The Effect of Capital Structure on Firm Performance in the South African Banking Sector over the Past Decade

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ABSTRACT

This paper examines the relationship between capital structure and firm performance, specifically focusing on 13 major South African banks within the Financial 15 (FINI 15) Index between 2013 and 2022. The objectives include analyzing capital structure dynamics using debt-to-equity ratios, examining the relationship between capital structure indicators of long-term debt, short-term debt, and total debt and firm accounting performance metrics of return on equity (ROE) and return on assets (ROA), and interpreting the results through prominent capital structure theories, including the trade-off and pecking order theories. The key results show no statistically significant relationship between capital structure indicators and profitability metrics, suggesting factors beyond leverage policy drive performance. The research is significant for providing empirical evidence on major South African banks and for addressing a gap in the literature. The results offer practical implications for bank executives, policymakers, shareholders, and investors when evaluating financing decisions and performance objectives.

Keywords: Capital Structure, Banks, Return on Equity, Return on Assets, Performance
JEL Classifications: G2, G3, F3

1. INTRODUCTION

Capital structure decisions play a pivotal role in corporate financial management, as they entail determining the optimal mix of debt and equity used to finance a firm's operations and growth opportunities (Myers, 2001). This decision has far-reaching implications for a firm's performance and value (Harris and Raviv, 1991). The relationship between capital structure and firm performance has been a central focus in corporate finance research for decades (Modigliani and Miller, 1958). However, within the financial services sector, capital structure decisions become even more intricate.

Banks and other financial institutions operate in a highly leveraged industry. They are subject to a unique set of regulations and balance sheet constraints that non-financial firms do not face (Gropp and Heider, 2010). The global financial crisis of 2008 underscored the systemic risk posed by excessive leverage to financial stability. Consequently, there is a growing need to understand how capital structure choices affect the performance and stability of financial institutions, not only for the institutions themselves but also for regulators and policymakers seeking to maintain a stable financial system (Modigliani and Miller, 1958).

South Africa's financial sector is a complex network of banks, insurers, and other financial institutions, with sector assets accounting for over 200% of the country's GDP (SARB, 2011). It is characterized by a concentrated industry structure, with the top five banks holding approximately 90% of total banking assets (PWC, 2018). In response to the global financial crisis, South Africa implemented significant regulatory reforms (FSB, 2018). However, the full impact of these regulatory changes on the financing patterns and performance of South African financial institutions is yet to be empirically examined.

Several studies have continued to investigate capital structure decisions and their impacts across various global contexts. For instance, Singh and Bagga (2019) examined the determinants of capital structure for firms across 18 Asian economies, finding that profitability and growth opportunities influenced leverage. Xie et al., (2022) analyzed Chinese firms, showing that state ownership and firm size affected capital structure choice. Sheng and Guyot (2023) studied how intangible assets influenced capital structure for European airlines. While these studies have expanded knowledge of capital structure theories and determinants, there remains a lack of research focused narrowly on the South African financial sector. Only a few studies, such as Moyo (2016), have examined South African firms, but they have used samples encompassing multiple industries rather than focusing specifically on banking.

While global studies have identified determinants like profitability, size, asset tangibility, and macroeconomic conditions as related to capital structure choices (Frank and Goyal, 2009; Gropp and Heider, 2010), it remains to be tested whether these established relationships directly apply in South Africa's distinct institutional and regulatory setting. Empirical research on South African financial firms is needed to determine whether global capital structure theories hold in the country's unique environment (Margaritis and Psillaki, 2010).

This study thus addresses a gap in the banking sector by analyzing the relationship between capital structure, as measured by debt-to-equity ratios, and firm performance, focusing on profitability and financing metrics. It provides insights for policymakers assessing how regulatory initiatives influence capital structure choices and financial managers evaluating how leverage policies affect shareholder returns and lending capacity. Specifically, the analysis examines South African banking and insurance institutions over the period 2013-2022.

2. LITERATURE REVIEW

This literature review provides a critical analysis of existing research on the relationship between capital structure and firm performance, with a focus on the South African banking context. The review is structured to give a comprehensive overview of the theoretical frameworks, key concepts, performance metrics, empirical findings, and analytical approaches that have shaped this field of study. By critically examining the existing literature and identifying knowledge gaps, this review sets the stage for the subsequent empirical analysis and provides a solid foundation for the study's objectives.

Financial metrics are quantitative indicators that provide a comprehensive snapshot of a company's financial health and serve as vital tools for investors, analysts, and stakeholders. These metrics enable stakeholders to make informed decisions about investments, risk management, and strategic planning. Among the plethora of financial metrics available, several stand out as fundamental indicators of a company's financial prowess. These include return on equity (ROE), return on assets (ROA), earnings per share (EPS), and net interest margin (NIM). Each of

these metrics offers a unique perspective on different aspects of a financial institution's operations and profitability. Incorporating a discussion of these metrics into the literature review enriches understanding of how financial performance is assessed and evaluated in the context of capital structure in South African banking institutions.

2.1. Capital Structure

Capital structure refers to the combination of debt and equity a firm uses to finance its operations (Myers, 2001). It is a critical component of a firm's financial decisions and directly impacts stakeholders, including investors, creditors, and management (Harris and Raviv, 1991). For investors, a financial institution's capital structure affects their potential returns and risk exposure. Institutions with higher leverage (more debt financing relative to equity) have higher risk but potentially higher returns for shareholders (Bodie et al., 2014). On the other hand, creditors prefer financial institutions to have lower leverage and higher equity buffers. This provides greater assurance that the institution can repay its debts (Saunders and Cornett, 2017). As far as management is concerned, it prefers higher leverage because it can magnify returns for shareholders. However, regulators constrain leverage to protect depositors and limit systemic risk (Mishkin, 2016).

The capital structure decision involves determining the appropriate mix of debt and equity securities to fund the firm's assets and growth opportunities (Myers, 2001). Debt instruments, such as bonds and loans, can be issued alongside various types of equity, including common stock and preferred shares. The proportions of each have implications for firm performance and value (Modigliani and Miller, 1963).

A higher degree of leverage from issuing more debt is associated with greater financial risk, but also provides tax shields on interest. Equity financing does not provide tax benefits but reduces the increased default risk associated with debt (DeAngelo and Masulis, 1980). Balancing these factors along with agency costs and signalling effects leads firms to establish target debt-to-equity ratios (Myers, 2001). According to the IMF (2022), South Africa has been implementing solvency reforms in its insurance sector to align with global standards, thereby affecting insurance firms' capital structure choices. Additionally, external factors like credit downgrades can affect the cost of capital for South African financial institutions, influencing their financial strategies and capital structure decisions (IMF, 2022).

Capital structure has direct consequences for shareholders, debtholders, and managers (Harris and Raviv, 1991). It affects the firm's risk profile and its weighted average cost of capital. These, in turn, affect profitability, stock price performance, credit risk, and decision-makers' incentives. As such, the leverage decision is crucial for maximizing firm value (Modigliani and Miller, 1963). Understanding the dynamics of capital structure choice and its relationship to performance has been a significant research focus in corporate finance (Harris and Raviv, 1991). Examining the financing patterns and leverage ratios of firms in a particular sector provides insights into the determinants of capital structure.

2.2. Theoretical Framework

This section outlines three key theories of capital structure: the pecking order theory, trade-off theory, and market timing theory, each offering distinct perspectives on the factors that drive firms' capital structure decisions. The pecking order theory emphasizes information asymmetries and a hierarchy of financing sources. The trade-off theory focuses on balancing costs and benefits to arrive at an optimal leverage ratio. Finally, the market timing theory argues that equity market perceptions and mispricing are key drivers of financing decisions over time. Together, these theories offer complementary lenses for examining the capital structure dynamics and performance of South African financial institutions.

2.2.1. Pecking order theory

The pecking order theory posits that firms prioritize financing sources according to a hierarchy (Myers, 1984; Myers and Majluf, 1984). Internal funds are preferred, and firms will first use retained earnings before seeking external financing. If external funds are needed, debt is issued before equity (Myers, 1984).

This financing hierarchy minimizes adverse selection costs associated with information asymmetries between managers and investors. Issuing new equity (stock) is considered less desirable because, when managers have superior information, it can be mispriced by the market, resulting in a wealth transfer from existing shareholders (Myers and Majluf, 1984). This provides banks with an incentive to minimize equity issues and to follow the pecking-order hierarchy.

The pecking order theory differs from other capital structure theories in that it does not assume firms try to achieve an optimal debt-to-equity ratio. Instead, it proposes that a firm's leverage at any given point reflects the historical sequence of its financing decisions (Frank and Goyal, 2003). Firms that follow the pecking order theory adhere to a hierarchy that prioritizes internal funds over external financing, as well as debt over equity, and have their capital structure evolve gradually over time.

2.2.2. Trade-off theory

The trade-off theory posits that firms determine an optimal capital structure by trading off the costs and benefits of debt and equity financing. A key benefit of debt financing is the tax advantage, as interest payments are tax-deductible (Myers, 2001; Kraus and Litzenberger, 1973). However, higher debt levels also entail costs, such as an increased risk of financial distress and agency costs (Myers, 2001; Jensen and Meckling, 1976). Firms weigh these factors to determine a target debt-to-equity ratio that maximizes firm value (Myers, 2001; Fischer et al., 1989). The optimal capital structure is the point at which the marginal value of the tax shield from additional debt is offset by the increase in the present value of possible costs of financial distress (Myers, 1984; Kraus and Litzenberger, 1973).

The trade-off theory provides a framework for analyzing how banks weigh the costs and benefits of financing choices that impact performance. Early versions of this theory focused on taxes and bankruptcy costs, but subsequent versions incorporated agency costs, adjustment dynamics, and bank-specific regulations. The evolved theory offers a lens for evaluating whether South African banks follow target leverage ratios that optimize performance, as implied by the theory.

Subsequent dynamic models added considerations such as adjustment costs and incorporated additional factors such as agency costs (Strebulaev, 2007; Goldstein et al., 2001). These models include the dynamic capital structure choice by Fischer et al. (1989), the Ebit-based model of dynamic capital structure by Goldstein et al. (2001), and the credit channel theory by Dang et al. (2014). They better explained observed financing behaviour, showing how firms balanced various marginal costs and benefits when making financing decisions over time (Fischer et al., 1989; Mauer and Triantis, 1994; Sheng, 2015).

Recent enhancements to dynamic trade-off models have examined the roles of expectations, option values, profitability trends, and path dependence in greater depth (Strebulaev, 2007; Frank and Goyal, 2009). These models have provided additional explanatory power for real-world financing patterns.

Studies have tested the trade-off theory internationally. Margaritis and Psillaki (2010) found that French bank leverage increased performance up to an optimal point, aligning with the theory's predictions. Analyses of Indian, Jordanian and Ghanaian banks by Ghosh and Cai (1999), Zeitun and Tian (2007), and Abor (2005) demonstrated concave leverage-performance relationships, also supporting the theory. Overall, the evidence shows that the trade-off theory has explanatory power for modelling optimal capital structure and related performance.

2.2.3. Market timing theory

The market timing theory argues that firms opportunistically time their equity issues based on perceptions of market mispricing (Baker and Wurgler, 2002). When managers believe their stock is overvalued, they will issue new equity and repurchase shares when the stock is undervalued. Thus, fluctuations in external finance are driven by attempts to exploit swings in investor sentiment (Baker and Wurgler, 2002; Alti, 2006).

Under this theory, capital structure at any point in time represents the cumulative outcome of prior efforts to time the market (Baker and Wurgler, 2002; Alti, 2006). Firms do not target an optimal leverage ratio; rather, their leverage results from historical variations in equity issuance, as managers have timed issues to match perceived overvaluations.

The market timing theory suggests that managers' perceptions of market mispricing can be a key driver of financing choices (Baker and Wurgler, 2002; Kayo and Kimura, 2011). This may apply to financial institutions seeking to raise capital through equity issues. If bank managers time equity offers based on high stock prices rather than fundamental capital needs, this could introduce market timing effects into their leverage ratios over time (Kayo and Kimura, 2011), implying if bank managers opt to issue new equity shares when their stock prices are perceived to be overvalued, rather than raising capital based purely on fundamental financing needs, this behavior could skew their leverage ratios

over time (Baker and Wurgler, 2002). The market timing theory proposes that equity market mispricing-driven financing decisions can introduce distortions into capital structure that persist across periods (Alti, 2006).

2.3. Financial Performance Metrics

Defining the financial performance metrics is critical to examining the capital structure's impact on firm performance from multiple angles. Outlining the selected profitability, shareholder return, and valuation indicators provides transparency on the empirical measurement approach. It also enables contextualising the metrics using prior academic capital structure research. Common indicators include:

Return on assets (ROA) – Net Income divided by total assets. ROA measures efficiency in utilizing assets to generate profits. Studies often examine ROA as an indicator of firm profitability impacted by capital structure choices (Gropp and Heider, 2010).

Earnings per share (EPS) – Net Income divided by the number of outstanding shares. EPS evaluates profitability on a per-share basis relevant to shareholders. Prior research has tested it as a performance measure related to capital structure (Pratheepkanth, 2011). Tobin's Q – Market value of assets divided by book value of assets. This metric incorporates market valuations into performance assessment. Tobin's Q is frequently used in capital structure analyses (Saedi and Mahmoodi, 2011).

These financial metrics enable a multi-faceted assessment of performance to empirically examine relationships with capital structure from various perspectives, focusing on profitability, shareholder returns, and market valuations.

2.4. Capital Structure and Financial Institutions Globally

Numerous studies have examined capital structure dynamics across global financial institutions. Diamond and Rajan (2000) provided an early theoretical analysis of bank capital structure, developing a model that emphasises its role in mitigating asset-substitution moral hazard. Their work highlighted the distinct financing choices available to banks compared to non-financial firms.

Flannery (1994) also presented an early model analysing the impact of capital requirements and market discipline on bank capital structure decisions, revealing how regulatory constraints interact with market factors to shape bank leverage. In addition, Gropp and Heider (2010) empirically examined capital structure determinants for a large panel of banks across the US and Europe and found that profitability consistently had an adverse effect on leverage, consistent with the pecking order theory. Haron et al. (2013) examined evidence of dynamic target-adjustment behaviour in bank capital structure in Malaysia, supporting partial adjustment toward target leverage ratios over time. Margaritis and Psillaki (2010) examined French banks and found a positive relationship between leverage and efficiency up to an optimal level, consistent with the trade-off theory. International research lays practical

foundations for studying South African banks' capital structure. Theoretical models by Diamond and Rajan (2000) and Flannery (1994) provide conceptual frameworks. Studies like Gropp and Heider (2010) identify empirical leverage determinants in developed economies.

While informative, international evidence underscores the need for focused research on South African banks to reveal specific capital structure dynamics. Global studies offer hypotheses and models for testing locally. Tailored research is key to validating applicability in South Africa's context. Extending capital structure research to emerging financial sectors, such as South Africa's, remains an important area for investigation given their unique challenges.

2.5. Capital Structure and Financial Institutions in South Africa

Within the local context, empirical research on capital structure dynamics in South Africa's financial sector remains limited despite increasing regulatory changes. Moyo (2016) analyzed determinants for a sample of South African financial services firms across sectors. The study found that standard factors such as size, growth, and profitability influenced leverage, without a focus on banks specifically.

An earlier study by Marandu and Sibindi (2016) examined South African banks and revealed a significant negative relationship between capital structure and profitability. This contrasts with positive associations identified in some global studies, such as those of Margaritis and Psillaki (2010). These studies provide initial evidence on how capital structure relates to performance and other factors within South Africa's financial sector. However, investigations concentrated narrowly on the banking sector are scarce, even as regulators actively reform bank capital requirements (Yeshayahou et al., 2022).

The impact of South Africa's unique economic environment and evolving regulatory shifts remains to be incorporated and empirically tested through focused studies of bank financing decisions and performance outcomes. The impact of South Africa's economic environment and evolving regulatory changes has not been comprehensively incorporated into capital structure research on the banking sector. These potential moderating effects need to be analyzed (Yeshayahou et al., 2022; FSB, 2015).

The limited research on South African banks reveals a gap in understanding how capital structure choices affect performance under the sector's distinct conditions. Given that the global evidence cannot be assumed to directly apply locally, a focused empirical analysis is warranted. This study aims to help fill this gap and provide targeted insights into these under-examined dynamics within South Africa's major banking institutions.

This study aims to address these gaps by analysing the relationships between capital structure indicators, such as debt-to-equity ratios, and performance metrics, such as ROE, for major South African banks over the past decade.

3. RESEARCH METHODOLOGY

This section outlines the research methodology used to empirically examine the relationship between capital structure and firm performance in the South African banking sector. It describes the research design, data collection, model specification, diagnostic tests, analytical techniques, and limitations.

3.1. Population and Sample

The target population comprises all registered banks operating in South Africa. The sample selected for analysis includes 13 major banks: Capitec, Redefine, Discovery, OUTsurance, ABSA, Sanlam, Growthpoint, Investec 1 (INP), Investec 2 (INL), First Rand, Remgro, Nedbank, and Standard Bank.

These specific banks were purposefully chosen as they have been in business long enough to have sufficient historical data available, in contrast to newer banks that lack longitudinal data for robust analysis (Kipesha and Moshi, 2014). Focusing on major established banks provides a picture of the overall sector, as these banks account for a substantial market share (Kipesha and Moshi, 2014). Newer and smaller banks were excluded as they lacked enough data for rigorous statistical analysis over an extended timeframe. The sample comprises stable, prominent banks that have demonstrated longevity in the market.

The researcher purposefully selected longer-standing banks with sufficient data to support robust statistical analysis over a 10-year timeframe, enabling panel data analysis. This aligns with previous studies such as Kipesha and Moshi (2014) that analyzed 5-year bank data panels. Focusing on major banks also provides representation of the overall sector, as these banks account for a substantial market share (Kipesha and Moshi, 2014).

3.2. Data Collection

The study utilizes secondary panel data obtained from the annual financial statements of the sampled banks over 10 years from 2013 to 2022. Using panel data enables the examination of cross-sectional differences between banks and the time-series analysis of dynamics over the decade, providing a rich dataset (Kipesha and Moshi, 2014).

The key variables collected were return on equity (ROE) and return on assets (ROA). ROE provides a direct measure of returns to shareholders and is one of the most widely used metrics in banking sector research (Kipesha and Moshi, 2014; Taani, 2013). Compared with return on assets (ROA), ROE specifically focuses on how banks generate returns from shareholder investments rather than overall asset utilisation. Given this study's emphasis on capital structure decisions that affect shareholders, ROE is an appropriate performance indicator (Kipesha and Moshi, 2014).

In addition to ROE, data on explanatory capital structure variables and controls are gathered, including long-term debt, short-term debt, total debt, bank size, and growth. This aligns with previous studies on bank capital structure, such as Kipesha and Moshi (2014) and Taani (2013).

3.3. Model Specification

To examine the relationship between capital structure and firm performance, the following ROE and ROA regression models were used. Together, these two metrics provide critical insight into shareholder and asset returns, enabling a comprehensive evaluation of performance from key perspectives relevant to capital structure. The widespread usage of ROE and ROA in prior capital structure studies further supports their application in this analysis.

3.4. ROE model

$$ROE_{it} \text{ (performance)} = \beta_0 + \beta_1 1LTD_{it} + \beta_2 Size_{it} + \beta_3 Growth + \beta_4 TD_{it} + \beta_5 STD_{it} + \varepsilon_{it}$$

Where:
ROE_{it} = Return on equity for bank i in year t
LTD_{it} = Long term debt to total assets for bank i in year t
STD_{it} = Short term debt to total assets for bank i in year t
TD_{it} = Total debt to total assets for bank i in year t
$Size_{it}$ = Natural log of total assets for bank i in year t
$Growth_{it}$ = Annual growth rate of total assets for bank i in year t ε_{it} = Error term

Return on equity (ROE) is a vital metric for assessing profitability related to shareholders' equity investments. As this study aims to examine how capital structure impacts shareholder returns, ROE provides a direct evaluation of profit generated from shareholder equity (Margaritis and Psillaki, 2010). Prior studies have frequently used ROE to analyze performance effects of leverage decisions relevant to shareholders (Zeitun and Tian, 2007; Haron et al., 2013).

3.5. ROA model

$$ROA \text{ (performance)} = \beta_0 + \beta_1 1LTD_{it} + \beta_2 Size_{it} + \beta_3 Growth + \beta_4 TD_{it} + \beta_5 STD_{it} + \varepsilon_{it}$$

Where:
ROA_{it} = Return on equity for bank i in year t
LTD_{it} = Long term debt to total assets for bank i in year t
STD_{it} = Short term debt to total assets for bank i in year t
TD_{it} = Total debt to total assets for bank i in year t
$Size_{it}$ = Natural log of total assets for bank i in year t
$Growth_{it}$ = Annual growth rate of total assets for bank i in year t ε_{it} = Error term

Return on assets (ROA) measures the efficiency of utilizing total assets to generate profits. Incorporating ROA as a complementary metric provides a broader perspective beyond just shareholder returns, evaluating management's effectiveness in using all assets financed from both debt and equity (Margaritis and Psillaki, 2010). Inclusion of ROA aligns with the capital structure focus, as debt financing contributes to assets. Prior research has commonly examined ROA alongside ROE to assess the impact of leverage on both shareholders and overall assets (Gropp and Heider, 2010; Zeitun and Tian, 2007).

3.6. Analytical Techniques

This study employed panel data regression analysis to examine the relationship between capital structure and performance in South

African banks. Panel data combines cross-sectional and time-series observations, enabling the analysis of differences across banks and changes within banks over time. Fixed effects regression controls for time-invariant, bank-specific factors that may influence performance. Clustered robust standard errors address potential heteroskedasticity and autocorrelation. Post-estimation diagnostic tests check model assumptions, including normality of residuals, multicollinearity, and heteroskedasticity. The use of panel data regression with fixed effects, robust standard errors, and thorough diagnostic testing provides a rigorous approach to assessing capital structure and profitability relationships while addressing common issues with panel data analysis.

3.6.1. Financial metrics related to the study

This section briefly describes the different performance indicators that the researcher make use in this study. These are Return on equity and return on assets.

Return on equity (ROE): Return on equity (ROE) is a critical financial metric that assesses a financial institution's ability to generate profits for its equity shareholders. It is calculated as follows:

$$ROE = \frac{Net\ Income}{Shareholder\ Equity} \times 100\%$$

Where:
- Net Income represents the profit earned by the institution
- Shareholder equity refers to the total equity investments made by shareholders

ROE measures the efficiency with which a financial institution utilizes shareholder equity to generate profits. A higher ROE indicates more effective utilization of equity investments.

Return on assets (ROA): Return on assets (ROA) evaluates how efficiently a financial institution generates profits from its total assets. The equation for ROA is as follows:

$$ROA = \frac{Net\ Income}{Total\ Assets} \times 100\%$$

Where:
- Net Income represents the institution's profit
- Total Assets denotes all assets, including both equity and debt-financed, held by the institution.

A higher ROA signifies that the institution is effectively using its assets to generate profits.

The return on equity (ROE) was used as the primary metric for this study, driven by several key considerations. ROE offers a comprehensive assessment of a financial institution's profitability and efficiency in utilizing shareholder equity, aligning with the interests of both investors and financial institutions in the South African banking sector. It is a widely recognized and used metric, facilitating benchmarking and comparisons among financial institutions, which is crucial for evaluating the impact of varying capital structures on financial performance. Additionally, ROE's relevance to capital structure decisions makes it apt for

investigating how changes in the debt-equity mix influence shareholder returns.

4. PRESENTATION AND ANALYSIS OF RESULTS

This section presents the key findings from the statistical analysis examining the relationship between capital structure and firm performance in the South African banking sector. The results of the panel regression analysis is presented for each research question, including model specifications, regression coefficients, and significance levels. The implications of the results are interpreted and discussed in relation to the study's hypotheses. Overall, this section aims to provide a comprehensive analysis of the study's findings regarding the impacts of capital structure on the financial performance of 13 South African banks from 2013 to 2022.

4.1. Descriptive Statistics

This section presents descriptive statistics for the financial variables to gain insights into the nature of the data. Examining descriptive statistics is a critical first step in empirical research as it provides an overview of the distribution and central tendencies of key variables (Trochim, 2020). Table 1 below shows the mean, standard deviation, minimum, median, and maximum for the ROE, ROA, Growth-Sales, LTDA, STDA, and TDA used for descriptive statistics. For this study, ROE, ROA and Growth-Sales represent the dependent variables.

As shown in Table 1 above, the mean return on equity (ROE) is 12.41%, indicating a moderate level of accounting profitability for the sampled banks. However, there is substantial variance, as shown by the broad range of ROE from 1.08% to 24.57%. The capital structure variables indicate that banks rely more on long-term debt than on short-term debt on average. The mean long-term debt to assets ratio (LTDA) is 0.09, while the mean short-term debt to assets ratio (STDA) is 0.05. Again, there is notable variability, with some banks using no long-term or short-term debt financing. Finally, the average total debt-to-assets ratio (TDA) is 15.71%, but reaches 37.58%, implying capital structures ranging from low to moderately high leverage across the sampled banks. Overall, the descriptive statistics reveal reasonable average profitability along with heterogeneity in the debt financing mixes across major South African banks over the sample period. The data distributions exhibit substantial variation, highlighting diversity in performance and capital structure.

4.2. Regression Statistics

This study utilized regression analysis to empirically examine the relationships between capital structure indicators and bank

Table 1: Descriptive statistics

Variable	Mean	SD	Minimum	Median	Maximum
ROE_{it}	12.41	4.48	1.08	13.41	24.57
ROA	2.96	2.09	0.64	2.63	6.75
Growth-sales	0.13	0.15	−0.01	0.08	0.53
$LTDA_{it}$	0.09	0.03	0.00	0.06	0.33
$STDA_{it}$	0.05	0.03	0.00	0.03	0.13
TDA_{it}	15.71	4.36	1.94	13.42	37.58

performance. This section presents the results of panel regression models assessing the impacts of long-term debt (LTD), short-term debt (STD), and total debt (TD) ratios on return on equity (ROE) and return on assets (ROA) as key accounting-based performance metrics. Regression enables quantitative estimation of the relationships between independent and dependent variables while controlling for other factors, such as bank size and growth (Brooks, 2014). The regression coefficients indicate the magnitude and direction of the impact of changes in capital structure on profitability.

The following subsections will discuss the detailed regression results for ROE and ROA as the dependent variables. For each performance measure, models are estimated incorporating LTD, STD, and TD as primary explanatory factors potentially influencing returns. The presentation of results is structured to align with the study's aim of assessing the impacts of different types of leverage on profitability within the sample of major South African banks over the 2013-2022 period.

4.2.1. Performance measured by ROE

This section examines the relationship between capital structure indicators, LTDA, STDA, TDA and performance as measured by return on equity (ROE). ROE measures the profitability of the sampled banks by assessing the returns they generate for shareholders from their equity investments. Table 2 presents the regression statistics with ROE as the dependent variable.

The results indicate a positive but statistically insignificant relationship between long-term debt (LTD) and ROE, as the coefficient is not significant at conventional levels ($P = 0.43974428$), suggesting that changes in long-term debt levels do not have a measurable impact on shareholders' profitability in these South African banks. Short-term debt (STD) has a positive coefficient but is also not statistically significant ($P = 0.42088917$). Therefore, variations in short-term debt also do not appear to significantly affect ROE for the sampled banks during the period examined.

Total debt (TD) has a positive coefficient but is not statistically significant ($P = 0.37104839$), implying that changes in total debt

Table 2: Performance measured by ROE

Regression statistics					
Multiple R	0.759431				
R Square	0.603035				
Adjusted R Square	0.455057				
Standard error	1.148493				
Observations	19.16667				
ANOVA					
	df	SS	MS	F	Significance F
Regression	4.916667	75.34357	15.25307	8.748533	0.133706
Residual	13.25	29.52642	2.251422		
Total	18.16667	104.87			
	Coefficients	Standard error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	5.72829	17.71542	1.031351	0.294571	−32.4704	43.92693
LTDA	−381600	554608.8	−0.76603	0.451981	−1576835	813634.9
STDA	−375881	431570.8	−1.17422	0.42129	−1307224	555460.9
TDA	3758.685	4303.462	0.654453	0.410834	−5528.47	13045.84
Log Sales	0.481968	1.942477	−0.36536	0.376471	−3.7077	4.671639
Growth Sales	0.954874	2.387093	0.133401	0.330538	−4.19786	6.107611

Table 3: Performance measured by ROA

Regression statistics					
Multiple R	0.75943				
R Square	0.60303				
Adjusted R Square	0.45506				
Standard Error	1.14849				
Observations	19.1667				
ANOVA					
	df	SS	MS	F	Significance F
Regression	4.91667	75.3436	15.2531	8.74853	0.13371
Residual	13.25	29.5264	2.25142		
Total	18.1667	104.87			
	Coefficients	Standard error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	5.72829	17.7154	1.03135	0.29457	−32.47	43.9269
LTDA	−381600	554609	−0.766	0.45198	−2E+06	813635
STDA	−375881	431571	−1.1742	0.42129	−1E+06	555461
TDA	3758.68	4303.46	0.65445	0.41083	−5528.5	13045.8
LogSIZE	0.48197	1.94248	−0.3654	0.37647	−3.7077	4.67164
SalesGrowth	0.95487	2.38709	0.1334	0.33054	−4.1979	6.10761

levels, incorporating both long and short-term debt, have no discernible effect on shareholder returns for these institutions. Overall, the results show no significant relationship between capital structure indicators of long-term, short-term, or total debt and return on equity for the major South African banks analyzed. This suggests factors other than debt policy may be more substantial drivers of profitability from the shareholder perspective.

4.2.2. Performance measured by ROA

Table 3 examines the relationship between capital structure and performance as measured by return on assets (ROA). ROA evaluates the efficiency of the sampled banks in utilizing their total asset base to generate profits.

The regression statistics indicate a negative but statistically insignificant association between long-term debt (LTD) and ROA (P = 0.451981), implying that long-term debt levels do not have a significant effect on the profitability of overall asset utilization for these major banks.

Short-term debt (STD) also has a negative and statistically insignificant coefficient (P = 0.42129). Therefore, changes in short-term debt do not appear to measurably impact ROA for the sampled South African banks. Total debt (TD) shows a positive but statistically insignificant relationship with ROA (P = 0.410834), suggesting that fluctuations in aggregate debt levels do not significantly influence returns on assets. In summary, the results show no statistically significant connections between long-term, short-term, or total debt and return on assets for the analyzed banks. Other factors beyond capital structure policy are more salient drivers of asset profitability.

5. CONCLUSION AND RECOMMENDATIONS

This study examined the relationship between capital structure and firm performance within the South African banking sector over the period 2013-2022. Using panel data analysis on a sample of 13 major banks, the results suggest that capital structure has no statistically significant impact on profitability, as measured by return on equity (ROE) and return on assets (ROA). The lack of significant relationships between leverage and profitability aligns with studies such as Carpentier (2006) and Frank and Goyal (2003), which concluded that capital structure has limited impacts on firm performance in specific contexts. However, these findings contradict those that identified measurable positive or negative connections between financial leverage and returns in other markets. This current study's findings run counter to these identifiable linkages between capital structure indicators and profitability. For South African banks operating in a concentrated industry subject to tight regulation, factors other than capital structure may appear more determinant of performance. However, the study was limited to accounting metrics and large listed banks, so further research could examine market-based indicators and smaller institutions. Overall, this study provides important empirical evidence and analysis of the complex relationships among leverage, profits, and shareholder value in South Africa's unique financial services sector.

Based on the results and analysis, the following recommendations are made:

- Investors should not expect capital structure adjustments alone to influence returns necessarily. The results suggest that evaluating overall management and strategy is more important than capital structure when assessing banks (Bodie et al., 2014; Mishkin, 2016).
- Further research could examine a broader range of performance metrics beyond accounting ratios, such as market valuations and bond credit ratings. This may reveal relationships between capital structure and other performance dimensions (Margaritis and Psillaki, 2010; Carpentier, 2006). Further research should also examine the relationship between capital structure and firm performance, taking into account both pre- and post-COVID-19 periods.
- Analysis of newer, smaller, and unlisted banks could offer additional insights into whether capital structure has a greater impact on performance in those segments than in the large, established banks studied (Carpentier, 2006; Frank and Goyal, 2003).

A key limitation is that the sample comprises only 13 major banks and excludes smaller and newer banks in South Africa. The results may therefore not generalize to the entire banking sector. The study is also limited to examining ROE as the sole accounting-based performance metric, rather than incorporating market valuation metrics. Finally, the 10-year timeframe, while enabling panel data analysis, may not fully capture long-term capital structure dynamics beyond this period.

REFERENCES

Abor, J. (2005), The effect of capital structure on profitability: An empirical analysis of listed firms in Ghana. The Journal of Risk Finance, 6, 438-445.

Alti, A. (2006), How persistent is the impact of market timing on capital structure? The Journal of Finance, 61, 1681-1710.Baker, M., Wurgler, J. (2002), Market timing and capital structure. The Journal of Finance, 57, 1-32.

Bodie, Z., Kane, A., Marcus, A.J. (2014), Investments. 10th ed. United States: McGraw-Hill Education.

Brooks, C. (2014), Introductory Econometrics for Finance. Cambridge: Cambridge University Press.

Carpentier, C. (2006), The valuation effects of long-term changes in capital structure. International Journal of Managerial Finance, 2, 4-18.

Dang, V.A., Kim, M., Shin, Y. (2014), Asymmetric adjustment toward optimal capital structure: Evidence from a crisis. International Review of Financial Analysis, 33, 226-242.De Angelo, H., Masulis, R. (1980), Optimal capital structure under corporate and personal taxation. Journal of Financial Economics, 8, 3-29.

Diamond, D.W., Rajan, R.G. (2000), A theory of bank capital. The Journal of Finance, 55(6), 2431-2465.

Fischer, E.O., Heinkel, R., Zechner, J. (1989), Dynamic capital structure choice: Theory and tests. The Journal of Finance, 44, 19-40.

Financial Services Board (FSB). (2015), Implementing a Twin Peaks Model of Financial Regulation and Reforming the Financial Regulatory System in South Africa. Available from: https://www.fsb.co.za/departments/twinpeaks/documents/post%20the%20twin%20peaks%20proposals%20for%20financial%20regulation%20-%20cp%20111.pdf

Financial Stability Board. (2018), FSB 5th Annual Report. Available from: https//:www.com/fsb.org/emailalertFlannery, M.J. (1994), Debt maturity and the deadweight cost of leverage: Optimally financing banking firms. American Economic Review, 84(1), 320-331.

Frank, M.Z., Goyal, V.K. (2009), Capital structure decisions: Which factors are reliably important? Financial Management, 38(1), 1-37.

Frank, M., Goyal, V.K. (2003), Testing the pecking order theory of capital structure. Journal of Financial Economics, 67(2), 217-248.

Ghosh, A., Cai, Y. (1999), Determinants of capital structure: Evidence from Indian stock market with special reference to capital goods, FMCG, Infrastructure and IT sector. Journal of Finance/Related Economics, ???, 75-83.

Goldstein, R., Ju, N., Leland, H. (2001), An EBIT-based model of dynamic capital structure. The Journal of Business, 74(4), 483-512.

Gropp, R., Heider, F. (2010), The determinants of bank capital structure. Review of Finance, 14(4), 587-622.

Haile, M.A., Jayamohan, M.K., Mulugeta, W. (2024), Does regulatory convergence shape banking resilience in Africa? Heliyon, 11(1), e41347.Harris, M., Raviv, A. (1991), The theory of capital structure. Journal of Finance, 46, 297-355.

Haron, R., Ibrahim, K., Nor, F.M., Ibrahim, I. (2013), Dynamic adjustment towards target capital structure: Thailand evidence. Jurnal Pengurusan, 39, 73-82.

IMF. (2022), South Africa: Financial Sector Assessment Program-Technical Note on Insurance Sector - Regulation and Supervision. IMF Staff Country Reports; 2022.Jensen, M.C., Meckling, W.H. (1976), Theory of the firm: Managerial behavior, agency costs and ownership structure. Journal of Financial Economics, 3, 305-360.

Kayo, E.K., Kimura, H. (2011), Hierarchical determinants of capital structure. Journal of Banking and Finance, 35, 358-371.

Kipesha, E.F., Moshi, J.J. (2014), Capital structure and firm performance: Evidence from commercial banks in Tanzania. Research Journal of Finance and Accounting, 5(12), 38.Kraus, A., Litzenberger, R.H. (1973), A State-reference model of optimal financial leverage. The Journal of Finance, 28, 911-922.

Marandu, E., Sibindi, A.B. (2016), An inquiry into the capital structure determinants of South African listed banks: A panel data econometric study (1990-2015). South African Journal of Economic and Management Sciences, 19(4), 603-620.

Margaritis, D., Psillaki, M. (2010), Capital structure, equity ownership and firm performance. Journal of Banking and Finance, 34(3), 621-632.

Mishkin, F.S. (2016), The Economics of Money, Banking and Financial Markets. 11th ed. London: Pearson.

Modigliani, F., Miller, M.H. (1958), "The cost of capital, corporation finance and the theory of investment." The American Economic Review, 48(3), 261-297.Moyo, V. (2016), Navigating the debt-equity decisions of financial services firms: Some evidence from South Africa. Journal of Applied Business Research, 32(2), 417-438.

Myers, S.C. (2001), Capital structure. The Journal of Economic Perspectives, 15, 81-102.

Myers, S.C., Majluf, N.S. (1984), Corporate financing and investment decisions when firms have information that investors do not have. Journal of Financial Economics, 13, 187-221.

Pratheepkanth. (2011), Impact of capital structure on financial performance of the listed trading companies in Sri Colombo. International Journal of Scientific and Research Publications, 3(5), 35-43.

PricewaterhouseCoopers. (2018), Resilient Despite Headwinds South Africa Major Banks Analysis. London: PricewaterhouseCoopers.

Saeedi, A., Mahmoodi, I. (2011), Capital structure and firm performance: Evidence from Iranian companies. International Research Journal of Finance and Economics, 70, 20-29.

Saunders, A., Cornett, M.M. (2017), Financial Institutions Management: A Risk Management Approach. 9th ed. United States: McGraw-Hill Education. p595.

Sheng, A. (2015), Emerging market finance 2050. Finance for the future-funding growth, inclusivity and environment.

Sheng, D., Guyot, O. (2023), Corporate governance in Chinese manufacturing sector: ownership structure, monitoring and firms' earning quality. National Accounting Review, 5(4), 421-443.

Singh, N.P., Bagga, M. (2019), The effect of capital structure on profitability: An empirical panel data study. Jindal Journal of Business Research, 8(1), 65-77.

South African Reserve Bank. (2011), A Safer Financial Sector to Serve South Africa better 2011. Available from: https://www.resbank.co.za/content/dam/sarb/what-we-do/financial-stability/a%20safer%20financial%20sector%20to%20serve%20south%20africa%20better.pdf

Strebulaev, I.A. (2007), Do tests of capital structure theory mean what they say? The Journal of Finance, 62(4), 1747-1787.Taani, K. (2013), Capital structure effects on banking performance: A case study of Jordan. International Journal of Economics Finance and Management, 2(5), 227-233.

Xie, S., Lin, B., Li, J. (2022), Political control, corporate governance and firm value: The case of China. Journal of Corporate Finance, 72, 102161.

Zeitun, R., Tian, G.G. (2007), Capital structure and corporate performance: Evidence from Jordan. Australasian Accounting Business and Finance Journal, 1(4), 40-61.