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Financial Risk in Cross-Border Mergers and Acquisitions for Southern African Development Community Banks

Sedise Makhura (2119617)

Supervisor: Dr Jacques Totowa

Master of Management in Finance and Investments

Commerce, Law and Management Faculty

ABSTRACT

This study investigates the effect of cross-border mergers and acquisitions on financial risk and bank performance in the Southern African Development (SADC) region, where economic uncertainties are prevalent. Focusing on credit, market, and liquidity risks, the analysis draws on data across 14 bank cross-border mergers and acquisitions between 2002 and 2018. The fixed effects model used in this study revealed statistically significant relationships between performance, measured as the principal component variable of return on equity (ROE) and return on earning assets (ROEA); and specific financial risk factors, particularly non-performing loans to total loans as the credit risk proxy and net loans to total assets as the liquidity risk proxy. Firm size also demonstrated a significant relationship to performance.

Although the aggregate financial risk variable did not present any statistically significant impact on performance, liquidity risk emerged as the decisive factor in determining bank performance. An increased loan-to-asset ratio was associated with deteriorated bank performance, highlighting the importance of managing liquidity risk effectively. These findings suggest that banks in the SADC region involved in cross-border mergers should reassess their risk management strategies and prioritise liquidity and credit risk management to improve performance and ensure operational sustainability in the SADC region.

Keywords: Credit risk, liquidity risk, financial risk, performance, banks, cross-border, mergers and acquisitions.

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LIST OF ABBREVIATIONS

ARDL	Autoregressive distributed lag
BCBS	Basel Committee on Banking Supervision
CBMA	Cross-border mergers and acquisition
CPI	Consumer price index
FDI	Foreign direct investment
FRM	Financial risk management
GDP	Gross domestic product
IMF	International Monetary Fund
LDR	Loan-to-deposit ratio
LGDP	Logarithm of Gross domestic product growth rate for the SADC region
LOG	Logarithm
M&A	Mergers and acquisitions
NAV	Net asset value
NPL	Non-performing loan
OLS	Ordinary least squares
RAROC	Risk-adjusted return on capital
ROA	Return on assets
ROE	Return on equity
ROEA	Return on earning asset
SADC	Southern African Development Community
TL	Total loan
UK	United Kingdom
US	United States
VaR	Value at risk

CHAPTER 1: INTRODUCTION

1.1 Background to the Study

The Southern African Development Community (SADC), comprised of 16 nations, has emerged as an influential and ever-changing powerhouse on the African continent. SADC countries collectively represent a significant portion of the continent's gross domestic product (GDP); the GDP of SADC member countries combined constitutes US$720 billion, demonstrating their potential for growth and development. At the core of this economic vitality lies the region's banking sector, which plays an important role in facilitating commercial activity, investments and financial stability (SADC, 2022).

However, these banks are not impervious to wider globalising forces that have led to a rise in cross-border mergers and acquisitions (CBMA) in recent times. Furthermore, CBMA transactions play a profound role in the objectives of the SADC Regional Indicative Strategic Development Plan (Degbey et al., 2020). The SADC region has highlighted the importance of financial integration which includes CBMA as a measure to enhance the stability and growth of the sector within that region (Degbey et al., 2020).

CBMA deals involving financial institutions have emerged as a dominant trend within international banking as a result of extensive deregulation that has allowed the integration of financial activities. The SADC region is now characterised by economic integration efforts, identifying its capacity as the prime destination for CBMA in the banking sector (Wilson & Bala, 2019). Furthermore, banks in this region are increasingly seeking efforts to expand and collaborate across borders to capitalise on the economic opportunities presented by SADC's integration initiatives (Visagie & Turok, 2021). The deal volume, which reflects the number of CBMA transactions, has indicated steady growth over the years, highlighting the strong appetite for cross-border deals within the region (Hai et al., 2019).

In 2021, CBMA accounted for approximately 40% of all mergers and acquisitions (M&A) deals in the SADC banking sector (Merchantec Capital, 2023). These transactions stem from a multifaceted mix of financial, regulatory and strategic factors that encourage SADC banks to participate in CBMA ventures (SARB, 2021). Despite their importance, these actions are coupled with inherent financial risks that can greatly affect the stability and competitiveness of banks operating in the SADC region.

The work presented in this study investigated the implications of the FRs in CBMA for banks in the SADC region, particularly by looking at their influence on bank performance. Existing literature highlights an emerging peak in CBMA transactions, particularly in the SADC banking sector (Agbloyor et al.,2012).

However, while these opportunities present the appetite for growth and market expansion, they also introduce the complexity of FRs that can significantly impact the involved parties and the broader banking sector (Kioko, Tobias, & Ochieng, 2019; Sathyamoorthi et al., 2020). Similarly, in a study carried out by Kapingura, Mkosana, & Kusairi (2022), the SADC banking sector was shown to have a substantial amount of risk which could negatively impact the solidity of banks operating in this region.

The primary financial risks associated with CBMA encompass market risk, liquidity risk and credit risk (Sathyamoorthi et al., 2020). Credit risk arises from the potential deterioration in the quality of assets following a merger and acquisition. Liquidity risk emerges as a critical consideration in CBMA, as banks may encounter challenges in managing their cash flows and meeting short-term obligations across different jurisdictions (Sathyamoorthi et al., 2020). Market risk, stemming from fluctuations in interest and exchange rates, poses significant challenges to banks operating in multiple markets within the SADC region (Jefferis, 2007).

1.2 Overview of the Cross-border Mergers and Acquisition Landscape in the South African Development Community's Banking Sector

Financial services providers have been growing their footprint significantly across the African continent (Mpofu, 2022; Barka et al., 2023). This trend is driven by several factors, including the need to harness synergies, expand cross-border market access and tap into emerging markets with growth prospects (Beck et al., 2014). Over the past decade, the number of cross-border banks has increased rapidly and has resulted in the transformation of banking industries across the continent (Claessens & van Horen, 2014; Beck, 2015).

The SADC banking sector is considered globally competitive compared to its African counterparts; this is a result of the combined effects of better regulations and the adoption of cutting-edge technologies in member countries (van Walleghem, Yildirim, & Mukanya, 2020). Seeking to explore new revenue streams, SADC banks have ventured into M&A transactions across the continent. M&A is a strategic method used to meet their growth targets and reach broader markets.

CBMA has gained a lot of attention in the banking sector, particularly as a component of foreign investments in both developed and emerging markets (Cumming et al., 2023). The goal of this study was to identify and investigate any potential financial risks that are connected to CBMA in the banking industry and their impact on bank performance. Financial risks linked to M&A are of interest because banks facilitate financial transactions, thus, failure to manage these risks could lead to substantial losses or even the collapse of these establishments (Ramabulana & Moosa, 2022).

According to Brownstein, Rosenblum, & Goldfeld (2019), M&A transactions were able to generate a global deal volume of around US$4.2 trillion in 2018 with the banking sector being a significant contributor to this number. Furthermore, the M&A process, specifically in the banking sector, has the potential to expose parties to exacerbated FRs. Hence, Financial risk management (FRM) across banks in emerging markets will transform dramatically as M&As continue to grow across the landscape (Alabi, et al., 2023).

Additionally, the financial risks inherent in M&A can potentially limit the M&A process if financing is required (Vertakova et al., 2021). These risks are made worse in nations with unstable political and economic situations, adding to the challenges faced by banks, such as the case in SADC regions (Erasmus & Makina, 2014). Therefore, a good understanding of the Financial risk measures used in M&A can lead to the development of more effective Financial risk modelling methodologies (Vertakova et al., 2021).

Due to its complexity and high risk of failure, M&A has the potential to collapse and result in the loss of value creation (Zhou et al., 2016). Furthermore, firms that participate in CBMA are faced with challenges and risks that arise from cultural differences, regulations and customer profiles (Shimizu et al., 2004). Despite these risks, M&A activities continue to form a crucial component of corporate investments (Chatterjee & Sing, 2021).

Although there has been a global increase in the number of CBMA from 1985 to 2022 – from 472 deals to 12 000, respectively (Statista, 2023), the majority of the literature that examines how banks manage financial risk during M&A transactions focuses mostly on domestic or Western acquisitions (Cumming et al., 2023). There is a gap for literature that explores CBMA in the African context.

1.3 Problem Statement

The SADC banking sector is increasingly leveraging CBMA as a strategy for growth and competitiveness (Bhana, 1984). However, this introduces banks to significant credit, market, and liquidity risks, which can destabilise both these individual institutions and the broader economy. Unlike the extensively studied banking sectors, where the FRM frameworks are more developed, the impact of these financial risks on the success of CBMA in the SADC context remains underexplored, exposing the vulnerability to this banking sector and raising concerns about the potential longevity of the current approach (Tanna & Yousef, 2019; Batainah, Balushi, & Harthy, 2021; Oyetade & Muzindutsi, 2023).

The dominance of five banks, Standard Bank, FirstRand, Absa, Nedbank, and Investec; controlling nearly 90% of South Africa's banking assets and contributing substantially to GDP, makes the SADC financial system vulnerable to fluctuations in bank performance (Wanke, Maredza, & Gupta, 2017). Poor controls and mismanagement of financial risks in CBMA could result in significant disruptions in the financial markets, threatening the economic stability of SADV regions (Gala, 2023). The nuances of these risks and the absence of FRM frameworks tailored to the specific challenges of the SADC region exacerbate these risks, leaving banks ill-prepared to navigate and address these vulnerabilities (Oyetade & Muzindutsi, 2023). Therefore, this indicates the urgency for research that addresses these vulnerabilities and provides a framework for safeguarding financial stability in the SADC region (Jung, Lee, & & Lee, 2021; Awojobi, 2011).

This study aims to explore the impacted relationship between financial risk and bank performance in in CBMA within the SADC banking sector. By investigating how these risks affect bank performance and overall stability post-transaction, this research seeks to fill the existing gap in the literature and contribute to the development of a financial risk management framework that can help SADC banks manage risk more effectively. Addressing these challenges ensures the long-term sustainability and resilience of the region's banking sector and overall financial system (Zongwe, 2011).

1.4 Research Questions

This study investigated and determined the impact of CBMA on the financial risks of banks and how this affects the performance of banks in the SADC region. The following research questions were formulated:

1. How do specific financial risk factors, including Credit risk, Liquidity risk and Market risk, change in response to cross-border merger and acquisition transactions among SADC banks?
2. To what extent do cross-border mergers and acquisitions impact the financial risk profiles of SADC banks?
3. Do cross-border merger and acquisition transactions impact the individual components of credit, liquidity and market risk in the same way that they do on overall financial risk variables?

1.5 Research Objectives

The purpose of this study was therefore to comprehensively investigate the financial risks associated with CBMA for SADC region banks and to ascertain the dynamic impact of M&A activity on the overall Financial risk profile of these banks, considering the combined effects of Credit risk, Market risk and Liquidity risk as well as accounting for the moderating influence of return on earning assets (ROEAs).

This study holds value by contributing to advancements in the fields of finance, banking, M&A and economic development, with specific relevance to the SADC region. By shedding light on the dynamics of Financial risk in CBMA transactions, this research serves to inform banking executives, policymakers and regulatory authorities about the challenges and opportunities presented by such ventures. Furthermore, the findings in the study can guide the formulation of prudent risk management techniques, strategies and policies, thereby enhancing the resilience and robustness of SADC banks in the global financial landscape.

Thus, this study aimed to achieve the following:

1. To assess the effects of financial risk on the performance of SADC banks involved in cross-border mergers and acquisitions.
2. To establish the influence of cross-border mergers and acquisitions on the relationship between credit, market and liquidity risks and performance in the SADC banking sector.
3. To establish the effect of cross-border mergers and acquisitions on the individual components that make up credit, market and liquidity risks.

1.6 Research Hypotheses

The following hypotheses were formulated for this study:

1. Higher levels of total financial risk experienced by SADC banks are negatively associated with bank performance.
2. Specific risk categories, including credit, market and liquidity risk, individually or in combination, will have significant negative impacts on bank performance.
3. An increase in the non-performing loans to total loans ratio will be negatively correlated with bank performance.
4. Higher levels of the net loans to total assets ratio will negatively affect bank performance.
5. A higher net interest income to total earning assets ratio will be positively correlated with bank performance.

1.7 Chapter Summary

The chapter provides an introduction to the research study, outlining the background, objectives, and significance of investigating the implications of financial risks associated with CBMA for banks in the SADC region. It highlights the growing prominence of CBMA in the SADC banking landscape while acknowledging the financial risks associated with such transactions. These risks, including credit, market, and liquidity risks can impact bank stability and economic prosperity. The chapter emphasizes the research questions, hypotheses, and objectives that guide the study.

The next chapter delves into the existing body of literature on CBMA, Financial risk management, and their interaction in the banking sector. It aims to establish the theoretical framework and provide a foundation for the empirical analysis conducted in subsequent chapters.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

The banking industry plays a significant role in any economy, therefore the financial operating systems thereof must be stably maintained. Moreover, M&A has an impact on the financial stability of banks and such fluctuations in the financial system could potentially render them economically vulnerable in the future (Ngo, 2018).

Tanna & Yousef (2019) contend that previous studies in the field of M&A have historically paid more attention to activities conducted domestically in the United States (US) and United Kingdom (UK) environments (Berger & Humphrey, 1997). Moreover, there is a strong culture of focus on the evaluation of risk and performance in banks that are based in the US and Europe (de Borger, Ferrier, & Kerstens, 1998). Therefore, there is a gap in the focus on African banking that requires exploration, particularly in the SADC region as its banking industry compares largely to that of developed financial markets (Erasmus & Makina, 2014).

Cumming et al. (2023) outlines that banks exert substantial influence on M&A deal outcomes by providing the necessary firm value and possible synergy combinations as well as providing stock recommendations. Banks play a significant role in delivering greater returns to the acquirer (Bao & Edmans, 2011) and lowering acquisition risk premiums (Golubov, Petmezas, & Travlos, 2013).

2.2 Overview of the Southern African Development Community's Banking Sector

Banking is a subsidiary of the overall financial sector. To paint the substantial difference between banks and financial institutions adequately, an investigation of the intermediaries between the services of depositing and lending offered needs to be undertaken (Heffernan, 2005). Banks can generate profit from the interest rate spread between both rates (Heffernan, 2005). Following that, the bank's secondary function is to provide liquidity to its broad company base.

SADC has one of the largest banking industries on the African continent. The total GDP contribution realised by the region accounted for 28.43% of the total African Union GDP in 2022 (Secretariat, 2021). It also consists of one of the most sophisticated banking sectors globally and has the muscle to compete with banking sectors in developed regions.

2.3 Drivers of Cross-border Mergers and Acquisitions in the Southern African Development Community's Banking Sector

Extensive research has been directed towards uncovering the reasons for M&A. Several theories have been adopted in the existing literature to explain the occurrence of M&A. Abdulazeez, Suleiman, & Yahaya (2016) and Osifalujo, Najeem, & Olufemi (2020) investigated the efficiency theory of mergers, which is the model implemented across several studies within the sphere of banking, together with the resource dependency theory (Kandil & Chowdhury, 2014).

The rise of CBMA in the SADC region can be attributed to several key factors (Chege & Njoroge, 2020). One of the major drivers of CBMA in the region is economic integration. The SADC region is committed to economic integration which includes harmonising banking regulations, removing trade barriers and allowing banks to expand their reach across borders (SADC S. A., 2022).

Another key driver of CBMA is the region's market potential. The SADC region is characterised by diverse economies as well as a combination of both emerging and established markets (AfDB, 2022). This allows banks to enter into new and growing markets, broaden their customer base and diversify their operations. Finally, another driving force is increased global competitiveness. Banks in the region are faced with increasing competition from both domestic and international front-ends and this is driving the sector in this region to seek new ways of expanding and improving technologies and capabilities and their efficiency (World Bank, 2022). CBMA is a valuable tool for banks to achieve these objectives.

Investigation of the efficiency theory reveals that M&A is a result of a planned event with the forward outlook of generating potential outcomes for the stakeholders involved, such as the benefits of realisable synergies by combining both the operational and financial activities of two firms (Nguyen, Yung, & Sun, 2012).

When looking at the SADC landscape, particularly in South Africa, it is indicated that the rise in foreign direct investment (FDI) experienced a surge after the 1994 democratic elections (Wilson & Vencatachellum, 2020). The fight for democracy attracted global companies to merge and acquire SADC companies (Wilson & Vencatachellum, 2020). Another reason that was alluded to earlier in this paper is that SADC is perceived as the gateway to the African market, particularly because of its advanced infrastructure and regulations.

Additionally, in their paper, Wilson and Vencatachellum (2020) report that South Africa has participated in over 1 200 M&A transactions between 1991 and 2014 with 59% of those deals occurring in 2014 accounted for by the banking sector. Moreover, a similar pattern is observed in the most recent M&A activity. The value of announced CBMA transactions in 2022 totalled US$11 billion with SADC being the most targeted nation (Deloitte, 2023). A look into the CBMA involving the SADC region reveals that the number of CBMA transactions has been growing steadily over the past 30 years, except for a minor dip in 2020 due to the COVID-19 pandemic (Deloitte, 2023).

Previous literature reveals that in some cases the decision to pursue acquisitions can be fuelled by multiple motives. A clear example is Donaldson & Lorsch (1983), who suggested that acquiring firms will participate in an acquisition or merger activity to enhance their prolonged survival. Moreover, Bowers & Miller (1990) point out that corporate diversification enables firms to achieve a stable operating performance while lowering the risk to human capital.

Erel, Liao, & Weisbach (2012) investigate the reasons behind cross-border mergers and identify that the geography, quality of disclosures and bilateral trade as key properties that influence the outcome of a deal. The outcomes or returns in the event of CBMA deals are influenced by the variation in laws and regulations, corporate governance standards and institutional practices between the parties involved. Furthermore, Bonaime, Gulen, & Ion (2018) support that merger activity is further influenced by the uncertainties involved with policy and political uncertainties. Lastly, Dong & Doukas (2022) document that in successful cross-border deals, there has been a strong link to more efficient acquirers.

2.4 Motivations behind recent Cross-border Mergers and Acquisitions in the SADC region

The SADC region has experienced a surge in the prevalence of M&As across various sectors, driven by diverse strategic motivations (Ellis, Lamont, Reus, & Faifman, 2015). The South African market has cemented it position as the hub of M&A activity across industries, with a number of domestic and international players looking to capitalise on the region’s economic potential.

Deregulation, globalisation and the advancement of technology has changed the banking sector landscape and has reshaped prospects of growth and expansion dramatically. While these

CBMAs have the potential to drive economic growth and collaboration. They play a role in exposing firms to a range of financial risks, particularly in the banking sector.

Sarika & Vasantha (2018) emphasises in the study that financial institutions undergo M&A transactions as a form of expansion into new markets, diversify product portfolio, and enhance competitive positioning within the industry across regions. Furthermore, this strategic approach is prevalent in the SADC context, where CBMAs enable banks to enter new markets and mitigate exposure to financial risks through diversifying revenue streams effectively. Additionally, regulatory advancements are identified as key motivators for CBMAs in emerging markets (Ishwarya, 2019). The diverse regulatory environment in the SADC region provides strategic avenues for banks to navigate regulatory risks in periods of growth and expansion.

Ther merger between Ecobank Ghana Limited and the Trust Bank was aimed at achieving cost optimisation, streamlining operations, and enhancing operational efficiencies (Kwabla-King, 2017). The study examined operational synergies as the primary motivations behind CBMAs as means to mitigate financial risks associated with inefficiencies and operational redundancies. A motive closely linked to this study was also the aspiration to establish market leadership. Furthermore, banks undergo M&As to improve profitability, increase shareholder value, and achieve better financial outcomes (Jallow, 2017). This motive is pertinent in the SADC banking sector, where banks seek to optimise financial performance through the consolidation of resources, cost optimisation, and accessing new revenue opportunities.

2.5 Financial Risks Faced by Banks

Banks are constructed in a way that they are continuously exposed to asymmetrical risk, whether it is CR, financial or operational risks (Mawutor, 2012). Moreover, the Financial risk of a bank is the probability of either a successful or failed transaction as mentioned by Raghavan (2003). Managing risk at a level that minimises the extent of losses and maximises returns increases the probability of achieving a positive outcome (Batainah, Balushi, & Harthy, 2021).

The FRs of M&A are so strongly integrated that inefficiency in a single factor could restrict all the others. The factors that make up Financial risk include pricing risk, financing risk, payment risk and financial integration risk (Jintan & Hongkung, 2012).

FRM, which is aimed at minimising the frequency and extent of risks faced by banks during financing, includes the preventing and lightening modes (Liu, 2010). Liu (2010) highlights that the intention behind preventing and lightening is to ensure that the possibility of the occurrence of risk is minimised significantly and to reduce the degree of consequences of the risk faced, respectively.

Financial risk in the case of M&A arises because of a volume of reasons such as overestimation or underestimation of the firm value and choice of transaction methods. In the case where the acquirer's estimate of the target firm's value is too high, the repayments exceed capacity, leading to the inability to drive competitiveness through the company and ultimately reducing operational performance (Mustafa & Erhabor, 2021).

After the setback caused by the global financial crisis, banks started paying more and more attention to risk (Reddy, 2012). To explore the financial risks faced by a bank, the variable can be further broken down into Credit risk, Market risk and LR. No matter the type of risk, it is realised through four specific steps: identification, analysis, evaluation and management (Reddy, 2012).

Previous literature indicates that Merton's distance-to-default can be used to showcase Credit risk; the overall aspect of financial and investment risk is measured using the value at risk (VaR) model. Although there are insufficient studies regarding M&A and VaR, Fung & Wan (2013) statistically support the link between the Chinese Eastern Airlines merger with Shangai Airlines. However, in the case of this, VaR is not applicable.

2.5.1 Market risk

Market risk arises as a result of a bank's normal daily operations. It is then further broken down into three variables: interest rate risk, commodities risk and foreign exchange rate (Pu & Cheng, 2020). Each of these Market risk elements will have its own driving factors which serve as a reflection of the market conditions. As a result, it is clear that this danger is significant and cannot be eliminated (Pu & Cheng, 2020).

Market risk refers to fluctuations in net asset value (NAV) brought on by the changes in interest rates, exchange rates and equity and commodity prices, among other macroeconomic factors. There is a debate between researchers and financial market analysts on which variables are significant when measuring Market risk (Pyle, 1997). Furthermore, Pyle (1997) advocates the

use of quantitative and econometric methodologies employed by banks in managing market risk.

Warue (2013) panel data analysis examined the influence of systematic and idiosyncratic factors in the banking sector on non-performing loans (NPLs) in Kenya. Panel data were used in this analysis. This investigation demonstrated macroeconomic variables have analytical importance in evaluating bank risk and performance.

2.5.2 Credit risk

In the daily operations and activities of banks that involve lending money, Credit risk is significantly important as the recovery of bank loans is strongly linked to the bank's profitability because the majority of profits realised by banks is generated through interest paid by debtors (Boahene, 2012). In the banking sector, it is evident that a weakened quality of loans offered by a bank impacts the stability of financial institutions, therefore, financial distress in the banking sector is evidence of high exposure to Credit risk (Boahene, 2012; Kargi, 2011; Alshatti, 2015).

Klapo & Ayeni (2012) conducted a study on five Nigerian banks using panel data modelling to recommend the enhancement of capacity on credit analysis in these banks.

2.5.3 Liquidity risk

The sustainability of banking operations is reliant on their liquidity or capacity to pay short-term debts. BIS (2008) sets out clear guidelines for market and credit risk. The assumption that the liquidity risk imposed on banks is varied is supported by a body of existing knowledge. Marozva (2015) carried out a study in SADC that looked at the connection between the liquidity and performance of banks from 1998 to 2014. In that paper, Marozva (2015) details how net interest margin correlates to liquidity by employing the auto-regressive distributed lag (ARADL) approach as well as ordinary least squares (OLS).

2.6 Financial Risk Management and Performance

2.6.1 Financial risk management

In the context of the banking sector, FRM refers to a comprehensive set of processes and instructive policies aimed at creating a solidified risk environment, effective and efficient in

identifying, measuring, mitigating and controlling various financial risks (Awojobi, 2011). The Basel Committee of Banking Supervision further emphasises four critical elements of effectively managing Financial risk – event identification, risk assessment, monitoring and reporting and lastly risk control (Obadire, Moyo, & Munzhelele, 2022). Therefore, given the inherent complexities and diversities associated with banking activities, a general approach to FRM is not adequate. Hence, each institution should actively develop a unique framework tailored to encompass the diversities and needs of that institution (Laurence, 2012).

Effectively managing Financial risk requires constant identification and understanding of the risks associated with both existing and new business activities, encompassing credit, liquidity and market risk (Sathyamoorthi et al., 2020). Continuous identification of risks at both the transaction and portfolio levels is imperative to understanding the exposure to risk at all times.

Once identified, risks must be carefully measured to assess the potential implications on profitability, performance and capital adequacy (Harb et al., 2022). Therefore, accurate and timely risk measurement is essential for effective FRM as it gives institutions a view of current activities and enables institutions to proactively control and monitor risk levels within established limits (Vasile & Croitoru, 2012). Establishing clear risk limits through policies, standards and procedures in CBMA is important in ensuring accountability from all parties involved and also enabling a framework for adhering to risk management objectives (Sathyamoorthi et al., 2020).

Risk mitigation represents a key phase in the FRM process and involves the application of diverse models and tools to minimise exposure (Aven, 2016). Strategies such as diversification, due diligence and hedging can be employed to mitigate the risks associated with banking activities (Rehman et al., 2019). The evolution of FRM in the banking sector is driven by the increasingly large volatility in financial markets, innovative financial instruments and the significant losses faced by institutions lacking robust risk management techniques (de Jongh et al., 2013).

However, the core objective of FRM is not merely to mitigate against the risks associated with banking activities but also to engineer processes that optimise the risk-reward trade-off, ensuring institutions balance their risk appetite with guaranteed potential returns. While FRM practices in the context of the SADC banking sector remain an evolving process, continuous

efforts to adopt and enhance effective risk management methodologies are crucial for ensuring financial stability and building institutional resilience (Alabi et al., 2023).

2.6.2 Performance

A bank's financial performance serves as a key indicator of a bank's ultimate health and effectiveness in utilising its resources to generate profits (Lotto & Papavassiliou, 2019). It encompasses various metrics, including ROE, return on assets (ROA), ROEA, profitability ratios and risk-adjusted return on capital (RAROC). ROE, a widely used metric in existing literature to measure profitability or performance, gauges shareholder value by measuring the return on shareholders' equity investment (Zhang, Yuan, & Zhi, 2017). ROA, on the other hand, evaluates management's efficiency in generating income from available assets, thus indicating effectiveness in the utilisation of resources.

Risk plays a crucial role in influencing performance, with Credi risk, Market risk and Liquidity risk being the major concerns for banks (Abbas, 2014). Credit risk arises from the possibility of borrower default, Liquidity risk stems from funding mismatches and Market risk emerges from fluctuations in the market values of assets and liabilities (Jallow, 2017).

2.7 Relationship Between Basel III and Financial Risk of Banks

Like all business entities, banks face several risks and, in the case of banks, they face system risk which has systemic effects. Basel III reforms were implemented with the idea of accelerating the resilience and robust nature of banks to empower banks and safeguard against shocks arising from financial risks (Laurence, 2012). Consideration of the Basel III framework to alleviate future systemic risks is imperative to understanding banking regulation and stability.

The global financial crisis revealed significant gaps in how risk-weighted assets and capital ratios are calculated (Kasselaki & Tagkalakis, 2013; Anginer et al., 2021). The Basel reforms (I, II, III) are sets of regulations put in place and established for the banking sector by the Basel Committee on Banking Supervision (BCBS) which is a banking supervisory authority that is tasked with governing certain jurisdictions (Ferreira, Jenkinson, & Wilson, 2019).

Before the global financial crisis, there were already initiatives to create a framework of standards to supervise and regulate the operational activities of banks (Dordevic et al., 2021).

Basel I was developed in 1992 with the intent to strengthen banks financially by formulating a capital base that firms would have to maintain. The ultimate mission of Basel I was to enable banks to avoid losses through the maintenance of minimum capital adequacy (Cornford, 2005).

Following the onset of the Basel 1 reforms, Basel II was developed and introduced in 2014 as a framework for banking operations. Moreover, Basel III encourages banks to maintain high capital levels and capital equity holdings (Chockalingam, Dabadghao, & Soetekouw, 2018). With the new Basel III reforms, risk coverage is improved. Lastly, Basel III introduces the global standards for bank liquidity and funding to build the resilience of a bank's profile (Giordana & Schumacher, 2017; Obadire, Moyo, & Munzhelele, 2022).

2.8 Conceptual and Theoretical Concepts Related to Mergers and Acquisitions

2.8.1 Internationalisation theory in mergers and acquisitions

The internationalisation theory demonstrates how companies protect their proprietary information from exploitation by working within the constraints of intermediary product markets that involve the exchange of knowledge and the transportation of raw materials (Buckley & Casson, 1976). By carefully adopting an operational strategy appropriate for their activities, African banks have expanded into international markets (Coetzee, Bezuidenhout, & Mhonyera, 2020). This selection hinges upon optimising their current technological advantage while considering elements such as the feasibility of contract structuring, the uniqueness of assets and the viability of shielding against unlawful behaviour (Coetzee, 2018).

2.8.2 Eclectic theory in mergers and acquisitions

According to the eclectic theory, companies extend their ownership advantage as leverage to gain geographical advantages presented by other nations as a strategy to become international organisations (Dunning, 1988). This takes place when there are inherent benefits of taking these advantages and coordinating operational activities with the company as opposed to just relying on external markets. The internal-based perspectives are centred around the internal capabilities that firms possess to gain a competitive advantage on the global stage (Teece, Pisano, & Shuen, 1997). These core competencies can be applied across different countries as firms expand internationally (Dunning, 1988).

2.8.3 Financial intermediation theory

Financial intermediation theory stands as a cornerstone of economics and finance, highlighting the importance of financial institutions, particularly banks, in channelling funds between savers and borrowers (Bhatia & Khatkhate, 1975). This theory is crucial for dissecting the mechanisms through which banks facilitate such transactions and manage associated risks (Allen & Santomero, 1998).

At its core, financial intermediation signifies the process by which financial institutions, primarily banks, act as conduits channelling funds from surplus units to deficit units (Gertler & Kiyotaki, 2009). Banks and other intermediaries play a key role in collecting deposits, originating loans and offering diverse financial services to facilitate the transfer of funds within the economy (Bongomin et al., 2021). Their key functions include risk transformation, liquidity provision, information asymmetry mitigation and transaction cost reduction (van Nguyen & Lu, 2023).

Within the realm of CBMA in the SADC banking sector, banks play a crucial intermediary role. They facilitate fund transfers, conduct due diligence and structure financing arrangements for both acquiring and target institutions (Beck et al., 2014). Additionally, they assess creditworthiness, evaluate transaction viability and manage associated risks such as Credit risk, Liquidity risk and Market risk. Through financial intermediation, banks enable cross-border investors to access capital markets, navigate regulatory landscapes and execute complex transactions across various jurisdictions within the SADC region (Win, 2018).

However, it is important to acknowledge that opportunities come hand-in-hand with challenges. While financial intermediation enhances capital mobilisation and allocation, it can also generate systemic risks and regulatory burdens (Reddy, 2012). Furthermore, CBMA exposes banks to additional challenges such as currency risk, political instability and cultural disparities, all of which impact transaction outcomes and risk management strategies (Zhou, Xie, & Wang, 2016). Despite these challenges, financial intermediation offers substantial prospects for promoting economic development, fostering regional integration and stimulating investment within the SADC banking sector (Ahmed & Mmolainyane, 2014).

Financial intermediation theory thus provides a robust conceptual framework for comprehending the significance of banks in facilitating CBMA within the SADC banking sector (Boot et al., 2020). Leveraging their intermediary functions, banks contribute

significantly to fund mobilisation, capital allocation and risk management within the regional financial system, thereby driving growth and stability (Levine, 1997; Shah, Wang, & Yasmeen, 2023)

2.8.4 Liquidity preference theory

The liquidity preference theory offers a fundamental framework for understanding interest rate dynamics and the demand for money within an economy (Modigliani, 1944). This theory holds particular relevance to this study, as it sheds light on the factors governing interest rates and liquidity preferences, which significantly influence investment decisions and capital flows (Culham, 2020).

At its core, the liquidity preference theory proposes that individuals and investors hold assets in various forms based on their preferences for liquidity and risk (Stephanson, 1950). Liquidity refers to the ease with which an asset can be converted into cash without incurring significant value loss (Mitchell, 1923). The existing literature argues that individuals naturally desire liquidity and are willing to sacrifice potential returns by holding a portion of their wealth in liquid assets, such as cash and short-term securities, to meet immediate spending needs and unforeseen contingencies (Keating et al., 2016).

The theory suggests an inverse relationship between liquidity preference and the prevailing yield in terms of interest rate determination (Kiyotaki & Moore, 2019). As interest rates rise, the opportunity cost of holding non-interest-bearing assets, such as cash, increases, prompting individuals to reduce their money holdings and seek higher-yielding investments. Conversely, falling interest rates reduce the opportunity cost of holding money, leading to an expansion of money holdings as individuals seek the higher returns offered by alternative assets (Brito & Hartley, 1995).

In this study, the liquidity preference theory implies that interest rate fluctuations can significantly impact investment decisions and capital movements (Tobin, 1958). Lower interest rates stimulate borrowing and investment by reducing the cost of capital, thereby fostering economic activity and facilitating CBMA transactions (Coeurdacier et al., 2009). Conversely, higher interest rates may discourage investment and decelerate M&A activity as borrowing becomes more expensive (Culham, 2020).

Furthermore, liquidity preferences can influence the allocation of funds between domestic and foreign assets, potentially affecting the demand for foreign currencies and altering exchange rates (Andrade & Prates, 2013). Central banks play a crucial role in shaping interest rates and liquidity preferences through monetary policy tools such as open market operations and adjustments to the discount rate and reserve requirements (Kane & Unal, 1990; Nagel & Purnanandam, 2020). Changes in monetary policy can influence liquidity conditions in financial markets, impacting investment behaviour and CBMA activity in the SADC banking sector (Adrian et al., 2018).

2.9 Empirical Research on the Determinants and Markers of Financial Risk

2.9.1 Factors Contributing to Financial risk

Credit risk

The BCSB defines Credit risk as a representation of the potential loss arising from borrower defaults on loans. Credit risk encompasses the potential for loan defaults and non-repayment, thus, presenting a significant threat to bank profitability (Boahene, 2012). A substantial portion of bank earnings relies on interest payments from borrowers, making Credit risk a major concern A study conducted by Klapo & Ayeni (2012) identified Credit risk as the primary concern for banks, attributing financial distress trends to high exposure to this risk. This concern has resulted in an acceleration of numerous studies investigating the effectiveness of Credit risk management and its impact on bank performance (Velliscig, Floreani, & Polato, 2022.

A study conducted by Boahene (2012) employed panel data regression analysis on six large Ghanaian banks; a significant link between robust risk management practices and improved performance emerged from this study. Similarly, another study by Boahene (2012) echoed this sentiment in their study of five Nigerian banks, recommending enhanced credit analysis and proactive loan risk management. Another study examined Nigerian banks' post-regulatory changes; the outcomes demonstrated that improved performance is attributable to effective risk management strategies (Kargi, 2011).

Fanziah et al. (2018) studied Malaysian banks from 2006 to 2011, identifying Credit risk as a major determinant of ROA and ROE, potentially linking it to exposure to high-risk loans and subsequent NPL increases. This aligns with Chukwunulu, Ezeabasili, & Igbodika (2019) who

analysed Nigerian banks and found a negative relationship between NPLs and profitability indicators. Additionally, a study by Adolphus (2018) identified a positive relationship between Credit risk management and profitability in rural-specific contexts, suggesting that the efficient management of Credit risk improves the performance of banks.

Al-Tamimi et al. (2015) examined Jordanian banks, emphasising credit risk, liquidity risk, market risk and capital risks. While identifying relationships with all risk types, the study identified liquidity risk and credit risk as the most prominent contributors to total risk, potentially offering valuable insights for targeted risk management strategies. Ramadan (2018) further delved into Jordanian Islamic banks, finding a positive impact of Credit risk on profitability, aligned with previous research but without significant effects from factors such as bank size, non-interest earnings and management efficiency.

Market risk

The potential losses in NAV as discussed to be arising from key market-driving factors such as cost of borrowing and the prices of stocks and commodities are subsumed within market risk (Pu & Cheng, 2020). To manage this risk, banks employ various mathematical and econometric techniques, with VaR, developed by JPMorgan Chase, being a prominent model used for more than two decades now.

Several studies have also explored the determinants and management of Market risk in banks. A study investigated market risks in commercial banks in Malaysia, emphasising the need for comprehensive Market risk management systems to enhance performance (Zolkifli, Jonar, & Hamid, 2015).

Liquidity risk

Liquidity risk is defined as the ability to meet short-term financial obligations and is an important indicator of a bank's financial health and ongoing viability. Regulatory frameworks such as Basel I, Basel II and Basel III have addressed this critical aspect, with Basel III specifically introducing the liquidity coverage ratio to ensure adequate liquidity reserves (Laurence, 2012).

A study conducted in 2015 explored the complex relationship between liquidity risk and performance in South African banks, finding a negative association between performance and

funding liquidity risk (Marozva, 2015). A study conducted by Sathyamoorthi et al. (2020) examined commercial banks in Botswana and presented findings on the negative impact of liquidity risk and market risk on profitability. Similarly, a paper by Kandil & Chowdhury (2014) reported negative associations between M&A and various financial risks including credit risk, market risk, operational risk and liquidity risk on performance in Islamic banks. These findings suggest the potential benefits of proactive risk management in these regions.

Gweyi, Olweny, & Oloko (2018) conducted a study that investigated deposit-taking savings and credit institutions in Kenya and found that liquidity risk exerts a significant and negative impact on performance. This aligns with broader concerns regarding liquidity management in smaller financial institutions (Brockman & Chowdhury, 1997; Petropoulos et al., 2022).

2.9.2 Predictors of risk in the Banking Sector

NPLs have received significant regulatory attention, particularly under the Basel II Accord, which emphasises strict credit risk management practices (Laurence, 2012). Studies have shown that adhering to this accord and encouraging proactive measures against NPLs, enhances bank performance (Ahmad & Ariff, 2007). This is further evidenced by research indicating a surge in NPLs during banking crises, leading to bank closures and negative impacts on liquidity, credit expansion and real sector growth (Alshatti, 2015).

Neoclassical economic theory and the concept of economies of scale offer insights into the impact of firm size on performance, suggesting that economies of scale can manifest in financial, organisational and technical forms (Awojobi, 2011). Larger firms may benefit from lower interest rates and bulk purchasing discounts (Doğan, 2013). Organisationally, specialisation in specific areas can enhance efficiency. Technically, larger firms can leverage the division of fixed costs across more units. Based on these assumptions, a positive correlation between firm size and profitability is expected (Doğan, 2013).

However, opposing theories suggest a negative relationship, citing diseconomies of scale. This phenomenon may arise when managers prioritise personal objectives over profit maximisation, hindering firm performance (Mustafa & Erhabor, 2021).

The loan-to-deposit ratio (LDR), calculated as net loans divided by total deposits, serves as a liquidity indicator. A higher LDR signifies a decline in liquidity, reflecting heavier loan extensions relative to deposit inflows (Mafu, 2017). While reduced liquidity limits a bank's

ability to meet cash obligations promptly, it can present opportunities for higher profitability through increased interest revenues (Mustafa & Erhabor, 2021).

2.10 Determinants of Bank Performance

Inflation stands as a significant determinant of bank performance, often exhibiting a complex and multifaceted relationship. While loan interest rates and bank income may increase during periods of high inflation; the overall impact is rarely straightforward. Several studies have explored this intricate dynamic, highlighting both potential benefits and challenges for banks operating in inflationary environments (Ramadan, 2018).

Kapingura et al. (2022) identified a dual correlation between rising inflation and bank performance, characterised by both direct and indirect influences. On the one hand, inflation leads to higher prices across various sectors, which can directly translate into increased loan interest income for banks. Kapingura et al. (2022) further emphasise the positive impact of anticipated inflation on profitability, highlighting the ability of banks to adjust interest rates in line with expected inflation, thereby outpacing cost increases and boosting profit margins.

GDP serves as a crucial metric in macroeconomics, reflecting the totality of economic activity within a nation (Sara & Muhammed, 2013). By examining the GDP growth rate, valuable insights can be gleaned regarding the overall health and current state of an economy. A well-established link exists between GDP dynamics and the demand for loans within an economic system. Khrawish (2011) argues that asset-liability composition within banks is shaped by both economic conditions and specific market factors. Periods of economic expansion present banks with opportunities to pursue higher risk-reward strategies, potentially leading to increased profits.

2.11 Chapter Summary

This chapter provides a comprehensive overview of the existing literature related to financial risks and the impact on bank performance within the context of CBMA occurring in the SADC banking sector. Highlighting the pivotal role of banks in maintaining financial stability and the influence of M&A on the risk profiles, this chapter focuses on the African context, particularly SADC.

The chapter delves into the financial risks faced by banks, including market, liquidity, and credit risk. FRM frameworks, exemplified by Basel III, are crucial for mitigating these risks. It includes discussion research on effective risk management practices and the various conceptual and theoretical frameworks pertinent to M&A, including internationalisation theory, eclectic theory, financial intermediation theory, and liquidity preference theory. These frameworks presented a theoretical underpinning for understanding the dynamics of CBMA in the SADC banking sector.

The next chapter expands on this foundation by outlining the research methodology employed to analyse the impact of CBMA on Financial risk and Bank Performance. It details the collection methods, sample selection criteria, and the specific empirical models used for quantitative analysis.

CHAPTER 3: DATA AND METHODOLOGY

3.1 Introduction

This section sets out to outline the scope of the research and explores the data sources that underpin it. It also uncovers the detailed explanations and validations for the chosen econometric model, highlighting the compelling justifications for the variables explored.

The methodology employed in this study adheres to a comprehensive and rigorous research framework to investigate the dynamics of Financial risk associated with SADC banks involved in CBMA. To a large extent, this study adopts a quantitative approach to answering the proposed questions. This approach ensures that the necessary components of financial risk and their implications are explored to provide a holistic understanding of the phenomenon under investigation.

This approach investigates the changes in the financial risk of acquiring banks 730 days after the CBMA is completed compared to the financial risk 730 days prior and compares this to the industry average at the time for the domestic and target banks (Amihuda, DeLong, & Saunders, 2002). Although this study follows the methodology of Amihuda et al. (2002), 365 days were added to account for the time aspect required to identify the effect of Financial risk in this case (Abbas, 2014).

The effect of financial risk on CBMA is observed in the success or failure of banks after the transaction and this can be attributed to the performance thereof (Muhammad, Waqas, & Migliori, 2019).

3.2 Research Design

Researchers utilise various research designs, which specify methodologies for gathering, analysing and presenting information while acknowledging and working within identified limitations (Creswell & Zhang, 2009). Given the objective to investigate financial risks incurred by SADC banks in CBMA, a quantitative methodology was best suited to test these objectives. Quantitative research as an approach to explore how variables relate to each other engages numerically-driven techniques, encompassing mathematics and statistics (Creswell & Zhang, 2009).

3.3 Research Data

Secondary data from financial reports, regulatory filings and the databases of banks engaged in CBMA constitute the primary sources of quantitative data intended for use in this study. The data were reliably collected from three reputable sources: Bloomberg, the International Monetary Fund (IMF) and Bankfocus. Key financial indicators, NPLs and advances to total loans (TLs), net loans to total assets, net interest income to total assets, TLs to total deposits, TLs to total assets, ROEAs and ROE, were sourced from Bloomberg and Bankfocus. The macroeconomic variables, such as the GDP growth rate and the consumer price index (CPI) – an indicator of the inflation rate – were sourced from the IMF platform. The sample comprised a total of 14 bank CBMAs in the SADC region. These banks include; Barclays PLC, Standard Bank Group Limited, FirstRand Limited, NCBA Group PLC, Capitec Bank Holdings Limited, Absa Group Limited, BankBoston, Stanbic IBTC Holdings PLC, Finance Bank Zambia Limited, Barclays Africa Limited, Aldermore Group PLC, and Mercantile Bank Holdings Limited.

3.4 Sample Justification

This study planned to include all M&A that involved SADC banks over a specific period, 2002–2018. Several key considerations informed the selection of this time period. First, this was a broad selection and included a broader coverage of data that was not only limited to domestic landscapes; this was done to add variability to the sample. Second, it spanned a considerable period and captured market fluctuations and major industry developments that influenced the SADC banking sector. Third, data availability and quality informed the selection.

A broader selection is advantageous in that banks that do not have consistent records of releasing their financial data were removed from the study. This was done to avoid unbalanced datasets that would lead to further irregularities when performing statistical analyses.

3.4.1 Econometric specification and tests

To investigate the effect that Financial risk has on CBMA in the banking sector, panel data methodologies are utilised to accommodate the cross-sectional and time-series nature of the data (Gujarati, 2004). The panel data approach consists of both cross-sectional and time-series statistical analyses and corrects for heterogeneity. In this research, the preferred method was

panel data regression analysis; a total of 14 cross-border bank mergers were investigated before and after the transaction, therefore, 14 cross sections (i = 5) and periods (t = 2002 … 2018).

Methodological basis: Panel data regression allows for multiple data points that span a certain period to be analysed. This approach was suitable for achieving the objectives of this study by accommodating the dynamic interrelationship between Financial risk and the success of bank CBMA in a way that would not be covered by cross-sectional or time-series methods. Given the ability to address potential bias and improve estimation accuracy Panel data regression was employed. Lastly, this model accounted for entity-specific variations as well as time-specific effects.

Organisational dynamics: Provided the complex and ever-changing relationships in the banking sector that were under scrutiny, panel data excelled in modelling these complexities.

Data prerequisites: Panel data regression analysis requires a substantial dataset with an extensive number of observations across various periods. The requirement of comprehensive data might have posed a challenge.

Basic linear panel regression model:

$$Y_{jt} = a + bx_{jt} + \varepsilon_{jt} \quad j = 1, \dots, N \tag{1}$$

This model expresses the relationship between the dependent variable, denoted by Y, and the independent variable denoted by x. Moreover, a and b capture the magnitude and direction of the effect of x on Y. The subscript j identifies individual observations, while t represents the period. The error term, ε, accounts for unobserved factors that influence the dependent variable.

3.4.2 Variables and their measurement

The independent variables, which were derived from related research as indicated in the literature review (Sathyamoorthi et al., 2020), comprised ratios that quantify financial risk, such as market risk, credit risk and liquidity risk.

Credit risk: This dimension is represented by the NPL to TL ratios. In essence, it measures the proportion of loans that are at risk of not being repaid, indicating the extent of a bank's exposure to credit-related losses.

Market risk: The measure of this risk is captured by the interest rate spread, or alternatively, the net interest margin. This variable aims to assess the risks associated with interest rate fluctuations on a bank's profitability. This dimension is represented by net interest income to total assets,

Liquidity risk: The measure of this risk is determined through an assessment of the liquidity pool ratio, looking at cash equivalents, deposits, and temporary funding channels. It quantifies a bank's capacity to meet its long-term obligations. This dimension is represented by TLs to total deposits as well as net loans to total assets.

Total financial risk: In this study, credit risk, market risk and liquidity risk were construed as integral elements of FRM. Therefore, total financial risk was approximated as the principal component of the proxy values for credit risk, liquidity risk and market risk for each bank. This was based on the underlying premise that effective risk management in banks relies primarily on the management of these risk types.

3.5 Developing Models for Panel Data

This study explored two popular methods for modelling the panel data presented: the random effect model and the fixed effect model. The justification for selecting these models was based on the variability and the unique characteristics of the banks under investigation. Thus, the limitations associated with the pooled OLS restrict considerations of the uniqueness and variability inherent in the banks.

Ultimately, deciding on the most suitable model depended on the association between the regressing variables and the individual error component. The choice of the fixed effects model was guided by a link between the two factors, while the random effect model was chosen when the factors were indicated as uncorrelated (Gujarati, 2004).

3.6 Descriptive Statistics Analysis

The parameters of this study also covered a thorough analysis of descriptive statistics conducted for all the quantitative variables. This included significant metrics, such as mean, median, maximum and minimum. To obtain normality, the study explored the interpretations of kurtosis and the Jarque-Bera test.

Kurtosis

Kurtosis was important in this study. In an analysis, kurtosis indicates the degree of peak that the distribution exhibited. A normal distribution is indicated by a kurtosis equal to 3. Therefore, the level of variation from this benchmark provides important information regarding the distribution properties. A distribution with a strong peak and thick tails indicates leptokurtic tendencies and a kurtosis value greater than 3. Conversely, platykurtic characteristics are expressed by a kurtosis lower than 3.

Jarque-Bera

The Jarque-Bera test examines whether there is a match between the kurtosis and skewness of the data and the normal distribution. A normal distribution is indicated by skewness and an excess kurtosis of zero and, therefore, deviations from these distribution features act as a test for the distribution's normality. The hypotheses are as follows:

H_0: Presence of normal distribution
H_1: Absence of normal distribution

If the calculated p-value obtained proves to be statistically significant at the 5% level, then the null hypothesis is rejected and the alternative hypothesis is accepted to show that distribution deviates from normality.

Multicollinearity test

The adjustment of biases in estimators used for data modelling is a fundamental component of econometrics. The problem of multicollinearity occurs when there are strong correlations between explanatory variables. It is crucial to ensure the absence or elimination of multicollinearity, hence, the need for these adjustments. Additionally, multicollinearity can jeopardise the reliability of estimated coefficients, leading to exaggerated standard deviations and instability, which can compromise the validity of computed coefficients. Moreover, addressing multicollinearity is imperative, examining the correlation matrix provides an effective approach to determine its presence.

Positive coefficients within the matrix indicate a positive association, whereas negative coefficients signify an inverse relationship.

Determining model adequacy through the F-statistic test

Before analysing how CBMA affects the financial risks of banks, it is critical to rigorously evaluate the explanatory factors' efficacy in determining the outputs. This evaluation utilises the F-statistic test to reject either of the hypotheses:

H_0: The absence of a statistically significant relationship between the explanatory factors and the dependent variable, is an indication of model inadequacy.

H_1: A model demonstrating that the explanatory factors have a statistically significant influence on the dependent variable, is suitable.

If the F-statistic is less than the 5% significance level, the alternative is accepted and the null hypothesis is rejected. Alternatively, if the F-statistic is greater than the 5% significance level, then the null hypothesis is accepted and the alternative rejected. This rigorous assessment guarantees the model's appropriateness and dependability in representing Financial risk and bank performance (Mafu, 2017).

3.7 Statistical Analysis of Financial Risk

Objective One: To assess the impact of financial risk on banks in the SADC region involved in CBMA.

Investigating the influence of CBMA on the FRs of banks in the SADC region could be performed by considering a multitude of factors. This study carefully concentrated on a selected set of risk and performance indicators, uncovered from previous literature, to scrutinise these relationships (Funso, Kolade, & Ojo, 2012). Additionally, this study adopted the panel data approach of Ali & Oudat (2020), which mirrors the methodological framework undertaken in their study, fostering methodological unity between the two studies. This study expanded on the study by Ali & Oudat (2020), adding two variables – the logarithm of total assets and TLs. The addition of these variables aligns with that of Boahene (2012) who investigated the Credit risk factor in Ghanaian banks.

The logarithm of total assets serves as a proxy for bank size relative to its total assets. Additionally, existing literature insights suggest that larger banks improve their performance through economies of scale (Goddard, Molyneux, & Wilson, 2004). The TLs, serving as the capital structure of banks in the SADC region, were integrated based on the theoretical suggestions that banks with high levels of debt may exhibit improved performance. The

addition of these two variables enriched the analytical depth of this study and aligned with established theoretical frameworks in the analysis of the impacts of CBMA transactions on the financial risks of banks and their performance.

Risk indicators

- Financial risk (FR)
- LOG (total assets)
- Total loans
- Inflation rate
- LOG (GDP)

Performance indicators

- ROE
- ROEA

The equation below formally represents the econometric model:

$$RETURN_{j,t} = a + \beta_1 \cdot FR_{j,t} + \beta_2 \cdot Log(TA)_{j,t} + \beta_3 \cdot TL_{j,t} + \varepsilon_{j,t} \; j = 1, \dots, N \qquad (2)$$

Table 3.1 presents the Financial risk indicators related to Objective One.

Table 3.1: Objective One – Financial Risk Indicators

PARAMETER	CALCULATION	RELATIONSHIP	PREVIOUS RESEARCH
FR	Principal components of market, credit and liquidity risk	Negative	Boahene, 2012; Klapo & Ayeni, 2012; Abbas, 2014; Mafu, 2017
BANK SIZE	Natural logarithm of total bank assets at time t	Positive/Negative	
LEVERAGE	Total loans of bank at time t	Positive	
RETURN	Principal components of ROEAs and ROE		

Objective Two: To ascertain the relationship between CBMA transactions and the risk profiles of banks in the SADC region

Again, while several factors were available to investigate the relationship between CBMA transactions and the risk profiles of banks in the SADC region, this study applied methodology from the study by Ali & Oudat (2020) on FR. Additionally, numerous macroeconomic factors have the potential to affect the banking sector. In this study, the widely accepted view laid out by the African Development Bank is that market volatility may have a significant influence on results obtained from variations in revenues and expenses denominated in local currency, ultimately influencing the competitive landscape of banks engaged in CBMA (AfDB, 2022).

Risk indicators

- Credit risk (CR)
- Market risk (MR)
- Liquidity risk (LR)
- LOG (total assets)
- Total loans
- Inflation rate
- LOG (GDP)

Performance indicator

- ROEA
- ROE

The econometric equation is thus given as:

$$RETURN_{j,t} = a + \beta_1 \cdot CR_{j,t} + \beta_2 \cdot MR_{j,t} + \beta_3 \cdot LR_{j,t} + \beta_4 \cdot Log(TA)_{j,t} + \beta_5 \cdot TL_{j,t} + \varepsilon_{j,t} \quad j = 1, \dots, N \qquad (3)$$

Table 3.2 presents the Financial risk indicators related to Objective Two.

Table 3.2: Objective Two – Financial Risk Markers

PARAMETER	CALCULATION	RELATIONSHIP	PREVIOUS RESEARCH

CR	Credit risk component variable	Negative	Boahene, 2012; Klapo & Ayeni, 2012; Abbas, 2014; Mafu, 2017
MR	Market risk component variable	Negative	
LR	Liquidity risk component variable	Negative	
BANK SIZE	LOG of bank assets at time t	Positive/Negative	
LEVERAGE	Total loans of a bank at time t	Positive	
RETURN	Principal components of ROEAs and ROE		

Objective Three: To establish the effect of CBMA on the individual components of Financial risk encompassed in credit, market and liquidity risks.

As mentioned, there were several factors through which to investigate the influence of CBMA on Financial risk variables faced by SADC banks. However, this study used methodology from Ali & Oudat (2020) and Mustafa & Erhabor (2021) when looking at the variable factors of market risk, liquidity risk and credit risk to understand how they were affected by CBMA and ultimately their resultant impact on the financial risks faced by these banks.

Risk indicators

- Non-Performing loans to total loans
- Total loans to total deposits
- Net loan to total assets
- Net interest income to total earning assets
- Total loans
- LOG (total assets)
- Inflation rate (CPI)
- LOG (GDP)

Performance indicators (dependent variable)

- ROE
- ROEA

The formal econometric model equation is presented below:

$$RETURN_{j,t} = a + \beta_1 \cdot NPL/TA_{j,t} + \beta_2 \cdot TL/TD_{j,t} + \beta_3 \cdot NL/TA_{j,t} + \beta_4 \cdot NII/TEA_{j,t} + \beta_4 \cdot Log(TA)_{j,t} + \beta_5 \cdot TL_{j,t} + \varepsilon_{j,t} \; j = 1, \dots, N \quad (4)$$

Table 3.3 presents the Financial risk indicators related to Objective Three.

Table 3.3: Objective Three – Determinants of Financial Risk

PARAMETER	CALCULATION	RELATIONSHIP	PREVIOUS RESEARCH
NPL/TA	NPL/TA ratio at time t, a credit risk measure for banks	Negative/Positive	Boahene, 2012; Klapo & Ayeni, 2012; Abbas, 2014; Mafu, 2017
TL/TD	Total loans to total deposits of a bank at time t.	Negative	
NL/TA	Proportion of a bank's net loans to total assets at time t.		
NII/TEA	Net interest margin of bank at period t		
BANK SIZE	LOG of bank assets at time t	Positive/Negative	
LEVERAGE	Total loans of a bank at time t	Positive	
RETURN	Principal component of ROEAs and ROE		

3.8 The Correlation Between Performance and Markers of Risk

This study investigated the relationship between various financial and macroeconomic factors and bank performance across banks involved in CBMA in the SADC region. It delved into the operationalisation of FRs by classifying them into three variables: Credit risk, Market risk and Liquidity risk; the principal component variables of ROEA and ROA were used as primary criteria for performance.

The literature reveals that Financial risk has a predominantly negative effect on a bank's financial performance. Credit risk, market risk and liquidity risk are identified as significant contributors to the observed decline, highlighting the multifaceted nature of risk management concerned with CBMA in the financial sector. Furthermore, the existing literature suggests that the TLs to total deposits ratio exhibits a positive relationship with bank performance, particularly ROE and ROEA, as it reflects a bank's ability to use money received through deposits to generate income (Ali & Oudat, 2020)

Additionally, the ratio of NPLs to TLs, which serves as a proxy for credit risk, exhibits a negative effect on bank performance. Importantly, fluctuations in credit risk indicate the health of a loan portfolio, directly affecting the financial performance of banks. High-risk loans pose

a greater threat to accumulated unpaid debts which can be detrimental to a bank's performance (Boahene, 2012).

The benefits of economies of scale are expected to benefit larger-sized banks as they gain the advantage of bargaining power and operational efficiency, therefore, leading to increased performance in the sector.

GDP expansion, as an indicator of economic activity, is suggested to have a favourable effect on bank performance. Therefore, strong economic conditions in the SADC region promote lending opportunities and enhance the quality of the assets to give banks improved performance.

Lastly, the inflation rate or CPI presents an ambiguous influence on ROE and ROEA, suggesting no clear correlation to bank performance. Effectively controlled and managed inflation can result in increased revenues, positively impacting bank performance.

3.9 Chapter Outline

This study employed panel data fixed effects regression to examine the relationship between performance and financial risks in banks that are affected by CBMA in the SADC region. The longitudinal nature of the data, characterised by both time-series and cross-sectional elements, informed the selection of the technique.

The employed research design aligned with the data characteristics in that it was secondary data extracted from sources such as Bloomberg, IMF and Bankfocus. The data collected spanned from 2002 to 2018 to capture variations in macroeconomic factors as well as to include a broad selection criterion.

EViews 13 was employed in executing the statistical data. All this was performed in accordance with the research objectives to gather substantial evidence to reach well-supported conclusions. This chapter establishes the groundwork that enables effective analysis and interpretation of the research findings, to address the study's objectives.

CHAPTER 4: RESULTS AND DISCUSSION

4.1 Introduction

This section expands upon the model presented in Chapter 3 by exploring the estimated outcomes and subsequently discusses the findings. This study adopted a systematic approach, beginning with the preliminary examination of the study's employed data with special attention to summary statistics of the independent variables in the regression analysis (Mafu, 2017). Following that, the focus then shifted to the findings related to the estimation of bank performance and its relationship with the various Financial risk variables. The principal components of ROEAs and ROE served as the chosen dependent variables throughout the analysis. Each dimension of risk was further investigated through the application of the fixed effects model.

4.2 Results of Financial Risk Components

This section addresses the first research objective by exploring the influence of CBMA on financial risks and the bank's performance. Three independent variables were used in this analysis: Financial risk which is computed as the principal component of the individual components credit risk, market risk and liquidity risk, bank size which is the logarithm of total assets and lastly, TL. The dataset encompassed the period from 2002 to 2018 and focused on the relevant banks that fit the description outlined in Chapter 3. The analysis was conducted using EViews 13, specialised software for econometric panel data analysis.

4.2.1 Descriptive statistics analysis

This section presents the descriptive statistics and normality tests for key variables employed in the analysis of CBMA and its effect on the Financial risk of banks in the SADC region. The effect was investigated through the assessment of the bank's performance. Table 4.1 presents the descriptive analysis of financial risk.

Table 4.1: Statistical Analysis of Financial Risk

	PERFORMANCE	FR	BANK_SIZE	TL
Mean	-1.60E-16	-1.64E-16	19.00609	2.82E+08
Median	-0.424450	-0.447780	19.60716	1.94E+08
Maximum	2.575406	4.037730	21.37899	1.21E+09
Minimum	-1.677754	-1.867506	13.98522	457768.0

	PERFORMANCE	FR	BANK_SIZE	TL
Std. Dev.	1.176979	1.473253	2.051965	2.94E+08
Skewness	0.881387	1.089285	-1.014666	1.208623
Kurtosis	2.840415	3.534707	2.948524	4.428347
Jarque-Bera	3.263372	5.451417	4.807646	9.197128
Probability	0.195600	0.065500	0.090372	0.010066
Sum	-2.00E-15	-3.72E-15	532.1706	7.89E+09
Sum Sq. Dev.	33.24670	54.26187	113.6851	2.33E+18
Observations	25	26	28	28

The average performance, which was computed as the principal component of ROEAs and ROE, for the examined period was -0.0005% with a standard deviation of 1.18%, which was relatively low. However, this performance can be considered moderate and reasonable, considering the economic challenges encountered by SADC banks during this period as well as considerations of the levels of proficiency of banks on the continent. The minimum performance was recorded as -1.18% and the maximum reached 2.58%.

Furthermore, the average financial risk stood at 0.00037%, with a spread of 1.7%. The data ranged from a high of 4.04% and a substantial low of -1.87%. The average bank size, also computed as the LOG (total assets), was 19% with a dispersion of 2.05%. The bank sizes ranged from 2.05% (minimum) to 21.37% (maximum).

All series present features of non-normality, except for TL, which is a frequent occurrence in financial time-series data. This is evidenced by the kurtosis coefficients deviating from the standard value of 3 and the presence of non-zero kurtosis. Similarly, the Jarque-Bera test confirmed evidence of non-normality for TL with relatively low but highly significant p-values, approaching 0%.

Conversely, the performance of banks, bank size and Financial risk exhibited normal distribution with kurtosis values near 3. Additionally, skewness values varied across the selected variables, indicating asymmetry in the distributions. The peak distributions in the series were 2.84%, 3.53%, 2.94% and 4.42% for performance, financial risk, bank size and TL, respectively.

4.2.2 Multicollinearity test

Table 4.2 presents the correlations between Financial risk variables.

Table 4.2: Interdependence Matrix of Financial Risk Variables

	PERFORMANCE	FR1	BANK_SIZE	TL
PERFORMANCE	**1**	-0.155079	0.391606	0.181746
FR1	-0.155079	**1**	0.030003	-0.048047
BANK_SIZE	0.391606	0.030003	**1**	0.756080
TL	0.181746	-0.048047	0.756080	**1**

In Studenmund (2011), it is suggested that correlation coefficients exceeding 0.8 are considered potential indicators of multicollinearity; this study followed the insights presented in Studenmund (2011). Analysis of the correlation matrix revealed positive correlations which are reflective of a direct association among explanatory variables, while negative coefficients indicated inverse relationships (Mafu, 2017).

Analysis of matrix presented in Table 4.2 did not highlight any concerning instances of multicollinearity among the included variables. However, the highest observed correlation coefficient, between bank size and TL, recorded stood at 0.75. Although this value falls below the suggested threshold of 0.8, it is indicative of the risk of multicollinearity even though the values fall within accepted limits. This means that it is unlikely to significantly impact the stability and reliability of the estimated regression coefficients but faces a greater risk than all other variable combinations.

4.2.3 Determinants of Model Superiority

As a result of the nature of the data, the analysis employed only the fixed effects model to account for potential unobserved heterogeneity across the banks studied. This approach acknowledges the limitations of the pooled OLS regression model, which is assumed across all banks.

To determine the appropriateness of the model for further analysis, the redundant fixed effects test was conducted to test the efficiency of the fixed effects model on the OLS regression and provide statistical evidence for the presence or absence of unobserved heterogeneity. Preparing these assessments is imperative to mitigate against biased estimates and ensure the robustness of the analysis. The results of the fixed effects test are presented in Table 4.3.

Table 4.3: Fixed Effect Model of Financial Risk

VARIABLE	COEFFICIENT	STD. ERROR	T-STATISTIC	PROB.
FR1	-0.076690	0.140334	-0.546483	0.5911
BANK_SIZE	0.394154	0.160783	2.451460	0.0241
TL	-9.44E-10	1.06E-09	-0.894208	0.3824
C	-7.313866	2.848253	-2.567843	0.0188
	Effects Specification			
Cross-section fixed (dummy variables)				
R-squared	0.374527	Mean dependent var	-0.074761	
Adjusted R-squared	0.242848	S.D. dependent var	1.140045	
S.E. of regression	0.992004	Akaike info crit	3.004873	
Sum squared resid	18.69738	Schwarz crit	3.250301	
LOG likelihood	-31.05848	Hannan-Quinn crit	3.069985	
F-statistic	2.844250	Durbin-Watson stat	2.319084	
Prob(F-statistic)	0.052815			

4.2.4 Model choice

To ascertain the superiority of either the fixed effects model or OLS, the redundant fixed effects test was conducted. Table 4.4 presents the results.

H_0: OLS regression model is appropriate

H_1: Fixed effects model is appropriate

Table 4.4: Redundant Fixed Effects Test of Financial Risk

EFFECTS TEST	STATISTIC	D.F.	PROB.
Cross-section F	4.730374	(1,19)	0.0425
Cross-section Chi-square	5.335605	1	0.0209

The p-values were 0.0425 and 0.0209, respectively, which holds significance at the 5% level. This meant that the null hypothesis that the OLS regression is suitable is rejected in favour of the alternative hypothesis. Thus, the initial analysis and test of model suitability revealed that

the fixed effect model was most suitable based on the highly significant p-value below 0.05. Consequently, the fixed effects model was employed in the analysis of the effect of CBMA on Financial risk and the impact on bank performance across SADC banks. The study showed that Financial risk was not significant at either the 5% or 10% significance levels.

Bank size exhibited results that aligned with the existing literature on a positive relationship to highlight the presence of economies of scale. A positive and significant relationship was observed at the 5% significance level. The findings were in line with Ali & Oudat (2020). This means that a rise in 1% of the bank's total assets, increases performance at 0.39% ultimately increasing the bank's volume of accumulated risky assets.

4.2.5 Suitability of the research model

The study utilised a hypothesis to determine the best-suited model.

H_0: There is no effect of the independent on the dependent variable

H_1: It is evident that the independent variable affects the dependent variable

The significance level for accepting and rejecting H_0 was set at a significance level of 5%; ultimately, p-values less than 0.05 would support the alternative hypothesis.

Accept H_0 if (Sig. F) > 5%
Accept H_1 if (Sig. F) < 5%

Upon analysis of the model, it was revealed that the significance level (Sig. F) was found to be 0.053, which is just above the chosen significance level. The lack of a statistically significant result failed to reject H_0 and, thus, the rejection of H_1. This meant that the principal component of financial risk variables collectively did not exhibit a strong and statistically significant impact on bank performance. Therefore, although CBMA influences financial risks in banks, the influence on bank performance is poor and statistically insignificant and, thus, a negligible effect on the performance of the examined banks was evident.

4.2.6 Explanatory power of the model

In this study, the model's explanatory power regarding the dependent variable performance, which was computed as the principal component of ROEAs and ROE, was assessed using the R-squared (R^2) value. R^2 is indicative of the proportion of the total variance explained by the

combined variations in the independent variables. In this case, the R^2 value of 37.45% was extremely low and revealed that the chosen financial risk factors accounted for a low portion of the observed variations in the performance of the sampled banks.

4.3 Financial Risk Components Output

This section addresses the second research objective by exploring the extent to which CBMA transactions impact Financial risk and the performance of banks in the SADC region. Five independent variables were used in this analysis: Credit risk, liquidity risk, market risk, bank size and CPI. The dataset encompassed the period from 2002 to 2018 and focused on the relevant banks that fit the description outlined in Chapter 3. The analysis was conducted using EViews 13, specialised software for econometric panel data analysis. Table 4.5 presents the descriptive analysis of the financial risk components.

Table 4.5: Statistical Analysis of Financial Risk Components

	PERFORMANCE	CR	LR	MR	BANK_SIZE	CPI
Mean	-1.60E-16	3.771786	1.41E-16	463.5385	19.00609	8.184286
Median	-0.424450	3.490000	0.021241	341.0000	19.60716	7.825000
Maximum	2.575406	14.26000	1.837848	1673.000	21.37899	13.40000
Minimum	-1.677754	0.340000	-3.606139	88.00000	13.98522	5.300000
Std. Dev.	1.176979	2.958826	1.084765	348.9611	2.051965	2.091605
Skewness	0.881387	1.690683	-0.917911	1.861346	-1.014666	0.921500
Kurtosis	2.840415	6.714325	5.623784	6.645261	2.948524	3.587918
Jarque-Bera	3.263372	29.43483	11.96356	29.40856	4.807646	4.366016
Probability	0.195600	0.000000	0.002524	0.000000	0.090372	0.112702
Sum	-2.00E-15	105.6100	4.27E-15	12052.00	532.1706	229.1600
Sum Sq. Dev.	33.24670	236.3756	31.77128	3044346.	113.6851	118.1199
Observations	25	28	28	26	28	28

This section presents the descriptive statistics and normality tests for the key variables employed in the analysis of the extent of the impact that CBMA has on the financial risk profiles and performance of banks in the SADC region. The effect was investigated through

the assessment of the bank's performance, computed as the principal component of ROEAs and ROE.

The average performance of banks in the SADC region that had undergone CBMA transactions for the examined period was -0.00054% with a standard deviation of 1.18%, which was relatively low. However, this performance could be considered moderate and reasonable considering the economic challenges encountered by SADC banks during this period that affected economic performance as well as the levels of proficiency of banks in the continent over this period compared to those in developed regions. The minimum performance was recorded as -1.68% and the maximum reached 2.58%.

Furthermore, a look into the risk variables revealed that the average credit risk stood at 3.77%, with a 2.96% dispersion. The data ranged from a high of 14.26% and a low of 0.34%. On average, liquidity risk for the banks that had engaged in CBMA was recorded as 0.0041%. The highest and lowest values stood at 1.84% and -3.61%, respectively. The spread was recorded at 1.08%. Market risk exhibited outlier behaviour with an average of 463.54%. The highest and lowest were recorded at 1673% and 88%, respectively, with a standard deviation of 348.96%.

Moreover, the average bank size was 19% with a dispersion of 2.05%. The highest and lowest performances for LOG (total assets) were recorded at 21.38 and 2.05%, respectively.

All series data, except for credit risk, liquidity risk and market risk, exhibit characteristics of non-normality. This is evidenced by the kurtosis coefficients deviating from the standard value of 3 as well as the presence of non-zero kurtosis. Similarly, the Jarque-Bera test confirmed evidence of non-normality for the above-mentioned variables with relatively low but highly significant p-values approaching 0%.

Conversely, the performance of banks, bank size and CPI exhibited normal distributions with kurtosis values near 3. Additionally, skewness values varied across the selected variables, indicating asymmetry in the distributions. The peak distributions in the series were 6.71%, 5.62%, 6.65%, 3.59%, 2.95 and 3.58% for performance, credit risk, liquidity risk, market risk, bank size and TL, respectively. Market risk presented with the largest peak distribution.

Multicollinearity test

Table 4.6 presents the correlation matrix of the financial risk components.

Table 4.6: Financial Risk Components' interdependence matrix

	PERFORMANCE	CR	LR	MR	BANK_SIZE	CPI
PERFORMANCE	**1**	-0.197845	0.379026	0.050447	0.391606	-0.156721
CR	-0.197845	**1**	0.312258	0.351547	0.040526	0.291796
LR	0.379026	0.312258	**1**	0.005058	0.302755	0.122132
MR	0.050447	0.351547	0.005058	**1**	-0.129863	-0.001821
BANK_SIZE	0.391606	0.040526	0.302755	-0.129863	**1**	0.076899
CPI	-0.156721	0.291796	0.122132	-0.001821	0.076899	**1**

Studenmund (2011) argues that correlation coefficients exceeding 0.8 are to be considered potential problems of multicollinearity. This study follows those insights presented in Studenmund (2011). The analysis of the correlation matrix revealed positive and negative correlations reflective of a positive relationship between explanatory variables and representative of inverse relationships, respectively.

Nonetheless, the analysis of the correlation matrix indicates the absence of multicollinearity. The largest observed correlation coefficient, between bank size and performance of banks recorded, stood at 0.39. This value comfortably falls below the suggested threshold of 0.8, indicating that the level of multicollinearity is well within the acceptable limitations suggested. This means that they are unlikely to significantly impact the stability and reliability of the estimated regression coefficients.

In this instance, only the fixed effect model was run on EViews because of computational convenience that made this model the most suitable. The results of this model are presented in Table 4.7.

Table 4.7: Fixed Effect Model of Financial Risk Components

VARIABLE	COEFFICIENT	STD. ERROR	T-STATISTIC	PROB.
CR	-0.121977	0.075414	-1.617443	0.1242
LR	0.420091**	0.191551	2.193098	0.0425
MR	0.000758	0.000586	1.294378	0.2128
BANK_SIZE	0.237516**	0.104557	2.271634	0.0364
CPI	-0.004707	0.093811	-0.050175	0.9606
C	-4.364747	2.223207	-1.963267	0.0662
	Effects Specification			
Cross-section fixed (dummy variables)				
R-squared	0.525554	Mean dependent var		-0.074761
Adjusted R-squared	0.358102	S.D. dependent var		1.140045
S.E. of regression	0.913388	Akaike info crit		2.895180
Sum squared resid	14.18271	Schwarz crit		3.238779
LOG likelihood	-27.74216	Hannan-Quinn crit		2.986337
F-statistic	3.138538	Durbin-Watson stat		2.759342
Prob(F-statistic)	0.029390			

* ** 10% and 5% level of significance respectively

This particular study investigated the extent to which CBMA impacts the Financial risk profiles, including credit risk, market risk and liquidity risk, of SADC banks. Several key Financial risk variables were employed to investigate the significant associations with the principal components of ROEAs and ROE, offering insights into the performance of these banks over the period.

Credit risk: This variable did not exhibit any significant relationship with performance at the 10% and 5% significance levels. Although there was no significance, an inverse relationship emerged between Credit risk and performance, supporting and aligning with existing literature (Alshatti, 2015).

Market risk: Similar to credit risk, the results for this variable showed an insignificant and positive relationship between market risk and bank performance. These findings do not align with outcomes from the existing literature (Haakantu & Phiri, 2022) which argues potential

links between higher levels of market risk associated with detrimental bank performance. Due to the inconclusive nature of these results, further investigation is needed.

Liquidity risk: This variable exhibited a significant and positive relationship with bank performance at the 5% significance level, supporting expectations and aligning with existing literature (Marozva, 2015). This finding suggests that the ability of banks to meet short-term obligations positively impacts how they perform. This means that a 1% increase in this ratio translates to a 0.42% improvement in bank performance.

Bank size: At the 5% level of significance, a noteworthy and positive correlation was detected between bank size and bank performance, suggesting the presence of economies of scale as outlined in the existing literature (Boahene, 2012). This means that as the bank accumulates more assets, its performance increases. This means that an increase of 1% of the total assets is associated with a 0.24% increase in bank performance, highlighting the advantages of a larger bank size in CBMA.

Inflation (CPI): This variable exhibited an insignificant and negative relationship to bank performance. These findings are inconclusive and align with those in Sara & Muhammed (2013), suggesting that further investigation is needed.

The results of the redundant fixed effects test are presented in Table 4.8.

Table 4.8: Redundant Fixed Effects Test of Financial Risk Components

EFFECTS TEST	STATISTIC	D.F.	PROB.
Cross-section F	4.891837	(1,17)	0.0410
Cross-section Chi-square	6.069611	1	0.0138

4.3.1 Determining model adequacy

The study utilised a hypothesis to determine the best-suited model.

H_0: The model is not appropriate; the independent variable does not impact the dependent variable

H_1: The model is appropriate; the independent variable affects the dependent variable

The significance level for accepting and rejecting H_0 was set at 5%; ultimately, p-values less than 0.05 would support the alternative hypothesis.

Accept H_0 if (Sig. F) > 5%

Accept H_1 if (Sig. F) < 5%

Upon analysis of the model, it was revealed that the significance level (Sig. F) was found to be 0.029, which is comfortably within the 5% significance level. Therefore, the null hypothesis is rejected due to the substantial statistical significance presented in Table 4.7. This means that the financial risk component variables exhibit a strong and statistically significant impact on bank performance. Therefore, CBMA influences Financial risk component variables in banks as this can be seen in the level of performance.

4.3.2 Explanatory power of model

In this study, the model's explanatory power regarding the dependent variable performance, which was computed as the principal component of ROEAs and ROE, was assessed using the R-squared (R^2) value. This value is indicative of the proportion of the total variance explained by the combined variations in the independent variables. In this case, the R^2 value of 52.55% is moderate and reveals that the chosen financial risk factors account for a reasonable portion of the observed variations in the performance of the sampled banks.

4.4 Independent Credit, Market and Liquidity Risk Output

This section addresses the third research objective by exploring the independent components of market risk, credit risk and liquidity risk to determine the effect of CBMA transactions and their impact on the performance of banks in the SADC region. Five independent variables were used in this analysis: NPL to TL (NPL_TL), net loan to total assets (NL_TA), net interest margin – which is computed as net interest income – to total earning assets (NII_TA), bank size – which is the logarithm of total assets – and lastly, the GDP growth rate for SADC region (LGDP).

The dataset encompassed the period from 2002 to 2018 and focused on the relevant banks that fit the description outlined in Chapter 3. The analysis was conducted using EViews 13,

specialised software for econometric panel data analysis. Table 4.9 provides the descriptive analysis of the independent credit risk, market risk and liquidity risk components.

Table 4.9: Analysis of Independent Credit, Market and Liquidity Risk Components

	PERFORMANCE	NPL_TL	NL_TA	NII_TA	BANK_SIZE	LGDP
Mean	-1.60E-16	3.771786	5385.893	463.5385	19.00609	1.397060
Median	-0.424450	3.490000	5143.000	341.0000	19.60716	1.488400
Maximum	2.575406	14.26000	8768.000	1673.000	21.37899	1.911023
Minimum	-1.677754	0.340000	2801.000	88.00000	13.98522	0.285179
Std. Dev.	1.176979	2.958826	1730.973	348.9611	2.051965	0.504757
Skewness	0.881387	1.690683	0.090179	1.861346	-1.014666	-0.869429
Kurtosis	2.840415	6.714325	1.892519	6.645261	2.948524	2.680561
Jarque-Bera	3.263372	29.43483	1.468884	29.40856	4.807646	3.386141
Probability	0.195600	0.000000	0.479773	0.000000	0.090372	0.183954
Sum	-2.00E-15	105.6100	150805.0	12052.00	532.1706	36.32357
Sum Sq. Dev.	33.24670	236.3756	80899265	3044346.	113.6851	6.369480
Observations	25	28	28	26	28	26

Multicollinearity test

The correlation matrix of independent credit risk, market risk and liquidity risk components is presented in Table 4.10.

Table 4.10: Interdependence Matrix of Independent Credit, Market and Liquidity Risk Components

	PERFORMANCE	NPL_TL	NL_TA	NII_TA	BANK_SIZE	LGDP
PERFORMANCE	**1**	-0.205973	-0.460013	0.057339	0.353054	0.294062
NPL_TL	-0.205973	**1**	-0.275071	0.352051	0.038070	-0.095296
NL_TA	-0.460013	-0.275071	**1**	0.008250	-0.327148	-0.621741
NII_TA	0.057339	0.352051	0.008250	**1**	-0.127960	-0.177943
BANK_SIZE	0.353054	0.038070	-0.327148	-0.127960	**1**	0.308329
LGDP	0.294062	-0.095296	-0.621741	-0.177943	0.308329	**1**

As expressed, Studenmund (2011) argues that correlation coefficients exceeding 0.8 were to be considered as potential problems of multicollinearity. Similarly, this study follows insights presented in Studenmund (2011). Analysis of the correlation matrix revealed positive and

negative correlations reflective of a positive relationship between explanatory variables and representative of inverse relationships, respectively.

Nonetheless, the analysis of the correlation provides no evidence of significant multicollinearity. LGDP exhibited the strongest negative correlation (-0.62) with NL_TA among all variable pairs. This value comfortably falls below the suggested threshold of 0.8, indicating that the level of multicollinearity is well within the acceptable limitations suggested. This means that they are unlikely to significantly impact the stability and reliability of the estimated regression coefficients.

Due to computational limitations, the fixed effect model was exclusively employed in EViews, rendering it the most suitable. The results for the independent credit risk, market risk, and liquidity risk components are presented in Table 4.11.

Table 4.11: Fixed Effects Model of Independent Credit, Market and Liquidity Risk Components

VARIABLE	COEFFICIENT	STD. ERROR	T-STATISTIC	PROB.
NPL_TL	-0.143719*	0.076619	-1.875774	0.0791
NL_TA	-0.000374**	0.000163	-2.295536	0.0356
NII_TA	0.000716	0.000585	1.225526	0.2381
BANK_SIZE	0.226157*	0.116035	1.949033	0.0690
LGDP	-0.446373	0.520749	-0.857176	0.4040
C	-1.353749	2.884855	-0.469260	0.6452
	Effects Specification			
Cross-section fixed (dummy variables)				
R-squared	0.531149	Mean dependent var		-0.023855
Adjusted R-squared	0.355330	S.D. dependent var		1.137435
S.E. of regression	0.913262	Akaike info crit		2.902203
Sum squared resid	13.34476	Schwarz crit		3.247788
LOG likelihood	-26.37533	Hannan-Quinn crit		2.989116
F-statistic	3.020995	Durbin-Watson stat		2.117715
Prob(F-statistic)	0.035971			

* ** 10% and 5% level of significance respectively

This particular study investigated the impact of CBMA on the independent financial risk profiles, including the credit risk, market risk and liquidity risk components of SADC banks.

Several key Financial risk variables were employed to investigate the significant associations with the principal components of ROEAs and ROE, offering insights into the performance of these banks over the period.

NPL to total loan (NPL_TL): Serving as a proxy for credit risk, at the 5% significance level, this variable did not exhibit any significant relationship with the performance of banks. However, at the 10% significance level, there is an observed negative and significant relationship with bank performance which is the expected sign. Therefore, a 1% increase in NPL_TL causes a 0.14% decrease in the performance of banks. This emphasises the importance of controlling and managing loans for improved performance.

Net loan to total assets (NL_TA): As a proxy for liquidity risk, the results of this variable showed a significant and negative relationship with bank performance at the 10% and 5% significance levels. These findings do not align with the expected outcomes described in the existing literature – Marozva (2015) and Marembo (2012) argue the potential links between higher levels of liquidity risks associated with higher bank performance. A 1% increase in NL_TA will decrease bank performance by 0.0004%, which is relatively low.

Net interest margin (NII_TA): As a proxy for market risk, this variable exhibited an insignificant and positive relationship with bank performance. Further investigation is needed due to the inconclusive nature of these results.

Bank size: At the 10% level of significance, our analysis revealed a positive and statistically significant association between bank size and bank performance, consistent with the evidence of economies of scale as eluded to in existing literature (Boahene, 2012). This means that as the bank accumulates more assets, the performance thereof increases – an increase of 1% in total assets is associated with a 0.23% increase in bank performance, highlighting the advantages of a larger bank size in CBMA.

GDP growth rate (LGDP): This variable exhibited an insignificant and negative relationship with bank performance. These findings are inconclusive and align with those in Sara & Muhammed (2013), suggesting that further investigation is needed due to the inconclusive nature of the results.

The results of the redundant fixed effects test for these components are presented in Figure 4.12.

Table 4.12: Redundant Fixed Effects Test of Independent Credit, Market and Liquidity Risk Components

EFFECTS TEST	STATISTIC	D.F.	PROB.
Cross-section F	3.206988	(1,16)	0.0923
Cross-section Chi-square	4.201766	1	0.0404

Determining model adequacy

The study utilised a hypothesis to determine the best-suited model.

H_0: The model is not appropriate; the independent variable does not impact the dependent variable

H_1: The model is appropriate; the independent variable affects the dependent variable

The significance level for accepting and rejecting H_0 was set at a significance level of 5%, ultimately, p-values less than 0.05 would support the alternative hypothesis.

Accept H_0 if (Sig. F) > 5%

Accept H_1 if (Sig. F) < 5%

Upon analysis of the model, it was revealed that the significance level (Sig. F) was found to be 0.036, which is comfortably within the 5% significance level. Therefore, the null hypothesis is rejected due to the substantial statistical significance presented in Table 4.7. This means that the independent component variables of credit risk, market risk and liquidity risk exhibit a strong and statistically significant impact on bank performance. Therefore, CBMA influences financial risk's component variables in banks and this can be seen in the level of performance.

Explanatory power of the model

In this study, the model's explanatory power regarding the dependent variable performance, which was computed as the principal component of ROEAs and ROE, was assessed using the R-squared (R^2) value. R^2 is indicative of the proportion of the total variance explained by the combined variations in the independent variables. In this case, the R^2 value of 53.11% is moderate and reveals that the chosen financial risk factors account for a reasonable portion of the observed variations in the performance of the sampled banks.

4.5 Summary of Findings

This section explored the influence of CBMA on the financial risk of banks by visualising the impact on bank performance. A panel data fixed effect model was utilised to determine each objective. Furthermore, a redundant fixed effects test was conducted to confirm the validity of the model utilised for each objective.

The first objective was to understand the effect of CBMA on the financial risk of banks in the SADC region and to understand the change in bank performance as a result of CBMA transactions. The analysis of Financial risk included the principal component of the independent variables of credit risk, market risk and liquidity risk to form the independent variable of financial risk. Additionally, TLs and the logarithm of total assets were used to control the variable of firm size. The principal component of ROEAs and ROE was used as the dependent variable representing bank performance. The relationship was observed as statistically insignificant at the 5% and 10% significance levels. Therefore, further investigation is required to understand the inconclusive nature of these results.

The second objective was to determine the extent to which CBMA impacts the Financial risk components; including the credit risk, market risk and liquidity risk components of SADC banks. The analysis of financial risk included credit risk which was expressed as the principal component of NPLs to TLs and TLs to total deposits. Additionally, the liquidity risk was expressed as the principal component of net loans to total assets and NPLs to total assets, while market risk was expressed as the net interest margin. The analysis revealed that at the 5% significance level, only the liquidity risk component indicated a significant relationship with bank performance. The credit risk and market risk components observed an insignificant relationship to bank performance.

Lastly, the study's third objective was to establish the effects of CBMA transactions on individual components of credit risk, market risk and liquidity risk. The analysis of credit risk included the primary independent variable, NPLs to TLs. Additionally, the logarithm of total assets was used as a proxy for firm size and the GDP rate as a macroeconomic indicator variable. The principal component of ROEAs and ROE was used as the dependent variable representing bank performance.

Statistically significant relationships between NPLs to TLs as well as firm size were observed at the 10% significance level. Furthermore, the analysis of Liquidity risk included the primary

independent variable, net loans to total assets. Likewise, the GDP growth rate and the logarithm of total assets were used as proxies for the macroeconomic environment and firm size, respectively. A statistically significant relationship was observed with bank performance at the 5% significance level.

Lastly, the analysis of Market risk included the primary independent variable, net interest income to total earning assets. With the control variables kept constant as GDP growth rate and logarithm of total assets, the relationship to bank performance was insignificant and inconclusive.

CHAPTER 5: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents a comprehensive synthesis of the research and insights into the key findings; it also draws conclusions aligned with the study objectives and formulates policy recommendations based on the insights inferred. The structure of this section follows a methodological approach, first, presenting a summary of the research approach and then the summary of findings, model robustness and adequacy, as well as limitations of the study and recommendations for future research.

5.2 Research Synopsis

This study investigated impacts of CBMA on FRs of banks in the SADC region and determined how credit risk, market risk and liquidity risk affected the performance of banks. Banks that participated in CBMA across the SADC region constituted the sample, with data sourced from reputable sources, including Bloomberg, Bankfocus and macroeconomic data extracted from the IMF, spanning the period from 2002 to 2018. To further analyse the relationship between Financial risk indicators and bank performance, the study employed a panel data fixed effect model which was implemented using EViews 13. The research was guided by the following three objectives:

Objective 1: The analysis of Financial risk employed the principal components of credit risk, market risk and liquidity risk as the independent variable, financial risk. TLs and the logarithm of total assets served as the control variables in this analysis. The principal component of ROEAs and ROE served as the dependent variable, performance. The findings revealed statistically insignificant relationships for the financial risk variable. These inconclusive results did not align with research expectations and existing research, thus, further investigation into the variable is required.

Objective 2: This objective aimed to investigate and determine the extent to which CBMA transactions impact the financial risk profiles of banks by looking at the components of financial risk, including credit risk, market risk and liquidity risk. In the analysis of credit risk, market risk and liquidity risk as independent components, the logarithm of total assets and CPI of the SADC region were utilised as control variables. The principal component of ROEAs and ROE served as the dependent variable, performance. The findings revealed that significant

associations were identified at the 5% level for Liquidity risk and firm size. Conversely, market risk, credit risk and inflation rate displayed no significant relationships with bank performance.

Objective 3: The third objective was to determine whether CBMA transactions impacted the individual components that make up credit risk, market risk and liquidity risk in the same way that they do on the overall Financial risk variable. To perform this objective, NPLs to TLs were used as a proxy for credit risk, net loans to total assets were used as a proxy for liquidity risk and net interest margin (net interest income to total earning asset) was used as a proxy for market risk. The principal component of ROEAs and ROE was used as the dependent variable, performance. Control variables included the logarithm of total assets as well as the average GDP growth rate of the SADC region. Statistically significant relationships were observed at the 5% level for net loans to total assets, while NPLs to TLs and bank size exhibited significance at the 10% level.

5.2.1 Summary of findings

The research study unveiled a complex and multifaceted relationship between the effect of CBMA transactions on Financial risk factors and bank performance across banks in the SADC region. Each dimension of financial risk, including credit risk, market risk and liquidity risk and the component variables thereof, exhibited both expected and unexpected results, highlighting the nuanced dynamics of the banking sector in the SADC region.

5.2.2 Robustness of the study model

This section evaluates the model capabilities and goodness-of-fit by analysing how accurately the model captures the data as well as how well the chosen variables predict and explain variability in the bank performance.

Objective 1: The model's goodness-of-fit was assessed using the R^2 statistic; $R^2 = 0.374527$, indicating that 37.45% of the variance in the bank performance was explained by the effect of CBMA on financial risk. The remaining 62.55% represented unexplained variance in error terms. Similarly, the F-statistic (2.844, Prob(F-statistic) > 0.05) confirmed that the principal component of financial risk jointly had a low and insignificant influence on bank performance. Thus, as the result does not support the robustness of the model, further analysis of the components is required.

Objective 2: Similarly, the R^2 value for this model revealed that 52.55% of the total variation in the dependent variable, the performance of banks, was accounted for by the combined variations in the credit risk, market risk and liquidity risk variables. The remaining 47.45% represented unexplained variance. Additionally, the highly significant F-statistic (3.14, Prob(F-statistic) < 0.05) suggested a moderately optimistic view of the model's explanatory power and indicated that liquidity risk influenced the performance of banks to a greater extent, demonstrating the model's robustness.

Objective 3: The model, composed of the independent variables of credit risk, market risk and liquidity risk, showed that 53.11% of the variation in performance was explained by the joint variations of the chosen variables, with the credit and liquidity risk proxies exhibiting a greater influence. Furthermore, the F-statistic (3.02, Prob(F-statistic) < 0.05) confirmed the joint influence of the significant variables on bank performance, suggesting a moderately optimistic view of the model's robustness.

5.3 Conclusions

The R-squared values for the Financial risk principal components, the credit risk, market risk and liquidity risk as well as the individual components thereof, were recorded as 37.45%, 52.55% and 53.11%, respectively. For the two later models, the R^2 values explain in particular that a moderately substantial proportion of the variance in bank performance was attributed to the individual proxies for liquidity risk and credit risk, net loans to total assets and NPLs to TLs. This demonstrated their moderately strong explanatory power. Notably, the liquidity risk proxy emerged as the most determinant of bank performance, as evidenced by the descriptive statistics in Table 4.7.

5.4 Recommendations

Based on the research methodology and findings outlined in Chapters 3 and 4 regarding the effect of CBMA transactions and the impact they have on the financial risks of banks in the SADC region, respectively, this study makes the following recommendations:

To mitigate liquidity risk and its impact on the performance of banks, this study suggests that banks impacted by CBMA transactions should prioritise attracting deposits and diversifying funding sources by reducing their reliance on external finance and the volatile stock market.

Based on the findings regarding the credit, market and liquidity proxies, this study recommends that for banks impacted by the CBMA transactions, capabilities in credit risk and loan management should be improved to enhance the quality of loan portfolios. Moreover, for liquidity risk, these banks should attract deposits and improve their agile capabilities to proactively adapt to changing market conditions.

5.5 Limitations of the Study

This study recognises several limitations that could impact the interpretation of its findings. First, the analysis is focused on the SADC region, limiting its representativeness of the entire banking sector. The relatively small sample size is a result of the inefficient capturing and reporting of financial information by banks; the generalisability of the findings is thus restricted.

In terms of the reliability of the data, this study relied on secondary data from readily available sources, including Bloomberg, Bankfocus and the IMF. Thus, while these are reputable, inherent limitations emerge from any reliance on secondary data as this study's conclusions are contingent upon the accuracy of the employed data. Additionally, the potential for inaccuracies in the original data cannot be entirely ruled out.

Lastly, this study experienced limitations in the scope of the independent variables employed in the data models.

5.6 Recommendations for Future Research

This study explored the impact of CBMA on the financial risks of banks and how this affects the performance of banks in the SADC region. Future research could contribute to ongoing discussion in the fields of finance in the following ways:

Broadening the scope of the research: The research could include diverse bank types and geographical regions. Additionally, this could broaden the scope of data accuracy as the SADC region faces problems with inefficient financial reporting.

Expanding the sample size: Future research could further enhance this aspect by incorporating a larger and more representative sample. A larger sample size across a greater timeline could reveal potential variations in outcomes across different regions.

Examining additional performance metrics: Looking into other performance indicators, such as effectiveness, efficiency, prudence and stability, could offer more rich insights.

Exploring alternative methodologies: Making use of different analytical techniques, such as GARCH, ARCH and VaR models, could potentially yield varied results and deeper understanding.

Investigating additional variables: Examining the influence of other variables and their lagged effects on bank performance, as well as exploring other macroeconomic variables that could be relevant to the model, would further broaden the knowledge base and improve the explanatory power of models.

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