The relationship between banks' investing activities and profitability

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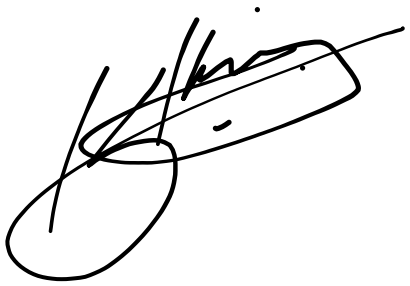
DECLARATION

I, Kwezi Kondile, declare that the research work reported in this dissertation is my own, except where otherwise indicated and acknowledged. It is submitted in partial fulfilment of the requirements for the degree of Master of Management in Finance and Investment at the University of the Witwatersrand, Johannesburg. This thesis has not, either in whole or in part, been submitted for a degree or diploma, in this or any other University.

Name: Kwezi Kondile Signature: 

Signed at Bryanston……

On the 31…….. Day of May…… 2023…….

DEDICATION

I dedicate this thesis and Master's degree to my family without whose assistance, support and love, I would not have achieved such a great milestone in my life:

- My late mother, Lindiwe Kondile. We made it ma'am. We made it!
- iQiniso Lam, my wife, whom I love, and I am proud of
- Khusta, my pit bull, whom without her late night barks and gate lookouts as 2nd in command of security I would not have achieved this

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ABSTRACT

The objective of this study is to examine the relationship between the investing activities of banks and overall bank profitability. This is undertaken across 4 profitability-driven variables: (i) Profit After Tax; (ii) Return on Equity; (iii) Return on Assets; and (iv) Efficiency Ratio (Cost to Income Ratio). The research ascertains the effect on overall profit carried by investing variables which include investments in Property, Plant and Equipment, Intangible Assets and Cash flow from Investing Activities and Investments in Associates. A panel regression model was employed to analyse the relationship between profitability-driven variables and investing activities, incorporating external and internal control variables. . The study analysed a sample of banks from various developing country regions over an eight-to-ten-year period. The study found that the relationship between investing activities and overall profitability was not statistically significant. Furthermore, the study found that Gross Domestic Product (GDP), growth, inflation, and interest rates had a significant impact on profitability, supporting previous literature.

Keywords: Investing activities; Cash flow informativeness; Net interest income; Net interest margin; Non-interest revenue

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LIST OF ABBREVIATIONS

BS	Balance Sheet
CAR	Capital Adequacy Ratio
CEM	Common Effects Model
CFF	Cash Flow from Financing Activities
CFI	Cash Flow from Investing Activities
CFO	Cash Flow from Operating Activities
CPI	Consumer Price Index
CI	Cost to Income Ratio
EfR	Efficiency Ratio
EMEA	Europe, Middle East, and Africa
FEM	Fixed Effects Model
GDP	Gross Domestic Product
GLS	General Least Squares
HHI	Herfindahl–Hirschman index
IRR	Internal Rate of Return
Ln	Log Linearisation
LSDV	Least Square Dummy Variable
MSCI	Morgan Stanley Capital International
NII	Net Interest Income
NIM	Net Interest Margin
NIR	Non-Interest Revenue
NPAT	Net Profit After Tax
NPL	Non-Performing Loans
NPV	Net Present Value
OLS	Ordinary Least Squares
OMO	Open Market Operations
P/E	Price Earnings Multiple
POS	Point of sale
PP&E	Property, Plant and Equity
QAT	Qualitative Asset Transformation
REM	Random Effects Model
RWA	Risk Weighted Assets
RoA	Return on Assets
RoE	Return on Equity
ROIC	Return on Invested Capital
SCF	Statement of Cash Flows

CHAPTER 1: INTRODUCTION

This study aims to investigate the relationship between a bank's investing activities and overall profit. Ahead of outlining the purpose of the study, problem statement and outcomes of the research, this section of the dissertation sheds light on the context giving rise to the aforementioned aim, which is to establish the extent to which the investing activities of a bank contribute to the overall performance of a bank from a profitability perspective.

1.1. CONTEXT OF THE STUDY

The context and background of the study is essential in framing the detail of subsequent sections. Firms by their nature seek investing opportunities that maximise shareholder value, meaning that capital expenditure is a critical component of profit maximisation. Within this framework, exploring the concept of capital expenditure for profit maximisation in the banking sector is becoming critical to contextually anchor.

The financial sector comprises of financial institutions which include central banks, commercial banks, investment firms, and credit unions that engage in the provision of financial services to consumers and firms (Cornell Law School, 2022). Its reach and relevance can be contextualised through the following concepts considered in this research:

1. The importance of finance and the financial system to economic growth.
2. The relevance of bank-based systems and market-based systems in economic growth.
3. The relevance and roles of commercial banks in macroeconomics and macro-finance.
4. The efficiency considerations of commercial banks to be able to fulfil their duties.

1.1.1. THE IMPORTANCE OF FINANCE AND THE FINANCIAL SYSTEM

Several studies have noted a direct correlation between the development of the financial sector and income growth. The most notable include Law and Singh (2014); Levine (2002); Popov (2017); Rajan and Zingales (1998).

This is also supported by the work of Ojah and Kodongo (2014) which notes that the prevailing theory submits that finance leads growth more-so in emerging market environments. Furthermore, the work of Rajan and Zingales (1998) demonstrates the degree to which the financial sector drives the real economy. This was done by observing the growth of industrial sectors that require external financing for their production technology relative to industries which are not in intense demand for external finance.

Essentially, Rajan and Zingales (1998) conducted research to demonstrate the interaction between industrial sectors' dependence on external finance and local financial market development. By lagging variables on financial sector development to the rate of growth of industries dependent on external finance for productive technologies (e.g., Pharmaceuticals), Rajan and Zingales' (1998) study found that externally financed industries in highly developed financial markets accelerated faster relative to industries which were not dependent on external financing (e.g., textiles).

Fundamentally, the level of the development of financial markets leads to economic growth. The finding also suggests that a country's period or phase of developmental progress steers the course of the relationship between financial development and economic growth. To reinforce this theory, Ojah and Kodongo (2014) note that economies at the acceleration phase of economic growth (growth from a low base) typically get more flight from the advancement and strengthening of their financial markets. This is because many merchants tend to have an increased demand for money through external financing to finance their capital expansion and thus growth. And this capital can be generated when there is confidence in the infrastructure and

plumping set in place in that market (e.g. enforcement of contracts, regulation and policy).

Subsequently, these economies generally get the most lift from financial development to accelerate growth. This concept becomes an important consideration in highlighting the impact of banking systems as essential in emerging economies which require the capital to accelerate economic development. The analysis of banks in such environment becomes pertinent as their performance ties into economic growth and therefore their capital allocation and management.

1.1.2. BANK-BASED VERSUS MARKETS-BASED SYSTEMS

Research conducted by Boot and Thakor (1997); Levine (2002); Stiglitz (1985); as well as Tufano and Sirri (1995), sought to understand which is more effective between bank-based systems and market-based systems for economic growth. The overall conclusion is that there is no empirical evidence to highlight which, between bank-based systems and market-based systems dominant. However, the research found that bank-based systems are essential for countries in the early stage of development given the nascent development of equity and debt market (which require sufficient market infrastructure, regulation and contractual enforcement to support development).

This finding, like that of Ojah and Kodongo (2014) on “take-off stage economies” is relevant because emerging markets serve as the cornerstone of the research topic covered by this thesis. Within this context, a banking environment with banks that are highly capitalised and with adequate liquidity to drive their profit maximisation efforts becomes fundamental as an enabler of economic growth for emerging economies.

1.1.3. COMMERICAL BANKS IN MACROECONOMICS AND MACRO-FINANCE

Commercial banks fulfil significant roles in the fields of macroeconomics and macro-finance. These banks play a vital role in the allocation of resources in various economies through the aggregation of funds from surplus savings units to the distribution of funds in demand for production activities (Ojah, 2022).

This is reiterated by Widyastuti, Dedi and Zulahaiti (2017) who note “that an efficient banking sector contributes positively to economic development through the aggregation of savings and supply of credit”. Additionally, they serve as the mechanism through which central banks channel their macroeconomic policies. In the real markets (i.e., the real economy), banks make funds available for investors to borrow to drive investing and consumption activities. They also aid in increasing the depth of financial markets through the provision of liquidity and facilitating of transactions (Duraj & Moci 2015).

Commercial banks play a positive role in economic growth. First, they participate in ascertaining knowledge on a firms’ performance and managers associated risks, thus enhancing money distribution, and improving risk management and governance (Diamond, (1984); Ramakrishnan & Thakor, (1984)). Secondly, banks manage cross-sectional and liquidity risk, thus improving investment productivity and economic development (Allen & Gale, 1999; Bencivenga & Smith, 1991). Thirdly, they mobilize capital to exploit economies of scale (Tufano & Sirri, 1995). Lastly, banking profitability is beneficial to economic growth, evidenced through panel research of banks in 132 countries between 1999 and 2013 by Klein and Weill (2022).

Commercial banks thus serve as an important intermediator for money demand, supply and transaction facilitation between central banks, individuals and firms. This facilitates low risk transactions between these constituents and enables the implementation of macro finance and economic policies. Having noted this, more work

still has to be covered in the prevailing literature to concretely anchor the view point of banking systems and economic growth of emerging markets.

1.1.4. EFFICIENCY CONSIDERATIONS OF COMMERCIAL BANKS

Banks' profit becomes an essential consideration as commercial banks, like other firms, exist to maximise shareholder value (Saif-Alyousfi, 2022). The returns of the pre-eminent banks increased by circa USD 600bn between 2008 and 2012. This accelerated to circa 5% in 2013, and profits of these banks were circa USD 700 bn in 2014. Effectively, this provides a glimpse to the significant role of profitability in the banking sector. Furthermore, it demonstrates the importance of banks in the financial markets.

Notwithstanding, banks serve as an essential transmission/ facilitation mechanism for money, and the efficiency of such operations aids in reducing the transacting costs in various markets for individuals and firms. Thus, the efficiency considerations become an important consideration to profit maximisation of banks as it would be for industrial firms. The efficiency of a bank's ability to conduct its activities can be measured through its overall profitability (Widyastuti et al., 2017). As a result, determinants of bank profitability have been the subject of various academics, investors, and policy makers across various regions (Bourke, 1989; Petria et al., 2015; Scott & Arias, 2011). Ugwunta, Ezeudu and Ugwuanyi (2012) support this by stating that the determinants of banking profitability are well explored, with several practitioners investigating banking characteristics as potential determinants, while others consider the macro-financial structure and macro-economic drivers.

Le and Ngo (2020) also further corroborate this by noting that literature on the determinants of banking performance is "significantly enormous". To that extent, Duraj and Moci (2015) found that the determinants of banking profitability can be divided into internal and external factors. Internal factors can be characterised as those that are influenced by management's policy objectives and decisions (Widyastuti et al., 2017).

The impact on profitability is the result of the differences in bank management policies, decisions, objectives, and actions relating to the sources and uses of funds obtained. The significant variables tested in this study typically included the capital adequacy ratio; liquidity ratios; non-performing loans; net interest margin (NIM); loan to deposit ratio and operating efficiency. Ugwunta et al. (2012) tested total assets, total equity to total asset ratio, and total loans and advances to total assets.

External factors are concerned with those variables that influence banking performance but fall outside of the remit of management decisions. They reflect the legal and economic environment in which banks operate (Ramadan et al., 2011). These factors include inflation; industry size; ownership structure and market concentration. Previous studies indicate that macro-economic policies that promote low inflation and stable economic growth generate improved banking performance (Ramadan et al., 2011). Studies by Chortareas as well as Garza-Garcia and De Mexico (2011) also validate the significance of macroeconomic variables such as market structure on the performance of banks.

It is important to account for profit maximisation and banking efficiency as a factor in that while commercial banks are intermediators from a macro-finance lens, they are also private sector participants who compete to maximise shareholder value. That means they fall under the same scrutiny of other sectors of private participation especially when it attains to profit maximisation measures (e.g. return on equity).

1.1.5. SUMMARY

While banking profitability and its determinants are a well-researched topic, there is limited research pertaining to the relationship between banking performance and the investing activities of banks.

This limitation is significant given the major role that commercial banks assume in the economy and economic growth as written above. It is also further exacerbated given the increasing disruption of digital financial technologies in the banking industry (Temelkov, 2018). Gitiri (2010) is one of the few to shed light on the investing relationship of banks to their overall profit (with a specific focus on cash flows from investing activities), however, more work is required to add conclusive insight on whether a bank's investing activities improve overall profitability.

Given the four concepts highlighted, the scope of the study covers, amongst others: (i) the theory of banking; (ii) the deconstruction of banking profitability; (iii) The impact of investing activities on profitability. This scope will cover a review that aids in proving or disproving the research hypotheses.

1.2. PURPOSE OF THE STUDY

The purpose of this study is to analyse the impact of banks' investing activities to its overall profit. The analysis will include that of tangible and intangible assets, changes in cash flows from investing activities and investments in associates.

The aim is to establish if there is a correlation between the banks' investing activities to the overall profitability. Essentially, do managers in banks have a similar objective to other contemporary industrial firms, which is the sourcing of investment projects that generate sustainable shareholder returns (e.g., Internal Rate of Return (IRR) and Net Present Value (NPV)) aligned to investor expectations? Alternatively, should most of the bank capital be deployed to conventional treasury and market making trading and liquidity providing activities (e.g., trading, dealing, hedge accounting, and valuation adjustment and collateral management among other activities).

The rationale for investigating the impact of investing activities on profitability is significant to the extent that bank's need to make decisions on how to use the capital

they have at their disposal vis a vis what is the mix of capital that banks should use to fund their lending activities vs investing in capital projects or giving it back to shareholders in the form of e.g., share buybacks or special dividends. This is a significant consideration for banking managers, investors and policymakers as the banking industry as grapples with balancing considerations for capital projects to drive transformation among others.

1.3. STATEMENT OF THE RESEARCH PROBLEM

Commercial banks have increased the scale and scope of activities they undertake in financial services. They have made non-financial investments (i.e., investments in tangible and intangible assets) to diversify their business in order to respond to increasing disruptions, market, and regulatory pressures.

These non-financial investments include among others transformation of their technology to align to current market trends, customer and regulatory requirements. They also include mergers and acquisitions or organic growth into new regions and geographies. Also included here is consideration for increased real estate to service more customers. These investments are being necessitated by the various disruptions taking place in the banking industry where entrants from startups and other non-banking peers look to enter the banking industry.

Furthermore, as policy makers look to increase financial inclusion barriers to entry are becoming diminished. It is however unclear whether these investments have resulted in an increase in their overall profitability, as there has been limited research conducted to investigate the relationship of a banks' investing activities on its profitability. For instance, the prevailing literature on banks' investing activities typically appraises banking activities in so far as trading and risk management is concerned. Furthermore, while there is a lot of literature on the emergence of digital and financial technology (fintech) that is impacting the banking industry, there is limited appraisal

on the extent to which investing in those activities has significantly impacted the profitability of banks.

This lack of clarity results in limited tools to judge the returns generated from the projects banks deploy their capital towards. By understanding the significance of the relationship between investing activities and overall profit of the bank, bank managers can make more informed decisions when it comes to the management of the banks' capital. Investors and analysts are also able to gauge the extent to which banking returns can be driven by investing activities.

1.4. MOTIVATION FOR THE RESEARCH

This study is based on the argument that banks have shifted towards overall holistic profit as they look to diversify away from deposits and loans (essentially interest expense and interest income) as production inputs and outputs of profit (Saif-Alyousfi, 2022).

The Bank of England states that banks, like individuals, are seeking to reduce their risk by investing into business lines that yield more non-interest income (Mcleay, Radia & Thomas, 2014). These entail activities generating fees and commissions rather than interest, and tend to be less capital consuming in nature and hence are accretive on return on equity. This also takes into consideration the increasing regulatory capital provisions on balance sheet and off-balance sheet activities, coupled with increased market forces weighing in (Saif-Alyousfi, 2022).

This research is also motivated by the premise that some banks are attractive based on their asset strength and marketing which depicts them as safe havens for money deposits (Martín-Oliver & Salas-Fumás, 2007). In this scenario, investing activities may not necessarily be beneficial for the outcome of profitability; therefore, by understanding the linkage between a bank's investing activity and overall performance

this study will assess whether banks are efficient in investing to maximise shareholder value.

1.5. RESEARCH QUESTION(S)

Based on the identified problem, and motivation, the following research question(s) has been investigated in this study:

1. Do commercial banks with higher indexed investing activities (meaning more investing activities than their peer group) generate higher profitability?

1.6. RESEARCH HYPOTHESES

To answer the research question, the following hypotheses have been tested:

i. H1: Commercial banks with higher indexed investing activities are more profitable.
   a. Null hypothesis H0: Commercial banks with higher indexed investing activities are not more profitable

ii. H2: Commercial banks with higher indexed investing activities have a better cost to income ratio.
   a. Null hypothesis H0: Commercial banks with higher indexed investing activities do not have better cost to income ratios
   a. H3: Commercial banks with higher indexed investing activities are expected to have a higher Return on Equity (RoE).Null hypothesis H0: Commercial banks with higher indexed investing activities are not expected to have better RoE

iii. H4: Commercial banks with higher indexed investing activities are expected to have a higher Return on Assets (RoA).
   a. Null hypothesis H0: Commercial banks with higher indexed investing activities are not expected to have better RoA

1.7. SIGNIFICANCE OF THE STUDY

The findings of this study fill a research gap that will inform financial managers and senior executives in the banking sector on how to appropriate their non-financial investments to produce the best returns for shareholders. It also aids academics who hold the view that the predominant theory that banks productive' inputs are financial in nature, i.e., deposits and that metric is what matters most in evaluating the performance of a bank. Other productive inputs are not as relevant in fulfilling their financial intermediary duties for the maximisation of profit and shareholder value (e.g., the prototypical bricks and mortar, hardware, and software technologies, sales, and marketing endeavours). This study puts that viewpoint to the test by investigating the significance of inputs outside of those which are financial in nature, with a specific focus on the physical and intangible investments of the bank.

1.8. THE LIMITATIONS OF THE STUDY

The research covered banks that fall within a relevant benchmark index of emerging market economics. For this purpose, The Morgan Stanley Capital International (MSCI) emerging market basket index was used, hence:

1. The study focuses on commercial banks in sampled countries falling in this index. As the index covers 23 countries, these have to been narrowed down due to data limitations prevalent in emerging markets that may hinder analysis (i.e., some banks may or may not report on variables within the study).
2. It focuses on banking performance within a time bound period that is stable in nature to be able to conduct analysis. In this instance pre-Covid-19 data (2019 and before) and is time bound for an eight-to-ten-year period.
3. The study measures the investing activities of the banks through an observation of cash flows from investing activities or changes in physical and intangible assets in the balance sheet (and a combination of both where further

robustness is required on the analysis). This is measured against operating profit.

4. The study makes available the use of Commercial and State banks where required to augment analysis as such publicly available data is used as this has been through the rigour of external audits and investor due diligence and is therefore deemed robust enough for analysis.
5. Some of the variables in the study are not provided for banks as this is public data, therefore standardisation of the data to ensure applicability was essential.
6. Furthermore, other variables that may be too wide to scope into this exercise and be to the benefit of future studies to investigate.
7. Lastly, there may be more variables to gauge profitability other than those highlighted in the study. For the purposes of ensuring sufficient scope for analysis these variables four variables have been investigated (Net Profit After Tax; Return on Assets; Return on Equity; Efficiency Ratio).

1.9. OUTLINE OF THE STUDY

The study is outlined as follows:

- **Chapter 1**: Chapter one details the introduction, which offers a background and structure of the literature.
- **Chapter 2**: The literature review follows in chapter 2 from the introduction and includes a review of books, journals, thesis, and other works conducted in this research. The opportunity to review the literature highlighted areas where more research is required to fill the gap on this subject. Specifically, the literature is structured across three anchor topics: The theory of banking, deconstructing banking profitability, and Investing activities and profitability.
- **Chapter 3**: Chapter 3 lays out the research methodology utilised in the analysis of the data – comparing the various statistical methods and deep diving on the preferred method of selection, panel data.
- **Chapter 4**: This chapter concentrates on the analysis, presentation and interpretation of the findings resulting from this study. For the purposes of this

research, it is essential to structure and analyse the data collected to test the hypotheses and answer the research question.

- **Chapter 5**: This chapter summarises the research presented, together with the findings of the study which are discussed and interpreted. It is concluded with recommendations for further research on the significance of the relationship between banks' investing activities and overall profitability.

CHAPTER 2: LITERATURE REVIEW

2.1. INTRODUCTION

Banks act as financial intermediaries offering individual and businesses (essentially natural and juristic customers) deposit, transacting and lending capabilities. Deposits are provided for the preservation of money, while transacting capabilities are provided to exchange money (as a standard transacting medium) for goods and services, and lastly, borrowing solutions to finance investments or consumption activities (Ho & Saunders, 1981).

The role of this financial intermediary is imperative; not only does it provide firms and individuals with funding for their investments and working capital requirements, it also assists in the effective functioning of money demand and supply in the economy. These financial intermediaries reduce transacting costs through centralising market information, in so doing, reducing the cost of capital and transactions. They also play a role in reducing moral hazard and adverse selections through processes of effective risk management by the regulatory bodies that oversee them.

This then reduces to some extent the differential cost of external financing as cited by Rajan and Zingales (1998). Moreover, research conducted by Levine (2002) sought to establish whether bank-based, or market-based determinants drove economic growth. The study found that financial development (as measured by bank credit which is deposits put into the market as a percentage of Gross Domestic Product (GDP)) is strongly correlated to long run economic growth. It also found that stock market activity as measured through liquidity (total value trade as a percentage of GDP) is strongly correlated to long run economic growth.

As financial intermediaries within the market system, banks pay interest to depositors and charge interest on financing solutions to consumers in demand of credit. This is

the fundamental distribution role banks assume in the industry. Ideally, the bank pays lower interest to depositors and charges higher interest to individuals and firms that borrow from the banks (Endri et al., 2020). There is the balancing act that banks cannot offer too low interest rates to depositors as that does not incentivise lending, neither can banks charge exorbitantly high interest rates to firms and individuals as that does not entice them to borrow.

This banking business model has in recent times evolved with new entrants bringing disruptions in the financial markets, a trend which has been accelerating rapidly in recent years. Across the banking value chain various start-ups have emerged to encroach on revenues that would typically be to the benefit of banks alone (Vives, 2017). These new entrants in financial technology (FinTechs) are operating at much lower costs and can disrupt without the legacy that traditional banks encounter (Temelkov, 2018).

The disruption from these financial technology firms (otherwise known as FinTechs) entrants ranges from product innovation which includes innovating across payments, transactional, lending, saving and investment. Following this, is segment innovation focusing on disruptions to offer banking solutions to segments that would be viewed as either non-qualifying and/ or non-accessible to service. Lastly, there is disruption also in process innovation (e.g., onboarding, account administration) with the view of optimising processes to drive improved customer experience (Abualloush et al., 2016).

Increased efficiency and the ability to fend off competition from banks, other financial institutions and non-financial industries is key to winning in this space. It may prove difficult for banks to do this through an incentive optimisation exercise (e.g., pricing deposits better and making loans cheaper) as that is a race to the bottom which will impact their overall profit. This places banks in a space where they need to be more effective in the deployment of their productive capital. The increased innovation and knowledge mobilisation has created an outcome where technology is diminishing the

traditional bricks and mortar bank branches, cash and manual labour that has contributed to part of the inefficiencies in the banking sector (Manjusha Goel, 2012).

Specifically, the following trends, among others, have been observed:

- Forces acting in favour of banks:
    - Front: Value proposition enhancement. Digitisation and digitalisation are enabling banks to enhance their offerings to customers and wholesalers.
    - Middle: Compliance and risk management. Digitisation is enabling better mechanisms to manage risk through enhancing profiles of customer bases that would typically be unattainable. Furthermore, this includes the enablement of the workforce with more effective platforms to service customers better.
    - Back: Process superiority in providing more efficient and effective rails required to drive customer service and excellence.

- Forces acting against banks:
    - Reduced barriers to entry: The entry of new banks and non-financial intermediaries such as telecommunication and retail companies to offer banking services to customers and wholesalers, through the provision of improved banking regulations incentivising financial inclusion, and reduced costs to enter banking.
    - Changing consumer needs – customer preferences are changing as they demand more value and better experiences.
    - Advances in technology – technology is making it easier than ever to setup new banking infrastructure, coupled with improved process efficiency through the ability of customers to switch easily.

These trends have created the burning platform for banks to be competitive through effective allocation of investing assets to beat the influx of disruption. The successful outcome of such investments is reflected through Return on Total Capital employed in the banks' quest to maximise total shareholder value (Mullins, 1982). Profitability is a relevant starting point for banks to measure such returns because it is a gauge of

financial institutions' performance and part of maximising shareholder value. It serves to demonstrate the banks' ability to generate an income from the productive assets they own (Program & Manajemen, 2018).

2.2. THE THEORY OF BANKING

Banking has undergone various innovations over the past decades which necessitate a review and appreciation of the prevailing dynamics. In trying to address these reviews, Bhattahchara & Thakor (1993) note that it is important to first distil the differentiation between banking and brokerage from an asset transformation lens.

A broker in contemporary banking theory orchestrates transactions between benefactors and consumers of capital, while on the other hand a qualitative asset transformer (QAT) processes risk in altering the attributes of the claim. This posits that the services which the financial sector provides are to accumulate surplus deposits and reallocate them to institutions who are in demand for resources to increase production. This is conducted with the goal of achieving the highest maximisation of value while reducing as much as possible the considerable probability of failure through moral hazard, or transaction costs.

According to Bhattahchara and Thakor (1993), the broad categories of concepts addressed in contemporary banking theory can be summarised across the following themes:

1. Credit allocation: the overarching framework and rationale that anchors banks to routinely ration credit disposal to certain customers and decline others vs pricing it higher. This concept further analyses the extent to which credit rationing is either a static or dynamic phenomenon.
2. Liquidity transformation: the funding of illiquid assets with liquid liabilities (and the management of tenor and maturity of assets and liabilities thereof, otherwise known as Assets and Liabilities Management (ALM)).

3. Maturity transformation: the rationale driving origination to distribution, and the extent to which securitisation resolves the problem of maturity transformation.
4. Bank regulation: the extent to which banks should be regulated and the extent to which funders of banks (e.g., depositors) should be protected.
5. Borrowers' choices: the rationale applied by borrowers in choosing between banks and capital markets to finance their business activities is broadly based on their financial policy and debt to equity requirements as firms.

The 2007/2008 global financial crisis highlighted the limitations of awareness of these contemporary concepts (Werner, 2016). According to Werner (2016), it is essential to first understand the predominant frameworks under which a bank's purpose can be classified; in so far as this is concerned, three predominant theories hold. The most predominant bank theory is currently *financial intermediation,* which posits that banks borrow deposits at cheap rates and lend them at higher rates. The spread, which is the difference between the lending and borrowing rates is the profit banks depend on.

The implications of financial intermediation theory form the basis of banking regulation in its current format. Essentially, banks must maintain a level of capital adequacy and high levels of liquidity to manage their risk weighted assets and liabilities respectively. Financial intermediation is noted as a strong driver of financial distribution in economies with sound financial infrastructure (Endri et al., 2020). Banks act as liaisons to funnel funds from consumers and entities with excess funds to those in need of such liquidity or financing and a margin is attached to such transactions.

The oldest of these three theories, which is, *fractional reserve theory*, views banks as an individual financial intermediary without the power to market make. Market making can only be achieved through the collective power of banks. The last theory, which is *credit creation theory of banking* views the bank as a net lender. This is based on the premise that banks do not reject customers who qualify for loans because of limitations in deposits. Money is created through the various levers' banks have at their disposal (e.g., certificates of deposits, money market exchanges) and then supplied to

customers. Effectively, when the bank borrows through these liability mechanisms, money is created.

2.2.1. FINANCIAL INTERMEDIATION THEORY

Financial intermediation, specifically, bank-like intermediation in the context of the financial system can be defined through the following activities:

1. Resources are borrowed from one group of agents and lent to another group of agents.
2. The terms, “borrow” and “lend” translates into the fact that the contracts involved are debt contracts.
3. Lenders and borrowers are large parties, which infers variation on both sides of the balance sheet (Gorton & Winton, 2003).
4. The entitlements issued to both debtors and creditors have different contingent payoffs.

Essentially, banking financial intermediaries are not different to other financial institutions as they aggregate deposits and lend them out (Werner, 2016). To that point, conventional concepts of intermediation are predicated on dealing costs and information asymmetry (Allen & Santomero, 1997). Von Mises (1980) has supported this thinking and ascertains that banks essentially act as lenders of other people’s surplus reserves, i.e., banks use borrowed money and lend it out. This makes banking a negotiation mechanism between the granters and grantees of credit. Only those who take deposits from others and lend them out can be deemed to be bankers. Individuals and firms who lend out their own capital are deemed capitalists / investors.

2.2.2. FRACTIONAL RESERVE THEORY

Fractional reserve theory obtained its roots from the Austrian School of Economics, which deals with monetary equilibrium, defined as “the state of affairs that prevails

when there is neither an excess demand for money nor an excess supply of it at the existing level of prices" (Selgin, 1988).

Fractional reserve banking is the system through which financial institutions increase money supply (Rothbard, 1995). The prototypical example is that of a bank that accepts a deposit of one hundred rand. This fractional reserve bank is only expected to hold a small "fraction" in reserve. The excess amount can be distributed as credit to customers. These customers unsurprisingly keep up with the same deposit activity with newly acquired money – and in this decentralised manner money travels between banks with a multiplicative effect. As this process continues and increases – money supply lowers interest rates below the real interest rate at which "demand and supply are equal".

The cash production procedure made through fractional-reserve theory is different to financial intermediation. Austrians' assessment of money creation in a fractional-reserve process is that of a credit creation system vs a financial intermediation process. This is because it does not enable the transfer of savings to consumers and investors. Cochran, Call and Glahe (1999) anchor this by stating that fractional reserve banking and the related cash-creation procedure is a credit creation procedure. This theory states that each bank on its own is an intercessor without the ability to produce money. Conversely, it is the organisation of banks as a holistic infrastructure that can produce money through using the excess in the surplus of deposits provided (i.e., the delta in deposits that remains in the system; essentially the remaining fraction) (Werner, 2016).

The process which converts shifts in cash (and credit) into shifts in prices and quantities is accelerated by the injection effect.

2.2.3. CREDIT CREATION THEORY

The Bank of England argues that the mechanism through which money is generated and distributed differs from the popular misconceptions of financial intermediation as well as fractional banking (Mcleay, Radia & Thomas, 2014).

When a bank originates a loan, in parallel it produces a corresponding deposit in the borrower's bank account, thereby producing new money. Credit creation theory hence suggests that banks as individual (juristic) constituents can make money. They do not merely loan out surplus funds in the form of deposits that have been provided to the bank from surplus savings units. Conversely, the bank as a credit creator produces deposits because of bank loaning. The bank is not constrained in its ability to supply credit and does not in its practice turn away customers who qualify for credit facilities from a risk assessment basis.

Consequently, the quantum of cash that a financial institution in the form of a bank can produce is not constrained by its capacity to take on deposits as a source of production input in the money creation process. When a bank lends money through its distribution mechanisms, this pursuit establishes new acquiring power that would not have otherwise existed in its normal course of doing business. Furthermore, when the debt is being repaid, it results in the destruction of money in the economy. This is because of the reduction of bank loans (which form part of the composition of risk weighted assets of the bank) and deposits which are the surplus savings units forming the liabilities of the bank that customers use to settle their credit. This ultimately means a reduction of assets in the economy which controls the oversupply of money and hence demand of transactions which may not be serviced by adequate supply from industrial sectors. Essentially, this may effectively demonstrate a reduction in the demand for money and transactions in general (Starkey, 2018).

There is a plethora of factors that play a role on a bank's ability to produce money. The first is an appraisal of the fact that electronic money transactions account for greater than 95% of all transactions conducted in the market. These electronic money transactions are settled through non-cash transmissions within the financial system. The aptitude of the bank to preside as a credit creator precipitates from a mixture of deposit activities, lending activities and banking regulations. Given that they preside as the general ledger within the markets, this gives them the ability to create "fabrication" that the borrower deposited money at the bank as consumers cannot see the difference between money that has been produced by the bank, and money deposited by savers (Starkey, 2018).

While commercial banks produce money when customers borrow from them, there are limitations in place to guard from this activity happening without prudence. For instance, prudential regulation performs an oversite role and acts as a limitation on banks' actions to preserve the strength of the monetary structure (Mcleay et al., 2014). Lastly, the households and firms who are recipients of the cash created by new advancing may undertake activities that impact the volume of money in the system — they could quickly 'diminish' cash by repaying their existing debt or transfer their deposits to institutions which are viewed as safer havens for their reserves, for instance (Mcleay et al., 2014).

2.3. DECONSTRUCTING OVERALL BANK PROFITABILITY

Banks overall profitability can be segmented into two broad categories, which are Interest Income and Non-Interest Revenue respectively.

2.3.1. NET INTEREST INCOME, NET INTEREST MARGIN

The first category that drives profitability is a banks' Interest Income, which becomes Net Interest Income (NII) when interest expenses have been taken into consideration.

During the banks' business activities, they accept deposits from customers (surplus funding groups), which are treated as liabilities, transform them into a loan and lend to the deficit group.

Banks pay interest to customers for these deposits, and essentially this payment serves as the opportunity cost for forgoing current consumption from the customer. On the assets side of the balance, banks earn interest on the loans they distribute to qualifying customers (cash outflow). NII is a profit metric which represents the difference between a bank's total interest income and the interest expense incurred (Smith et al., 2003). However, to measure the estimated earnings from the banks' activities, the NII is standardised by the banks' earnings to generate the net interest margin (NIM), which is the actual measure of banks profit from its intermediating functions (Klein, 2020).

The extent to which the net interest margin (NIM) plays a part in banking profitability is essential as it is the most predictable measure of bank profitability when it comes to financial intermediation (Widyanty & Otkasari, 2020). Various studies have been conducted focusing on the determinants of net interest margins which include Ho et al (1981), Chortareas et al (2011), Lin et al (2012), Maudos et al (2004) and Programe et al (2018). The seminal and most cited work on determinants of NIM is Ho & Saunders (1981).

The studies suggest that bank interest margins are driven by four factors: the degree of managerial risk aversion, the size of transactions undertaken by the bank, the variance of interest rates, and the banks market structure. Their theoretical model views banks as risk averse dealers facing the asymmetric arrival of demands for loans and supplies of deposits. Various studies have followed on this work across different regions, this includes Europe (Angori et al., (2019), Saunders et al., (2000), and Maudos & Fernández De Guevara, 2004), Asia (Lin et al., 2012), and Latin America (Chortareas et al.,2011). These studies have typically focused on the determinants and drivers of net interest margins.

They have broadly bucketed NIM determinants into macroeconomic and microeconomic factors (see Table 1).

Table 1: Determinants of overall profit

Overarching Metric	Drivers	Determinants
Overall profit	Net Interest Income	Macroeconomic determinants a. Central bank policy b. Market interest rates c. Inflation rates d. Exchange rates e. Economic growth Microeconomic determinants a. Bank size b. Operational efficiencies c. Capital adequacy d. Credit quality
	Non-Interest Revenue	a. Bank specific factors (bank size, bank efficiency and bank liquidity)

Source: Chortareas et al. (2011), and Le and Ngo (2020)

2.3.1.1. MACROECONOMIC DETERMINANTS

There are various macroeconomic factors that have been suggested as determinants of NIM. This includes the influence of the central bank policy on short term interest rates, and subsequently market interest rates i.e., lower interest rates compress the margins banks make on their loans while their deposit rates remain constant (Klein, 2020). The central policy mechanisms can result in either expansion or compression of NIM. Since the central bank policy is a determinant of NIM, so are the mechanisms

/ levers it uses to influence liquidity in money markets. This is because money markets serve as a transmission mechanism for money between the real economy and the nominal economy (Malikane, 2022).

By that extension, Open Market Operations (OMO) driven by Central Banks / Reserve Banks also serve as determinants of NIM as one of the levers to control interest rates in the market through money supply and demand. In this scenario, reserve banks supply (reduce) money to markets through selling (acquiring) of bonds, thereby influencing liquidity and margin expansion (contraction) of banks. In summary, while banks generate deposits at fixed interest rates, nominal interest rate fluctuations are the mandate of the reserve bank to manage the buying power of the currency and have played a significant role in so doing.

Other influencers include exchange rates, inflation rates and economic growth in the real economy. One of the macroeconomic variables that has also been investigated as a determinant is market concentration (the extent to which the number of active banks in the market and subsequently, competitiveness influence margins). Using panel data, Chortareas et al. (2011) found that high market concentration does not necessarily imply low competition in Latin American Markets. They also found this market structure to be positive and significant in Argentina, Brazil, Colombia, and Uruguay.

2.3.1.2. MICROECONOMIC DETERMINANTS

Some microeconomic or bank specific factors have also been noted as drivers of NIM. Endri, Marlina and Hurriyaturrohman (2020) cite influencers such as operational efficiencies, loans, capital adequacy, credit quality, bad credit, size of banks assets, opportunity costs for bank reserves, interest rate risk and ownership structure.

The operating expenditure is interesting to markets with a monopolistic/oligopolistic structure to the extent that banks can earn rents to finance the inefficiencies inherent

in their structures (Chortareas, Garza-Garcia, De Mexico and Girardone 2011). Duraj and Moci (2015) conducted a regression analysis to investigate the profitability behaviour of bank-specific, industry related and macroeconomic determinants for banks particularly in Albania. The focus was on Return on Equity (RoE), liquidity risk and net income to total equity as regressors. The study found that both macro and microeconomic variables were statistically significant for the dependent variables investigated, specifically Non-Performing Loans (NPL), Deposit to Loan Ratio and Loan Size. Operating expenses have also been regressed with mixed results by Maudos (2004). Le and Ngo (2020) extended the lens of operating expenses to include technology operated items such as the number of banking cards issued in the system, automated teller machines (ATMs) to branches and point of sale (POS) device terminals which were also found to be statistically significant.

This infers that market concentration or rather the competitiveness of financial intermediation can be a driver of NIM. Capital adequacy that the bank employs would be driven by the regulatory minimum imposed by the central bank, coupled with additional buffers based on the composition of assets and profile of the customer base. Typically, most banks may choose to be conservative on these buffers to demonstrate sufficient safety nets for risk-based assets.

There is also consideration of the size of assets, as banks with larger assets may be viewed as safe havens to store money and project more robustness in being able to manage through economic downturns.

2.3.2. NON-INTEREST REVENUE

While interest income has been recognised as the most traditional and predictable source of income for the bank, a trend has taken place in the hunt for non-interest revenue (NIR) in the form of commissions, fees, and other sets of income. This comes as banks experience an advent of competition and technology disruption on their

traditional sources of NIM, which compels them to diversify into other revenue sources (Rahim Atellu, 2012).

Non-interest income comprises of various components which include fees generated from transacting and lending activities, trading activities, commissions from insurance and other distribution activities among others. One of the significant advantages of non-interest income is that it is risk free in its nature (i.e., it does not require the provision and/or management of risk weighted assets in most instances), hence its ability to accelerate return on equity and return on assets. Previous work on non-interest income has covered its relationship with bank size as a diversification effect. The results show an equal correlation on the importance of the NIR with diversification of the banks activities (Pennathur et al., 2012).

Other studies by Atellu (2012), Kiweu (2012) and Hahm (2008) have investigated drivers and determinants of NIR which were macroeconomic in nature, demonstrating an equally important relationship between NIR and macroeconomic variables. Zenebe (2018) studied banks' specific variables, with empirical results verifying that the non-interest income of private banks correlated strongly and directly with bank specific factors which are relative bank efficiency, bank size, and bank liquidity.

2.4. THE IMPACT OF INVESTING ACTIVITIES ON BANKING PROFITABILITY

While doing business for the purpose of maximising shareholder returns, financial managers and senior executives of firms strive to find investment opportunities to optimise portfolio returns (Firer et al, 2012).

The Harry Markowitz (H.M.) model was developed to provide a standardised approach to investors' decisions regarding investing in assets or risk weighted securities (Rahim Atellu, 2012). The model assumes that investors are rational, risk averse and that they will decide based on the most optimum portfolio in the efficient frontier set (i.e., the set

of optimal portfolios that offer the highest expected return for a defined level of risk or the lowest risk for a given level of expected return). It therefore holds that they would choose investments in a portfolio with low risk at optimum return level. Given the various portfolio of assets and capital that banks hold, the ultimate deployment of such investments is a point of departure given that production outputs are financial in nature.

2.4.1. OVERVIEW OF CASH FLOW AND PROFITABILITY

The fundamental purpose of the business is to maximise the value for its shareholders (Firer et al., 2012). Financial management strategy and capital budgeting plays a pivotal role in identifying long term projects for the firm to pursue to maximise shareholder value.

Statement of cash flows (SCFs) have been used as an informative tool into business's operating activities (translation of accrued accounting profit to cash accounting), investing activities and financing activities. Cash flows from investing activities clarify the firm's investment in productive assets to maximise shareholder wealth.

Studies examining the relationship between cash flows and bank profitability are limited and have yielded varied results. A study conducted in Kenya highlights the positive relationship between cash flows from financing and investing activities to the banks' profitability (Gitiri, 2010). This is a useful observation as a proxy gauge on the impact that capital expenditure has on bank profitability. It is complemented by Burke and Wieland (2017) who note the value relevance of cash flows and their significance on share prices. Nevertheless, other studies by Gao et al. (2019), Burke and Wieland (2017) and Ryan, Tucker and Zarowin (2008) cite there is little informativeness from the banks' statement of cash flows.

This is supported by Gao, Li, and O'Hanlon (2019), whose research finds that in an unambiguous distinction to their peers in non-financial industries (i.e. industrial companies), there is little evidence that can be disseminated from banks' statement of cash flows, and there is limited insight that can be generated from cumulative items (i.e., subtotals) in the presence of net income and book value of equity. This is also true of individual items in banks' cash flow statement.

2.4.2. INVESTMENT ACTIVITIES: DIGITAL TECHNOLOGIES

Information technology (IT) plays a leading role in the banking sector. A key element has been the impact of ITin the deepening of financial markets. It has improved the interrelationship between banks and the financial markets and brought closer the real markets to financial markets and in so doing, transforming the bank business models.

It is necessary to account for the innovation in banking services when determining the factors affecting bank performance (Le & Ngo, 2020). It stands to reason that this proliferation of information technology drives more diversification and liquidity. What has arguably not been contested is that banks have become more transaction focused on the cost of less relationship-based banking. As information technology has brought banks closer to the financial markets, transacting has been easier and increased based on the availability of capital (Boot, 2017).

This means that banks can scale their capabilities and exposure. Additionally, the advancement of IT seems to have produced more scale (offering more solutions) and scope opportunities for banks (i.e., more productive, and efficient direct distribution to customers) (Boot, 2017). The work of Le and Ngo (2020) highlights the significance that digital assets such as Point of Sale Devices (POS) and ATM machines have on profitability. The same also holds for the prevalence of transacting cards which make it easier for the facilitation of money.

Studies that investigated the impact of technology and digitally driven banking services on banking profitability have been inconclusive (Martín-Oliver & Salas-Fumás, 2007). Boot, (2016) notes early research findings which saw a positive relationship between technology and profitability, however, prevailing versions demonstrate differing results. This may be due to the breadth of the disruption taking place which could distort the ability to make effective resource allocation decisions. Secondly, this may also result in diminishing marginal benefits.

Some studies also have it that inconclusiveness may be driven by the fact that technology is not a substitution effect for physical presence but rather complementary in activities (Hernando & Nieto, 2011).

2.4.3. INVESTING ACTIVITIES AND PHYSICAL ASSETS

The dawn of digital technologies has posed a question to the need and relevance of physical assets in the form of bricks and mortar among others. Various studies on whether physical assets such as branches, substitute or complement digital disruptions by Yakhlef (2001), Hannan and Hanweck (2008) and Kumar, Thrikawal and Acharya have been inconclusive.

Studies by Hannan and Hanweck (2008) on branch profit maximisation and return found a positive correlation between the number of branches and the return on banks' risk weighted assets. Furthermore, Granger causality tests performed by Kumar, Thrikawala and Acharya (2022) to test whether there's a bi-directional relationship between branches and bank profitability discovered that bank branches cause bank profitability, not the reverse. This is contrary to earlier studies by Hester and Zoellner (1966) and Emery (1971), which demonstrate that banking utility has transitioned in value and relevance through the digitalisation era.

One of the key relevant forces of change is that technology, specifically financial technology, may lead to disaggregation of the banking value chain given the emergence of customers that are fully digital and those that prefer branches – which is where the relevance and utility of branches may be increasing for a fundamentally different service and sales function rather than being completely replaced by digital.

2.5. CONCLUSION

The literature review highlights the vast previous research conducted in the field of banking profitability, which covers both internal and external factors. The next chapter (chapter 3) will provide the method proposed to carry out this study. Table 2 summarises the research themes tabulated across the various sections of the study from notable authors in the literature.

Table 2: Summary of the literature reviewed

Authors	Data time frame	Methodology	Main Findings	Countries
Gitiri (2010)	2005 – 2009	Regression analysis	Cash flow from the financing and investing activities had a positive influence on the banks' profit while operating cash flow had a negative effect.	Kenya
Burke, Wieland (2017)	2004 – 2014	Panel Regression analysis	Banks' cash flows from operations are positively and significantly associated with share prices.	United States of America

Gao, Li, O'Hanlon (2019)		Panel regression analysis	Relevance of statement of cash flows with regard to its informativeness on bank performance and position relative to net income and book value of equity	Cross regional (Bank of International Settlements)
Le, Ngo (2020)	2002 – 2020	Panel Regression analysis	Relevance of digital assets vis a vis ATMs, POS, and Cards to banking profitability.	Southeast Asia
Kiweu (2012)	2000 – 2012	Mean dispersion	Diversification of product offerings does not reduce earnings variability.	Kenya
Petria, Capraru, Ihnatov (2015)	2004 – 2011	Panel data	Credit and liquidity risk, management efficiency, the diversification of business, the market concentration/competition and the economic growth had an influence on bank profitability.	European Union
Chortareas, Garza-Garcia and De Mexico (2011)	1999 – 2006	Panel data	Market concentration and market share had little influence on profitability.	Latin America (Argentina, Brazil, Colombia, Costa Rica, Paraguay, Peru, Uruguay, and Venezuela)

Beccalli (2007)	1995 – 2000	Panel data	Does IT investment improve bank performance? Evidence from Europe.	Europe
Tunay, Tunay and Akhisar (2015)	2005 – 2013	Panel data	The Effects of Innovations on Bank Performance: The Case of Electronic Banking Services.	23 developed and developing countries

CHAPTER 3: RESEARCH METHODOLOGY

3.1. INTRODUCTION

The purpose of this chapter is to shed light on the methods in which the empirical work of this research is carried out. This section will further describe in broad terms the relevant data sources and variables used in the study.

3.2. RESEARCH DESIGN

The research design is quantitative in nature, using panel regression modelling as the main medium for analysis. This method of research design has been used in studies of the same nature as detailed in the literature review which include Al-Homaidi et al. (2018); Burke and Wieland (2017); Jothikumar et al. (2017); Petria et al. (2015).

The overall profitability of the bank is the dependent variable. The proxy variables that have been tested as dependent variables are the measures of profitability as detailed in the hypotheses in the first chapter. These include net profit after tax (NPAT), cost to income ratio (CI) vis-a-vis efficiency ratio (EfR), return on equity (RoE) and return

on assets (RoA). Testing for these dependent variables shed light on the measures of profitability that are influenced by the investing activities variables.

Investing activities are the independent variables. The proxies that have been used for these are Cash Flows from Investing Activities (CFI), changes in Property, Plant and Equipment (balance sheet), investments in associates and changes in intangible assets (balance sheet). A cash outflow (inflow) in CFI demonstrates positive (negative) investments, while positive (negative) changes in intangible assets and Property, Plant and Equipment (PP&E) year-on-year (YoY) also signal investments (disinvestments/devaluations in investments).

PP&E is the proxy used to depict investments in Automated Teller Machines (ATMs), POS machines and Card. It also accounts for investments in physical infrastructure (e.g., upgrades to branches). Intangible assets on the other end accounts for investment in software and digital applications (as mediums for customer acquisition and service fulfilment) as well as marketing. Since this study involves the analysis of various samples of data across banks from several regions during a 10-year period, the multi-dimensionality of panel data was found to be suitable. Investments in associates signal annuities and valuations from investments outside of operating activities of the bank.

Proxies for control variables have been factored in. A control variable in econometric analysis is used to hold constant other factors that may be affecting the relationship between the independent and dependent variables being studied. This helps to isolate the effect of the independent variable of interest on the dependent variable and reduces the likelihood of spurious correlations (Farrar & Glauber, 1964). The control variables used in this analysis include cash flow from investing activities (CFI), inflation and gross domestic product (GDP) as a lens for economic growth. Including control variables in the analysis is essential for controlling external and internal factors that may influence the relationship between banks' investing activities and profitability. The

specific control variables mentioned—GDP growth, interest rates, inflation, and cash flow from operating activities—can help account for these factors.

GDP growth is a widely used control variable in financial research because it reflects the overall economic performance of a country or region. It captures the broader macroeconomic conditions that can impact banks' profitability. Higher GDP growth may indicate increased economic activity, leading to potential opportunities for banks to generate profits through investing activities. Including GDP growth as a control variable helps isolate the relationship between investing activities and profitability from the influence of economic growth.

Interest rates play a crucial role in shaping the financial environment and the profitability of banks. Changes in interest rates affect the cost of borrowing, lending rates, and the returns on investment securities. By including interest rates as a control variable, the study can account for the impact of monetary policy and changes in the cost of funds on banks' profitability. Higher interest rates may increase borrowing costs for banks, affecting their investment decisions and ultimately their profitability.

Inflation is an important macroeconomic factor that affects the purchasing power of individuals and businesses. Including inflation as a control variable helps account for its potential impact on banks' profitability. High inflation can erode the value of assets and reduce the real returns on investments. By controlling for inflation, the study can assess the relationship between investing activities and profitability while isolating the effects of changes in the general price level.

Cash flow from operating activities reflects the liquidity and operational efficiency of a bank. Including this as a control variable helps account for internal factors that may affect profitability. Banks with strong operating cash flows may have better resources to support their investing activities and generate profits. By controlling for cash flow

from operating activities, the research can better isolate the impact of investing activities on profitability, independent of the bank's operational performance.

3.2.1. RATIONALE FOR PANEL DATA

Panel data is longitudinal data containing observations about different individuals across time, collected at regular frequencies and containing observations across a collection of data-points (Hsiao & Wang, 2006). The advantages of using panel data for this analysis include the fact that panel data typically contains more degrees of freedom and less multi-collinearity than cross-sectional data hence improving the efficiency of econometric estimates (Hsiao & Wang, 2006). Moreover, panel data can model both the common and individual behaviours of groups, and contains more information, variability, and efficiency than pure time series data or cross-sectional data.

The justification for panel data analysis, also known as longitudinal or cross-sectional time series analysis, is supported by the following reasons:

1. Time and country-specific effects: Panel data allows you to account for time-specific effects (temporal variation) and country-specific effects (cross-sectional variation) simultaneously. By including both dimensions, the analysis can capture the unique characteristics and differences across countries while also examining how the relationship between variables evolves over time.
2. Increased statistical power: Panel data analysis provides more observations compared to a simple cross-sectional study. Considering that the dataset is large at circa 60 banks and 8 – 10 years of data, the statistical power of the analysis can be increased. This allows for more precise estimation of the relationships between variables and enhances the robustness of the findings.
3. Controlling for unobserved heterogeneity: Panel data analysis enables the control of unobserved heterogeneity or individual-specific effects that may affect the relationship between banks' investing activities and profitability. By including fixed effects or random effects models, the study can account for time-

invariant factors specific to each country that might otherwise bias the estimates.

4. Addressing endogeneity concerns: Panel data analysis helps mitigate endogeneity issues by employing instrumental variables or employing fixed effects models that control for time-invariant unobserved factors. This allows for a more reliable estimation of the causal relationship between investing activities and profitability.
5. Capturing dynamics and lagged effects: Panel data analysis enables the examination of dynamics and lagged effects by including lagged independent variables. This allows the research to investigate how past investing activities affect current profitability and identify potential time lags in the relationship.
6. Increased generalizability: By including data from various emerging market regions, panel data analysis allows for broader generalisability of the findings. It helps capture the diversity and heterogeneity across countries and provides a more comprehensive understanding of the relationship between banks' investing activities and profitability in emerging markets.

There are other research materials that have been considered and for this analysis. The methods are detailed below together with their potential drawbacks for this form of analysis.

Cross-sectional analysis: Cross-sectional analysis involves examining data from a single point in time, disregarding the time dimension. This method would overlook the dynamic relationship between investing activities and profitability over an eight to ten year period. It also fails to capture time-specific effects and might not adequately account for changes occurring within the countries over time.

Time series analysis: Time series analysis focuses on examining the behaviour of variables over time, often using data from a single entity (e.g., a specific bank) or aggregate data for a single country. This method would not allow the researcher to

capture cross-country variations and the impact of investing activities in different countries. It may limit the generalisability of the findings, especially when studying a sample of circa 60 banks.

Case studies: Case studies involve in-depth analysis of a specific bank or a small number of banks, providing detailed insights into the relationship between investing activities and profitability. However, case studies lack generalisability, as they focus on specific contexts and may not represent the broader trends and patterns across various emerging market regions.

Experimental research: Experimental research involves designing and conducting controlled experiments to assess causal relationships between variables. However, conducting experiments in the context of banks' investing activities and profitability can be challenging, as it is difficult to control real-world factors and replicate the complexity of banking systems across multiple countries.

Survey research: Survey research involves collecting data through questionnaires or interviews to gather insights and opinions from individuals within the banking industry. While surveys can provide valuable qualitative data and perspectives, they may not provide robust quantitative evidence on the relationship between investing activities and profitability. Additionally, obtaining responses from a diverse range of banks across 60 countries can be logistically challenging.

Panel data methods typically include homogeneous and heterogenous methods. The challenge that must be managed is to control the impact of unobserved heterogeneity represented by incidental parameters (Hsiao & Wang, 2006). Panel data enables researchers to regulate individual heterogeneity (Kazmi, 2007).

3.2.2. DATA ANALYSIS OVERVIEW

Once in Microsoft excel, The data was extracted from the banking income statements, balance sheets and cash flows for the banks in scope through the Bloomberg Financial Analysis.

The data was analysed in a currency that is consistent for analysis (dollar currency across the dataset for consistency and standardisation). Banks residing within countries listed in the MSCI Emerging Market Benchmark Index were selected for this analysis. The banks were gathered from South Africa, China, India, Brazil, Russia, Turkey, Mexico, and Indonesia. The broad base enables for geographic representation across the regions. The rationale for this sample is detailed below in the “Population and Sample” section.

The data covers a ten-year reporting period to ensure sufficient datapoints required are present to demonstrate the trend of investing behaviour. Such a timeline allows for capturing long-term trends; accounting for business cycles (e.g., global financial crises, regional macro factors); estimating lagged effects; assessing stability over time and enhancing the statistical power. Furthermore, expanding the data beyond ten years (i.e., to fifteen or twenty years) would result in lack of data for specific emerging markets as well as adverse impact to analysis caused by global financial crises.

The data is structured with the RoE, RoA, CI, and NPAT as dependent variables. The dependent variables are measured as ratios (e.g., net profitability of bank divided by total equity of bank x in country y at period z). Other dependent profit proxy variables could have been used but due to time and data analysis constraints the identified dependent variables were anchored. Further research would benefit to explore these. These include gross operating margin, operating margin, pre-tax margin, net profit margin. In the analysis these dependent variables are regressed against the independent variables below.

Independent variables were used in the form of direct variable drivers (which included changes in PP&E, investments in associates, intangible assets from the balance sheet, and cash flow from investing activities). On appropriateness of balance sheet variables, the year on year (y-o-y) percentage change of PP&E, intangible assets, and investments in associates. Essentially, an increase in y-o-y change on PP&E means capital purchase of property, plant and equipment (also including valuation effects).

Likewise, an increase in the value of investment in associates (y-o-y change) would infer more income in the form of dividends generated from equity in those associates which reflects into profitability. On measurement, regressing the y-o-y change to dependent variable such as RoE for bank x in country y at period z will be able to analyse lag and dynamic effects of such yoy changes in the dependent variable to the independent variable. Therefore, percentage changes in the balance sheet and cash positions were calculated as inputs to measure the statistical significance to the f variables. Furthermore, other investing activities could have been considered however the quality of the data could only limit the analysis to the aforementioned variables as data was available for these. Further research to would benefit from the exploration of other investing activity variables.

Control variables are included in regression analyses to estimate the causal effect of a treatment on an outcome. Control variables were factored in which include those that are external in nature (GDP growth, interest rates and inflation) and internal (cash flow from operating activities). The choice of these variables is guided by the existing literature review specifically given the statistical significance of external and internal bank factors to overall profit. Including these control variables allows the researcher to isolate the relationship between banks' investing activities and profitability from the effects of broader economic conditions, monetary policy, inflationary pressures, and internal financial factors.

By controlling for these external and internal factors, you can obtain a more accurate understanding of the specific impact of investing activities on banks' profitability. E-views was the software used to run descriptive statistics and the panel regression model.

3.2.3. POPULATION AND SAMPLE

The MSCI Emerging Market index comprises companies from 24 countries. Given the time constraints to analyse all the conventional banks in the relevant MSCI countries – the focus was on a subset of countries in each of the regions. The index contains four regions: Europe, Middle East, and Africa (EMEA) and Asia. The rationale for narrowing the bank panel is as follows:

1. The following countries have been included from the above regions to ensure representation and robustness (EMEA: South Africa; Russia; Turkey. Asia: India; China; Indonesia. Americas: Brazil; Mexico)
2. The rationale for these countries included the state of development (emerging markets); relative GDP size within the emerging market context; state of development of the financial sector (through prevalence of publicly listed banks).
3. Within the countries the top public listed banks by balance sheet size were shortlisted and selected. This assisted in observing the appropriate trend of investing activities and overall profit.

Further expanding the focusing on emerging market economies that appear in the MSCI Emerging Markets Index can provide several benefits and insights. Here's why such a study would be valuable:

3.2.4. UNIQUE MARKET CHARACTERISTICS

Emerging market economies often exhibit distinct market dynamics and characteristics compared to developed economies. They may have different regulatory frameworks, varying levels of economic development, and specific challenges and opportunities. By focusing on emerging markets, the study can capture

these unique factors and shed light on how investing activities impact profitability within these specific contexts.

3.2.5. POLICY IMPLICATIONS

Emerging markets often experience unique regulatory challenges and policy considerations. By examining the relationship between investing activities and profitability in these markets, the study can provide evidence-based insights that inform policymakers and regulators about the potential impact of policies related to investing activities. This can contribute to the development of more effective and tailored regulations to support sustainable and profitable banking sectors in emerging markets.

3.2.6. GROWTH POTENTIAL

Emerging markets are known for their growth potential and their ability to provide attractive investment opportunities. Understanding the relationship between banks' investing activities and profitability in these markets can offer insights into the factors that drive financial success in rapidly evolving economies. This knowledge can be valuable for both investors and policymakers seeking to make informed decisions in these markets. This aligns to the literature pertaining to bank-based and market-based systems, where emerging markets are noted as significantly reliable on bank-based systems to drive economic drive.

3.2.7. DIVERSIFICATION BENEFITS

Examining a sample of emerging market economies from the MSCI Emerging Markets Index allows the analysis to capture a diverse range of countries and regions. Each country may have its own unique economic, political, and social factors that influence banks' investing activities and profitability. By including a broad range of emerging markets, your study can provide a more comprehensive understanding of the

relationship across different contexts and potentially identify common patterns or differences across regions.

Overall, conducting a study on the relationship between investing activities of banks and overall profitability in emerging market economies listed in the MSCI Emerging Markets Index offers a unique opportunity to gain insights into the specific dynamics and challenges faced by banks in these markets. It can contribute to the academic understanding of the banking sector in emerging economies and provide practical implications for investors, policymakers, and regulators operating within these markets.

3.3. DATA COLLECTION

In accordance with the research objectives, the study analysed the relationship between the cash flow from investment activities to the overall profitability of banks in the MSCI emerging market basket.

Bloomberg was preferred given the robustness of the data as it is of publicly listed companies which have undergone the review of various market analysts and auditors for validation. The data was corroborated across the numerous sources for accuracy and reliability. The data was collected from Bloomberg Terminal. Bloomberg houses publicly available financial data for listed companies globally, making it an ideal source for collecting a coherent and consistent set of data for analysis across the sample set.

From the Bloomberg terminal the sample of countries identified were selected. The top banks from those countries were sub selected. From there, the financial statements of those banks were drawn up. This included income statement, balance sheet and statement of cash flows with their prototypically detailed sub-components and data (e.g., income statement with income and expense items to go down to net profit after tax). Furthermore, the data also included key ratios for analysis (e.g. cost

to income ratio, return on equity, return on assets) which is necessary for the analysis of proxy profitability variables.

Furthermore, key economic indicators of these countries was also extracted (e.g. GDP, inflation, interest rates). These would be used as control variables in the analysis. The data was organised for these aforementioned outputs and extracted into excel.

3.4. DATA ANALYSIS

The method of analysis used was panel regression modelling, where investing activities were detailed as independent variables and overall profitability of the bank as the dependent variable. The variables that were tested as dependent variables were those highlighted in the hypotheses which under profitability include net profit after tax, cost to income ratio, return on equity and return on assets.

The following equation was estimated:

$$Y_{jit} = \alpha_i + \beta_1 X1_{jit} + \beta_2 X2_{jit} + \beta_3 X3_{jit} + \beta_4 X4_{jit} + \beta_5 X5_{jit} + \beta_6 X6_{jit} + \beta_7 X7_{jit} + \varepsilon_{it} \quad \text{.....(1)}$$

Where:

- y is the measure of profit for bank *j* in country *i* at time *t*, with i = 1,2,3
- *α* is the constant
- *β* is the Beta co-efficient
- X is the independent variables within cash flow for investing activities for bank *j* in *country i* at time *t* (Corporate Finance Institute, 2022). Such variables include:
    - X_1 depicts changes in Property, Plant and Equipment (PP&E), also known as physical capital expenditures.
    - X_2 is for changes in intangible assets (e.g., goodwill, acquisition of software).

- X_3 represents investments in associates.
- X_4 is Cash Flows from Investing Activities (CFI).
- X_5 is the internal control variable of Cash Flow from Operating Activities (CFO).
- X_6 is the external control variable of GDP.
- X_7 is the external variable of inflation.

- ε is error term

The variables are represented in table 3 below:

Table 3: Equation variables

Symbol	**Variable**	**Proxy and argument**	**Expected outcome**
Dependent variables			
NPAT	Net profit after tax	Net profit	
CI	Cost to income ratio	Cost to income ratio / efficiency ratio	
RoE	Return on Equity	Share price attractiveness because of returns generated from profits.	
RoA	Return on Assets	Net profit / total assets.	
Independent variables			
PP&E	Property, plant, and equipment	Balance sheet change in PP&E – operating with PP&E such as real estate, may translate into positive.	+

Intangible assets	Intangible assets	Balance sheet change in intangible assets.	+/-
Investments in associates	Investments in associates	Balance sheet change in investments in associates.	+/1
Cash flow from investing activities	Business investing / capitalised activities	Percentage (%) change in cash flow from investing activities.	+/-
Growth (control variable)	Economic growth	GDP (%) - Banks will benefit from a high growth environment due to increased demand for transactions – necessitating money supply (assuming no supply-side constraints in the real economy).	+
Inflation	Inflation	Inflation (%) - Consumer Price Index (CPI) a change in the average increase of goods and services in a particular economy, given its impact on overall profitability.	+/-
Cash flow from operating activities (CFO) (control variable)	CFO	CFO as a function of profit may influence profitability upward given that retained earnings will feed into the following year's investing activities.	-

There are three estimation models of panel data regression: Ordinary Least Square (OLS), also known as Common Effect Methods (CEM); Fixed Effect Methods (FEM)

and Random Effects Methods (REM). A panel data model approach in OLS regression combines only the time series and cross-section data. It assumes that the error term is not correlated with the independent variables and has constant variance. OLS provides unbiased estimates of the coefficients when the error term is independent and identically distributed. OLS is commonly used as a baseline model in panel data analysis to estimate the relationship between investing activities and profitability without explicitly accounting for individual-specific effects or time-specific effects. OLS is suitable as a baseline model to examine the relationship between investing activities and profitability without explicitly considering individual-specific or time-specific effects. Individual dimensions and time are out of scope for consideration. It is therefore expected that the performance of the data will be consistent across various periods (Zulfikar, 2019).

$$Y_{it} = \alpha + \beta^{t} X_{it} + \varepsilon_{it} \quad \text{..... (2)}$$

The second variation is the FEM (also known as fixed effect model, the within estimator or the individual-specific estimator). This model assumes that all the included analyses share a common size effect. The model parameters are fixed, and the intercept is allowed to vary across data points (whether these may be individuals or groups) as depicted in the formula below. FEMs control the impact of time-invariant parameters. It accounts for individual-specific heterogeneity. It includes individual-specific fixed effects in the regression model to capture unobserved heterogeneity that may be correlated with both the independent and dependent variables. The fixed effect model effectively removes the individual-specific time-invariant factors and focuses on the within-individual variation. It is particularly useful when there are unobserved individual-specific factors that affect both investing activities and profitability. FEM is appropriate for addressing the research question by controlling for individual-specific heterogeneity that may influence the relationship between indexed investing activities and profitability. Essentially, it is typically used towards panel data to regulate various individual-specific characteristics that do not diverge across periods (Borenstein et al., 2010).

$$Y_{it} = \alpha_i + \beta^t X_{it} + \varepsilon_{it} \quad \text{.....(3)}$$

The third estimation model is the Random Effect Model (REM, also known as the between estimator). REM is suitable for exploring the relationship between indexed investing activities and profitability across banks while accounting for both individual-specific and time-specific effects. REM allows for flexibility by treating individual-specific effects as random variables. REM approximates panel data where intrusion parameters could be interlinked across individual and time parameters. It assumes that the individual-specific effects are uncorrelated with the independent variables but may be correlated with the error term. The random effect model treats the individual-specific effects as random variables and estimates the pooled effect across all individuals. It provides efficiency gains compared to the fixed effect model when the individual-specific effects are uncorrelated with the independent variables. The delta between intercepts is accommodated by the error terms of each company. The purpose of REM is to reduce heteroscedasticity. This model is also referenced as the Generalized Least Square (GLS). Principally, the REM is different to the CEM and FEM, as it does not leverage the values that encompass OLS but leverages the values of highest probability or GLS (Zulfikar, 2019).

$$Y_{it} = \alpha + \beta^t X_{it} + u_i \, \varepsilon_{it} \quad \text{.....(4)}$$

Several tests were run to choose the appropriate variation of the panel data to be run which includes for example the Chow Test (testing for which is appropriate between CEM and FEM) and Hausmann Test (appropriateness between FEM and REM).

The Hausman test is another criterion for model selection between FEM and REM. It tests the presence of endogeneity between the individual-specific effects and the independent variables. The test compares the coefficients estimated from the fixed effect model (FEM), which accounts for individual-specific effects, with the coefficients estimated from the random effect model (REM), which assumes that the individual-

specific effects are uncorrelated with the independent variables. If the Hausman test reveals that the coefficients estimated from the fixed effect model are significantly different from the coefficients estimated from the random effect model, suggesting endogeneity, then the fixed effect model (FEM) is preferred as it provides consistent and efficient estimates. If the Hausman test does not detect significant endogeneity, the random effect model (REM) may be more appropriate.

Both the Chow test and the Hausman test are statistical tests used to determine the presence of specific effects and the suitability of the models for panel data analysis. By employing these tests, an informed decision can be made on whether to use the fixed effect model (FEM) or the random effect model (REM) based on the characteristics of their data and the underlying assumptions of the models.

The Hausmann test has been used specifically selected to run the test. The Hausman test is relatively straightforward to implement compared to the Chow test. It involves estimating both the FEM and REM models and comparing the coefficients using a statistical test, typically a Wald test. The Chow test, on the other hand, requires estimating a separate model for each group or sub-sample, which can be more complex and computationally demanding. Furthermore, The Hausman test is relatively straightforward to implement compared to the Chow test. It involves estimating both the FEM and REM models and comparing the coefficients using a statistical test, typically a Wald test.

The Chow test, on the other hand, requires estimating a separate model for each group or sub-sample, which can be more complex and computationally demanding.

3.5. VALIDITY AND RELIABILITY

Borsboom, Mellenbergh and van Heerden (2004) view validity as a test for measuring an attribute to the extent that (a) the attribute subsists and (b) variations in the attribute result in variations in the measurement.

A test can be viewed as reliable when it can repeatedly be utilised by different investigators under steady environments, for predictably constant outcomes with limited to non-variance (Fraenkel & Wallen, 2003). In so far as this study is concerned, reliable data sources were used. These include Bloomberg which leverages various analysts and data that is internally and externally audited by listed banks. Some basic checks that were run included quantum of observations to ensure completeness, as well as ranges to ensure the analysis and conclusions were premised on data that is valid and reliable.

Other validity and reliability that were conducted included a thorough data cleaning process to ensure the accuracy and consistency of the extracted data. This involved identifying and correcting any errors, inconsistencies, or missing values. It also included checking for outliers and anomalies that may affect the reliability of the data. Time-Series consistency was also done to check for consistency in data formatting and units across different time periods. Also, a random selection of a subset of banks from the sample was done to manually compare their financial data with the extracted data to compare potential discrepancies (essentially comparatively analysis).

Lastly, a peer review was done to help identify any potential issues and provide suggestions for improvement.

3.6. LIMITATIONS OF THE DATA ANALYSIS

The panel regression modelling approach used in the study has certain limitations that should be considered. Some of the potential limitations include endogeneity, omitted

variable bias, assumptions of linear bias, heteroscedasticity and cross-sectional dependence.

Endogeneity arises when there is a correlation between the independent variables and the error term in the regression model. In panel data analysis, endogeneity can occur if there are unobserved time-varying factors that affect both the independent variables (investing activities) and the dependent variables (profitability measures). This can lead to biased and inconsistent coefficient estimates. To address endogeneity, instrumental variable techniques or fixed effects models that control for time-invariant individual-specific effects can be employed.

Omitted variable bias occurs when important variables that are not included in the regression model are correlated with both the independent and dependent variables. In the study, there may be other factors that influence profitability, such as market conditions, regulatory factors, or bank-specific characteristics that are not included in the model. Omitted variable bias can lead to biased coefficient estimates and inaccurate conclusions. While relevant control variables in the regression model that capture other potential determinants of profitability have been included, they might not totally nullify effects of omitted variable bias.

Panel regression models assume a linear relationship between the independent and dependent variables. However, in reality, the relationship may be non-linear. If the true relationship is non-linear, using linear models may yield biased results. Future research may benefit from leveraging other types of models which may capture non-linear effects, such as polynomial models or fixed effects spline models, to capture potential non-linear relationships. Furthermore, heteroscedasticity has to be appraised as a potential limitation. Heteroscedasticity refers to the unequal variances of the error term across different levels of the independent variables. If heteroscedasticity is present, it violates one of the assumptions of panel regression models, leading to inefficient and inconsistent coefficient estimates. Robust standard errors or cluster-

robust standard errors have been used to account for heteroscedasticity and obtain reliable statistical inference.

Lastly, panel data may exhibit cross-sectional dependence, which occurs when the observations for different individuals are not independent but are correlated. Cross-sectional dependence violates the assumption of independence, which may affect the standard errors and lead to inefficient inference. Various methods, such as generalized least squares or cluster-robust standard errors, be employed in further research to address cross-sectional dependence in the panel regression models.

It is important to acknowledge these limitations and potential concerns in the interpretation of the results

3.7. ETHICAL CONSIDERATIONS

The research has been conducted using secondary data and is quantitative in nature. This did not involve the participation of humans or animals. Therefore, the data did not pose any risks to humans and animals during the research process. As the data is secondary, no primary data was collected as part of different research, with purposes other than those of the present study.

In addition, the secondary data is publicly available data from trusted sources. No use of personal information is disclosed in the research as all data is from publicly listed companies and sourced from public sites which are open source in nature. Any misleading information, as well as representation of primary data findings in a biased way have been avoided. Lastly, the study abided by the ethical frameworks of the University of the Witwatersrand during the research process. Applications for ethics clearance and waiver were completed and approval was granted by the institution.

3.8. CHAPTER SUMMARY

The data used for this analysis is panel analysis data which has been drawn from publicly available sources. The data comprised of +50 banks from Emerging Markets in line with the MSCI Index and spanned back 10 years.

The dependent variables were focused on overall profit; NPAT, RoA, CI, and RoE with the explanatory variables being proxies of investing activity (changes in PP&E, changes in intangible assets, investments in associates and cash flows from investing activities). Fixed Effect Methods, and Random Effect Methods (or a combination of the three) will be used for regression analysis. The relationship between investing activities and profitability can be influenced by various factors such as market conditions, regulatory environment, competition, management effectiveness, and macroeconomic variables. There are also micro or rather internal management factors influencing such variables. These factors can interact with investing activities and impact their effect on profitability and hence have moderating outcomes.

It is important to interpret the results of the panel data analysis carefully, considering the limitations, assumptions, and robustness of the model. Additionally, the specific findings will depend on the characteristics and dynamics of the banking industry in the countries included in the study.

CHAPTER 4: PRESENTATION OF RESULTS

4.1. INTRODUCTION

This section presents the analyses and delineates the results from the methodology applied as explained in Chapter 3. Using dynamic panel data enabled the study to account for bank-specific individual heterogeneity and capture the persistence of the dependent variable over time.

4.2. DESCRIPTIVE STATISTICS

The descriptive statistics are presented and discussed. Regressions were carried using three model types (Random Effects and Fixed Effects) with each model type having three variable types (Levels, Growth (% change) and Logs). The preface of the regression was the various tests conducted to down select which of the three was the most robust to use for the analysis. The dependent variable (Y) was kept as a level variable for Pooled OLS. Growth regressions as independent variables were not significant when regressed on the percentage change of the dependent variables. The descriptive statistics of the data were conducted at levels (absolutes) and their percentage change (periodic deltas) and logs.

Further to this, the data was log linearised. Logs serve as percentage changes – that is, a one percentage change in the explanatory, leads to a [coefficient value] percentage change in the dependent variable (Baum, 2014). The descriptive statistics of the log linearised data provided the appropriate output from which to conduct the analysis given the impact of the difference on the variance of the numerical outputs. The level and percentage change descriptive analytics were not sufficient as such can be referred to in the appendix for their variance differentials.

Table 4: Descriptive Statistics

LOG LINEARISED VARIABLE DESCRIPTIONS						
Variable	Description	Obs	Mean	Std.Dev.	Min	Max
lny9	Net Profit After Tax (log scale)	634	10,1075	3,3615	2,4647	17,9587
lnx5	Property, Plant & Equipment (log scale)	647	9,8085	2,8205	3,5319	17,7103
lnx6	Total Intangible Assets (log scale)	530	7,7757	2,3307	1,5433	15,4471
lnx9	Investment in Associates (log scale)	505	8,2677	3,7805	-4,6052	17,3757
lnxcf1	Cash flow from operating activities (log scale)	426	11,0731	2,7626	3,6278	18,6822
lnxcf2	Cash flow from investing activities (log scale)	102	9,0735	2,9345	0,3436	16,8421
lnxr1	Return on Equity (log scale)	616	2,5912	1,3931	-2,1203	10,7046
lnxr2	Return on Assets (log scale)	628	0,3818	0,8915	-4,6052	3,2488
lnxm2	Efficiency Ratio (log scale)	623	4,0726	1,0785	1,292	10,7046
xc1	GDP Growth (Annual, %)	668	4,2812	3,8142	-8,17	11,2
xc2	Inflation, Consumer Prices (Annual, %)	668	5,9486	3,5909	0,98	19,6

From the above, specific variables were carved out and sufficient to be used as proxies to test for the impact of investing activities (independent variables) for panel data regression. Control variables were also leveraged to understand the impact of the overarching environment on the regression. The dependent variables utilised include Net Profit After Tax (NPAT – lny9), Return on Equity (RoE - lnxr1), Return on Assets (RoA – lnxr2) and Efficiency Ratio (Cost to income ratio – lnxm2). The independent variables used include Property, Plant and Equipment (lnx5 – which accounts for investments made in the prototypical bricks and mortar, and hardware in running the business), Total Intangible Assets (lnx6 – which are the assets for investments in software, marketing, and other non-physical assets), Investments in Associates (lnx9

– investments made in other business lines), and Cash Flows from Investing Activities (lnxcf2 – a summation of the total amount of cash that flows out of the business for the purposes of investment projects / activities).

The control variables that were included entailed Cash Flow from operating activities (lnxcf1 – the total amount of cash generated from general business operations); GDP (xc1 – a measure of growth in the economy from economic value add), and inflation (xc2 – a metric on the average price increase in a basket of goods and services of an economy). Regarding the standard descriptive statistics of the dependent variables, these varied from standard deviation 2.3 to 3.7 from the mean. This inferred that descriptive statistics of the dependent variables were relatively consistent among themselves as a group.

Finally, the data depicted suggests that a wider variance around its mean should be anticipated. The standard deviations of the independent variables also display the same relative behaviour as a group.

4.3. MODEL TESTS

4.3.1. NPAT

Several tests were conducted to gauge which between Random Effects and Fixed Effects was the most effective model to use for analysis across the dependent variables tested.

The tests were conducted to down select the preferred panel data model between Random Effects Model and Fixed Effects Model/Generalised Least Squares. The Hausman test was used to test between Fixed Effects and Random Effects, where the null hypothesis is that the preferred model is Random Effects versus the alternative of Fixed Effects. It basically tests whether the unique errors (U) are correlated with the

regressors. The null hypothesis (H_0) is that errors are not correlated with the regressors (Torres-Reyna, 2007). The Hausman test showed that a Fixed Effects model with time dummies is superior to a Random Effects model when testing the null hypothesis (H_0) and that the difference in coefficients is not systematic. The chi squared test under Hausman rejects null hypothesis. Given this, the Fixed Effects model was used for analysis.

Table 5: NPAT Hausman Test

HAUSMAN TEST	
RE VERSUS FE	
LOG	Test: H_0: difference in coefficients not systematic
	chi2(7) = (b-B)'[(V_b-V_B)^(-1)](b-B)
	= 104.12
	Prob>chi2 = 0.0000
Reject null --> FE is better than RE	

4.3.2. ROE

Like NPAT, analysis of RoE used Hausman to gauge the right-fit model for the study. The Hausman Test for RE vs FE found that FE is better than RE, thus, the Fixed Effects model was used for analysis.

Table 6: RoE Hausman Test

HAUSMAN TEST	
RE VERSUS FE	
LOG	Test: H_0: difference in coefficients is not systematic
	chi2(7) = (b-B)'[(V_b-V_B)^(-1)](b-B)
	= 17.55
	Prob>chi2 = 0.0142
Reject null → FE is better than RE	

4.3.3. Return on Assets

For RoA, the Hausman Test for RE vs FE found that FE is better than RE at. As a result, the Fixed Effects model was used for analysis given its superiority to Random Effects.

Table 7: RoA Hausman Test

HAUSMAN TEST	
RE VERSUS FE	
LOG	Test: H_0: difference in coefficients is not systematic
	chi2(7) = (b-B)'[(V_b-V_B)^(-1)](b-B)
	= 7.99
	Prob>chi2 = 0.3336
Reject null --> FE is better than RE	

4.3.4. EFFICIENCY RATIO

EfR used a similar model fitness as NPAT, RoA and RoE, however, this time the Hausman Test for RE vs FE found that FE is inferior to RE. Consequently, the Random Effects model was used for analysis given its superiority to Fixed Effects.

Table 8: EfR Hausman Test

HAUSMAN TEST	
RE VERSUS FE	
LOG	Test: H_0: difference in coefficients is not systematic
	chi2(7) = (b-B)'[(V_b-V_B) ^(-1)](b-B)
	= 13.84
	Prob>chi2 = 0.0540

Do not reject null --> FE is not better than RE

4.4. MODEL RESULTS

The regression results are displayed below. Independent variables were lagged to observe such causation impact. These results address the overarching research which is to investigate the relationship between a banks' investing activities and overall profitability.

The specific research questions these results address is where a higher level of indexed investing activities in commercial banks result in higher profitability? Essentially, are banks with greater investing capabilities, as measured by their cash flows from investing activities, investments in associates, and tangible and intangible assets, more profitable than their peers? And how do these investing activities relate to key profitability measures such as Return on Equity (ROE), Return on Assets (ROA), Net Profit after Tax (NPAT), and Cost-to-Income Ratio?

As previously noted, this research is significant in enabling bank managers, investors and analysts to better inform their capital management decisions or be more critical of them. Understanding the relationship between investing activities and profitability can inform strategic decisions, risk management, and overall performance evaluation for banks. This is also supported by the rationale for selecting the specific independent variables (cash flows from investing activities, investments in associates, tangible and intangible assets) as measures of investing activities. These variables leverage to a large extent into the capital that the bank has at its disposal. For instance, where y-o-y cash flow from investing activities is negative, this means cash from the business has been invested into capital projects. In summary, the essence of these independent variables should capture the banks' investing capabilities and their potential impact on profitability.

On the other hand, the dependent variables used to assess profitability are ROE, ROA, NPAT, and Cost-to-Income Ratio. These variables capture the essential measures of

profit which essentially, when addressed, can answer the overarching question as to whether there is a relationship between a banks' investing activities to overall profit. Return on equity provide a measure on the extent to which profit is generated relative to the capital the bank has at its disposal. Return on assets is essential given that the banks mobilise risk weighted assets in the form of lending activities to make income from the production inputs of deposits that they get from customers. Cost to income is essential as a measure of the efficiency with profitability is generated, especially given that some investments may drive top-line revenue while others may be effective on the overarching bottom-line profitability via cost optimisation/ efficiency. Lastly, Net Profit After tax is a direct profit measure that is used to measure taken into account in the analysis.

The co-efficient values β mean that at 0 the lag effect on the dependent variable is characterised by no persistency, whereas a value statistically equal to 1 means the adjustment has high persistency. Values ranging from 0 to 1 suggest the presence of persistency, with those closer to zero implying low and those closer to 1 noting them as high. Values higher than 1 imply an unstable dynamic with accelerating divergence from equilibrium. Negative values mean equilibrium cannot be reached. The control variables of growth and inflation are lagged because they have a lagged transmission of spill overs in dependent variable. GDP growth drives demand spill overs for money, while inflation drives spill overs to changes in interest rates.

Real interest rate (xc3) is not lagged as it has an instantaneous and direct impact on net interest income which impacts the dependent variable. P-values demonstrate the statistical significance of the outputs.

Table 9: Panel Regression Output

MODEL RESULTS				
	NPAT	RoE	RoA	Efficiency ratio

	Fixed Effects	Fixed Effects	Fixed Effects	Random Effects
L.x5	0.3008***	-0.5026***	-0.107	-0.0427
	(0.0562)	(0.1413)	(0.0761)	(0.0326)
L.x6	0.0937***	-0.0292	0.0487	0.00791
	(0.0333)	(0.0868)	(0.0662)	(0.0285)
L.x9	0.0309*	0.0941**	0.0213	0.0258*
	(0.0186)	(0.0464)	(0.0335)	(0.0147)
xcf1	0.0171	-0.0632	-0.0674	-0.00265
	(0.0218)	(0.0543)	(0.0493)	(0.0221)
xcf2	-	-	-	-
	-	-	-	-
L.xc1	0.0097	0.0220	0.0333**	-0.00485
	(0.0069)	(0.0169)	(0.0148)	(0.00669)
L.xc2	-0.0186*	-0.0345	0.0202	-0.0256**
	(0.0108)	(0.0275)	(0.0230)	(0.00998)
xc3	0.0020	0.0049	-0.00633	0.00888**
	(0.0051)	(0.0130)	(0.00950)	(0.00416)
Constant	6.9291***	8.1701***	1.257**	4.142***
	(0.5429)	(1.3221)	(0.618)	(0.257)
Observations	180	183	180	167
R-squared	0.5008	0.1567	30	28
Number of sid	29	31	0.0724	0.1390
F-stat	20.64	3.85	13.72	15.84
p-value	0.0000	0.0007	0.0564	0.0266
Standard errors in parentheses				
*** p<0.01, ** p<0.05, * p<0.1				

4.4.1. NPAT REGRESSION RESULTS

Based on the model results of Log Linearised Fixed Effects for NPAT. The analysis suggests that investing activities have limited impact on the Net Profit After Tax of the bank. Therefore, we do not reject null hypothesis H_0 commercial banks with higher indexed investing activities are not more profitable

When Property, Plant and Equipment (PP&E (L.lnx5)) is regressed against NPAT it results in a co-efficient of 0.3008 at logs demonstrating a moderate effect on the NPAT at high statistical significance and low error function (0.0562). This pattern follows across other investment proxy variables which include Total Intangible Assets (TIA (L.lnx6)) with a slightly moderate effect of 0.0937 at logs with low error function (0.0333). Investments in Associates (IA (L.lnx9)) also had less moderate impact of 0.0309 at 10% statistical significance and low error function (0.0186). Cash Flow from Investing Activities (CFI (xcf2)) had no effect. The environment under which NPAT takes place also has limited impact on the dependent variable when observing internal control variables of Cash Flow from Operating Activities (CFO (lnxcf1)), and external control variable of GDP growth (lxc1). The same applies for inflation (lxc2).

The analysis suggests that positive or negative changes in the investing activities as measured through total intangible assets, investments in associates, PP&E and cash flow from investing activities are not statistically significant. Furthermore, it is noted that control variables are not statistically significant. This empirical finding is contrary to the literature review where banks' profitability is noted as dependent on macro environment factors.

4.4.2. ROE REGRESSION RESULTS

Based on the model results of Log Linearised Fixed Effects for RoE. The analysis suggests that investing activities have limited impact on the Return on Equity.

Therefore, we do not reject the null hypothesis H_0 that commercial banks with higher indexed investing activities are not expected to have better RoE

The exception to this is Property, Plant and Equipment. When Property, Plant and Equipment (PP&E (L.lnx5)) is regressed against RoE the outcome suggests a strong negative relation with a high level of statistical significance. At levels this comes to co-efficient of -5.37 while at logs its -0.5026. This indicates that while investments in PP&E are made, the impact on profitability would be negative given the impact of the depreciation profile on profitability. From an equity lens these PP&E may be viewed negatively by the market given their benefit to the underlying business (i.e., branches are seen as a non-effective drag cost for servicing customers).

While intangible assets are not statistically significant, Investments in Associates have a strong correlation to overall RoE - given that there is no existence of the risk weighting on income from associates in so far as risk weighted assets are concerned. Therefore, the annuity income generated from these investments has a positive effect on returns. It is also clear that the environment under which a bank exists impacts RoE. The GDP regression output suggests a strong relationship with RoE at levels with a co-efficient of 0.580 (0.115) at 1% significance level. The same prevails for high inflation which is an interesting observation of a positive relationship of 0.585 (0.186) at 1% significance level, each respectively at Levels. Output from interest rates did not generate a conclusive outcome.

The effect of the inflation rate may be driven from the lag perspective of demand push on prices which impact NIM spreads, while GDP as growth effect will induce positive demand effect to drive growth in RoE. The aforementioned empirical outcomes align to the literature review. It is however worth noting that investment in PP&E has negative impact. While the literature suggests that digital technology, investments in ATMs and branches has positive impact on banks performance, the empirical findings of this analysis suggests differently.

Further research employing different methods would be beneficial to solidify this finding, especially given the direction of the coefficient is negative and highly statistically significant.

4.4.3. ROA REGRESSION RESULTS

Based on the model results of Log Linearised Fixed Effects for RoA. The regression output suggests investing activities have limited impact on the Return on Assets. Therefore, we do not reject the null hypothesis H_0 that commercial banks with higher indexed investing activities are not expected to have better RoA

Of significance is the macro environment which facilitates the enabling conditions to drive asset growth. This is based on the positive regression output with GDP growth of 0.0549 (0.0106) at 1% level of significant at levels and 0.0333 (0.0148) at 5% level of significance at logs, which means that the change in RoA is caused by changes in growth (albeit given slightly low co-efficient variables).

The Return (profit) on Assets of a Bank is highly driven by risk weighted assets. Therefore, the empirical findings of the analysis align with the literature, wherein macro environment of GDP growth is significant in generating more returns due to the increased demand for credit.

4.4.4. EFFICIENCY REGRESSION RESULTS

Based on the model results of Log Linearised Random Effects, the analysis suggests that investing activities have limited impact on the Efficiency ratio of the bank. Therefore, we do not reject the null hypothesis H_0 that commercial banks with higher indexed investing activities do not have better cost to income ratios

Across proxies of PP&E, intangible assets, cash flow from investing activities and investments in associates, there is limited evidence to suggest a relationship between these proxies' effectiveness on the efficiency ratio. On the other hand, the macro environment has an impact. GDP has a negative relationship with the Efficiency Ratio (EfR) at 5% level of significance at levels. Likewise, inflation also has a negative relationship at 5% level of significance, at both levels and growth. On the contrary, Interest rates had a positive relationship at 10% and 5% significance at levels and logs respectively. These are the control variables impacting efficiency.

The inverse impact of GDP and inflation may be explained by the focus on top-line during high growth phases which results in a neglect of costs, therefore activities may need to be managed more effectively. This would be the case when investments are in high levels of branches, technology, and marketing budgets to attract customers for purposes of growth. Inflation on the other hand would be the cost push effect, with revenue remaining constant, a negative relationship would be expected. A final observation was that interest rates have an impact on efficiency albeit marginal (Lishinski & Test, 1990; Torres-Reyna, 2007; Williams, 2020).

CHAPTER 5: CONCLUSION

5.1. INTRODUCTION

In this chapter, we make some concluding remarks. We first summarize the strand of literature we have used in this study to investigate the relationship that exists between the overall profitability of banks to their investing activities. We also give a summary of the methodology that we have used in this research. A brief summary of the data stylised facts, Breusch-Pagan Test, Wald Test, Hausman test. We then give an analysis of the Panel Regression outputs when measuring the 4 levers of overall profit (NPAT, RoE, RoA, and EfR) across the proxies of independent variables of measuring overall profit. We provide some insights on the implications for investing activities on overall profit for senior business leaders and academia alike. Lastly, we make some recommendations for future research in this subject.

5.2. KEY FINDINGS

The literature review highlighted the vast previous research conducted in the field of banking profitability, which covers both internal and external factors. While the literature is limited in the relationship between the investing activities of banks to overall profitability, that which prevails on this topic provides useful insights when profitability is deconstructed to its constituent parts, which includes NII (interest income less expenses).

On interest income, it is found that the degree of managerial risk aversion, the size of transactions undertaken by the bank, the variance of interest rates, and the bank market structure act as strong drivers of NII. This is premised on the theory that banks are risk averse dealers facing the asymmetric arrival of demands for loans and supplies of deposits. On non-interest revenue, significant benefits are demonstrated on the impact of digital disruption and managerial decision making. The prevalence of

ATMs, POS devices, Cards and to a certain extent branches has demonstrated significant impact on profitability as researched by Le and Ngo (2020).

Finally, while cash flow typically provides a view on the investing outflow of firms, research by Gao, Li, and O'Hanlon (2019) found that banks cash flow statements have inadequate incremental relevance from a value attribution as financial outputs to measure bank performance, especially when considered relative to more trade and industrial based firms. The findings highlight that investing capabilities are not statistically significant for banks' overall profit. It contributes to the body of knowledge that emphasises that that the main units of production of a bank are demand deposits which it uses to lend out for profit, and that profit maximisation activity should be the core focus to maximise shareholder value.

Nonetheless, the literature highlights that more work is required in this area to add to the body of knowledge on the value relevance of banks investing capital in non-financial activities in order to remain competitiveness, especially in light of increasing digitalisation and the evolution of FinTechs encroaching on tradition banking revenues.

5.2.1. EMPIRICAL RESULTS

Panel regression methodology was used to understand the relationship between overall profitability and investing activities of banks. It was used to specifically address the problem statement which highlighted the lack of clarity as to whether banks' investing activities have resulted in an increase in their overall profitability.

This research is also conducted on the backdrop that there has been limited research conducted to investigate the relationship of a banks' investing activities on its profitability. For instance, the prevailing literature on banks' investing activities typically appraises banking activities in so far as trading and risk management is concerned. The empirical findings are conducted in line with the codified hypothesis pertaining to

whether banks with higher indexed RoE, RoA, NPAT and Cost to Income Ratio perform better on the measures of overall profit relative to their peers.

Tests were conducted to gauge which model would be most fit to run analysis across the various independent variable. These tests were predominantly between Fixed and Random Effects, done through the Hausman Test. The overarching empirical finding is that investing activities have limited impact on overall profitability. Specifically, when observed across 4 dependent proxies of NPAT (lag effect), RoE, RoA and EfR, the impact was found predominantly on NPAT. This is to state that in the instance of logs, 30% of the change in NPAT could be explained by a change in PP&E. Theoretically, one would expect a result of this nature from a lagged perspective as investments in physical infrastructure and marketing activities may give customers the impression of an improved business environment and safety to increase their transactions and deposits with the bank. This is also aligned with literature from Hannan and Hanweck (2008).

With the other variables, there was limited impact demonstrated by investing activities on RoA, RoE and EfR (not lagged). RoA and RoE are impacted by general macro environmental factors like interest rates, inflation and GDP growth as depicted by the literature. This also makes theoretical sense since most assets are risk weighted in nature. Essentially, RoA (more-so the majority of assets of a bank) is driven from the prototypical production inputs of deposits. Vis-a-vis RoE, the equity composition would be influenced typically by management performance and market interpretation. The macroeconomic climate would also influence either the good news story or bad news story for equity markets. With many emerging economies as the ones under study, such economic considerations would be influenced by prevailing macro environments because they are seen as high-risk, high return economies relative to their counterparts who are perceived to be more stable. Therefore, the investing activities' role on RoE would be perceived as minimal.

Lastly, it is essential for managers to understand the underlying economic impact of their investing activities, more-so the opportunity cost of deploying capital to trading and other market making activities vs the drive to digital transformation to fend off competitor pressures. More research on this topic will be beneficial to bank managers to appropriately inform them of what to do with the banking book, trading book, cash and capital, or investing in adjacencies or other banks to diversify or increase their scale and scope.

5.3. POLICY RECOMMENDATIONS

From the empirical evidence that has been obtained, it is clear that banks investing activities have minimal impact on overall profit. This is proven when NPAT and RoA is regressed against investing activities.

This outcome suggests that managers should focus their efforts on deploying capital towards alternative revenue generating sources such as trading and market making. Furthermore, banks could play a role in investing directly into the FinTechs and other adjacent businesses which complement their revenue streams as they look to diversify away from income that is capital intensive (i.e. interest income). By getting more involved in these FinTechs they can accelerate the development and deployment in a sandbox environment and complement the efforts that regulators are undertaking to enable technologies that service customers better, more-so in emerging market environments.

Furthermore, investors and analysts should pay more scrutiny to the amount of capital that banks look to use to invest in their capabilities. Rigorous models should be employed to ensure these investments will generate the accretive returns. Furthermore, sufficient measures should be put in place to ensure those returns can be linked to the associated investments and not other external or internal factors. Therefore those benefits must be traceable. Investors should also play a bigger role in the balance sheet management of the bank, especially as it pertains to capital

allocation and management. Especially when it comes to the formulation of policy that guides how the bank invests the equity it has at its disposal (either through acquisition or other capital expenditure activities)

Finally, where there is insufficient capital to deploy into such activities, banks may do well to reward their customers with better dividends to improve their investment profile.

5.4. RECOMMENDATIONS FOR FURTHER RESEARCH

The research undertaken focused on emerging market economies from a sample perspective. It would be interesting to see how this research performs with a larger sample size.

The research methods used in this study is panel methods, with its associated benefits and pitfalls. Future research would also benefit from employing different research methods and models for analysis (e.g. mean differencing, case study analysis and non linear methods). Furthermore, the proxies for investing activities focused on PP&E, Intangible Assets and CFI. More research would be helpful as a lens into other proxies that can be used to stress test the extent to which indeed there is a limited relationship between investing activities to overall profit. The research in the area of digital disruptions and FinTech development would be of aid in this area because banks have been seen to invest heavily to transform and modernise their infrastructure in order to defend their revenue streams and tap into alternative sources of revenue.

Lastly, the research could also be extended to test other profit variables (e.g. operating margin, gross margin) for robustness. The extent to which such investments translate to bottom-line impact would be impactful in order to inform managers on which areas to appropriate their investments to achieve maximum returns.

5.5. RISKS WITH RECOMMENDATIONS

The recommendations cannot be treated and taken in isolation without observing some of the recommendations that may arise.

The first of these risks is the high investments being made in digital and technology to modernise banks to better sell and service their customers. Secondly, investors and regulators may also want to see banks implementing the necessary investments to ensure that they are robust against emerging risks such as cyber security. With prevailing topic of financial inclusion banks are also looking at leveraging alternative means and investments into servicing customer basis but might not otherwise be accessible.

Furthermore, banks have to balance their short term profitability goals with long term sustainability of the business and need to make sure that as some of their infrastructure becomes legacy it does not increase their operating risk.

5.6. CHAPTER SUMMARY

The research has shown that the relationship between the investing activities of banks to overall profit is limit if not non-existent. It has even demonstrated that to the extent to which certain profitability proxy variables that have been lagged (e.g., NPAT), such causality on profit improvement does not materialise.

Conversely, the research has demonstrated that the macro environment plays a significant role on the performance of banks through the control variables adopted in the research: i.e. GDP growth, inflation and interest rates. The findings in this study have implications that are significant for bank managers in the choices they have to make on how to appropriate the capital they have at their disposal to drive initiatives that yield more returns for shareholders.

To that extent a more prudent capital management approach is recommended, where managers consider acquisitions in adjacencies and further enablement of FinTech development to diversify their revenue streams.

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