advanced and emerging economies. Antoniades (2021) indicated that exposure to the real estate industry, rather than aggregate funding pressures, was the key factor contributing to commercial banks' failure during the Great Recession. Statistics on bank failure in the U.S show that an estimated 140 banks failed in 2009, and this was because of these banks skewing their portfolios toward series of products that, overall, fared badly (Carmona, Climent, & Momparler, 2019). Moreover, 429 banks failed between the years 2005 and 2012. During the recession, the majority of these bank failures increased (Federal Deposit Insurance Corporation, 2012; Sami, 2014). According to more recent data, independently owned commercial banks fell by 14% between 2007 and 2013, totaling over 800 institutions (McCord, Prescott & Sablik, 2015), whereas in 2020, 4 commercial banks failed (Jacobi & Tzur, 2021).

In Europe, there has been progressive analysis of corporate default, bankruptcy, and financial distress. Alves (2012) posited that bank failures were mainly determined by macroeconomic conditions and financial accounting information. However, Mili, Khayati, and Khouaja (2019) stated that there were few cases of banks failure in Europe. Commercial banks in the European Union experienced financial distress at the start of the Great Recession. In fact, European Commission's data on financial distress shows that by the end of 2010, the aid provided by European Union countries to go towards stabilization of the banking industry in EU had surpassed €1.6 trillion, accounting for over 13% of gross domestic product (Betz, Oprica, Peltonen, & Sarlin, 2012). There has been steady and robust prediction of banking sector distress in Europe because the European Commission has been reporting data on failure events and commercial banks requiring public bailouts (Abreu, Alves, & Gulamhussen, 2019). As the financial crisis across the globe progressed on and in particular in 2009, the EU bailed out 31 banks, the majority of which were from France (Hennessy, 2014).

Extant evidence in Africa suggests that local banks in Zambia, Nigeria, Uganda, and Kenya, among others, have faced financial distress. Brownbridge (1998) was among the first scholars to analyze longitudinally financial distress among banks in Africa where he stated that local banks experienced failure and financial distress because of non-performing loans, which resulted from problems related to bad debt attributed to moral hazard and rise in capital adequacy and asset quality. In Ethiopia, financial distress among commercial banks was precipitated by non-performing loans, which resulted from raw material price shock in 2009 coupled with the devaluation of the Ethiopian currency (Birr) in 2010 (Gebreslassie, 2015). In Zimbabwe, collapse of financial institutions started in 2003 where, among other factors, rapid ill-planned expansion, abuse of liquidity of the reserve bank, inadequate risk management systems, and insufficient regulatory framework, contributed to failure of more than 10 commercial banks in the country (Dzomira, 2014).

Banks in Kenya face various challenges that hinder the economy from functioning properly, and they perform abysmally because of poor corporate governance, inadequate risk management techniques, lack of internal controls, weak regulatory system, ineffective laws and political interference (Mandala, Kaijage, Aduda, & Iraya, 2018). Commercial banks in Kenya are getting losses that are attributed to moral hazard and adverse selection, including low capitalization, access to public sector deposits, excessive ownership concentration and regulatory forbearing (Kwambai & Wandera, 2013). Insider trading and financing to high-risk projects, such as real estate, contribute to a big share of bad loans due to adverse selection (Berndt & Gupta, 2009). High interest rates result in a high cost of funding, and bank managers take excessive risks to cover the loss (Berndt & Gupta, 2009).

Despite the issues experienced by Kenya's banking sector, the country's financial sector is sturdier than those of other East African countries. Despite its vast markets and extensive regulation, the sector faces a number of issues, the most prevalent of which is financial distress. (Mwega, 2016; Spratt, 2016). Several Kenyan banks experienced severe financial distress between 2015 and 2016. The CBK placed one bank under receivership in August 2015 due to illiquidity challenges. Due to heavy insider loans and a lack of proper corporate governance, two banks were put under regulatory management in October 2015 and April 2016. In 2016, the banking industry experienced a decline in pre-tax profits of about 9.6 percent, an increase in NPLs from 9.3% to 12.3% and a decline in asset quality that could be accredited to a decline in the economic activities (Central Bank Kenya, 2017).

Meher and Getaneh (2019) observe that bank-specific characteristics constitute the core internal factors that can potentially cause financial distress in banks. Financial distress might be reduced greatly through better management of banks' specific internal attributes, like net interest risk, asset quality, net income growth, and cash ratio (SirElkhatim & Salim, 2015). Bank-specific factors, like expense management, deposits, size, and capital structure, are internal to banks and therefore, corporates have control over them (Rahaman & Akhter, 2015). Conversely, a recent wave of literature has linked bank concentration to stability, or lack of it thereof, of financial institutions

where scholars have posited conflicting views on whether it is beneficial or detrimental to financial soundness of banks. Cipollini and Fiordelisi (2009) indicate that greater bank concentration in the market raises borrowers' credit risk because business loans attract high interest rates.

Scholars have outlined a series of bank-specific characteristics that have been identified as potential causes of financial distress in banks. Ikpesu (2019) asserts that bank-specific characteristics, such as firm size, share price, revenue growth, profitability, leverage, and liquidity, are the financial distress determinants of commercial banks. Bank management must understand internal elements that they could exploit to their advantage in order to thrive, avoid bankruptcies, and remain competitive (Spratt, 2016). Václav and David (2017) suggest that bank fragility is influenced by a variety of factors, like macroeconomic circumstances, potential spillover effects, and bank-specific problems.

Statement of the Problem

In Kenya's banking system, there are banks that have collapsed, placed under receivership, or operating under statutory management. The consolidated annual bank supervision reports by the CBK for the period 2010-2014 depict that the banking industry experienced stability as profit before tax grew at average of 18% year from 74.3 billion to 141 billion but declined for the period 2015 to 134.0 billion then increased slowly to 159.1 billion in 2019 (Central Bank of Kenya, 2019). Based on a report by the Kenya Bankers' Association (2020), there has been an average decline of 78.6% on loan-to-deposit ratio for the period 2015-2019 in the banking system. The Zmijewski model was utilized to forecast the financial distress of Kenyan commercial banks, and the results suggested that although some banks are in financial trouble, others were not. While utilizing the Zmijewski X-score, Mochabo, Benedict and Ondiek (2017) established that that majority of the banks in Kenya were financially distressed between 2006 and 2015. Financial distress, as one of the disruptions in the banking industry, impedes banks' ability to intermediate financial flows, potentially leading to general economic crises (Akani & Kingsley, 2018).

Substantial literature has focused on the concept of financial distress given that many banks in Kenya have been getting profit warnings; however, they have exhibited several weaknesses. Firstly, the issue of financial distress has been covered in isolation but the causes that can be mitigated have not been addressed. Some of these studies include Kihooto, Omagwa, and Ronald (2016); Maina and Sakwa (2017); Karugu, Achoki, and Kiriri (2018); Ouma and Kirori (2019). Secondly, most studies measured financial distress utilizing the Altman Z-score. However, this study used the Bankometer model in addition to Zmijewski model that was found to be more superior in several studies (Ashraf & Tariq, 2016; Rahman, 2017; Africa, 2018; Erari, Salim & Idrus, 2013; Saputri & Krisnawati, 2020). In this context, the conceptual gap that this research filled from the previously mentioned studies is the use of the Zmijewski model as proxy measure of financial distress of Kenyan commercial banks.

Empirical evidence from Kenya suggests that most of the existing studies have largely considered bank-specific determinants; bank size, corporate governance, bank funding, credit exposure, and regulatory capital on financial stability (Kiemo, Olweny, Muturi, & Mwangi, 2019), financial

distress and profitability of tier three Kenyan Commercal Banks (Kimathi & Mungai, 2018), and capital adequacy ratios as indicators of financial distress (Karugu, Achoki, & Kiriri, 2018). None of these studies (Kiemo *et al.*, 2019; Karugu *et al.*, 2018; Kimathi & Mungai, 2018) have linked bank-specific characteristics to financial distress, indicating a very different focus that can prevent findings from being generalized. The international empirical literature focuses on financial distress prediction using the audit quality of banks (Jin, Kanagaretnam, & Lobo, 2011), real estate investments (Cole & White, 2012), internal controls on risk-taking (Jin, Kanagaretnam, & Lobo, 2013), and non-traditional banking activities income (DeYoung & Torna, 2013). As a result, this study will fill contextual and empirical gaps due to the deficiency of research on the link between bank-specific characteristics and financial distress in Kenyan commercial banks.

Methodologically, most of the existing studies have used research designs and models that limit the generalization of study findings: Such studies include Ongare and Kusa (2013), Manzaneque, Priego, & Merino (2016), Al-Hadi *et al.* (2017), Kassem and Sakr (2018) and Kiemo, Olweny, Muturi and Mwangi (2019). The aforementioned studies utilized descriptive research design and failed to consider bank concentration as the moderating variable. Additionally, these research did not take into account the dynamic logit model as adopted by Shehzad, De Haan, and Scholtens (2013) This enables the study to distinguish between true state dependence and the proclivity to experience a specific outcome at all times, when the latter is determined by unobservable factors. State dependence arises in a variety of economic contexts, including financial decisions, investment decisions, and brand selection, and can have a variety of policy implications. In view of these studies, the existing relationship between bank-specific characteristics and financial distress against a moderating effect of bank concentration remains unclear and inconclusive hence the motivation for the current study.

Objective of the Study
To evaluate the relationship between bank-specific characteristics and the financial distress of Kenya's commercial banks.

Specific Objective
To establish the moderating effect of bank concentration on the link between Bank-Specific Characteristics and Financial Distress of Kenyan commercial banks.

THEORETICAL REVIEW
Institutional Theory
The theory suggests that institutions tend to conform and behave in the same way as others in the industry so that they are not singled out for criticism (Meyer & Rowan, 1977). This makes organizations in the same industry to adapt to similar behaviors over time. When banks are competing for the same resources, they face pressure from their customers, political environment, economic and social arenas that force them to conform. Contrary to this, their legitimacy is questioned and could limit acquisition of resources and support (Zhu, Jia, & Wu, 2019). Therefore, commercial banks are forced to grow bigger as this is perceived to be the measure of success.

Firms tend to adapt and conform to institutions as the basis of gaining legitimacy to their stakeholders and accomplishment within an organizational field and this is the key tenet of institutionalism (Deephouse, & Suchman, 2008). However, it is worth noting that this legitimacy moves in both directions. Conforming to institutional pressure not only affects organizational success, but organizational success confers a "reverse-legitimacy" to specific banks that are believed to be involved in the success of organizations associated with these banks (Riaz, 2009). Smaller banks and bigger banks face the same regulation, which forces smaller banks to conform and remain competitive (Elliot & Cäker, 2017). Banks strive to be bigger and adopt strategies to make them so, such as merging, acquisition, and even borrowing. The pressure of banks to become bigger possesses a problem of too-big-to-fail. This research evaluates the moderating effect of bank concentration on the link between bank-specific characteristics and likelihood of success or failure of commercial banks. Banks that are perceived not to fail owing to the fact that they are too big are very important because their failure would cause a catastrophic market problem. The government is often forced to inject funds into the big banks to avoid financial crisis (Stern & Feldman, 2014). Whilst some studies demonstrate that large commercial banks face fewer risks, have healthier financial performance, and diversify better, other studies have maintained that since larger commercial banks are provided with subsidizations under the policies on "too big to fail", these firms might pursue riskier actions and indeed their complexity and size means that they are problematic to manage (Beck et al., 2007). The institutional theory has received criticisms because it fails to explain strategic behavior and exercise of influence in its origins of institutionalization. The other criticism of the theory is based on its assumption of organizational passivity. This theory supports the bank concentration variable of the study.

Gambler's Ruin Theory

The theory was postulated by Feller in 1968 and derived it from the principles of probability theory, whereby a gambler's financial outcome depends on by random chance. Using the analogy developed in the gambler's ruin theory in relation to financial institutions, a commercial bank begins with a positive, arbitrary amount of money and can realize profit with probability (p) and lose with probability (1-p) for every period (Lim, Lim Xiu Yun, Siwei, & Jiang, 2012). In this context, a bank is very optimistic of remaining profitable until it incurs a loss (Rabin & Vayanos, 2010). The theory is grounded on the random walk premise, which postulates that if something occurs more frequently than usual during a given period, it will occur less frequently in the future. The bank can be compared to a gambler who plays repeatedly with a chance of losing and continues to operate until its net worth reaches zero (Vilen, 2010; Ankomah, Oduro, & Amoah, 2020).

Banks continue to operate in uncertain environment and sometimes they loose and sometimes they are able to attain their business objectives. When a bank's net assets are negative, it is said to be in financial distress (Coad, Frankish, Roberts & Storey, 2016). With a given amount of funds, a net positive probability exists on the bank's cash flow being steadily negative over a certain timeframe, eventually culminating to bankruptcy (Aziz & Dar, 2006).

The theory presupposes that a bank has a fixed amount of cash that it enters and exits at random depending on the firm's operations. The bank would have either positive or negative cash flow at any given time (Lim *et al*., 2012). It is likely that a composite probability exists that a bank will experience a negative cash flow over a period of time. The operations of the bank will continue to a point where financial difficulties will be inevitable, leading to bankruptcy (Coad *et al*., 2016; Akani, & Kingsley, 2018). The theory is applicable to the study since demonstrates that net assets of banks coupled with cash flows ought to be managed internally to ensure net worth is greater than zero. Banks should avoid taking a probabilistic approach in their operations and strive to manage and control internal factors to realize stability.

While the Gambler Ruin theory indicates that the present value and cash flow processes of commercial banks involve probability distributions of returns (Coad *et al*., 2016), and might show the expected returns for each of the periods of investment, both of the processes fail to consider the ultimate failure or success of the investment with regard to specified risks. In fact, none of the processes can identify the risk of losing the total amount of capital invested that would be associated with the desire to attain a given probability of success for the banks. The study is anchored on the Gambler Ruin theory

Wreckers Theory of Financial Distress

Campbell, Hilscher, &Szilagy (2005) were the earlier proponents of the Wreckers theory who claimed that the stocks of financially healthy companies performed better than stocks of firms in distress. The theory explains to stakeholders the imperatives that might arise because of financial distress. The "wrecking" act is thought as the withdrawal of funds from a firm that is already financially distressed, but the firm needs those funds at that particular time (Campbell *et a.l*, 2005). This action is analogous to the old concept of tearing an old ship into parts since it is not repairable or requires large sums of money to reconstruct it and using each of the parts to construct a new one that fails to meet economic viability (Kalckreuth, 2005).

The difficulties that are apparent to the public will affect the destiny of the company if a bank has several negative shocks, loses money, and suffers losses, culminating in financial distress (Nyamboga, Omwario, Muriuki, & Gongera, 2014). Because of information asymmetry, the uninformed investors desert the firm from the perspective that it is a theory of lemons. The investors that stay would be the insiders (managers) and market participants who would have the privilege of obtaining more information about the firm, such as competing firms (Xie, 2013). The other group would fund the firm and would be working on restructuring it.

In the context of this theory, the bank is the firm that is very sensitive to market information in that when the depositors keep their funds in the banks, they will closely monitor the banks to avoid loss of their funds (Marsh & Roman, 2018). However, if other banks believe that this is a temporary problem, they lend to the bank through the interbank lending. The CBK that is also privy to the information could also provide liquidity for the bank (Allen, Carletti, & Gale, 2009). This theory supports the deposit mobilization and Profitability growth variables in the study. Banks get a large

chunk of their funds from the depositors, and if there is a slight problem and depositors withdrawal their money, these financial institutions may face a cycle of financial distress.

Empirical literature Review
Bank Concentration, Bank--Specific Characteristics and Financial Distress

Yudaruddin (2022) researched financial stability and bank concentration. This study focused on the combined effects of capital regulation and financial openness to ascertain the link between bank concentration and stability. A sample of five nations in Central Asia was obtained, specifically between 1993 and 2017, using information from the World Bank's Global Financial Development Database and the Heritage Foundation's and The Wall Street Journal's Index of Financial Freedom. The findings demonstrate that the concentration-stability theory was supported by the association between bank stability and concentration. Additionally, banks with strong capitalization and increased concentration boost financial stability. However, there is a negative and considerable impact on stability from bank concentration and financial freedom. To address financial instability, the financial sector's capital regulation and authority control need to be tightened. The study explored the topic of study using evidence from five different nations, leaving a gap in understanding the topic in a specific nation.

Riadi *et al.* (2022) explored bank stability and bank concentration during Covid-19 using Indonesia data. The COVID-19 epidemic had a more detrimental effect on the banking industry. Bank concentration and capitalization helped maintain the stability of financial systems in emergencies. This study assessed the monthly financial statements of commercial banks to analyze the collective influence of the COVID-19 pandemic and bank concentration on their financial health. Furthermore, this research investigated whether sufficient capitalization might amplify the beneficial effects of the relationship between COVID-19 and bank concentration during the pandemic.Fixed-effects estimator with heteroskedasticity and within-panel serial correlations were used to examine the collected data, from 108 commercial banks between March 2020 and May 2021. The epidemic and bank concentration had a major and negative impact, but their interactions helped to maintain financial stability. As the epidemic increased, bank concentration declined to stabilize financial stability. The study used commercial banks between 2020 and 2021 to gain more knowledge about Covid-19 impact and bank concentration, leaving a gap in understanding the same topic outside the Covid-19 period.

Antony *et al.* (2021) investigated banking concentration and financial stability using Kenya's banking sector evidence following the 2007-2009 global financial crisis. This study examined the impact of bank concentration on financial health in Kenya. Competition acted as an intermediary variable. It was motivated by contradictory theoretical assessments of the relationship between bank concentration and the possibility of a systemic banking crisis. This study was innovative in that it analyzed the indirect and direct effects of bank concentration on financial stability through structural equation modeling (SEM). According to the findings, banks were compelled to raise service costs as a result of increasing concentration, which may have exacerbated credit risk and exposed them to systemic financial hazards. The study did not use panel data to understand the

topic of study, leaving a gap in understanding bank concentration and financial risk across a given timeline.

Kombo *et al.* (2021) researched banking sector stability under market concentration using panel data from 2005 to 2015 from Central Africa. Analysis of how the Economic Community of Central African States (CEMAC)'s banking sector is affected by banking market concentration was the main goal of the research. The study discovered that deposit and credit market concentration had a destabilizing influence on the banking system and the system GMM approach. In order to ensure banking stability, it would be desirable to put in place procedures that would aid in reducing the market dominance of some banks. The study focused more on data from Central Africa, leaving a gap in understanding the topic using evidence from other regions.

Aldomy et al. (2020) explored financial risk and bank concentration using Jordan banking sector evidence. The paper's primary goal was to examine the link between bank risk and concentration using Islamic and commercial banks from 2005 to 2016. The study utilized two measures of bank risk (non-performing loan ratio and Z-score) while adjusting for the business cycle and bank fundamentals and three measures of bank concentration (the Lerner Index, Herfindahl-Hirschmann Index, and Concentration Ratio). The study examined the correlation between risk and concentration using the two-step Generalized Method of Moments (GMM). According to empirical data, bank risk and concentration are positively correlated when using the NPL ratio and negatively corre

lated when using the Z-score. As a result, the concentration-fragility argument is supported since it shows that increased market power increases risks. Islamic and commercial banks from 2005 to 2016 were the focus of the study, leaving a gap in understanding the same topic using data outside the period.
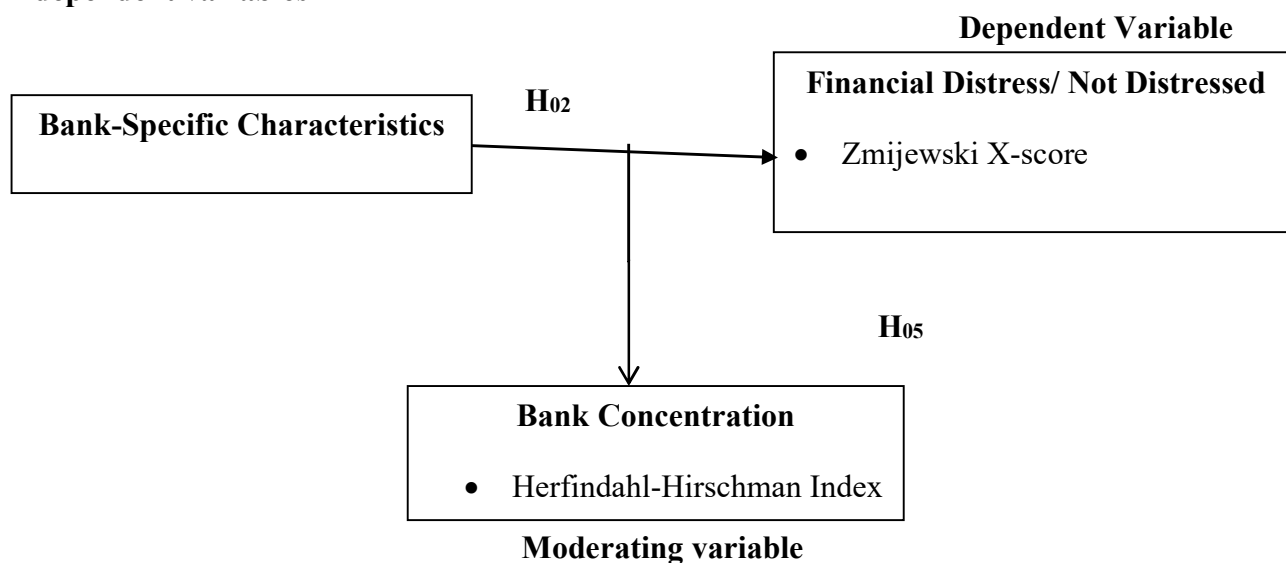
Independent variables

Dependent Variable

Figure showing conceptual framework with boxes:

- **Bank-Specific Characteristics** (box) — H$_{02}$ → **Financial Distress/ Not Distressed** (box)
  - Zmijewski X-score
- H$_{05}$
- **Bank Concentration** (box)
  - Herfindahl-Hirschman Index
- **Moderating variable**

Figure 1.1: Conceptual Framework
Source: Researcher (2023)

Research Philosophy

The study utilized the positivism philosophy as it follows the deductive approach where the hypotheses are acquired from existing theories, data is collected and empirically confirmed to reject or accept a hypothesis (Weinberg, 2013). Given that this research work involved testing of interrelationships between banks specific characteristics and financial distress, and used the quantitative approach; the positivist approach is considered appropriate. The study adopted the positivism philosophy to establish causality and focus on facts relating to the link between bank-specific characteristics and financial distress among banks.

Research Design

The study utilized a causal research design. The design identifies the causal-effect of the link between dependent and independent variables (Oso & Onen, 2009). This is an appropriate design for this study because it explains the pattern between bank-specific characteristics and financial distress (Kothari, 2010). Causal studies leave room for replication, which increases internal validity, and evaluates the impact of the changes in the independent variable on the dependent variable (Samii, 2016). Moreover, this design is critical towards identification of the causes behind processes that occur within a system, for example, in the banking sector, the causal design can allow a researcher to delve into the factors associated with financial distress (Maxwell, 2012). In addition, this design allows for replication of findings and promotes internal validity.

Empirical Model

This study will employed panel logit regression analysis by considering data from all the 36 banks that were operational in the stipulated period (2011-2019). This research work adopted the Dynamic Panel Logit model that emanates from the panel logit model (Bartolucci & Nigro, 2010). The Dynamic Panel Logit model is a probabilistic statistical framework, which measures the

interconnection between response variable and one or more regressor variables (Baetschmann, Staub & Winkelmann, 2015). The study adopted the Zmijewski model to ascertain whether commercial banks in Kenya are financially distressed or not. The scores from the model provided a binary outcome of financial stability of banks before applying the logit model in the analysis as indicated;

Zmijewski X - score $= -4.3 - 4.5X_1 + 5.7X_2 - 0.004X_3$........................... **(Equation 1)**

Where:

X_1 = ROA

X_2 = Total liabilities / total assets

X_3 = Current assets / current liabilities = current ratio.

Banks exhibiting probabilities greater than zero are considered financially distressed and below 0 are not financially distressed (Husein & Pambekti, 2015; Saputri & Krisnawati, 2020).

Model for the Moderating Effect

The study adopted a single generalized model that simultaneously estimates the influence of the moderating variable on the interaction between the explanatory and response variables (Fairchild & MacKinnon, 2009). In the study, the model estimated the Moderating Effect of bank concentration on the relationship between bank-specific characteristics and financial distress. The output model for the moderating factor is expressed as follows;

$$y = p(y_i|\alpha_i, X, y_{io}) = \frac{\exp(y_i+\alpha_i+\Sigma_t y_{i,t}\, x'_{i,t}\beta+y_{i,*}\Upsilon)}{\Pi_t(1+\exp(\alpha_i+x^i_{it}\beta+y_{i.t-1}\gamma))} = \alpha + \beta_1 S_{it} + \beta_2 DM_{it} + \beta_3 G_{it} + \beta_4 DIV_{it} + \beta_{11}(S_{it}$$

$BC_t) + \beta_{22}(DM_{it}\, BC_t) + \beta_{33}(G_{it}\, BC_t) + \beta_{44}(DIV_{it}\, BC_t) + u_{it} + \varepsilon_{i,t}$....................................... **(Equation 3.6)**

Where:

Where:

p = Probability of financial distress for bank *i* at time *t*

$1 - p(X_{it})$ = Probability of not having financial distress for bank *i* at time *t*

i = observations

t = 2011-2019 (Period)

β = the coefficient of the predictor variables;

S = Bank Size

DM= Deposit Mobilization

G = Profitability Growth

DIV = Income Diversification

BC_t = the moderator variable (Bank Concentration) at time t.

$X_{it}\, BC_{it}$ = the interaction between the moderating factor and the independent variable;

$\varepsilon_{i,t}$ = Residual.

The moderating effect is denoted by β_{12}, β_{22}, β_{33} and β_{44}, which characterize the link among the explanatory and response variables, the moderating variable, and the moderating and explanatory variable interaction, in that order. The moderator variable $X_{it}\, BC_{it}$ is the result of X_{it} and BC_{it} where X_{it} and BC_{it} are often centered.

Target Population

For this study, the target population constituted of 36 licensed commercial banks that have been fully operational from 2011 to 2019 (CBK, 2019). Commercial banks in Kenya that had collapsed, placed under receivership, or operating under liquidation were not included in the target population.

Sampling Design

For the period 2011-2019, some banks have either been newly licensed or merged, while others have been placed under receivership and therefore, they will not be included in the study because of difficulty of obtaining data from them. Consequently, the research was census of active (36) Commercial Banks in Kenya Licensed as at December 31, 2019 (CBK 2019), and were operational within the time scope considered in the study (Appendix II).

Data Collection Instruments

Research data was collected using a data extraction tool captured as Appendix I. The instrument contains the proxy measurements for all the constructs of the predictor and outcome variables of the study. Bank-Specific Characteristics as an independent variable included bank size, deposit mobilization, growth, and income diversification, whereas financial distress was the outcome variable, with bank concentration being the moderating variable. Information on the response, moderating and explanatory variables were gathered from Financial Statements of individual Banks for 2011 - 2019 (Appendix I).

Data Collection Procedure

The researcher actively pursued and successfully acquired an authorization letter from KU Graduate School authorized the researcher to submit a letter to the NACOSTI. The permit for the study was then obtained. The study collected secondary data that was used for analysis as it is better categorized and reduces biasness as opposed to primary data. The study collected the data in a systematic manner from the year 2011 to 2019. This period was considered most appropriate as it was most recent and some banks in Kenya had experienced some form of financial distress during the period. The data collection was guided by the data collection instrument. Data from the constructs of the independent variable was acquired from websites of the CBK and individual Commercial Banks, audited financial statements and Annual supervision reports. Data on bank concentration as a moderating variable was gathered from the annual bank supervision annual reports made available by Central Bank.

Data Analysis and presentation

The research adopted secondary data containing Quantitative details from 36 commercial banks, which were extracted and summarized using Microsoft Excel. The Zmijewski values were calculated using Microsoft Excel. The data was then exported to a statistical software (STATA version 15) where appropriate diagnostic, descriptive and inferential statistical tests were carried out. Zmijewski X-score values were used for binary classification of commercial banks in Kenya as financially distressed or not, and subsequently application of the panel logit model to assess the

hypotheses. Weights of the logit models change across time in panel data (McCormick, Raftery, Madigan, & Burd, 2012), hence the use of the panel logit model in this research work.

This research work employed descriptive and inferential statistics to analyze general trends of constructs being examined. Descriptive statistics involved the standard deviation as well as mean, whereas the inferential statistics constituted of Pearson's Product moments correlation and the panel data estimation methodology, which was undertaken using the panel logit analysis. Graphs and tables aided data presentation.

RESEARCH FINDINGS AND DISCUSSIONS

Descriptive Statistics

Bank Concentration

This study used the Herfindahl - Hirschman Index, (HHI), which is computed through the summation of the Squares of Market Share percentages of the Commercial Banks. Elevated levels of banking concentration may result in less competition, decreased efficiency, and elevated price for financial services. Conversely, lower levels of bank concentration may result in heightened competition, more efficiency, and reduced pricing for financial services (Bara et al., 2017). Table 1and figure 1 exhibit the results of the study for the period 2011 through 2019.

Table 1: Herfindahl-Hirschman Index

Year	Mean	Median	Std.	Min	Max
2011	6.521352	6.521352	0	6.52135	6.521352
2012	6.277486	6.277486	0	6.27749	6.277486
2013	5.995766	5.995766	0	5.99577	5.995766
2014	5.698702	5.698702	0	5.6987	5.698702
2015	6.483438	6.483438	0	6.48344	6.483438
2016	6.7268	6.7268	0	6.7268	6.7268
2017	6.818466	6.818466	0	6.81847	6.818466
2018	6.723323	6.723323	0	6.72332	6.723323
2019	7.207203	7.207203	0	7.2072	7.207203
Total	6.494726	6.521352	0	5.6987	7.207203

Table 1 indicates that bank concentration as measured by HHI dropped considerably for the year 2011 through 2014 after which it rose gradually in the period between 2015 and 2017, decreasing by a small margin in 2018 and finally surging to the highest level at 7.207203 in 2019. It is important to note that a higher HHI indicates a higher degree of Market Concentration and less competition among banks. In the banking sector, an HHI of below 1,500 is often seen as competitive when the Herfindahl-Hirschman Index (HHI) is below a certain threshold, but an HHI beyond 2,500 indicates a market with excessive concentration. This, therefore, means that the HHI for 2019 was approximately 720 signifying that the banking sector was characterized by lower concentration, but higher competition. However, the highest HHI in 2019 was probably contributed by the merger of Commercial Bank of Africa Ltd and NIC Group PLC banks. When two or more

banks merge or one bank acquires another, the market concentration increases as the number of competitors decreases (Altuntas & Rauch, 2017).

Given that the HHI is computed through the summation of the squares of market share percentages, the mean, minimum and maximum values are the same for all the years between 2011 and 2019. Even though the standard deviation appears to be zero across the period, the overall standard deviation value of 0.42873 exemplifies that HHI clusters around the mean value of 6.494726. In this regard, the banking industry is lowly concentrated as reflected by an average Herfindahl-Hirschman Index of 6.494726, a score of about 650.

Financial Distress of Commercial Banks

The study's dependent variable was financial distress, which the study aimed to determine how it was predicted by bank-specific characteristics. Financial distress was measured based on Zmijewski model which is one of the popular financial distress prediction models employed to ascertain the prospect of banks experiencing Financial Distress. The model uses financial ratios to predict Financial Distress in banks. The model calculates an X-score, which is a composite measure of financial health (Saputri & Krisnawati, 2020). The Z-score is calculated using a combination of financial ratios, such as total liabilities to total assets and current ratio, which are indicative of a bank's financial health. The Z-score is compared to a set of cutoff points to determine whether a bank is considered distressed or not. Banks with probabilities greater than 0 are considered financially distressed and below 0 are not financially distressed (Husein & Pambekti, 2015).

Table 2: Zmijewski X-scores

Year.	Mean.	Median	Std	Min.	Max.
2011	0.341029	0.4338423	0.60179	-2.6439	1.016639
2012	0.3378976	0.3603925	0.55837	-2.099	1.316023
2013	0.3442827	0.3171148	0.32155	-0.4892	1.024818
2014	0.3758485	0.3037882	0.2878	-0.1558	1.12695
2015	0.3765967	0.3260065	0.27725	-0.2203	0.962348
2016	0.3006488	0.29285	0.35918	-0.8236	1.051973
2017	0.3482514	0.3362609	0.38565	-0.5066	1.427505
2018	0.4365338	0.3680512	0.48525	-0.5592	2.399086
2019	0.4808582	0.4096401	0.51298	-0.4044	2.16704
Total	0.3704419	0.3558978	0.43324	-2.6439	2.399086

The study's outcome shown in table 2 demonstrated that across the 9 years of the study the scores of the Zmijewski model raised marginally from an average low of 0.341029 in 2011 to 0.3765967 in 2015 after which the score dropped to 0.3006488 in 2016. The X-scores of the model increased steadily for the period between 2017 and 2019, suggesting that banks in Kenya's banking sector were in an unhealthy position as scores further away from a probability of zero exemplified the likelihood for financial distress. The maximum values of more than one across the periods with the exception of 2015 reveal the existence of banks that were continually in a position, which would potentially predispose them to financial distress.

Besides, the minimum values of the Zmijewski x-score of less than zero or those approaching zero reveal that despite the possibility of insolvency, there are banks that have been relatively stable over the 9 years. The overall mean value of 0.3704419 and the std dev of 0.43324 evince that regardless of the variability in the scores, most of the banks were within a region of financial stability. The minimum observed value of -2.6439 and the maximum value of 2.399086 imply that there are financially sound banks and those that might be unable to fulfill their financial obligations. Previous studies on estimation of financial distress utilizing the Zmijweski model seem to agree with the findings of this research. One of such studies is by Saputri and Krisnawati (2020) who utilized the Zmijewski model alongside other models to forecast financial distress among Indonesian banks quoted in the Stock Exchange and established that the model classified the banks as financially non-distressed.

Correlation Analysis

Based on table 3, the study results suggested that there is a weak positive correlation between bank concentration and Zmijewski Score, with a correlation coefficient of 0.125; however, the relationship is statistically insignificant. This, therefore, reveals that market share has little influence on the financial health of Kenya's Commercial Banks.

Table 3: Correlation Matrix

Variable	Zmijewski Score	Bank Concentration
Zmijewski Score	1.000	
Bank Concentration	0.125	1.000

*** $p<0.01$, ** $p<0.05$, * $p<0.1$*

Regression Analysis

Moderating effect of bank concentration on the connection between bank-specific characteristics and financial distress based on Zmijewski Score (ZFNF)

This study employed a single approach in testing the moderating effect. In this approach, the link between the independent variables and the moderation variable is computed. For instance, in the Zmijewski Score, Bank Size, Deposit Mobilization, Profitability Growth, Income Mobilization are used as independent variables whereas Bank Concentration is used as the moderator variable. The moderating effect of bank concentration on the link between bank-specific characteristics and the Zmijewski Score (ZFNF) of commercial banks in Kenya is demonstrated in Table 4 below.

Table 4: Moderating effect of bank concentration on the relationship between bank-specific characteristics and financial distress based on Zmijewski Score (ZFNF).

ZFNF	Coef.	Std. Err.	Z	p > [z]	[95% Conf. Interval]	
ZFNF L1.	.3951126	.0821278	4.81	0.000	.234145	.5560802
ZFNF L2.	.0920335	.0663228	1.39	0.165	-.0379568	.2220238
Bank size	127.227	78.44095	1.62	0.105	-26.51441	280.9685

Deposit Mobilization	-2.373784	1.560122	-1.52	0.128	-5.431568	.6839991
Profitability growth	0.309819	0.1009634	0.31	0.759	-.1669027	.2288666
Income diversification	-1.252885	2.691479	-0.47	0.642	-6.528086	4.022317
Sit BCt	-0.1172402	0.0527671	-2.22	0.026	-.2206618	-.0138186
DMit BCt	0.4058631	0.2418597	1.68	0.093	-.0681731	.8798993
Git BCt	-0.0047728	0.0141536	-0.34	0.736	-.0325134	.0229678
DIVit BCt	0.1343783	0.417706	0.32	0.748	-.6843105	.9530671
Constant	-417.4866	258.8457	-1.61	0.107	-924.8148	89.84156
Wald Chi 2(10) =32.53						
Prob >Chi 2 =0.0003						

$$y_2 = p(y_i|\alpha_i, X, y_{io}) = \frac{\exp(y_i+\alpha_i+\Sigma_t y_{i,t}\, x'_{i,t}\beta + y_{i,*}\Upsilon)}{\Pi_t(1+\exp(\alpha_i+x^i_{it}\beta+y_{i.t-1}\gamma))} = \text{-417.4866+} \quad \text{127.227}S_{it} \quad \text{-2.373784}DM_{it}$$

$+0.309819 G_{it} + -1.252885\, DIV_{it} - 0.1172402\, (S_{it}\, BC_t) + 0.4058631\, (DM_{it}\, BC_t) - 0.0047728\, (G_{it}\, BC_t) + 0.1343783\, (DIV_{it}\, BC_t) + u_{it} + \varepsilon_{i,t}$

Where:
Where:
p = Probability of financial distress for bank i at time t
$1 - p(X_{it})$ = Probability of not having financial distress for bank i at time t
i = observations
t = 2011-2019 (Period)
β = the coefficient of the predictor variables;
S = Bank Size
DM= Deposit Mobilization
G = Profitability Growth
DIV = Income Diversification
BC_t = the moderator variable (Bank Concentration) at time t.
$X_{it}\, BC_{it}$ = interaction of the moderator and the independent variable;
$\varepsilon_{i,t}$ = residual.

H01: Bank concentration has no significant moderating effect on the connection between bank-specific characteristics and financial distress of Kenyan commercial banks
Table 4 demonstrates that Wald Chi-square is statistically significant (p=0.0003<0.05), Therefore we reject the null hypothesis. We conclude that Bank Concentration had a substantial moderating influence on the relationship between Bank-Specific characteristics and Financial Distress of Kenyan commercial banks. This is an indication that there is a moderating effect on the link

between bank-specific characteristics and financial distress of Kenyan commercial banks as measured by Zmijewski score. The results also suggested that Bank Concentration had a moderating influence on the link between the Bank size and Financial Distress with a P-value of 0.026 which is less than 0.05. The Bank Concentration did not exhibit a substantial moderating influence on the correlation between the other independent variables, namely Deposit Mobilisation, Bank Growth, and Income Diversification, and Financial Distress, as measured by the Zmijewski score. The corresponding P-values of 0.093, 0.736, and 0.748 were all greater than the significance level of 0.05. The coefficients associated with the individual interactions were as follows (β=-0.1172402, 0.4058631, -0.0047728, 0.1343783) for Bank Size, Deposit Mobilization, Bank Growth and Income Diversification respectively. From the coefficients, it can be seen that Bank Size, Deposit Mobilization and Income Diversification have positive coefficients, this implies that an increase in Bank Size, Deposit Mobilization and Income Diversification would increase the moderation effect of Bank Concentration on Zmijewski score hence financial distress. However, the negative coefficient of -0.0047728 for Bank Growth suggests that an increase in Bank Growth would decrease the moderation effect of Bank Concentration on Zmijewski score hence Financial Distress.

CONCLUSION AND RECOMMENDATIONS

Conclusion

Based on the study outcomes, the study found a significant moderating effect of bank concentration on the connection between three bank-specific characteristics (Deposit Mobilization, Profitability Growth, and Income Diversification) and Financial Distress. The logit model showed that the moderating effect of bank concentration was statistically significant, with p-values less than 0.05 for all three bank-specific characteristics.

Recommendations

CBK should take into account bank concentration when designing policies and strategies for commercial banks. Specifically, regulators of commercial banks should consider the level of bank concentration in a particular market and how it can affect the relationship between different bank-specific characteristics and financial distress. This could involve measures such as encouraging competition among banks, regulating mergers and acquisitions, and promoting diversity in the banking sector to mitigate the negative impact of bank concentration on financial stability.

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