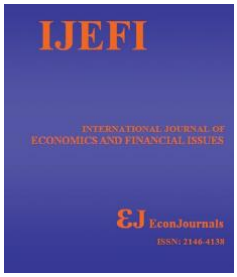

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The Effects of Changing Macroeconomic Conditions on the Commercial Bank Returns in South Africa

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ABSTRACT

The stability and profitability of commercial banks are closely tied to macroeconomic conditions, yet the precise nature of this relationship remains debated, especially in emerging markets like South Africa. Consequently, the objective of this study is to examine the effect of macroeconomic factors on South African commercial bank returns under changing market conditions. Using a two-state Markov regime-switching model, the study analyses data from six major South African banks over the period 2002-2023, including crucial financial periods like the global financial crisis (GFC) and the COVID-19 pandemic. The study finds that ABSA, Capitec, Nedbank, First Rand Bank, Standard Bank and Investec bank returns are influenced both positively and negatively by macroeconomic variables. Furthermore, such an effect alternates with bull and bear conditions which makes the effect nonlinear, time-varying and regime specific. This research contributes to the literature by applying regime-switching methodologies to an emerging market, revealing the non-linear and time-varying effects of macroeconomic conditions on bank returns. The study offers vital insights for policymakers and investors, emphasizing the need for adaptive financial strategies in managing bank performance under fluctuating economic conditions. By highlighting the differential effects of macroeconomic factors in various market regimes, this research provides a framework for more resilient financial decision-making in the South African banking sector.

Keywords: Macroeconomic Variables, Commercial Banks, Markov Model, Bull, and Bear Regimes
JEL Classifications: E32; E43; E60; G21

1. INTRODUCTION

A financial organisation that takes deposits and extends loans is known as a commercial bank (Law and Smullen, 2014). The main function of banks is to collect deposits, make and receive payments on behalf of their clients, and provide short-term loans to people, businesses, and other entities (Law and Smullen, 2014). The South African banking sector review illustrates that it is the largest banking sector in Africa, as published statistics show that the tier one capital of the South African banking sector was over $34.4 billion in 2021 and the total assets of the banking industry in 2020 were almost 88% of South Africa's gross domestic product (GDP). Moreover, approximately 90% of the country's banking assets are held by the top six commercial banks, such as Capitec Bank, Standard Bank, First National Bank, Absa Bank, Nedbank, and Investec Bank (Cowling, 2024). Consequently, commercial banks play a vital role in modern economies, both in developing and developed economies, as the financial services offered by commercial banks significantly boost the economy (Moodley, 2024). The stable and favourable return prospect of commercial banks encourages investor participation and enhances confidence in depositors and investors, which influences bank returns and supports the overall financial stability of the banking sector (Mishkin, 2007). Therefore, policymakers, regulators, and market participants who wish to encourage resilient and sustainable development in the larger economy must understand the relationship between commercial bank returns and factors that influence commercial bank returns (Paavo, 2018).

There exist two main factors that influence commercial bank returns; these include macroeconomic conditions and bank-specific risk. Studies reveal that high returns of commercial banks can be attributed to both macroeconomic and bank-specific risk factors. In many areas, especially in emerging markets, these variables play a critical role in determining commercial banks' returns (Flamini et al., 2009). Bank-specific risk and macroeconomic factors known as external and internal variables have a significant impact on the performance of commercial banks, which in turn affect commercial bank returns and overall economic development (Ongore and Kusa, 2013). It is evident from empirical literature that bank-specific risks have been considered to great lengths by academics (Anbar and Alper, 2011; Hunjra et al., 2020; Chai et al., 2022). Despite this, studies examining the effect of macroeconomic factors on commercial bank returns are limited and understudied in emerging markets, which are prone to macroeconomic uncertainty and economic instability. Hence, academics have since prioritised this body of literature as macroeconomic variables such as GDP, interest rates, inflation, money supply and exchange rates, among others, are found to affect the returns of commercial banks (Kanwal and Nadeem, 2013; Okech and Mugambi, 2016; Akani et al., 2016).

The review of the aforementioned studies indicates that the returns of commercial banks are significantly affected by macroeconomic factors. For instance, low GDP levels correlate with suboptimal banking profitability and efficiency (Tan and Floros, 2012). Conversely, an increase in interest rates tends to enhance bank earnings. However, inadequate macroeconomic performance can adversely impact bank profitability and returns. The 2008 Great Recession, which followed the 2007 global financial crisis (GFC), exemplifies this, as it hindered economic growth across Africa (Maswana, 2009). During the GFC, the deterioration of borrowers' balance sheets disrupts credit circulation, which negatively affecting banks' returns and subsequently leading to a decline in overall economic activity (Maswana, 2009). Additionally, inflation has been identified as a primary factor influencing profitability and bank return. To mitigate exposure to macroeconomic fluctuations and enhance financial outcomes, it is essential for banks, regulators, and policymakers to comprehensively understand these dynamics. This understanding will enable informed decision-making and the establishment of effective policies.

Despite macroeconomic variables found to affect commercial bank returns, there is no consensus on the type of relationship that exists. That being, some academics find that commercial bank returns are influenced linearly by macroeconomic factors (Sufian and Kamarrudin, 2012; Simiyu and Ngile, 2015; Otambo, 2016), whereas some scholars show that the effect should be nonlinear (Fani et al., 2018). The debate on the type of effect that exists stems from two financial theories, the efficient market hypothesis (EMH) and the adaptive market hypothesis (AMH). According to EMH, all available security information is contained in the security price. Hence, investors cannot beat the market to earn excess returns. Consequently, the semi-strong form of EMH illustrates that macroeconomic variables should have a linear effect on commercial bank returns. However, AMH shows how shifting market conditions, such as bull and bear markets, affect how macroeconomic factors affect the profits of commercial banks; as a result, the relationship should not be linear (Lo, 2004). That is, macroeconomic variables should have a time-varying effect on commercial bank returns, where the effect found in a bull market condition will not be the same in a bear market condition.

Based on this premise, the study looks at how macroeconomic variables affect the returns of South African commercial banks in the face of changing market conditions to resolve the controversy found in the literature. To accomplish the study's goal, a two-state Markov regime-switching model is used, with macroeconomic factors serving as the independent variables and commercial bank returns as the dependent variables. The studies novelty can be derived from its contribution to emerging market literature. That being, this study introduces the AMH perspective to emerging markets banking sector, where literature is limited, especially in South Africa. Moreover, the study makes pronunciations on South African banking sector efficiency, which contributes significantly to financial market policies, which is still centred around markets being efficient as appose too adaptive. This study contributes to investors decision making, when deciding to invest in South African commercial banks, as it provides evidence on how market conditions and macroeconomic variables influence returns. Thus, the findings of this study will assist investors to make more calculated investment decisions by conducting portfolio rebalancing during macroeconomic policy uncertainty and changing market conditions. Finally, the paper presents a novel approach to emerging market empirical literature, by using regime-switching techniques, which has gained attention in the developed market literature because of its ability to accurately depict economic realities.

The remainder of the paper is presented as follows; section 2 presents the literature review, which consists of the theoretical considerations and empirical literature. Section 3 presents the methodology which is segregated according to the data and empirical model description. Section 4 includes the empirical results, which include preliminary results and empirical model results. Section 5 presents the discussion of findings and section 6 considers the conclusion and implications.

2. LITERATURE REVIEW

2.1. Theoretical Considerations

The following sub-section begins with an in-depth explanation of the theoretical underpinnings of the effect of macroeconomic variables on commercial bank returns. The first theory addressed herein is the EMH, which postulated that the effect should be linear, making the market efficient as no excess returns can be earned. Secondly, the behavioural finance (BF) theory is then examined which postulates that excess returns can be earned, which makes the effect nonlinear and the market inefficient. Thirdly, the AMH is considered to reconcile EMH and BF, such that the effect should be nonlinear due to market conditions, which makes the market adaptive, such that it contains alternating efficiencies and inefficiencies. Lastly, the CAPM and APT are considered to conceptualise the risk-return relationship about macroeconomic fundamentals.

2.1.1. Eficient market hypothesis

The efficient market hypothesis (EMH) was established by Fama (1970), and it portrays that all available information is reflected in stock prices of which it is impossible to outperform the market and earn excess returns. The proposition by EMH is based on three forms of market efficiency, these include weak-form efficiency, semi-strong-form efficiency, and strong-form efficiency. The weak-form efficiency suggests that all available information about the security market, including historical prices, rates of return, conventional volume data, and other data produced by the market, is reflected in the securities pricing at this time. The semi-strong form is efficient and assumes that all information that is currently accessible to the public, both market and non-market, is reflected in the security prices. The strong-form efficiency demonstrates that all relevant public and private information is reflected in the present stock prices. This covers both insider information and information that is readily available to the general public. These forms of market efficiency are dictated by the random walk process, such that current price changes are independent of previous price changes and using technical and fundamental analysis to study price changes will not yield excess returns as such markets are efficient. As a result, the semi-strong form efficient market implies that commercial bank returns are influenced linearly by macroeconomic variables. The failure of EMH to account for excess returns caused by market inefficiency has drawn criticism from numerous academics, despite the theory's increasing popularity.

2.1.2. Behavioral finance

Examining the psychological effects and prejudices that impact investors and financial markets is the focus of the field of behavioural finance. It investigates how irrational decision-making is assumed by classic economic theories and how human behaviour, emotions, and cognitive biases affect financial decisions. Investment decisions that are not optimal can result from investors' loss aversion, herd mentality, overconfidence, and other behaviours that are not necessarily rational and can be impacted by biases, according to behavioural finance. The aim is to increase comprehension of the investor patterns through reasoning and explanation. This covers both the emotionally charged events and the degree to which they influence the way decisions are made. Behavioural finance elaborates on what, why, and how of finance and investment from a human perspective (Otambo, 2016). The theory of behavioural finance illustrates the inefficiency of financial markets by displaying a nonlinear relationship. Even so, BF can account for inefficient markets and excess returns, but the explanation for varying efficiency is lacking. As a result, AMH was created to balance EMH and AMH.

2.1.3. Adaptive market hypothesis

The adaptive market hypothesis (AMH), put forth by Lo (2004), applies evolutionary ideas to financial interactions to reconcile EMH and BF by incorporating behavioural alternatives with economic theories. According to this theory, self-interest, learning from mistakes, adaptation, and innovation driven by natural selection are among the fundamental principles of biology that regulate markets more than laws of physics. According to the AMH, as investor populations and the financial landscape shift over time, financial markets are dynamic, inventive, and competitive, with various degrees of efficiency. AMH argued that market efficiency contradictions and the EMH's violation of rationality are true and in line with an evolutionary theory in which individuals adapt to environmental changes by using sample heuristics (Fani et al., 2018). Market efficiency fluctuates in response to changing macroeconomic conditions and how they affect commercial bank returns. According to research, under the AMH paradigm, return predictability can change over time because of changing market conditions. Consequently, macroeconomic variables should have a non-linear effect on commercial bank returns so that they will alternate with the state of the asset market (Yousuf and Makina, 2022). This could cause investment strategies to be profitable in various market environments (Li et al., 2021). Furthermore, as natural selection drives market behaviour, investors adapt and learn from their mistakes, which can impact the efficiency and predictability of commercial bank returns in various macroeconomic scenarios (Obalade, 2019). According to the AMH theory, markets can adapt to become both efficient and inefficient.

Despite the above-mentioned theory's ability to explain the type of effect, macroeconomic variables have on commercial bank returns. It is still unclear what conceptualizes the risk-return prospects between macroeconomic variables and commercial bank returns. As a result, the CAPM and APT will be examined in the next section.

2.1.4. Capital asset pricing model

The Capital Asset Pricing Model (CAPM) is used to calculate the required rate of return that an asset should have in theory. This helps with portfolio diversification decision-making. It takes into account an asset's beta-measured sensitivity to non-diversifiable risk as well as the market's projected return and a theoretically risk-free asset. This model was established by Sharpe (1964). The equity risk premium, risk-free rate, and beta of an asset are assumed to have a linear relationship under CAPM, therefore implying that there are no excess returns to be obtained (Jacoby et al., 2000). According to CAPM, investors make logical decisions to maximize their wealth and lower risk. This presumption suggests that investors behave risk-aversely and make well-informed judgments based on available market information CAPM states that an asset's expected return is linearly correlated with its systematic risk, which is expressed in terms of beta (β). The sensitivity of commercial banks to market-wide events that impact the banking industry as a whole is reflected in their beta. The systemic risk that banks face can be impacted by various factors, including changes in regulations and macroeconomic factors.

2.1.5. Arbitrage pricing theory

To provide an alternative to the Capital Asset Pricing Model (CAPM) that suggested that the relationship between commercial bank returns and macroeconomic factors can be nonlinear, economist Stephen Ross created the Arbitrage Pricing Theory (1970) as EMH is not considered nonlinear and it is a single factor model. Based on the correlation between an asset's risk and expected return, APT seeks to quantify how sensitive an asset's returns are to shifts in particular macroeconomic variables.

As per this hypothesis, there are sporadic instances of market inefficiencies, which are rectified by arbitrageurs by spotting and removing them. Investors can price securities using an APT method that uses multiple factors to link an asset's expected return to different macroeconomic indicators. APT is one financial model that considers the impact of various macroeconomic conditions on asset returns. Analyzing the effects of macroeconomic factors on commercial bank returns is possible through the application of APT. APT can assist investors in understanding and projecting the expected returns of commercial banks based on various factors by determining how sensitive commercial bank returns are to variables such as interest rates, GDP growth, inflation, and other pertinent macroeconomic indicators. This model makes it possible to evaluate the risks and rewards of investing in commercial banks more thoroughly, giving investors the information, they need to make wise decisions and possibly take advantage of market arbitrage possibilities.

2.2. Empirical Review

The review of empirical literature demonstrates extensive literature centred around the linear effect as appose to the nonlinear effect as proposed by AMH. For example, Vejzagic and Zarafat (2014) conducted a study that analysed the macroeconomic factors that affected the profitability of Malaysian commercial banks between 1995 and 2011. This research study investigated the relationship between macroeconomic variables such as real GDP growth, inflation (CPI), and real interest rates, and the profitability of Malaysian commercial banks determined by return on assets (ROA). Using conventional regression and correlation approaches, the analysis was carried out over 17 years, from 1995 to 2011. The profitability of banks including Maybank, Public Bank, and Hong Leong Bank, as well as the overall profitability of all banks, was found to be positively impacted by real GDP growth. For Public Bank and Hong Leong Bank, there was a notable negative correlation between inflation (CPI) and profitability. The study emphasised the importance of economic growth in boosting bank profits through increased demand. Similarly, the study conducted by Lyimo and Hussein (2022) on the impact of macroeconomic variables on bank performance in Tanzania discovered a favourable correlation between the Return on Assets (ROA) of Tanzanian commercial banks and economic growth, suggesting that higher economic growth improves bank performance. Furthermore, the research indicated a negative correlation between ROA and money supply, suggesting that a higher money supply in the economy is detrimental to the performance of Tanzania's commercial banks.

Akani et al. (2016) examined the effect of macroeconomic factors on the performance of commercial banks in Nigeria. Macroeconomic factors (interest rates, currency rates, money supply, GDP, inflation rate, unemployment rate) and return on investment in Nigerian commercial banks have a long-term relationship, according to the co-integration analysis using the Johansen test. The results of this study indicate that the return on equity and the return on assets are positively impacted by exchange rates. In contrast, Otambo's (2016) study on the impact of macroeconomic variables on the financial performance of Kenya's commercial banking sector finds a negative correlation between exchange rate and return on assets. According to the study, there is a positive correlation between the GDP inflation rate and return on assets. The study concluded that the generated regression model is reliable and has a decent fit based on ANOVA statistics.

Baba and Naseiku (2016) on the study Effect of macroeconomic factors on the financial performance of commercial banks in Nigeria. The study found that the unemployment rate and Return on Equity (ROE) in Nigeria's commercial banks have a negative and substantial relationship. This suggests that commercial banks' financial performance, as indicated by ROE, declines as the unemployment rate increases. The study also found that the relationship between the inflation rate and ROE in Nigerian commercial banks is positive but not statistically significant. This implies that although the inflation rate and financial performance have a positive association, it is not statistically significant. The study also found a substantial and negative correlation between the exchange rate and ROE in Nigerian commercial banks. Overall, the study discovered that while inflation has a negligible association with financial performance, the unemployment rate, exchange rate, and real interest rate have a strong relationship with the financial performance of commercial banks in Nigeria. Similarly, the study by Islam et al. (2022) on the impact of macroeconomic factors on bank performance in Bangladesh also found that changes in the unemployment rate and GDP may have an impact on the country's banks' performance. The paper also could not discover a statistically significant correlation between inflation and ROA for Bangladesh banks.

Okech and Mugambi (2016) conducted a study on the effect of macroeconomic variables on the stock returns of listed commercial banks in Kenya. The study supported theories like the Capital Asset Pricing Model (CAPM) and Arbitrage Price Theory (APT) by confirming the predicted relationship between macroeconomic variables and the stock returns of listed banks. The interest rate, the currency rate, and inflation all had a substantial impact on the returns of the bank stocks, but the GDP had an insignificant one. However, Gikombo and Mbugua (2018) discovered that Kenyan bank profitability is significantly affected by macroeconomic factors including GDP. GDP showed a positive correlation with commercial banks' performance and exerted a significant influence on their profitability. The study also found that exchange rates had a substantial impact on ROE and ROA, suggesting that higher exchange rates were associated with higher profitability.

Olokoyo et al. (2019) conducted empirical research on the impact of macroeconomic variables on Bank Performance in Nigeria. The primary goal of the study was to examine how different macroeconomic factors affected Nigerian banks' performance. The study determined that the GDP growth rate, trade, and interest rate were the most significant factors influencing bank performance in the nation. The findings showed that trade and GDP growth rates have a beneficial effect on bank performance, however, a higher interest rate has the opposite effect. It was discovered that foreign capital flows had little effect on bank performance, presumably as a result of the industry's low investment and instability. The study made clear how crucial it is to take into account macroeconomic factors like trade, interest rates, and GDP growth rates when evaluating the performance of Nigerian banks.

Despite the growing prominence of the linear effect of macroeconomic variables on commercial bank returns, some studies also consider the nonlinear effect. For example, San and Heng's (2012) study's main goal was to identify the variables affecting Malaysian commercial banks' profitability. The study examined macroeconomic factors including GDP growth and inflation to determine how they affected Malaysian commercial banks' profitability. According to the research findings, return on assets (ROA), return on equity (ROE), and net interest margin (NIM) measurements of profitability did not significantly depend on GDP growth or inflation. The study highlighted that, in contrast to macroeconomic influences, internal bank-specific drivers had a greater impact on bank profitability. Although GDP and inflation are frequently employed as stand-in indicators for macroeconomic conditions, the study's findings did not corroborate their influence on the profitability of Malaysian commercial banks. The study's regression models showed that, in comparison to macroeconomic variables, the profitability of Malaysian commercial banks was more significantly impacted by variables like equity assets, loan loss reserves, and cost-to-income ratio.

The empirical review has shown that there's little information on non-linear effects and that the influence of macroeconomic conditions on commercial bank returns has mostly concentrated on linear correlations. Although the impact of macroeconomic factors such as GDP, inflation, and interest rates on bank profits has been the subject of several research studies, the conclusions and outcomes sometimes conflict with each other. Because each country has different institutional frameworks, policies, and economic realities, the research now available contrasts with one another. This demonstrates the nuanced and intricate link that exists between commercial bank returns and macroeconomic variables. Additional research is necessary to fully comprehend the dynamics at work, as evidenced by the paucity of studies on nonlinear effects. There remains a substantial vacuum in the literature despite the wealth of studies on the influence of macroeconomic conditions on commercial bank returns. The possible intricacies and subtleties of the relationship between macroeconomic conditions and commercial bank returns have been overlooked in favour of linear relationships in the literature that has already been published.

3. METHODOLOGY AND DATA

3.1. Secondary Data

The study used a monthly time series data set for 2002-2023. This data covered significant financial periods such as the 2008/2009 global financial crises and the 2019-2022 COVID-19 pandemic. The sample period was selected according to data availability, since the selected commercial bank returns were only available from 2002. The dependent variables include the prices of South African commercial banks, while the independent variables comprise macroeconomic variables, namely the inflation, money supply, GDP, short term interest rate, long term interest rate and the real effective exchange rate. The study used commercial bank returns as a dependent variable in the study and macroeconomic variables as an independent variable. The study obtained the data on the dependent variables from the IRSS database, while the independent variables was accessed from the South African Reserve Bank (SARB). The construction of the dependent and independent variables is given below:

3.1.1. South African commercial bank returns

Banks listed on the Johannesburg Stock Exchange (JSE) are evaluated in this study. The six banks that are part of this group include Standard Bank Group Limited, FirstRand Limited, Investec Limited, Absa Group Limited, and Capitec Bank Holdings Limited. The lack of data prevents Finbond Group Limited and unlisted South African banks from being considered. Despite this, the above banks account for more than 85% of all banking assets in the South African banking industry (Du Toit and Cuba, 2018) and are considered sufficient as the same banks were used in studies (Kunjal and Suvvari, 2024; Peerbhai and Kunjal, 2024).

3.1.2. Macroeconomic variables

The study has chosen to use five macroeconomic variables, including the South African inflation rate, money supply rate, short-term and long-term interest rate, GDP and real effective exchange rate (REER). The selection of the variables was done in line with empirical literature, as these variables were the most widely used by academics. The following is a detailed explanation of each macroeconomic variable.

3.1.2.1. Inflation rate

The inflation rate is the rate at which the average level of prices for goods and services increases, resulting in a decline in purchasing power, which is a crucial economic concept (Vipond, 2021). It can be estimated using a variety of indices, most commonly the Consumer Price Index, and is usually measured over a specified period of time, usually annually (Oner, 2012). As a result, the South African Reserve Bank (SARB) provided the consumer price index for this study. Studies by Akani et al. (2016), Mugambi (2016), and Lyimo and Hussein (2022) also used inflation in their studies when considering commercial bank returns. The study hypothesises that there will be a negative relationship between inflation and commercial bank returns.

3.1.2.2. Money supply rate

Due to its impact on inflation, interest rates, and general economic activity, the money supply is an essential economic indicator (Schwartz, 2008). There are several categories into which the money supply is separated, including M1, M2, and M3. However, a wide money supply (M2) rate is employed in this study since it is a more trustworthy measure of price stability (Akani et al., 2016). The addition of M2 (market securities, savings deposits, mutual funds, and other time deposits) to M1 (bank deposits and cash) yields a wide money supply rate (Orphanides et al., 1994). The study will employ a variable that is sourced from the SARB. Previous research by Jarada and Al-Qudah (2013), Akani et al. (2016), and Zhang (2023) found that broad money supply might have a favourable or negative impact on the returns of commercial banks. Based on this, the study postulates that the money supply impacted commercial bank returns in one of two ways: positively or negatively.

3.1.2.3. Short-term and long-term interest rate

Both short- and long-term interest rates have a significant impact on the financial markets and the economy, affecting different parts of economic activity, such as investment, spending, and bank behaviour. Although long-term rates have an impact on investment choices and expectations for future economic conditions, short-term rates largely affect borrowing costs and spending patterns in the short term (Kiley, 2014). However, empirical studies validated the usage of the 91-day Treasury Bill Rate as a proxy for the short interest rate and the yield on 10-year government bonds as a proxy for the long-term interest rate (Dube and Zhou, 2013; Naicker, 2017). Short-term interest rates and bank financing costs have a positive long-term association, according to a study that used the Johannesburg Interbank Agreed Rate (JIBAR) as a proxy. Increased expenses for banks due to higher short-term rates may have an impact on their profitability and returns on equity (Nomsobo and Van Wyk, 2019). According to the hypothesis of the study, the returns of commercial banks will be significantly impacted by both short- and long-term interest rates.

3.1.2.4. Gross domestic product

GDP serves as a comprehensive scorecard of a nation's economic health and is used by policymakers, economists, and investors to gauge economic performance. Numerous empirical studies have examined the connection between GDP and commercial bank returns, emphasising the important influence of macroeconomic variables on bank returns. Numerous studies have consistently found that GDP growth has a positive impact on bank profitability (Joaqui-Barandica et al., 2022; Ceylan and Ceylan, 2020; Abdelmoneim and Yasser, 2023). Consequently, the hypothesis has a positive effect between GDP and commercial bank returns.

3.1.2.5. Real effective exchange rate

After accounting for inflation, the Real Effective Exchange Rate (REER) is a crucial metric for assessing the worth of a currency relative to its trade partners. It is essential for determining monetary policy, evaluating international competitiveness, and comprehending economic performance in a global setting (Bahmani-Oskooee, 1995). Empirical research has shown that the REER can have a major effect on commercial banks' returns. Research has indicated that the return on assets (ROA), a measure of bank profitability, and the REER have a positive correlation. Better bank returns are linked to a higher REER, which indicates an increase in the value of the home currency (Hassan and Mano, 2019). Bank funding expenses are reduced by an increase in REER because domestic currency borrowing becomes more affordable. This raises net interest margins and income (Borio and Gambacorta, 2017). Based on this, the study emphasises that REER has a positive effect on commercial bank returns.

3.2. Empirical Model

The purpose of the study was to investigate how macroeconomic factors, in the context of fluctuating market conditions, affect the returns of South African listed commercial banks. To account for the shifting economic conditions, such as bull and bear states, a regime-switching model was required. It is evident in the literature that the most utilised regime-switching model is the Markov regime-switching model when assessing market conditions (Moodley et al., 2024b; Moodley et al., 2024a; Kuan, 2002; Delbianco et al., 2020; Piger, 2009). On this basis, the study uses the Markov regime-switching model, where the model with conditional mean and constant transition probabilities, is given by:

$$C_t = U_{Rt} + a_{0iRt}\,\Delta INFL + a_{1iRt}\,\Delta M2 + a_{2iRt}\,\Delta ST_{INT} + a_{3iRt}\,\Delta LT_{INT} + a_{4iRt}\,\Delta GDP + a_{5iRt}\,\Delta REER + \varepsilon_{rt} \quad (1)$$

Where C_t is the commercial bank returns, *Urt* is the constant, and Rt refers to the two regimes: the bull (1) and the bear regime (2). The macroeconomic variables are the independent variables and state-dependent, given by $\Delta INFL$ is the change in the inflation rate, $\Delta M2$ is the change in money supply, ΔST_INTR is the change in short-term interest rate, ΔLT_INTR is the change in long-term interest rate, ΔGDP is the change in GDP and $\Delta REER$ is the change in REER. ε_{Rt} is given to be the error term of the model which captures the volatility of each regime.

It is assumed that each regime is a first-order Markov process, as depicted by the transition probability matrix. The likelihood of being in a certain regime under the first-order Markov process depends on the most recent state as follows:

$$Prob\,[R_t = k \mid R_{t-1} = j] = prob_{kj(t)} \quad (2)$$

Where *kj* is the probability of switching from a regime denoted as *j* in a t-1 period to a regime k in a specific period. Since the probability is assumed to be constant throughout all time intervals so that $prob(t) = prob_{kj}$. Thus, two regime model matrices are provided by:

$$Prob| = 1|R_t\text{-}R_{t-1} = 1 = Prob_{11} \quad (3)$$

$$Prob[R_t = 2 \mid R_{t-1} = 1] = 1\text{-}Prob_{12} \quad (4)$$

$$Prob[R_{t=2} \mid R_{t-1} = 2] = Prob_{21} \quad (5)$$

$$Prob[R_t = 1 \mid R_{t-1} = 2] = 1\text{-}Prob_{22} \quad (6)$$

Where $Prob_{11}$ denotes the probability that the commercial bank returns are in the bull state at the t-1 period, whereas $Prob_{21}$ denotes the probability that the returns from the commercial banks are in the bull state and proceed to the bear state (state two) at a specific period. $Prob_{22}$ is the probability that the commercial bank returns are in the bear state at t-1, whereas $Prob_{12}$ assumes that commercial bank returns are in the bear state at t-1 and proceed to the bull state at a specific period (t) (Brooks, 2019).

3.3. Preliminary and Diagnostic Tests

The study considered three preliminary tests these include the variance inflation factor (VIF) test, and the unit root and stationarity test. That being, the VIF test was estimated to determine the existence of multicollinearity in the independent variables. The Augmented Dickey-Fuller (ADF) test, the ADF break-point test and the Kwiatkowski-Phillips Schmidt Shin (KPSS) test were considered to determine the stationarity of the variables used in the study. Once the ADF test and the KPSS test confirmed that the variables are stationary in levels and the presence of structural

breaks, the study proceeded to estimate the Markov regime-switching model. However, the Durbin-Watson (DW) test and the Breusch-Godfrey (BG) test were run to determine the robustness of the estimated model.

4. RESULTS AND DISCUSSION

4.1. Preliminary Results

This section provides a detailed analysis, starting with the descriptive statistics of commercial bank returns and key macroeconomic variables to offer insights into the data's overall distribution and behaviour. Furthermore, the VIF for the macroeconomic variables is estimated to assess multicollinearity and ensure the reliability of regression results. In addition, the stationarity of the data is tested using the ADF, KPSS, and ADF min-t break point tests, allowing for a thorough examination of the time series properties and potential structural breaks in the variables. Finally, the unconditional correlation between commercial bank returns and macroeconomic variables is estimated to explore the degree of association and potential linear relationships between these two sets of variables, providing a foundational understanding of their interconnectedness.

4.1.1. Descriptive statistics results

In Table 1, the descriptive statistics associated with the commercial bank returns and macroeconomic variables are presented. The mean values of the commercial bank performance illustrate consistent pattern of positive growth averages across all institutions examined. Notably, Capitec exhibited the highest average growth rate, followed closely by First Rand Bank during the sample period. In contrast, Nedbank demonstrated the lowest average growth among the commercial banks studied. These findings suggest that Capitec outperformed its peers in terms of returns, while Nedbank underperformed relative to the other commercial banks in the sample.

The distribution of commercial bank returns exhibited negative skewness, indicating that the mean lies to the left of the median and mode. This asymmetry suggests a higher frequency of extreme negative returns than of positive returns during the sample period. Investec demonstrated higher volatility and risk, as evidenced by its elevated maximum and minimum values as well as a high standard deviation. In contrast, Standard Bank displayed relatively low maximum and minimum values coupled with a low standard deviation, indicating lower volatility. This observation is further supported by the Standard Bank's high average growth.

The analysis of commercial bank returns revealed a leptokurtic distribution, characterized by a kurtosis value exceeding 3. This distribution pattern indicates departure from the normal bell curve, exhibiting pronounced peaks and flattened tails. The observed leptokurtic nature coupled with negative skewness suggests a non-normal distribution of commercial bank returns. The Jarque-Bera test statistics corroborated these findings, leading to the rejection of the null hypothesis (normal distribution) and acceptance of the alternative hypothesis, thus confirming the non-normal distribution of commercial bank returns.

Table 1: Descriptive statistic of commercial bank return and macroeconomic variables

Variable	ABSA	CAPITEC	FIRST_RAND	INVESTEC	NEDBANK	STAN_BANK	ΔCPI	ΔM2	ΔST_INT	ΔLT_INT	ΔGDP	ΔREER
Mean	0.650156	2.725830	0.870886	0.643439	0.301246	0.722006	−0.270254	−2.558157	−0.039279	0.035724	0.088110	0.113455
Median	0.958977	3.097946	1.590203	0.389803	0.431289	0.152014	0.000000	−1.131364	0.005420	−0.457666	0.135519	0.325990
Maximum	23.71937	28.22325	22.88416	26.56245	26.00537	20.13698	20.00000	717.1429	13.69863	21.67488	28.12335	9.863370
Minimum	−56.75840	−39.01899	−31.39059	−84.17346	−75.92081	−37.10149	−88.76923	−720.0000	−24.28571	−12.96642	−23.98950	−11.80298
Standard Deviation	7.897784	9.341115	7.287211	9.401911	8.281893	6.962582	7.038045	74.76131	4.066968	3.928849	2.586860	3.105757
Skewness	−1.312116	−0.457067	−0.436649	−2.699961	−2.934520	−0.383273	−7.717482	−0.553441	−1.066530	1.166319	1.754176	−0.317859
Kurtosis	12.89378	4.910964	4.367692	27.64234	29.68775	6.021939	98.56833	68.98212	8.845585	8.341006	83.51283	4.044083
Jarque-Bera	1130.680	48.42681	28.41695	6867.861	8057.940	104.8918	101134.6	46996.25	417.8621	366.5664	70087.81	16.12541
Probability	0.000000	0.000000	0.000001	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000315
Observations	259	259	259	259	259	259	259	259	259	259	259	259

Source: Author's own estimation

The examination of macroeconomic variables revealed diverse growth patterns. Long-term interest rates, gross domestic product and real effective exchange rate demonstrate positive average growth, while the inflation, money supply, and short-term interest rates exhibit negative average growth. Real effective exchange rate displayed the highest growth average, which is indicative of currency appreciation during the sample period. Conversely, money supply has the lowest average growth rate. The negative average growth rates observed in inflation, money supply, and short-term interest rates can be attributed to the economic impact of the COVID-19 pandemic and subsequent monetary policy adjustments implemented by the South African Reserve Bank (SARB) to mitigate inflationary pressures.

Among the macroeconomic variables, money supply exhibited the highest maximum, minimum, and standard deviation values, suggesting significant fluctuations and volatility. This observation is further supported by the negative average growth rate. In contrast, the real effective exchange growth rate, gross domestic product growth rate, and long-term interest growth rate demonstrated the lowest minimum values and standard deviations, indicating relatively lower volatility. It is seen that inflation growth rate, money supply growth rate, and short-term interest growth rate are negatively skewed, while the long-term interest growth rate, gross domestic product growth rate, and real effective exchange growth rate are positive skewed. All macroeconomic variables displayed kurtosis values exceeding 3, indicating leptokurtic distributions. This finding further supports the non-normal distribution of growth rates of these variables and is confirmed by the Jarque-Bera test of normality.

4.1.2. Variance inflation factor results

The VIF results in Table 2 for the macroeconomic variables indicate very low levels of multicollinearity across the dataset. The VIF values for the inflation growth rate, money supply growth rate, short-term interest growth rate, long-term interest growth rate, gross domestic product growth rate, and real effective exchange growth rate is all close to 1. None of the variables exceed the common threshold for multicollinearity concern (usually a VIF of 5 or higher). Therefore, each variable is sufficiently independent, and there is no need for corrective measures like variable removal or transformation. These low VIF values indicate that the regression model will provide reliable coefficient estimates without being distorted by multicollinearity, allowing for a clear interpretation of the relationships between the macroeconomic variables and commercial bank returns.

Table 2: Variance inflation factor output for macroeconomic variables

Variable	Coefficient	Uncentered	Centred
Explanatory variables	Variance	VIF	VIF
C	0.217144	1.006355	NA
ΔCPI	0.004558	1.043829	1.042286
ΔM2	3.90E-05	1.007032	1.005849
ΔST_INT	0.014608	1.115598	1.115493
ΔLT_INT	0.017829	1.270634	1.270529
ΔGDP	0.035316	1.092316	1.091046
ΔREER	0.028354	1.264299	1.262607

Source: Author's own estimation (2024)

4.1.3. Unit root and stationarity results

Table 3 presents the unit root and stationarity test parameters for the commercial bank returns and macroeconomic variables. It is evident from the ADF test that the test statistic is more negative than associated critical values at all levels of significance. Consequently, the study rejects the null hypothesis that the commercial bank returns contain a unit root in favour of the alternative hypothesis that the commercial bank returns are stationery. These findings are further supported by the KPSS test, as the study fails to reject the null hypothesis that the commercial bank returns are stationery at all levels of significance. Additionally, the breakpoint unit root test corroborated these findings, demonstrating that the commercial bank returns remain stationary even in the presence of structural breaks. The test statistic was also more negative than the critical value at all levels of significance, leading to the rejection of the unit root hypothesis in favour of the stationarity hypothesis. Collectively, these results affirm that commercial bank returns are stationary both in levels and when accounting for structural breaks.

The results of the ADF test for macroeconomic variables revealed that the test statistics were substantially more negative than the critical values at all levels of significance. This significant deviation led to the rejection of the null hypothesis, which posits that macroeconomic variables exhibit a unit root, thereby concluding that these variables are stationary. This finding is further supported by the results of the KPSS test, which also indicated stationarity. Specifically, the KPSS test statistics for the macroeconomic variables were all below the critical values at all levels of significance, leading to a failure to reject the null hypothesis of stationarity. Additionally, the breakpoint unit root test reinforced these conclusions by demonstrating that macroeconomic variables remain stationary even in the presence of structural breaks. The test statistic in this context was notably more negative than the critical value at all levels significance, resulting in the rejection of the null hypothesis that macroeconomic variables contain a unit root. Consequently, the comprehensive analysis across multiple tests supports the conclusion that macroeconomic variables are stationary both in levels and when accounting for structural breaks.

4.1.4. Unconditional correlation results

Table 4 presents the correlation coefficients between South African commercial bank returns and various macroeconomic variables. It is evident that that inflation growth rate has a positive significant effect on ABSA, FirstRand Bank, Investec, and Standard Bank returns but a negative significant effect on Nedbank returns. Money supply growth rate has a positive significant effect on FirstRand Bank, Nedbank, and Standard Bank returns, but Capitec returns indicated a significantly negative relationship with the money supply growth rate. Short-term interest growth rate, coefficients for all commercial banks except Capitec and Investec were positive, suggesting that commercial bank returns are influenced positively and negatively by short-term interest growth rate. All coefficients for the long-term interest rate were negative, and these relationships had a statistically negative effect on commercial bank returns. There exists a statistically significant positive relationship between GDP growth rate and the returns of Nedbank, Standard Bank, Capitec, and Investec. All coefficients

for the real effective exchange rate growth were positive and had a statistically significant effect on the commercial bank returns.

The findings suggest that commercial bank returns are influenced by macroeconomic variables both positively and negatively. However, such an effect demonstrates linearity and does not account for nonlinearity such as changing market conditions. Therefore, it is essential to proceed by using a nonlinear model to examine the desired objective of the study, the effect of macroeconomic variables on commercial bank returns under changing market conditions.

4.2. Empirical Results

This section analyses and interprets the transition probabilities of returns and the expected duration for commercial banks in South Africa. It includes a discussion of the graphical representation of the smooth transition probabilities for each bank. Additionally, the findings from the Markov regime-switching model are interpreted.

4.2.1. Expected duration and constant transition probabilities

The transition probabilities and constant expected duration is presented in Table 5. This was estimated to compare the levels of bull and bear market conditions across the South Africa's commercial Banks Returns. The transition probabilities for ABSA bank returns indicate a probability of 0.969486 for remaining in a bull market condition and 0.471596 for remaining in a bear market condition. This higher probability for the bull market suggests that ABSA returns remain in a bull market for a longer duration compared to a bear market. The proximity of the bull market probability to 1 indicates a high level of persistence, while the bear market probability, being significantly lower, suggests a lack of persistence in that regime. The expected duration further supports this finding, as the returns remained in a bull market condition for an average of 32 months, substantially longer than the 1.8 months observed in a bear market condition. Thus, the analysis concludes that ABSA exhibits a predominantly bullish trend over the sample period.

The probability of Capitec bank returns being in a bull market condition is substantially higher than the probability of being in a bear market condition. This suggests that Capitec returns tend to remain in a bull market regime for a significantly longer period than in a bear market regime. The bull market probability, being close to 1, demonstrates a high degree of persistence, in contrast to the much lower persistence of the bear market condition. This

Table 3: Unit root and stationarity output of commercial bank returns and macroeconomic variables

Variable	ABSA	CAPITEC	FIRST_RAND	INVESTEC	NEDBANK	STAN_BANK
ADF	−17.38551***	−15.82418***	−17.90546***	−16.25486***	−16.95580***	−17.06362***
KPS	0.320304	0.241431	0.150205	0.074753	0.051384	0.206452
ADF-BREAK	−19.77345***	−16.63285***	−18.80151***	−20.23130***	−21.75222***	−18.42086***
Macroeconomic Variables						
	ΔCPI	ΔM2	ΔST_INT	ΔLT_INT	ΔGDP	ΔREER
ADF	−16.02713***	−5.633612***	−7.888908***	−12.10078***	−6.842741***	−12.78207***
KPS	0.155556	0.117356	0.195759	0.205300	0.130568	0.113492
ADF-BREAK	−25.94942***	−14.60258***	−12.29776***	−14.44298***	−13.91394***	−14.54548***

1. ***, **, * indicate a 1, 5 and 10 percent level of significance. 2. The associated critical values of the KPSS test is 0.7390, 0.4630 and 0.3470. 3. Source: Author's own estimation (2024)

Table 4: Unconditional correlation output of commercial bank returns and macroeconomic variables

Probability	ABSA	CAPITEC	FIRST_RAND	INVESTEC	NEDBANK	STAN_BANK
ΔCPI	0.084567	-0.041027	0.030671	0.096517	-0.002742	0.115832
	(0.0748)	(0.5110)	(0.0232)	(0.0213)	(0.0650)	(0.0627)
ΔM2	0.039179	-0.033161	0.067036	0.051520	0.008741	0.035268
	(0.5302)	(0.0952)	(0.0824)	(0.4090)	(0.0887)	(0.0721)
ΔST_INT	0.022725	-0.029306	0.081256	-0.009796	0.091325	0.066758
	(0.0719)	(0.6387)	(0.1924)	(0.0453)	(0.1427)	(0.0845)
ΔLT_INT	-0.316204	-0.256603	-0.309219	-0.267895	-0.304846	-0.328251
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
ΔGDP	-0.008030	0.053749	0.093974	0.067168	0.033534	0.101312
	(0.8977)	(0.0890)	(0.1315)	(0.0815)	(0.0011)	(0.0038)
ΔREER	0.212791	0.262945	0.264725	0.183423	0.264562	0.271154
	(0.0006)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)

1. The parenthesis provides the *P* values associated with each variable. 2. Source: Author's own estimation (2024)

Table 5: Expected duration and constant transition probabilities of commercial bank returns and macroeconomic variables

Panel A: Bull regime						
Variable	ABSA	CAPITEC	FIRST_RAND	INVESTEC	NEDBANK	STAN_BANK
P_{11}	0.969486	0.970063	0.205487	0.918349	0.901320	0.882515
T_{11}	32.77157	33.40384	1.258633	12.24727	10.13377	8.511703
Panel B: Bear Regime						
P_{22}	0.471596	0.007400	0.303137	0.180253	1.00E-09	0.500130
T_{22}	1.892492	1.007455	1.435002	1.219889	1.000000	2.000518

Source: Author's own estimation (2024)

is corroborated by the expected duration, with returns remaining in a bull market condition for approximately 33 months, compared to just 1 month in a bear market condition.

For FirstRand Bank, the transition probabilities are notably low and indicate a lack of persistence, as both bull and bear market probabilities are significantly lower than 1. The probability of returns being in a bull market condition is considerably lower than that of being in a bear market condition. This implies that FirstRand Bank returns exhibit a short-lived presence in both market conditions. The expected duration further confirms this observation, with returns staying only 1.2 months in a bull market condition and 1.4 months in a bear market condition.

The transition probabilities for Investec show that the likelihood of remaining in a bull market condition is higher than that of remaining in a bear market condition. This suggests that Investec returns tend to remain in a bull market for a longer duration compared to a bear market. The high persistence of the bull market condition, indicated by a probability close to 1, contrasts with the lower persistence of the bear market condition. The expected duration reinforces this, with returns lasting an average of 12 months in a bull market condition compared to only 1.2 months in a bear market condition. Thus, Investec returns are predominantly bullish over the sample period.

The transition probabilities of the bank returns following a bull market condition and the bear market condition were 0.901320 and 1.00E-09 respectively. The probability of the bank returns being in the bull market condition was higher than the probability of the bank returns being in the bear market condition. This suggested that the bank returns stayed in the bull market condition longer than in the bear market condition. It is concluded that the returns of Nedbank are bullish for the sample period as this is confirmed by the expected duration as the duration of the returns in a bull market condition of 10 months is greater than that of a bear market condition of 1 month.

Similarly, the transition probabilities for Standard Bank returns under bull and bear market conditions are 0.882515 and 0.500130, respectively. This indicates a higher likelihood of returns remaining in a bull market condition compared to a bear market condition. The persistence of the bull market condition is suggested by its probability being close to 1, whereas the bear market condition's probability is significantly lower. Consequently, it is anticipated that Standard Bank returns will remain in a bull market condition for approximately 8.5 months and in a bear market condition for about 2 months.

4.2.2. Smooth regime probabilities

The smooth regime probability graphs are presented in Figure 1. It is evident that ABSA Bank returns shows a long duration in a bullish market regime and a brief stay in a bearish market regime. These observations are corroborated by the transition probabilities and expected durations detailed in Table 5. ABSA's returns transitioned into a bear market regime in 2008, 2013, and from 2019 to 2022. The 2008 bear market aligns with the global financial crisis, which led to widespread uncertainty and reduced confidence, impacting banks worldwide, including ABSA. Post-crisis, ABSA's returns began to recover as economic conditions stabilized, contributing to a bull market phase. The bear market conditions observed between 2019 and 2020 were influenced by economic challenges and the COVID-19 pandemic. In 2022, ABSA entered another bear market, driven primarily by deteriorating macroeconomic variables and rising inflation.

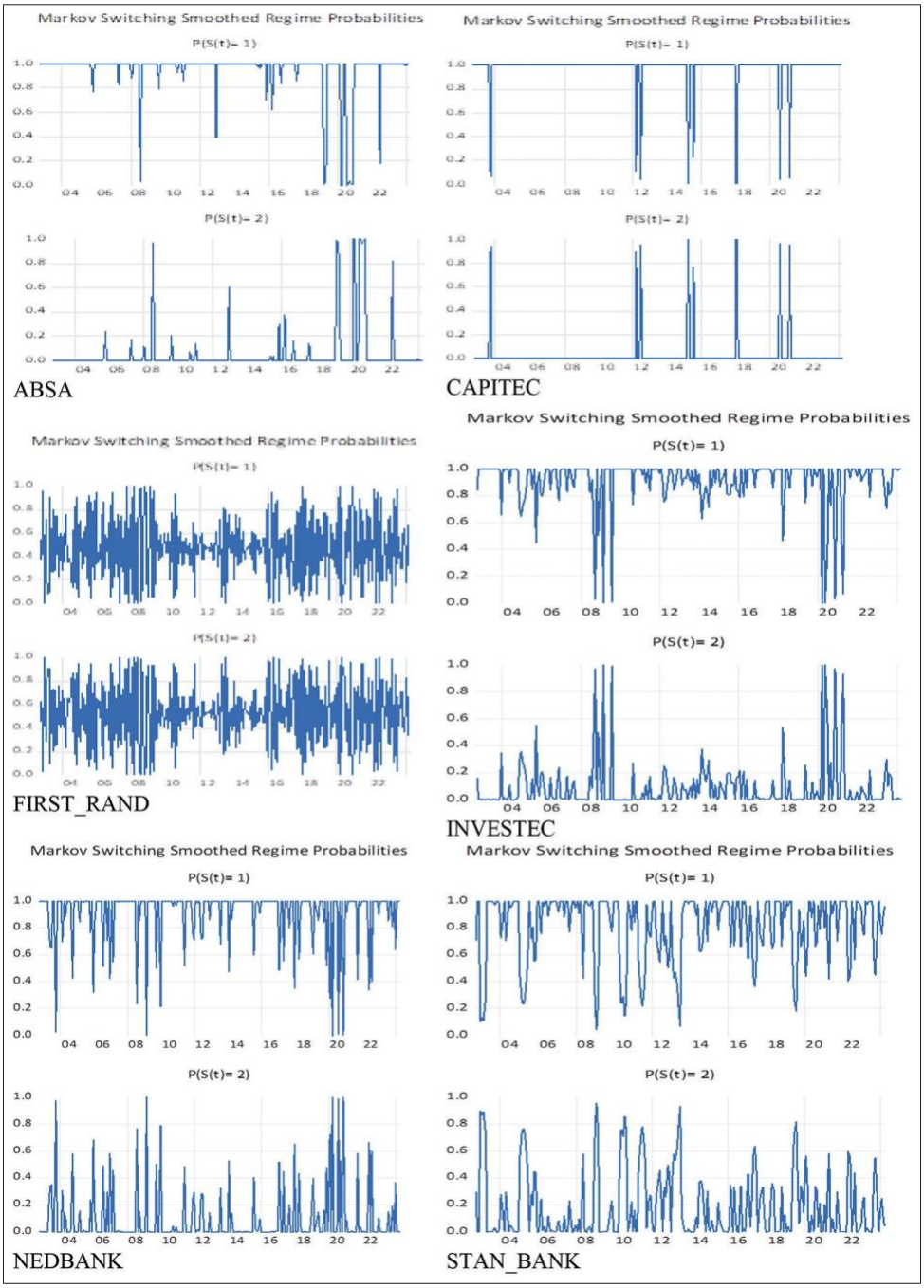
Similarly, the Capitec Bank returns reveals a prolonged bull market regime compared to the bear market condition. This finding is supported by the transition probabilities and expected durations shown in Table 5. Capitec experienced a bear market in 2003, attributed to early operational challenges and competitive pressures within the South African banking sector. Subsequently, Capitec entered a bull market from 2004 to 2011, unaffected by the 2008 financial crisis. The bank faced bear market conditions again in 2012, 2014, and 2017 due to increased credit impairments and heightened scrutiny of its lending practices, especially in unsecured lending. The bear market conditions observed in 2020 and 2021 were primarily due to the adverse economic effects of the COVID-19 pandemic.

First Rand Bank returns did not remain in a bull or bear market condition for a prolonged period of time and this was also indicated by the transition probabilities of the bank's returns in Table 5. The constant spikes of the bull and the spikes of a bear market was experienced throughout the sample period. This suggests that the returns experience constant periods of increasing and decreasing returns with limited stability. This implies, that current and historical financial market events such as the Global Financial Crises, inflation targeting and Covid-19, among others, have a prolonged negative and positive effects on the bank's returns.

The transition probabilities for Investec bank returns indicate that returns remained in a bull market regime significantly longer than in a bear market regime. The returns entered a bear market between 2008 and 2009, primarily due to the global financial crisis, which had a severe impact on the banking sector worldwide. Following the crisis, the bank's returns began to recover, transitioning to a bullish regime. Additionally, bear market conditions were observed between 2005 and 2006, 2018 and 2019, and 2020 and 2021, corresponding to periods of global market volatility in 2018, economic challenges in 2005, and the COVID-19 pandemic between 2020 and 2021.

The smooth transition probabilities graph associated with Nedbank returns and Standard Bank returns demonstrate high persistence of the bull market condition as indicated by the constant spikes in the bull market condition. These findings are collaborated by the transition probabilities and expected duration in section 4.2.1. It is worthy to note, that the two bank returns are not adversely affected by current and past historical events as it presented stable and increasing returns during the Global Financial crises and Covid-19 pandemic. These findings don't come as a shock as Nedbank and Standard Bank have heighten internal mechanisms to elevate financial distress as compared to other commercial banks.

Figure 1: Smooth transition probabilities



Source: Author's own estimation

4.2.3. Marko regime-switching results

The Markov regime-switching model results is presented in Table 6. The constant term (C) provides the average return of the commercial bank returns. It is evident in the bull market condition that the returns of all commercial banks are positive and significant. These findings suggest that the commercial bank returns are positive and increasing in favourable market conditions as supported by the low volatility parameters (Log(SIGMA)). Furthermore, inflation growth rate has positive significant effect on ABSA returns and Investec returns in a bull regime. However, only Investec returns is positively significantly affected by money supply growth rate in a bull regime. In contrast, short-term interest growth rate has a negative significant effect on Capitec returns, Investec returns, and Nedbank returns in a bull regime but a positive significant effect on First Rand returns in the same regime. Long-term interest growth rate has a negative significant effect on all commercial bank returns, besides Nedbank returns in a bull market condition. Gross domestic product growth rate has a positive significant effect on ABSA returns, but a negative significant effect on Nedbank returns in a bull regime. Similarly, real effective exchange rate only has a positive Significant effect on all commercial bank returns, besides ABSA and Investec in a bull market condition.

The constant term (C) represents the average returns of commercial banks, indicating that ABSA's returns are positive and statistically

Table 6: Markov regime-switching results

Variable	ABSA	CAPITEC	FIRST_RAND	INVESTEC	NEDBANK	STAN_BANK
Panel A: Bull Regime						
C	0.673984	2.793485***	2.223865***	1.019907**	0.540413***	1.352067**
CPI	0.125981**	−0.063767	0.042599	0.147870**	0.030853	0.059976
M2	0.008135	−0.002995	0.009548	0.010615*	0.005678	−0.000781
ST_INT	0.020102	−0.097820	0.735862***	−0.282795**	−0.085767**	0.083135
LT_INT	−0.362480***	−0.504315***	−0.922904***	−0.330730**	−0.154177	−0.626066***
GDP	0.873090**	0.288509	0.194221	−0.233613	−0.565990**	0.072292
REER	0.154567	0.615784***	1.040529***	0.023267	0.319907**	0.482365**
LOG (SIGMA)	1.818341***	2.124887***	1.708790***	1.884361***	1.821392***	1.861636***
Panel B: Bear Regime						
C	1.790605***	−2.876910***	−0.430217	−0.455079	−1.545780***	−1.999951***
CPI	−1.202097***	0.075919***	0.053992***	0.690542**	0.722408***	0.101361***
M2	−0.229857***	0.046544***	0.002058	−0.345835***	−0.022792***	0.018031***
ST_INT	−1.404336***	0.098951***	−0.295132	1.640106***	1.276800***	0.521902***
LT_INT	−2.115078***	4.364966***	−0.231113	0.227942	−2.478533***	−0.195584*
GDP	−0.196471***	−0.554635***	0.330137	3.966332***	0.379828***	0.355003***
REER	3.384294***	−0.025052***	−0.359940	2.882346***	1.555037***	−0.909022***
LOG (SIGMA)	−0.602361***	−4.041277***	1.724702***	1.156828***	−0.223423	0.682778*
Panel C: Diagnostic Tests						
F-Stat	0.80386	0.934445	0.526618	0.872185	2.382383	1.791027
D-W	2.428927	2.129939	2.318784	2.328503	2.109717	2.437563

1. The F-statistic is associated with the Breusch-Godfrey Serial Correlation LM Test. 2. ***, **, * indicate a 1, 5 and 10% level of significance. 3. Source: Author's own estimation

significant. In contrast, the returns for Capitec, Nedbank, and Standard Bank are negative and significant during bear market conditions. These findings suggest that ABSA's returns are not only positive but also increasing in favourable market conditions, as evidenced by the low volatility parameters (Log (SIGMA)). Furthermore, the inflation growth rate significantly and positively impacts the returns of Capitec, FirstRand, Investec, Nedbank, and Standard Bank in bear markets. The growth rate of money supply also significantly influences the returns of ABSA, Capitec, Investec, Nedbank, and Standard Bank under similar market conditions. Similarly, the growth rate of short-term interest rates significantly affects the returns of these banks in bear market scenarios. Conversely, the growth rate of long-term interest rates negatively impacts the returns of ABSA, Nedbank, and Standard Bank, while positively affecting Capitec's returns during bear market conditions. Additionally, GDP growth rate demonstrates a significant negative effect on the returns of ABSA and Capitec, while positively influencing the returns of Investec, Nedbank, and Standard Bank in bear markets. Lastly, the real effective exchange rate growth rate significantly affects the returns of all mentioned banks during these adverse market conditions.

4.3. Discussion of Results

The findings regarding the impact of inflation growth rates on the returns of commercial banks in South Africa indicate that, according to the Markov switching model, inflation growth notably influenced the returns of ABSA and Investec during bull market conditions. In contrast, it did not significantly impact the returns of other listed commercial banks. However, in bear market conditions, inflation growth rates significantly affected all commercial bank returns. Thus, the influence of inflation was apparent in both market scenarios. These results align with earlier research by Otambo (2016), Okech and Mugambi (2016), and Gikombo and Mbugua (2018), which indicated that inflation growth rates have a significant impact on commercial bank returns. Additionally, research highlights a notable inverse relationship between inflation rates and the return on equity (ROE) of South African commercial banks. Increased inflation generally raises operational costs and diminishes the real value of returns, adversely affecting profitability (Moyo and Tursoy, 2020). Consequently, while inflation growth rates significantly impacted all selected commercial bank returns in bear market conditions, the effects varied, with some banks experiencing a significant positive impact and others facing a significant negative impact.

The results indicated that the money supply growth rate had no significant impact on the returns of the selected commercial banks during bull market conditions, except for Investec. In bear market conditions, however, it significantly affected most commercial bank returns, with FirstRand Bank being the exception. These findings align with earlier research, including a study by Mueni (2016), which highlighted a significant positive effect of money supply growth on bank returns. The lack of impact on FirstRand Bank corresponds with findings by Akani et al. (2016), who noted that money supply growth had an insignificant effect on commercial bank returns in Nigeria. The growth rate of money supply is crucial for South African commercial banks, especially amid fluctuating inflation rates. An increase in money supply generally boosts liquidity, facilitating greater lending and higher interest income, which can enhance return on equity (ROE). However, if money supply growth exceeds economic growth, it may trigger inflationary pressures that erode the real value of returns, negatively affecting banks. Thus, while there is a connection between money supply growth and bank returns, this relationship can be complicated during periods of high inflation or economic instability, leading to both significant and insignificant effects on returns.

The study's findings revealed that short-term interest growth rates significantly impacted the returns of FirstRand Bank, Investec, and Nedbank during bull market conditions, while in bear markets, they significantly affected the returns of ABSA, Capitec, Investec,

Nedbank, and Standard Bank. Long-term interest growth rates also had a significant effect on the returns of ABSA, Capitec, FirstRand Bank, Investec, and Standard Bank in bull markets, and significantly influenced ABSA, Capitec, Nedbank, and Standard Bank in bear markets. These results are consistent with earlier studies indicating that interest rates significantly affect commercial bank returns (Kanwal and Nadeem, 2013; Otambo, 2016; Okech, 2016; Gikombo and Mbugua, 2018). However, interest rates did not have a significant impact on other selected commercial banks, aligning with findings by Akani et al. (2016), which showed that interest rates had no notable effect on commercial bank performance. Overall, the influence of both short-term and long-term interest growth rates on the returns of South African commercial banks was apparent in both bull and bear market conditions.

The findings indicated that gross domestic growth rate significantly affected ABSA and Nedbank during bull markets, but had no notable impact on Capitec, FirstRand Bank, or Investec. While GDP growth influenced the returns of most selected commercial banks, FirstRand was an exception. Previous research (Otambo, 2014; Mueni, 2016; Nadeem and Kwanal, 2016) also demonstrated that GDP significantly impacted commercial banks, with some studies showing an insignificant effect on others, aligning with results from Khan et al. (2014), Kiganda (2014), and Bhattarai (2018). Overall, a positive correlation exists between GDP growth and commercial bank returns, as higher GDP leads to enhanced profitability through increased lending and reduced credit risk, while economic downturns negatively affect returns due to higher defaults and lower credit demand.

The findings of real effective exchange growth rate significantly influenced Capitec, FirstRand Bank, Nedbank, and Standard Bank during bull market conditions, while it had an insignificant effect on ABSA and Investec. In bear market conditions, real effective exchange growth rate significantly impacted ABSA, Capitec, Investec, Nedbank, and Standard Bank, but did not affect FirstRand. These results align with Otambo (2014) and Mueni (2016), which noted significant effects of REER on commercial bank returns, while Kiganda (2014) and Bhattarai (2018) indicated it had no significant impact. A higher Real effective exchange rate often signals decreased competitiveness for South African exports, potentially leading to lower demand and economic growth. This can result in decreased business revenues and higher credit risks for banks, with increased defaults negatively affecting returns on equity. Mayo et al. (2020) found that while Real effective exchange rate influences broader economic conditions, its direct impact on bank returns may be less significant than factors like inflation and interest rates.

It was apparent that a bullish market condition existed for the selected South African commercial banks, namely ABSA, Capitec, Investec, Nedbank, and Standard Bank, resulting in positive returns. In contrast, FirstRand Bank did not achieve positive returns in this scenario. The findings imply that the bull market condition is the most dominate market condition among South African commercial bank returns.

5. CONCLUSION

This study provides a comprehensive analysis of the effects of macroeconomic conditions on the returns of South African listed commercial banks, offering valuable insights into how these banks respond to both favourable and adverse economic environments. By utilizing a two-state Markov regime-switching model, the research captures the dynamic and time-varying relationship between key macroeconomic factors, such as inflation, GDP, money supply, interest rates, and exchange rates and bank performance. The analysis reveals that these relationships are non-linear, with distinct variations depending on whether the market is in a bull or bear regime. For instance, inflation and GDP growth are found to significantly enhance bank returns during periods of economic expansion, while adverse market conditions like recessions or crises lead to a marked decline in profitability.

The study's findings demonstrate that South African commercial banks, like those in many emerging markets, are particularly sensitive to macroeconomic shifts, especially during periods of financial instability. The results show that in bull markets, banks like Capitec and FirstRand consistently outperform their peers, experiencing substantial gains, while in bear markets, banks such as Nedbank and Investec face greater challenges in maintaining profitability. These findings underscore the importance of understanding the differentiated impacts of macroeconomic variables on banks under changing market conditions.

This research makes significant contributions to the academic literature by addressing the gap in studies that examine the South African banking sector's response to macroeconomic fluctuations in an emerging market context. While much of the prior research has focused on developed economies, this study highlights the unique challenges and opportunities facing South African banks. The use of a regime-switching model is particularly noteworthy, as it provides a more accurate reflection of the complex, non-linear interactions between macroeconomic variables and bank returns.

In practical terms, this study has several implications for policymakers, financial managers, and investors. Policymakers must recognize the importance of stabilizing macroeconomic variables such as inflation and exchange rates, as these factors are critical to maintaining the profitability and stability of the banking sector. Regulatory bodies can also use these findings to craft policies that buffer banks from the adverse effects of bear markets, ensuring long-term stability in times of economic downturns. For investors and financial managers, the study highlights the need for adaptive strategies that can respond effectively to shifting economic conditions, allowing them to better manage risk and optimize returns during both bull and bear markets.

The study's relevance extends beyond the South African context, offering broader insights into the role of macroeconomic stability in the banking sector's performance across emerging markets. Given the volatility and susceptibility of emerging economies to global economic shifts, the findings suggest that banks operating in these regions must develop more resilient strategies to mitigate risks and capitalize on periods of economic growth. Future

research could build upon these findings by exploring the role of additional factors, such as political stability or global economic events, in influencing the returns of commercial banks in South Africa and other emerging markets.

This study underscores the intricate and evolving relationship between macroeconomic conditions and commercial bank returns in South Africa. The findings provide a foundation for more effective financial planning and risk management, emphasizing the need for a deeper understanding of how macroeconomic variables shape bank performance across different economic cycles. By highlighting the non-linear and regime-dependent nature of these relationships, this research offers a robust framework for stakeholders to enhance the resilience and sustainability of the banking sector in a rapidly changing global economy.

However, the study is not without limitations. The focus was primarily on six major banks and the analysis was restricted to the period from 2002 to 2023, potentially overlooking longer-term trends. Future research could benefit from a broader dataset and an exploration of additional macroeconomic factors to enhance understanding of their impacts on bank returns.

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