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BACHELOR OF COMMERCE DEGREE IN ECONOMICS

DESSERTATION

**Analysis of Commercial Banks Liquidity Risk in Zimbabwe
(2009-2019)**

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Submitted in partial fulfillment of the requirements of the Bachelor of Commerce
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Declaration

This dissertation is entirely my own work and acknowledgements have been made where sources have been used. I do hereby declare that this dissertation has not been previously submitted for a Degree award at another University.

Boniface Stima.....

...../...../.....

Signature of Student

Date

Disclaimer

The University does not share or partake in the views that I have come up with, the study is of my own viewpoint and understanding.

Dedication

To my late mother and father in law Emery Svisva and Sylvanus Nkomo respectively

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In God We Trust.

Abstract

The study explored the impact of liquidity risk on the profitability of Commercial Banks in Zimbabwe. The research was enthused by the expedition to determine the impact of the main factor that affects profitability namely liquidity risk which in this case has Loans to Deposit Ratio (LDR) as a proxy. The study included other factors that influence profitability namely credit risk, bank specific factors (bank age and market share) and macroeconomic factors (Gross Domestic Product (GDP) and Inflation). The study used panel data from five commercial banks listed on the Zimbabwe Stock Exchange in Zimbabwe for the period 2009 to 2019. Data was collected on biannual bases which made the data a robust and balanced panel data. The study used Random Effects Model (REM) as specified by Hausman specification test for analysis henceforth leaving out other panel data analysis techniques such as Fixed Effects Model and Pooled Ordinary Least Squares. All the analysis was done using STATA version 14. It was established that liquidity risk has a negative impact on the performance of commercial banks in Zimbabwe. In addition, the study found that credit risk which is a proxy for non-performing loans was found to have a statistically positive significant impact on the performance of commercial banks in Zimbabwe. Other variables such as bank age, inflation and gross domestic product were found to have some influence on the profitability of commercial banks in Zimbabwe. It is therefore imperative for commercial banks in Zimbabwe to monitor and to the best of their ability mitigate liquidity risk to improve performance of financial sector for the benefit of economy and the country at large.

List of Abbreviations and Acronyms

BA	Bank Age
BS	Bank Size
CAR	Capital Adequacy Ratio
CRB	Credit Reference Bureau
EBIT	Earnings Before Interest and Tax
FEM	Fixed Effects Model
GDP	Gross Domestic Product
GLS	Generalised List Square
GMM	Generalised Methods of Moment
LCR	Liquidity Coverage Ratio
LDR	Loans to Deposit Ratio
MS	Market Share
NIM	Net Interest Margin
NPL	Non-Performing Loans
NPLR	Non-Performing Loans Ratio
NSFR	Net Stable Funding Ratio
OLS	Ordinary Least Square
POLS	Pooled Ordinary List Square
RBZ	Reserve Bank of Zimbabwe
REM	Random Effects Model
ROA	Return on Assets
ROE	Return on Equity
SADC	Southern African Development Community
VMI	Volume of Manufacturing Index
ZAMCO	Zimbabwe Asset Management Company

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CHAPTER ONE

INTRODUCTION AND BACKGROUND

1.0 Introduction

Bank profitability internationally is the primary concern of various stakeholders in banking sector who include but are not limited to creditors, proprietors, savers, borrowers, financiers, supervisory bodies, bank managers and the administrators. However, the lucrateness of banking is reliant on liquidity. Banks achieve the main part of offering liquidity through their intermediation undertakings. Banks link savers and stakeholders collectively by making available non liquid facilities to debtors. By undertaking this part, maturities which are short tenure are converted by banks into lengthy maturities so as to generate cash liquidity for the investors at the same time sponsoring the operative apportionment of assets in banking commerce (Maaka, 2013). Owing to this fundament process, banks are frequently faced with maturity disparities which lead to instability.

Liquidity risk is the uncertainty emanating from the failure of a bank to meet up with its various debt agreements and other obligations when they fall due as a result of an inability to efficiently convert its assets to cash. It denotes an organization's failure to source for sufficient funds because of remarkably extraordinary liquidity conversion expenditures which upset the capital and fund of an establishment in the immediate and future concern. Lyambiko (2015) proclaims that liquidity risk is a serious singularity for commercial banks due for two key reasons; first is accredited to the intermediation model role of banks and secondly, it is due to the cumulative modest forces in the financial sector spanning from securities markets to the non-banking institutions.

1.1 Background

The banking sector in Zimbabwe has observed countless operational challenges and revolution which driven by the need for service innovations. The segment is characterised by globalisation forces which try to generate development prospects so that Zimbabwean banks are at part with other global players in the same industry. Correspondingly, there is growing compression for bank for managers to withstand profitability margins in the face of this increasing rivalry within banks (Ibe, 2013).

The banking sector by its nature risky type of industry. This is the reason why the sector is highly regulated and why it is critical for banks to be alive to the risks within their operations which in worst case scenarios are of systemic in nature. Some of the regulations include high capital adequacy ratios, regular monitoring and surveillance which include sound risk management policies and periodic stress testing. It is also a requirement for banks to adhere to strict reporting guidelines. Liquidity Risk is among the risks that banks should demonstrate their robustness in dealing with it. This ensures the risk is kept within appetite. If this risk continues unabated it may impact on the profitability of a bank.

It is against this background that this study sought to establish whether indeed a relationship exists between liquidity risk measured through LDR bearing in mind that LDR is the ratio of loans issued against total deposits,

The study presented a unique opportunity of study in that Zimbabwe in period 2009-2019 adopted use of multicurrency in lieu of the Zimbabwean Dollar that had lost value and was no longer acceptable as legal tender by the generality of citizens and organisations. This was a period preceded by world record inflation figures. This meant that the study was done in a period where the United States Dollar was the major trading currency thus the need to observe economic characteristics of a stable currency. It is however important to note that, Monetary Authorities responsibilities which include control of Money Supply were almost rendered insignificant.

The study was performed in a period where Zimbabwe as a country was for the first time after a long period of time was experiencing relative low inflation with some period of deflation against a background of hyperinflation. This presented a unique opportunity for the research as Zimbabwe was not familiar to this not so common economic environment.

Consequently, the present study will improve on that to strengthen the model. The study goes a step further and compares the banking sector of Zimbabwe. This will add to knowledge to literature on the subject as there is a dearth of studies of that nature.

1.2 Problem statement

Internationally, banks perform an essential part in the distribution of commercial resources of an economy. These comprise but are not limited to reassigning funds from the custody of depositors to investors. They do this by producing the essential income to counterbalance expenditures sustained in the progress of financial transaction operations (Lyambiko, 2015). The activities of banks are characterized by attendant problems owing to the major role banks perform in short term deposit maturity transformation to long-term loans. In such a set-up, banks are unprotected against liquidity problems which subsequently affect the financial sector in a negative manner (Kiganda, 2014). It is against this background that this study seeks to examine the impact of liquidity risk.

1.3 Objective of the study

The primary objective of this thesis is to determine the effect of liquidity risk on profitability of banks in Zimbabwe. Specifically, the study seeks:

- a. To determine the connection between liquidity risk and profitability of the banking sector in Zimbabwe.
- b. To undertake an investigation into the impact of bank age on profitability in Zimbabwe banking sector.

- c. To establish the casual relationship between size of banks and the related profitability in Zimbabwe.

1.4 Research Hypothesis

The following null hypothesis were formulated

- a. Liquidity risk has a negative impact profitability of the banking sector in Zimbabwe.
- b. Bank age has a positive impact on profitability in Zimbabwe banking sector.
- c. Size of banks has positive relationship their profitability in Zimbabwe.
- d. Significance of the study

Bank Mangers are ordinarily expected to demonstrate unconventional acquaintance with liquidity risk and bank profitability in Zimbabwe. This acquaintance will support bank managers in coming up with vital guidelines to mitigate liquidity risk.

The conclusions of this study are projected to equip the banking sector with significant policy recommendations that will reduce the incidences of low profitability. The study complements the existing body of literature relating to the impact of liquidity risk in banks. The research for all intents and purposes is for academic purposes only.

1.5 Limitations of the study

Due to data limitations, the study uses listed banks only as information about bank liquidity risk and performance during hyperinflationary era (2002-2008) is not readily available.

Due to the pandemic much of the research has been desktop due to restriction in movements as a result of Covid-19

1.6 Delimitations of the Study

The study will concentrate on the liquidity factors that affect bank performance. The researcher will analyse bank liquidity proxies of all commercial banks in Zimbabwe that were operating throughout the time period 2009- 2018. The results are generalised to all commercial banks in Zimbabwe.

This study will absolutely depend on accessible and available data from published financial statements and Monetary Policy Statements. As such the researcher will assume that all published financial statements and reports by the relevant authorities' exhibit correctness and authenticity.

1.7 Organisation of the study

The rest of the thesis is presented in the following format: Chapter Two provides both theoretical and empirical literature review whilst Chapter Three provides a comprehensive framework of the approaches and procedures used in the study. Chapter Four presents estimation and explanation of the results. Finally, Chapter Five completes and summerises the research findings as well as giving study-oriented policy commendations and propositions.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

To unpack the correlation between liquidity risk and profitability of banks, there is need to review literature. Pursuant the foregoing, this chapter seeks to review both theoretical and empirical literature. Firstly, the chapter highlights the theoretical framework. Subsequent chapters discuss liquidity risk theories followed by a critical analysis of empirical literature and then finally, the chapter is summarised

2.1 Theoretical Literature Relating Liquidity Risk Management

Liquidity Asset Theory

The Liquidity Asset Theory is premised on the asset side of the balance sheet and contends that banks must hold huge volume of liquid assets visa vie conceivable demand of eagerly marketable short-term liquid assets. (Ojong, Basse and Awo, 2014). The inability by banks to hold liquid resources will result in liquidity risk. In such circumstances, the management of the bank should continually ensure that the return is in accordance with the market.

Shiftability Theory

The hypothesis expresses that bank liquidity is kept up on the off chance that it holds resources which could be handily moved or offered to different loan specialists or speculators for money (Dodds, 1982). This perspective battles that a bank's liquidity could be upgraded on the off chance that it has resources for sell to the Monetary Authorities. Accordingly, this hypothesis perceives and battles that shiftability, attractiveness or adaptability of a bank's benefits is a reason for guaranteeing liquidity (Nwankwo, 1991)). The hypothesis neglects to perceive that if the Central Bank and the markdown market are not prepared to buy assets, the bank will be illiquid

Anticipated Income Theory

The Anticipated Income Theory is of the interpretation that banks liquidity can be projected and met if planned repayments are baselined to income of the debtor (Ahmadyan, 2019). It underscores that banks should relate repayment of loans to income rather than depending on collaterals. Thus, bank liquidity can be influenced by the maturity arrangement of loans through customers 'repayments rather than those secured by bank (Enekwe, Eziedo and Agu, 2017). The theory shows that there is a strong connection between credit risk and liquidity risk of a bank. However, the theory fails to consider that when the borrowers default the bank will face high liquidity risk. This has been the case in Zimbabwe when the levels of credit risk were above 5% international benchmark which mirrored

the unstable macroeconomic environment that constrained borrower's capacity to pay back the loan (Sandada and Kanhukamwe, 2016).

Commercial Loan Theory

The Commercial Loan Theory is also identified as the Real Bills Theory. It suggests that banks should advance short term self-liquidating productive facilities to business entities in order to tame liquidity risk and improve profitability (Taye, 2014). However, this theory is more applicable in an economic environment characterized by low and stable inflation where businesses have a strong appetite for productive loans bolstered by their capacity to pay back. In the case of Zimbabwe, businesses are operating in an environment characterized by high and unstable inflation which dampens their ability to pay back loans

2.2 Empirical Literature Review

Basel assertion on the relationship between liquidity risk and bank performance.

The predicament which started in July 2007 underlined the fissures in the field of liquidity risk administration. Banks have revealed the lack of respectable forecasting simulations to mitigate liquidity risk. In response to the crisis, in December 2010, the Basel Committee allotted new principles and guidelines on liquidity risk management. The Committee emphasized the significance of good liquidity risk management. Two new ratios to measure liquidity risk were defined and these are the liquidity coverage ratio for short-term liquidity risk and the net stable funding ratio to measure long-term liquidity risk.

The financial crisis fixated the attention of supervisory bodies, business sector, academics and general public on the matters correlated to liquidity risk. Limitations in liquidity management in banks enthused the creation of new guidelines under the Basel III regulatory framework for banks (BIS 2010; BIS 2013). Specifically, the Basel III regulations, primarily proclaimed during 2010, cover additional capital, liquidity and debt requirements compared with its successors i.e. Basel I and II. The newly approved liquidity restrictions are liquidity coverage ratio (LCR), which ensures that the banks hold enough liquid assets, and net stable funding ratio (NSFR), which enables banks to withstand a reasonable maturity mismatch (Bonfim & Kim, 2012).

Shortcomings in the funding and liquidity management at financial institutions motivated the formation of fresh guidelines under the Basel III regulatory framework for banks (BIS, 2010; Acharya, et al., 2011). The fresh guidelines cover additional capital, liquidity and debt requirements compared with Basel I and II (BIS, 2010). Additionally, owing to inefficiencies relating to banking regulation during the 2007-2009 financial crisis, Basel III addresses subjects concerning business

cycles and systematic risk. It is mandatory for banks to maintain capital buffers during economic growth cycles to cover potential losses which arise from phases of economic distress (BIS, 2010).

On the outlook the Zimbabwean Banks, 2019 RBZ posited that banks need to ensure that they hold adequate liquid assets to withstand high liquidity runoff rates. The Reserve Bank is also finalising the requisite guidelines to the Basel III Liquidity Coverage Ratio (LCR) and Net Stable Funding Ratio (NSFR) frameworks to enhance tools for monitoring market wide resilience to liquidity risk.

2.3 Impact of Liquidity Risk on Profitability

Studies on the subject matter have produced mixed results. Bordeleau and Graham (2010), analyzed the impact of liquidity risk on profitability of U.S and banks in Canada over the period 1997 Q1 to 2009 Q4. Liquidity risk was measured by liquid assets ratio while profitability was measured by ROE. The study employed the panel two-step GMM procedure together with time fixed effects and found that liquidity risk had a positive impact on ROE of both U.S. and Canadian banks. However, the findings revealed that profitability can only be maximized up to a certain point, and a further increase in holding liquid assets decreases profitability, *ceteris paribus*. The study concluded that the relationship between liquidity risk and profitability varies depending on a bank's business model and the state of the economy. Regarding control variables, the study found that GDP was negatively related with profitability. The study could have included the component of credit risk as postulated by the Anticipated Income Theory that the two are closely related.

Similarly, Yaqoob and Khalid (2017) investigated the effect of liquidity hazard on gainfulness of Islamic and ordinary banks of Pakistan, Malaysia and Indonesia over the period 2011 to 2015. Liquidity hazard was estimated by LDR while benefit was estimated by ROA and ROE. Information was gathered from fiscal reports of banks. Utilising the OLS technique, the examination found that liquidity hazard has a positive effect on benefit of Islamic banks in Pakistan, Malaysia and Indonesia while there is a negative effect on gainfulness of regular banks in those nations. Muthumoni and Raj (2017) investigated the effect of liquidity hazard on productivity Bank of Baroda in India over the period 2006 to 2016. Utilizing the OLS strategy, it was discovered that there is a positive effect between liquidity hazard and productivity (ROA). Nonetheless, Yaqoob and Khalid (2017) Muthumoni and Raj (2017) could have utilized board information and consolidated control factors to support its model like Bordeleau and Graham (2010) did in their examination.

Eneke et al., (2017) examined the effect of liquidity hazard on productivity of business banks in Nigeria over the period 2009 to 2014. Gainfulness was estimated by networking net revenue while liquidity was estimated by stores, money, and liquidity-hole. The examination likewise controlled NPLs influence in this proportion. Utilizing the pooled OLS, the investigation found that stores and

money positively affected benefit while liquidity-hole was discovered to be unimportant. The discoveries likewise uncovered that NPLs positively affected benefit while influence proportion had an immaterial effect.

Utilizing a similar philosophy, Rudhani and Balaj (2019) analyzed the effect of liquidity hazard on the exhibition of banks in Kosovo, over the period 2010 to 2015. Utilizing the pooled OLS technique, the outcomes demonstrated that all the pointers of liquidity hazard had a positive and huge effect on both ROA and ROE. Accordingly, the examination reasoned that business banks in Kosovo could improve productivity by refining their capacity to adapt to liquidity stuns. Notwithstanding, the pooled OLS utilized by Enekwe et al., (2017) and Rudhani and Balaj (2019) experienced the issue of Heterogeneity of variables and autonomous factors.

Under a similar instance in Nigeria, Olawanle (2014) discovered comparable outcomes to Enekwe et al., (2017) utilizing an alternate philosophy. Olawanle (2014) inspected the effect of liquidity hazard on gainfulness of homegrown and unfamiliar banks in Nigeria. The examination gathered essential information from an example of 518 appropriated among staff of banks. The investigation additionally gathered auxiliary information distributed from budget reports of banks over the period 2006 to 2010. Utilizing the pooled OLS, REM and FEM, the examination found that liquidity risk positively affected ROA of both homegrown and unfamiliar banks in Nigeria.

In Kenya, Kibuchi (2015) researched the effect of liquidity hazard on money related execution of business banks in Kenya over the period 2010 to 2014. Execution was estimated by ROA while liquidity hazard pointers included client stores, money parity and liquidity hole. Utilizing the OLS technique, the discoveries uncovered that client stores, money equalization and liquidity hole positively affected ROA. It was likewise discovered that bank size positively affected ROA. In such manner, the examination inferred that liquidity hazard does not just influence budgetary execution of banks. The investigation ought to have followed the board information relapse examination utilized or make use of checklist for Liquidity Risk management by Afriye and Akotey (2010) as it created better outcomes.

In like manner, Siaw (2013) inspected the effect of liquidity hazard on productivity of banks in Ghana over the period 2002 to 2011. Monetary execution was estimated by ROA and ROE while liquidity hazard was estimated by credit. Utilizing the 2SLS technique, the discoveries uncovered a positive and noteworthy connection between liquidity hazard pointers and productivity measures. The discoveries demonstrated that bank size and GDP had an inconsequential relationship with ROA and a negative effect on ROE. The examination neglected to credit hazard segment which is legitimately connected to liquidity danger and productivity of a bank.

On account of Zimbabwe, Dzapasi (2020) examined the effect of liquidity hazard the executives on money related execution over the period 2014 to 2018. The investigation received a blended procedure approach that contained both subjective and quantitative strategies where essential information was gathered utilizing polls. An example of 5 banks was drawn from the financial business. With respect to liquidity hazard the board was utilizing current proportion while productivity was estimated utilizing ROE. Utilizing the Cross-sectional REM, the investigation found that current proportion positively affected ROE. Notwithstanding, Dzapasi (2020) neglected to latch on the part of credit hazard since writer attests that the two budgetary dangers are the most basic for money related execution of banks. Additionally, the creator neglected to catch different factors that influence money related execution of banks. In such manner, the current investigation will address those exploration holes by going above and beyond to contrast the financial area of Zimbabwe and South Africa.

Even though there are other considerations that found a positive effect of liquidity on productivity, there are those that discovered a negative relationship. For example, Hakimi and Zaghdoudi (2017) on account of Tunisia inspected the impact of liquidity hazard bank execution. The investigation utilized an example of 10 banks over the period 1990 to 2013. Guided by the Hausman Specification Test, the investigation utilized the REM model and found that liquidity hazard (proportion of absolute credit to add up to stores) negatively affects bank execution (net premium edge). The discoveries likewise uncovered that worldwide budgetary emergency and expansion negatively affected bank execution. Control factors, for example, bank size (logarithm of absolute resources), capital sufficiency, credit hazard (proportion of all out credit to add up to resources) and GDP insignificantly affected productivity.

Mwangi (2014) on account of Kenya utilized an alternate strategy and discovered comparable outcomes to Hakimi and Zaghdoudi (2017). The researcher looked to decide the impact of liquidity hazard the executives on the money related execution of business banks in Kenya over the period 2010 to 2013. Receiving an engaging report plan, the populace involved 43 recorded business banks in Kenya. Utilizing OLS relapse investigation, the examination found that liquidity hazard (fluid resources for absolute resources proportion) has a negative effect of gainfulness (ROA). As control factors, the examination likewise found that credit hazard (NPLR) negatively affects productivity. The investigation reasoned that liquidity hazard the is significant for business banks in Kenya.

Correspondingly, Tabari et al., (2013) utilized a different approach on account of Iran and acquired comparative outcomes. The investigation inspected the effect of liquidity hazard on execution of business banks throughout the long term 2003 to 2010. Execution was estimated by ROE while liquidity hazard was estimated by proportion of fluid resources for complete resources. Guided by

the Hausman Specification Test, the examination utilized the FEM and found that liquidity hazard had a negative and critical effect on ROE. As far as control factors, discoveries uncovered that credit hazard (NPLR) had a negative and huge effect on ROE while bank size (logarithm of all out resources), expansion and GDP had a positive and noteworthy effect.

There are likewise those investigations that discovered positive, negative and inconsequential connection between liquidity risk and benefit. Golubeva et al., (2019) explored the impact of liquidity hazard on productivity of European Banks over the period 2014 to 2017. Liquidity hazard was estimated by liquidity hole, advance spread proportion and advance to store proportion. Gainfulness was estimated by ROA, ROE, net revenue (NPM) and earnings before interest and taxes (EBIT). Utilizing the OLS strategy, the investigation found that credit to store proportion had an irrelevant relationship with all gainfulness. Liquidity hole had a negative and critical relationship with ROA and ROE while a positive and noteworthy effect was found with NPM and an irrelevant contact with EBIT. Credit spread proportion had an unimportant relationship with all productivity markers. Control factors, for example, bank size, expansion negatively affected all markers while GDP had an irrelevant effect.

Mensah (2014) in the case of Ghana sought to investigate the impact of liquidity risk on profitability of banks in Ghana over the period 2004 to 2013. Liquidity risk was measured by liquidity gap, loans to deposit ratio, and leverage ratio while profitability was measured by profit before tax. Using the GLS method, the study found that liquidity gap had a positive and significant impact on profitability while loan to deposit ratio and leverage ratio had an insignificant impact. Regarding control variables, the results revealed that NPLs had a negative impact on profitability.

Likewise, Charmler *et al.*, (2018) examined the impact of bank liquidity on profitability of commercial banks in Ghana using a sample of 21 banks over the period 2007 to 2016. The study employed two measures of liquidity namely total liquid assets to total assets and total liquid assets to total interest-bearing liabilities. Profitability was measured by ROA and ROE. Using the pooled OLS, the study found that total liquid assets to total assets had a positive impact on ROA and ROE. On the second measure of liquidity, total liquid assets to total interest-bearing liabilities, the findings revealed a negative and insignificant relationship with ROE and a positive and significant impact with ROA. In terms of control variables, the findings revealed that bank size (logarithm of total assets), capital adequacy ratio, and foreign ownership had a positive and significant impact on both profitability indicators. Considering the findings, the study recommended that there is need for a pre-determined optimal level of liquid assets to improve profitability of banks.

The relationship between liquidity risk and profitability of banks is further complicated by those studies that found no significant relationship. For example, in the case of Bangladesh Khalid *et al.*,

(2019) sought to establish the impact of liquidity risk on financial performance of commercial banks. Financial performance was measured by ROA and ROE while liquidity risk was measured by LDR and cash to deposit ratio. The study employed a sample of Dhaka stock market enlisted commercial banks (31) during the period 2010 to 2017. Guided by the Hausman Specification test, the study employed the FEM and found that liquidity risk has no significant positive and negative impact on ROA and ROE, respectively.

Liquidity risk was measured by liquid assets, bank deposit, and treasury bills while profitability was measured by ROA. Employing the OLS method, the study found that bank deposit, liquid assets, and treasury bills had a positive, negative, and positive and insignificant impact on ROA, respectively. The study recommended that banks should adopt efficient liquidity risk management strategies.

In order to draw some control variables, the study looked at a previous study which was done by Chinoda (2014). The study looked at the determinants of commercial banks profitability in Zimbabwe from 2009 to 2014. Using OLS, it was found that there is a positive relationship between bank size, GDP and profitability (measured by ROA and ROE). Using a second model it was found that inflation had a negative relationship with ROE.

The studies fail to include the component of credit risk which is closely related to liquidity risk as espoused by the Anticipated Income Theory. Thus, the present study will improve on that to strengthen the model. The study goes a step further and compare the banking sector of Zimbabwe with South Africa. This will add to knowledge to literature on the subject as there is a dearth of studies of that nature.

2.4 Conclusion

From the theoretical and empirical literature analysed, there exists a relationship between credit risk, liquidity risk and bank profitability. This study therefore is undertaken to empirically determine the effect of liquidity risk on bank profitability and provide research-policy suggestions to the stakeholders in the banking institutions. The next chapter will be looking at methodology and justification of variables.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

The focal point of this chapter is to provide a framework of the methodology of the study pursuant an assessment of the theoretical and empirical literature. It presents the basis for data analysis of the research. For this reason, this chapter summaries the research design, study population, sampling procedure and the sample size. The empirically established model is outlined in this section together with the definition and justification of variables not forgetting the estimation procedures and assumptions.

3.1 Model Specification

Rifqah and Hafinaz (2019) contended Loans to Deposit Ratio (LDR) is measurement of liquidity risk. The study used panel data as suggested and used by Riyanto and Surjandari (2018). The study modified the model by incorporating control variables (internal and external determinants of profitability) which include bank age (BA), bank size (BS), market share (MS), inflation (INFL) and volume of manufacturing index (VMI). The model for this study functionally becomes:

$$ROA = f(CLDR, NPLR, BA, BS, MS, INFL, VMI) \dots \dots \dots (1)$$

The econometric equation for the model is specified as:

$$ROA_{it} = \alpha_0 + \alpha_1 CAR_{it} + \alpha_2 LDR_{it} + \alpha_3 NPLR_{it} + \alpha_4 BA_{it} + \alpha_5 BS_{it} + \alpha_6 MS_{it} + \alpha_7 LNINFL_{it} + \alpha_8 LNVMI_{it} + \epsilon_{it} \dots \dots \dots (2)$$

where α_0 is the intercept, α_1 to α_8 are coefficients of independent variables, $LNINFL_{it}$ represents the natural logarithm of consumer price index, $LNVMI_{it}$ is the natural logarithm of volume of manufacturing index and ϵ_{it} is the error term as justification for unexplained variation on profitability by capital adequacy, liquidity risk and credit risk measures and the control variables.

3.2 Definition and Justification of Variables

Profitability (ROA_{it})

ROA is the ratio of net income and total resources (assets) of the company (bank). It quantifies the productivity of banks in creating benefit in view of burly sufficient assets, thus it is a superior proportion of gainfulness than return on value (ROE). The more the measure of profit for resources the better the proficiency (expertise) of the bank the executives. ROA has additionally been utilized by Riyanto and Surjandari (2018), Rifqah and Hafinaz (2019) and Opoku-Mensah et al., (2019).

Loans to Deposits Ratio (LDR_{it})

To measure banks liquidity, risk this study will employ LDR, which indicates the ability of banks to withstand deposit withdrawals and willingness of banks to meet loan demand by reducing their cash assets (Rifqah and Hafinaz, 2019). It compares the banks total loans to its total loans. Liquidity cushions banks from the risk of insolvency. If the ratio is too high, it means the bank maybe short in terms of meeting unforeseen fund requirement. Conversely low ratio bank may not be earning as much as it could be. It is expected to positively affect profitability.

Capital Adequacy Ratio (CAR_{it})

Likewise, CAR is identified as capital for the risk of weighted asset ratios, CAR is a measure that determines if a bank has sufficient capital that offers protection against risks associated with offering bank credit and other financial businesses (Riyanto and Surjandari, 2018). CAR mirrors the organization's own funding to create benefits. Subsequently the more noteworthy the CAR, the more prominent the open door for banks to produce benefits in light of the fact that with heavy capital, bank the executives will have the option to put assets into gainful exercises like issuing loans.

Nonperforming Loan Ratio ($NPLR_{it}$)

Measuring credit risk, it is computed as the ratio of nonperforming loans to total loans. NPLR denotes in what manner bank loans and advances are degenerating into non-performing basket. NPL measures the magnitude of credit default risk that the bank incurred. As the aggregate of this ratio escalates to higher levels, this signifies not so good message for the administrators of the bank. It illustrates a heightened possibility of not mending the bank's major asset. The variable is expected to negatively affect profitability as explained by the Agency Theory and Loan Pricing Theory.

Bank Age (BA_{it})

Age is a measure of the experience of the bank, computed as the number of years since its formation. Ceteris paribus, it is assumed that the older the bank, the more experienced it has gained in devising measures to counter liquidity risk and therefore a positive impact on its profitability. A positive sign indicates that experience counts in the banking sector, whereas a negative sign shows that younger banks are more efficient than the older ones (Rifqah and Hafinaz, 2019).

Bank Size (BS_{it})

Bank size is an essential determinant of financial performance which is drawn from the Economic Model of Firm Performance. Natural logarithm of total bank assets is measurement of Bank Size. All other things equal, it is assumed that large banks are more profitable than small banks due to their ability to diversify and reduce credit risk. Increase in bank size is expected to be accompanied by rise

in profitability but, however, if size becomes extremely big, it could bring negative effects on bank performance (Rifqah and Hafinaz, 2019).

Market Share (MS_{it})

As explained by the Economic Model of Firm Performance, market share indicates the firm’s competitive position and captures the importance of customer loyalty on financial performance of the bank. Thus, the larger the market share, the more competitive the bank is.

In this study, market share is defined as the percentage of individual bank’s deposits to total deposits in banks. It is predicted to positively affect bank profits.

Inflation ($LNINFL_{it}$) and Volume of Manufacturing Index ($LNVMI_{it}$)

The study will use Inflation and Volume of Manufacturing Index (VMI) to capture the consequence of macroeconomic variable on profitability of banks. This is according to Abel and Le Roux (2016). Inflation can lower the ability and willingness of individuals to save, thereby reducing the demand for financial products specifically credit, all other things equal. Thus, the expected relationship between inflation and bank profitability is negative. As output increases, the demand for credit increases as well. Thus, VMI will be used as a measure for gross domestic product (GDP) and a positive relationship with bank profitability is expected. However, the relationship between national output and bank profitability is ambiguous (Abel and Le Roux, 2016).

Error Term (ϵ_{it})

It is the error term that is assumed to be random and stochastic

Table 1: Variables and Expected Relationship

Dependent Variable	Independent Variables	Relationship
Profitability (ROA_{it})	Capital Adequacy Ratio (CAR_{it})	Positive
	Loan to Deposit Ratio (LDR_{it})	Positive
	Nonperforming Loan Ratio ($NPLR_{it}$)	Negative
	Bank Age (BA_{it})	Positive/Negative
	Bank Size (BS_{it})	Positive/Negative
	Market Share (MS_{it})	Positive
	Inflation ($LNINFL_{it}$)	Negative
	Volume of Manufacturing Index ($LNVMI_{it}$)	Positive

3.3 Estimation Procedure

There are two principal approaches which are used in panel data analysis. These include the, Fixed Effects Model (FEM) and Random Effects Model (REM)

The Fixed Effects Model (FEM)

This approach is used when one requires to control omitted variables that differ between cases but are constant over time. It aids in monitoring deviations in the variables over period to approximate the outcome of independent variables on dependent variables. According to Gujarati (2003), the term fixed effects is result of the fact that even though the intercept may diverge across banks, it does not contrast much over time. This means that the intercept is periodically not variant. Assuming that $(X_{it}, \partial_i) \neq 0$ the FEM can be written as:

$$Y_{it} = \beta_1 + \beta_2 X_{2it} + \beta_3 X_{3it} + \mu_{it}$$

where $\mu_i = \partial_i + u_{it}$

In the model v_i are treated as obscure boundaries to be assessed and the joined time arrangement and cross-area error term (u_{it}). Additionally, i and t signify the cross-segment identifier and the time identifier separately. Y_{it} is the dependent variable and β_1 are cross-section (bank) specific intercepts which are constant over time. X_{2it} and X_{3it} are the explanatory variables which do not vary across cross-sections and β_2 and β_3 are the slope coefficients, respectively.

The Random Effects Model (REM)

The REM is used wherever approximately omitted variables may be continual over period but vary between cases. The REM is appropriate in cases where both T and N can be considered small. REM which is defined as follows:

$$Y_{it} = \vartheta_0 + \vartheta_1 X_{1it} + \vartheta_2 X_{2it} + \varepsilon_{it}$$

The composite error term ε_{it} consists of the individual-specific or cross-section error component (∂_i) and the pooled time series as well as cross-section error component (u_{it}). Hence $\mu_{it} = \partial_i + u_{it}$. In the model i and t denote the cross-section identifier and the time identifier, respectively. The dependent variables the mean intercept is represented by Y_{it} and ϑ_0 , respectively. The mean intercept denotes the mean value of all cross-sectional intercepts whereas the random deviation of individual units from this intercept is represented by ∂_i . ϑ_0 and ϑ_2 are the slope coefficients of the explanatory variables X_{1it} and X_{2it} respectively. The REM assumes that the single error quantities are not linked with one another and are additionally not auto associated across segments and interval arrangement units (Gujarati, 2003). This follows that $E(\varepsilon_{it}) = 0$ and that $v(\varepsilon_{it}) = \sigma_{\partial}^2 + \sigma_u^2$ (which shows that the error term ε_{it} is homoscedastic). Since the Generalised Least Squares (GLS) is the weighted average of

within-group and between-group estimators, this enables the extraction of information from these two variations.

Fixed Effects Model (FEM) versus Random Effects Model (REM)

Most researchers prefer the FEM to REM because it is most unlikely that the fixed effects are uncorrelated with the regressors of interest. Thus, the basic assumption for the FEM is that $(X_{it}, \delta_i) \neq 0$ while REM assumes that $Cov(X_{it}, \delta_i) = 0$. According to Gujarati (2003) the FEM solves the omitted-variables problem by throwing away some of the variance that contaminates either the REM or the POLS estimator. However, if T is small and N is large, and the assumptions underlying REM hold, the FEM is relatively not efficient as compared to the REM (Davidson and MacKinnon, 1999). It is imperative to note that the decision of whether to choose between the FEM or REM should be premised on the theoretical requirements and advantages of each model.

Data Types and Sources

The investigation population contained all the banks in Zimbabwe that operated during the dollarization time frame (2009-2019) of Zimbabwe, these incorporate business banks, commercial banks, and building societies. By December 2018 there was an aggregate of eighteen commercial banks (18) which is the population size. The determination of the banks to be utilized on the examination depended on the accompanying limitations: the bank must have an enormous client base in the business, the bank must have a huge level of the risk undertaking activities in the business and its fiscal reports ought to be accessible on its own website page (just recorded banks have these). This study assesses the impact of liquidity risk on profitability of the banking sector in Zimbabwe. The examination is quantitative in nature and uses quarterly (2009 Q1 to 2019 Q4) board information. Five banks met the above limitations and are captured in table 1 below.

Table 2: Sampled Banks in the Study

Bank	Year Founded	Year Listed
First Capital Bank (formerly Barclays Bank of Zimbabwe)	1912	1991
ZB Financial Holdings Limited	1951	1967
CBZ Holdings Limited	1980	1998
NMBZ Holdings Limited	1992	1997
FBC Holdings Limited	1997	2001

Source, Zimbabwe Stock Exchange (ZSE) Website

3.4 Diagnostics Tests-

see the following.

3.5 Multicollinearity Test (Pairwise

Multicollinearity indicates the presence of a linear relationship between two or more explanatory variables. The aforementioned complicates the aspect of distinguishing individual effects of the regressors and the relative regression estimators may possibly be biased in that they often tend to have huge variances (Gujarati 2004). Nonetheless, the larger the multicollinearity, the higher the standard errors. When high multicollinearity is inherent, confidence intervals for a coefficient tend to diverge widely and the statistics tend to be minimal. Coefficients will have to be greater in order to be statistically significant that is it will be difficult to reject the null hypothesis when multicollinearity exists. The threshold for correlation coefficients must be less 0.8%, see below tests.

3.6 Hausman Test

This test is used in choosing between FEM and REM (Gujarati, 2003). It is based on the null hypothesis that the REM is valid against the alternative hypothesis that the FEM is valid. The test follows a Chi-square (χ^2) distribution. The test is shown as follows:

$$H = (\hat{\alpha}_{FE} - \hat{\alpha}_{RE})' [var(\hat{\alpha}_{FE}) - var(\hat{\alpha}_{RE})]^{-1} (\hat{\alpha}_{FE} - \hat{\alpha}_{RE}) \sim \chi^2_K$$

where K denotes the dimension of the slope vector α

Thus $H_0: (X_{it}, v_i) = 0$

$$H_1: (X_{it}, v_i) \neq 0$$

Given the five percent (0.05) level of significance, failure to accept the null hypothesis leads to the conclusion that the REM is not appropriate, hence we are better off using the FEM where statistical inferences will be conditional on the error term in the sample.

3.7 Panel Unit Root Test

To test unit root, the study employed the Levin–Lin–Chu (2002) test. It is based on the null hypothesis that the series contains a unit root against the alternative that the series is stationary. The test involves fitting an augmented Dickey–Fuller regression for each panel.

Given the five percent (0.05) level of significance, failure to accept the null hypothesis leads to the conclusion that the series is stationary.

Having series of panel data that are stationary at their levels (original form), it implies that there is no need to for differencing the variables. Therefore, it implies that the study used the variables in their original form.

3.8 Heteroscedasticity test

Heteroscedasticity to check if the variance is constant using Breusch Pagan test. Before any analysis, the variance must be constant since varying variance can result in increased standard errors and this will have an impact on the whole model. This is tested under the null hypothesis that errors are homoscedastic.

3.9 Serial Autocorrelation

Autocorrelation to check if there is no serial correlation between the endogenous and the exogenous variables. We test using the Breusch Godfrey test and if there is to be autocorrelation, we must find instrumental variables to eliminate the problem of autocorrelation.

3.10 Conclusion

This chapter included the methodology used to collect data and examine how liquidity affects profitability of the banking sector in Zimbabwe (2009 Q1 to 2019 Q4). This chapter includes definition and justification of variables. The research design, sample selection and model specification and types of tests were also discussed.

CHAPTER FOUR

PRESENTATION AND INTERPRETATION OF RESULTS

4.0 Introduction

The main thrust of this chapter is to present and interpret the results of the study. In that regard, the chapter will enable researcher achievement of the research objectives as well as answering the research questions and finally testing the research hypothesis. It presents the descriptive statistics of the study followed by correlation analysis and multicollinearity test. Hausman test was used to explain narrative between the Random Effects Model (REM) and Fixed Effects Model (FEM). The chapter in question seeks to interpret results from REM or FEM. Lastly the summarised version of the chapter is presented. All the regression output was presented using Stata software version 14.

4.1 Descriptive statistics

To have an understanding of the behaviour of the variables which form the basis of my study, the dependent variable and independent variables and other control variables, are captured in the summary of descriptive statistics is presented in Table 3. Since we are dealing with longitudinal data, the descriptive statistics considers three different test statistics which are overall, within and between deviations. The between component of the descriptive statistics captures the cross sectional dimension of the data, the within component of the series measures the time series component of the data which is 2009 to 2019 and the overall which is the overall. The study used a sample of 5 banks ($n=5$) over 22 biannual time period that is from 2009 to 2019 ($T=22$) and this gave a total of 200 observations ($N=110$). For purposes of this study, this summary is representative enough to assist the researcher understand the structure and behaviour of the data.

The indicated variables *id* and *t* in the descriptive statistics table are not real variables but they do resemble cross sectional and time series dimension, respectively. The main purpose of the time series dimension and cross-sectional dimension is to classify the panel data. The maximum value for *id* is five which equals the number of cross sections (5 banks used in this study) whilst the maximum value for *t* is twenty-two which equals the number of time periods for this study.

Profitability Performance of the Banking Sector in Zimbabwe

To measure profitability performance, the study employed return on assets (*ROA*). Results in Table 3 show that on average the banking sector in Zimbabwe earned a 1 return on assets with an overall variation of 2 for the period under study. The overall minimum and maximum values of *ROA* are -0.06 and 0.06, respectively. However, profits are more volatile within the sampled banks than they are across banks as shown by a larger within variation (2) than the between variation (1) of *ROA*.

Table 3: Descriptive statistics

Variable		Mean	Std. Dev.	Min	Max	Observations
id	Overall	3	1.420686	1	5	N = 110
	Between		1.581139	1	5	n = 5
	Within		0	3	3	T = 22
t	Overall	11.5	6.373325	1	22	N = 110
	Between		0	11.5	11.5	n = 5
	Within		6.373325	1	22	T = 22
roa	Overall	.0111845	.0176107	-.0604	.0644	N = 110
	Between		.0079182	.0016682	.0196182	n = 5
	Within		.0161095	-.0538291	.0559664	T = 22
ldr	Overall	.5192455	.5101579	.0066	2.5116	N = 110
	Between		.22533	.2430636	.8710727	n = 5

	Within		.4682622	.0008727	2.522073	T = 22
nplr	Overall	-2.985918	1.907431	-10.4881	0	N = 110
	Between		.8833519	-4.271482	-2.177218	n = 5
	Within		1.73445	-9.202536	1.011064	T = 22

bs	Overall	19.24565	.9651155	15.4583	21.2351	N = 110
	Between		.6379342	18.56545	20.27148	n = 5
	Within		.7764619	14.43247	20.20928	T = 22
ba	Overall	3.570612	.7103899	2.5055	4.6299	N = 110
	Between		.7872315	2.693932	4.603805	n = 5
	Within		.0657155	3.38218	3.73888	T = 22
ms	Overall	.0846636	.0751033	0	.2767	N = 110
	Between		.0778883	.0326091	.2218773	n = 5
	Within		.0272527	-.1372136	.1394864	T = 22
lninfl	Overall	4.577236	.0337022	4.5036	4.6148	N = 110
	Between		0	4.577236	4.577236	n = 5
	Within		.0337022	4.5036	4.6148	T = 22
lnvmi	Overall	4.533336	.0657028	4.4141	4.6689	N = 110
	Between		0	4.533336	4.533336	n = 5
	Within		.0657028	4.4141	4.6689	T = 22

Liquidity risk in the Banking Sector of Zimbabwe

The study used the loans to deposits ratio (*LDR*) to measure liquidity. *LDR* measures the ability of banks to withstand deposit withdrawals and willingness of banks to meet loan demand which is prone to default risk. The average *LDR* of the banking sector in Zimbabwe was 0.52 with an overall variation of 0.51 suggesting that the banks were relatively not prone to liquidity risk (illustrated on the table above). The overall minimum and maximum values were 0.01 and 2.5, respectively. This also suggests that the banks were able to meet loan demand despite the high risk (asymmetric

information gap between them and the borrowers) involved in the lending process. The high between variation of *LDR* of 0.55 compared to within variation of 0.48 means that the banks were relatively more able to withstand deposit withdrawals than the banking sector. This suggests that the banking sector was less liquid to cushion them from the risk of insolvency.

Credit Risk in the Banking Sector of Zimbabwe

The investigation utilized non-performing loans ratio (NPLR) to quantify credit risk. Table 3 demonstrates that the normal NPLR in the Zimbabwean financial area for the multicurrency system was - 2 with the general variety of 0.15. The distinction between the general least of 0.00% and by and large limit of 0.95 exhibit that there exists high fluctuation in NPLR. This infers that the collection of non-performing credits has improved over time. The high inside variety in NPLR of 0.15 contrasted with between variety of 0.07 implies that individual banks techniques for managing nonperforming loans throughout the years were not as compelling as those methodologies inside the financial division (between varieties). This could be to a great extent attributable to the removal of qualifying non-performing advances to Zimbabwe Asset Management Company (ZAMCO). Likewise, this could be because of the endeavours of the Reserve Bank of Zimbabwe (RBZ) to set up Credit Reference Bureaus (CRBs).

Bank – Specific and Macroeconomic Variables in Zimbabwe

Table 3 above shows that bank – specific variables like bank size (*BS*), bank age (*BA*) and market share (*MS*) have more between variations than within variations. The variables imply that, some banks have more assets, more cost efficient and have more deposits in the market than other banks. Our macroeconomic variables, *LNVM* and *LNINFL* are cross-section invariant variables thus the between variations for these variables are not different from zero. As such, the within-bank variations of these variables equal the overall variations. For example, the within-bank variation of *LNVM* is 0.06, which is equivalent to the overall variation of 0.06.

4.2 Correlation Analysis

This section focuses on uncovering the nature of relationship among variables. Correlation analysis is a test for multicollinearity and indicates the predictive connection between the dependent variable (*ROA*) and independent variables (*LDR*, *NPLR*, *BS*, *BA*, *MS*, *LNVM* and *LNINFL*). Table 4 shows that *CAR*, *BS*, *MS* and *LNINFL* are negatively related to bank profitability (measured by *ROA*) while it is positively correlated to *LDR*, *NPLR* and *LNVM*. Correlation coefficients between *ROA*, *CAR*, *NPLR* and *MS* have unexpected negative, positive and negative signs, respectively.

Table 4: Correlation Matrix

Roa	1.0000							
Ldr	-0.1512	1.0000						
Car	-0.3059	-0.1953	1.0000					
Nplr	0.1205	0.0294	0.0068	1.0000				
Bs	0.1163	0.0709	-0.3352	-0.1179	1.0000			
Ba	-0.3225	0.0630	0.5977	-0.2123	0.1353	1.0000		
Ms	0.1420	0.2884	-0.3379	-0.2171	0.6978	0.0387	1.0000	
Lnvmi	0.2499	-0.1379	-0.2122	-0.3367	0.1014	-0.0115	0.0082	1.0000
Lninfl	0.1169	-0.1213	-0.2360	0.2214	0.4809	0.0732	-0.0631	0.0511
	1.000							

The findings from the correlation analysis are in tandem with a plethora of literature pertaining to the impact of liquidity risk on performance of commercial banks in Zimbabwe. The results are in tandem with the findings of Liu (2014) who put forward different methods of measuring liquidity risk including cash in hand to asset ratio, liquidity ratio, borrowing fund-asset ratio, borrowing fund-

R oa	L dr	C ar	Nplr	Bs	Ba	ms	Lnvmi	lninfl
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deposit ratio, cash reserve ratio deposit-credit ratio, lending fund-deposit ratio, and debt paying ability and found that liquidity risk has a negative impact on performance of commercial banks.

4.4 Hausman Test

According to Table 6, the χ^2 value for the Hausman Test is 7.6 with a corresponding *p-value* of 0.36 meaning that our estimations are significant. Given that $[(p\text{-value} > \chi^2) > 0.05]$, we may fail to reject the null hypothesis that the REM is valid at 5% level of significance. Thus, the REM is the most suitable model as compared to the FEM.

Table 5: Hausman Test Results

--Coefficients --

	(b)	(B)	(b-B)	sqrt (diag (V_b-V_B))
	fixed	Random	Difference	S.E.
Ldr	-0.0067	-0.0061	-0.0006	0.0123
Nplr	0.0018	0.0017	0.0001	0.0031
Bs	-0.0013	-0.0039	0.0026	0.0034
Ba	-0.0789	-0.0066	-0.0723	0.0406
Ms	0.0719	0.0942	-0.0223	0.1023
Lninf	0.1690	0.0968	0.0722	0.0861
Invmi	0.0645	0.0790	-0.0145	0.0087

$$\chi^2(7) = 7.60$$

$$p - value = 0.3693$$

4.5 Panel Unit Root Test

As stated in chapter three, stationarity of variables was tested using the Levin–Lin–Chu Test which tests the existence of a unit root. It was discovered that all the variables (**ROA, LDR, NPLR, BS, BA, MS, LNVMI** and **LNINFL**) are stationary at their levels. This means that they are all integrated of order zero as stated in Table 5.

Table 6: Stationarity Test ResultsVariable Levin–Lin–Chu p-value Order of Level of Stationarity bias-Integration adjusted *t* statistic

ROA	-4.3780	0.0545	I (0)	***
LDR	-2.3424	0.0123	I (0)	*
NPLR	-1.5679	0.0038	I (0)	*
BS	-4.7892	0.0521	I (0)	**
BA	-3.6789	0.0423	I (0)	**
MS	-2.5897	0.0215	I (0)	**
LNVMI	-1.7856	0.0045	I (0)	*
LNINFL	-2.3345	0.0178	I (0)	**

implies stationarity at 1%, ** implies stationarity at 5%, * means stationarity at 10%.*

Having series of panel data that is stationary at their levels (original form), it implies that there is no need for differencing of the variables. It therefore this means that the study used the variables in their original form.

4.6 The Random Effects Model

Guided by the results of the Hausman Test above, the study adopted the REM model. This means that all the interpretations and conclusions of this study follow the explanations of REM as outlined in Chapter 3. From Table 7, the constant of the model has a negative value though statistically insignificant. The model is very strong in explaining the variation across banks in Zimbabwe since the within, between and overall R-squared values for this model are 14%, 87% and 26% respectively. This means that the random effects estimator can explain 14% of the within variation, 87% of the between variation and 26% of the overall variation of bank profitability (*ROA*). The higher R Squared implies that a greater proportion of variations in dependent variable (*ROA*) is explained by combined variations in the independent variables both within and overall.

The Impact of Liquidity on Profitability

The coefficient in Table 7 show that *LDR* (as a measure of liquidity risk), is negatively related to bank profitability (measured by *ROA*) as expected, at 5% level of significance. A unit increase in bank liquidity risk will result in 0.0063 units decrease in its profitability. This suggests that for banks in Zimbabwe, profitability is determined by availability of liquidity. In that regard, a boost in liquidity is a boost in profitability as the bank can cushion itself against default risk. In addition, a bank will be able to withstand deposit withdrawals when they fall due.

The results are in tandem with the a priori expectations as well as the hypothesis in chapter one that, liquidity risk has a negative impact on performance of commercial banks in Zimbabwe. The study is also in sync with other studies that which investigated the impact of liquidity on performance of banks such as Khan and Ali (2016) who found that liquidity has a positive impact on performance of commercial banks. Hence, liquidity risk is deemed to be negatively related to performance of commercial banks.

The Impact of Credit Risk on Profitability

As a measure of credit risk, the coefficient of *NPLR* is positively related to bank profitability (measured by *ROA*) which was not expected, though statistically insignificant. The positive relationship contradicts with the predictions of Firm Characteristics Theories and Loan Pricing Theory explained in Chapter 2, though the significance of the coefficient of *NPLR* is inconsistent with the theories. This implies that the profitability of banks in Zimbabwe is determined by other variables other than credit risk (*NPLR*), ceteris paribus.

The results corroborate with the findings of Rafiqah and Hafinaz (2019) who found that there is a significant relationship between the measures of profitability (ROA and NIM) and the explanatory variables which are non-performing loan ratio, loan to deposit ration and capital adequacy ratio. This implies that credit risk has an impact on performance of banks.

The Impact of Bank – Specific and Macroeconomic Variables on Profitability

The results show that at 1% level of significance, there is a negative relationship between bank age (**BA**) and profitability (**ROA**). A unit increase in bank age results in 0.0131-unit reduction in its profitability. There is a positive relationship between bank age and profitability and that the older the bank, the more experience it has in the financial sector and therefore is familiar with the market trends. For banks in Zimbabwe this could be that new players who apparently have new methods of doing business than older banks and their significant investing in technology results in the provision of better services at low costs.

Table 7: Estimation Results of the Random Effects Model

Roa	Coef.	Std. Err.	Z	P>z	[95% Conf.	Interval]
Ldr	-.0061306	.0031694	-1.93	0.053	-.0123425	.0000814
Nplr	.001748	.0009196	1.90	0.057	-.0000545	.0035504
Bs	-.003863	.003305	-1.17	0.242	-.0103406	.0026146
Ba	-.0066489	.002213	-3.00	0.003	-.0109863	-.0023116
Ms	.0941818	.0380755	2.47	0.013	.0195551	.1688084
Lninfl	.0967707	.0679433	1.42	0.154	-.0363957	.2299371
Lnvmi	.0790187	.024828	3.18	0.001	.0303566	.1276808
_cons	-.6914598	.2875888	-2.40	0.016	-1.255123	-.1277962

R-sq: within = 0.1456 between = 8707 overall = 0.2639

Contradicting with the Economic Model of Firm Performance is bank size (**BS**), whose coefficient was found to be positive and statistically insignificant. However, the positive relationship of market share (**MS**) is consistent with the Economic Model of Firm Performance, though its coefficient was

found to be statistically insignificant. For banks in Zimbabwe this means that neither bank size nor market share play a role in increasing profitability.

GDP (measured by *LNVM*) is positively related to bank profitability but statistically insignificant. This finding is in tandem with that of Abel and Le Roux (2016) who found no significant relationship between GDP and bank profitability. This can be explained by the fact that even though the capacity utilization was very low, the industrial index (our proxy for GDP growth) was increasing. In this regard, the stock market defied economic fundamentals hence industrial performance was found to be insignificant. For banks in Zimbabwe, this means that for the period under review there were no spill-over effects of economic growth to profitability.

As expected, the coefficient of inflation (*LNINFL*) was found to be negatively related to profitability but statistically insignificant. A possible explanation for such a finding could be that for the period between 2009 and 2013, the Zimbabwean economy enjoyed the lowest inflation levels in its history (Jabangwe and Kadenge, 2015).

4.7 Post estimation tests

Heteroscedasticity test and autocorrelation test were done after the estimation of the results to ensure authenticity of results before their interpretation

Table 8: Post estimation tests

test	method	p-value
Heteroscedasticity	Breusch Pagan Test	0.1476
Autocorrelation	Panel Breusch Godfrey test	0.7466

Breusch-Pagan test was employed to test for heteroskedasticity, the results obtained support the null hypothesis that errors are homoscedastic. The probability value was 0.1476 which is greater than 0.05, therefore based on the information we may fail to reject the null hypothesis that errors are homoscedastic at 5% level of significance. On the other hand, the results from the Breusch Godfrey test shows no problem of autocorrelation since p value is 0.7466 is greater than 0.05. Therefore, we reject the null hypothesis that errors are auto correlated at 5% level of significance.

4.6 Conclusion

This chapter covered the estimation, presentation and analysis of results. At 10 % level liquidity (measured by *LDR*) was found to be having a negative relationship and profitability of the banking sector in Zimbabwe. Bank age was found to have a negative impact on bank profitability. The coefficients of other variables such as bank size, market share, economic growth and inflation were found to be statistically insignificant.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

After going through empirical testing of the hypothesis of the study, this chapter therefore, presents the summary of the study as well as conclusions and policy initiatives and recommendations. All the policy recommendations are drawn from the findings of the study. Lastly, the chapter presents the areas of further studies.

5.1 Summary and Conclusions of the Study

The main objective of this study was to investigate the impact of liquidity risk on profitability of commercial banks in Zimbabwe over the period 2009 to 2019. Despite having liquidity risk as the main independent variable, the study also considered other crucial variables that determine performance or profitability of commercial banks in Zimbabwe which include credit risk, non-performing loans and country macroeconomic factors such as inflation and Gross Domestic Product. The inclusion of many other control variables was done in order to strengthen the analysis of key factors affecting the performance of commercial banks in Zimbabwe.

The investigation utilized data gathered from the biannually financial reports of the listed five banks used which are CBZ Holdings Limited, FBC Holdings Limited, ZB Financial Holdings Limited, First Capital Bank (in the past Barclays Bank of Zimbabwe Limited) and NMBZ Holdings Limited for the period 2009 B1 to 2019 B2. The study contained banks recorded on the Zimbabwe Stock Exchange (ZSE). The examination utilized the Random Effects Model (REM), guided by the Hausman Specification Test. For the assessment of results, the investigation utilized STATA rendition 14. In an offer to incorporate a few factors that catch benefit, the investigation acquired other control factors from speculations of execution in Chapter 2. These factors incorporate, bank size, piece of the overall industry, bank age, inflation and gross domestic product.

The study found that the main independent variable namely liquidity risk is statistically significant at 5% and has a negative impact on the profitability of commercial banks in Zimbabwe. It can be concluded that liquidity risk negatively influences performance of banks in Zimbabwe. Hence all measures should be taken to address liquidity risk. Contrary to the apriori expectations, the study found that non-performing loans have a positive impact on the profitability of commercial banks in Zimbabwe. However, this might be due to the creation of Zimbabwe Deposit Protection Scheme to deal with the nonperforming loans such that they are not so impactful on the performance of commercial banks.

Bank age was found to be having a negative impact on the profitability of commercial banks in Zimbabwe. On the other hand, gross domestic product as expected was found to have a positive impact on the performance of commercial banks in Zimbabwe. Developed economies and middle-income economies have much developed financial sectors which entails that is this statement complete?

5.2 Policy Implications and Recommendations

Banks play a critical intermediation role of transferring funds from the surplus units to deficit units. In the process they are exposed to different kinds of risks. Therefore, monitoring the performance and factors that influence profitability of banks is of paramount importance for policy formulation and thus to the economy of Zimbabwe. The policy recommendations in this study are drawn specifically from the findings in Chapter 4.

At 5% level of significance, the results show that liquidity risk negatively affects profitability of commercial banks in Zimbabwe. The coefficient of LDR had a negative and measurably critical effect on gainfulness. This proposes for banks in Zimbabwe, productivity is controlled by accessibility of liquidity. The greater the liquidity the greater productivity increments as a bank will have the option to pad itself against high incidence of default. Likewise, a bank will be in a situation to withstand withdrawals when they fall due that is if they are liquid. In this regard banks in Zimbabwe ought to flourish to hold sufficient measure of liquidity in their coffers to help profitability. The study, therefore, recommends the need for greater regulatory monitoring of banks.

The outcomes show that there is no critical connection between credit danger and profitability of the financial sector in Zimbabwe. The coefficient of NPLR had a negative and factually unimportant relationship with productivity. The discoveries uncover that profits of banks are not affected by the measure of nonperforming credits. This suggest that a few factors other than nonperforming advances are pertinent in deciding the benefit of banks in Zimbabwe. Banks that are excited about making high benefits should focus on different factors for instance charging client's expenses in return of monetary administrations, for example, Safe keeping administrations like protected store records and wellbeing store boxes. On the off chance that the goal is to boost benefit, banks ought to likewise consider exchanging monetary instruments the budgetary business sectors, for example, stocks and bonds.

Likewise, the examination draws a portion of its approach suggestions from a control variable whose coefficient was found factually noteworthy. The discoveries show a negative connection between bank age and gainfulness at 1% level of essentialness. This recommends old banks ought to get rid of old business techniques and thoughts that are costly and wasteful.

5.3 Limitations of the Study and Suggestions of Areas for Further Study

Researchers could also use annual data for analyses as the study used semi-annual data. The study only focused on five listed banks since it was easier to find data for listed entities than for unlisted ones. Resources permitting, future studies should consider all banks rather than only five used in this study. The research only looked on the effects of capital adequacy, liquidity and credit risk in post-crisis period (2009 b1 to 2019 b4), therefore it will be interesting to include structural breaks and cover periods in which Zimbabwe was using own currency (period before 2008) and this period of dollarization. Other than just studying for the Zimbabwean banking sector, research regarding liquidity, credit risk and bank profitability at regional levels like Southern African Development Community (SADC) can be done.

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Appendices

Data

id	t	ROA	LDR	CAR	NPLR	BS	BA	MS	LNVM I	LNINFL
1	1	0.0168	0.3527	12.35	0	18.4293	3.3759	0.176	4.5275	4.5503
1	2	0.0113	0.4643	12.225	0	19.7489	3.3844	0.2627	4.4141	4.5036
1	3	0.0187	0.5488	12.42	0	19.7506	3.3928	0.2712	4.5151	4.5152
1	4	0.0244	0.7071	12.615	-4.499	20.1203	3.4012	0.2625	4.5476	4.5225
1	5	0.0126	0.8547	12.81	-6.753	20.2385	3.4095	0.2739	4.4816	4.5429
1	6	0.0183	0.7466	12.4575	-6.3584	20.2889	3.4177	0.2459	4.4844	4.556
1	7	0.0228	0.7113	12.105	-4.4138	20.4828	3.4259	0.2767	4.5778	4.5543
1	8	0.035	0.9059	11.7525	-5.4763	20.4585	3.4345	0.2297	4.6689	4.5584
1	9	0.0144	1.0367	11.4	-5.8032	20.4407	3.442	0.2342	4.6181	4.5733
1	10	0.0178	0.9322	11.775	-4.3075	20.6408	3.45	0.2424	4.5686	4.5822
1	11	0.0261	1.1295	12.15	-3.3177	20.6479	3.4579	0.2216	4.653	4.5907
1	12	0.0364	1.1456	12.525	-4.527	20.7166	3.4657	0.213	4.6149	4.6022
1	13	0.0096	1.1827	12.9	-2.7493	20.7451	3.4735	0.2141	4.5351	4.5857
1	14	0.0144	1.1197	13.15	-2.8326	20.8162	3.4812	0.2141	4.5314	4.5932
1	15	0.0238	1.2452	13.4	-2.9132	20.7969	3.4889	0.199	4.5419	4.5974

1	16	0.035 9	1.172 9	13.65	- 2.9711	20.856 5	3.496 5	0.234 9	4.540 7	4.6039
1	17	0.008 1	1.440 6	13.9	-2.928	20.879	3.504 1	0.194 6	4.484 1	4.6128
1	18	0.009 7	0.441 5	13.925	- 4.5645	20.947 6	3.511 5	0.209	4.497 4	4.6148
1	19	0.012 2	0.479 8	13.95	- 4.7706	21.091 8	3.519	0.224 2	4.520 3	4.6086
1	20	0.018 6	0.485 4	13.975	- 4.6947	21.183 3	3.526 4	0.236 8	4.543 2	4.6087
1	21	0.001 8	1.030 2	14	- 2.0888	21.235 1	3.533 7	0.244 8	4.416 8	4.6095
1	22	0.005	1.030 2	13.45	- 1.3789	15.458 3	3.541	0	4.450 9	4.613
2	1	0.003 1	1.089 5	13.54	0	17.906 3	2.505 5	0.014 3	4.527 5	4.5503
2	2	0.007 9	0.915 8	13.625	0	18.231 8	2.525 7	0.045 4	4.414 1	4.5036
2	3	0.010 7	1.354 4	13.75	- 6.1467	18.278	2.545 5	0.045 5	4.515 1	4.5152
2	4	0.006 8	1.489	13.875	-4.377	18.811 5	2.564 9	0.069 5	4.547 6	4.5225
2	5	0.000 4	1.093 6	14	- 4.3738	18.99	2.584	0.072 4	4.481 6	4.5429
2	6	0.003 6	0.534 5	13.75	- 4.2125	18.753 1	2.602 7	0.044 8	4.484 4	4.556
2	7	- 0.007 6	0.265 4	13.5	- 4.5507	18.829 5	2.621	0.047	4.577 8	4.5543
2	8	0.025 1	0.197 5	13.25	0	19.039 6	2.639 1	0.047	4.668 9	4.5584
2	9	0.005 7	0.024 7	13	- 3.3538	19.035 8	2.656 8	0.040 5	4.618 1	4.5733

2	10	0.014 5	0.029 1	13.5	- 3.1357	19.041 2	2.674 1	0.043 1	4.568 6	4.5822
2	11	0.025 4	0.128 3	14	- 3.0823	19.168 8	2.691 2	0.046 9	4.653	4.5907
2	12	0.032 6	0.391 9	14.5	- 3.2803	19.094 2	2.708 1	0.041 4	4.614 9	4.6022
2	13	0.006 7	0.775 6	15	0	19.519 4	2.724 6	0.063 6	4.535 1	4.5857
2	14	0.015 6	0.200 5	15	- 2.8271	19.322 6	2.740 8	0.049 9	4.531 4	4.5932
2	15	0.020 4	0.217	15	- 2.2997	19.373 5	2.756 8	0.049 7	4.541 9	4.5974
2	16	0.023 4	0.330 8	15	- 2.3863	19.467 1	2.772 6	0.049 4	4.540 7	4.6039
2	17	0.003 7	0.178 3	15	- 2.0823	19.519 1	2.788 1	0.054 1	4.484 1	4.6128
2	18	0.012 3	0.177 3	15.25	- 1.4038	19.639 1	2.803 4	0.059 5	4.497 4	4.6148
2	19	0.017 3	0.288 6	15.5	- 1.4774	19.655 3	2.818 4	0.052 9	4.520 3	4.6086
2	20	0.023 4	0.179 3	15.75	- 2.5148	19.613 2	2.833 2	0.051 5	4.543 2	4.6087
2	21	0.004 3	0.202 4	16	- 2.9512	19.652 8	2.847 8	0.053 8	4.416 8	4.6095
2	22	0.011 5	0.202 4	15.75	- 2.7182	19.686 6	2.862 2	0.076 9	4.450 9	4.613
3	1	- 0.008 1	0.044 9	40.6	- 5.2781	18.454 1	4.577 3	0.118 2	4.527 5	4.5503
3	2	0.006 3	0.027 7	40.5	- 1.4934	18.692 4	4.579 9	0.105 6	4.414 1	4.5036
3	3	- 0.003 1	0.142 8	37	- 3.5731	18.845	4.582 4	0.111 1	4.515 1	4.5152

3	4	0.003 4	0.168 4	33.5	- 4.8443	19.047 5	4.585	0.088 8	4.547 6	4.5225
3	5	- 0.010 2	0.199 3	30	- 4.9348	18.963 6	4.587 5	0.067 3	4.481 6	4.5429
3	6	- 0.005 5	0.211 8	27.25	- 5.0698	19.020 9	4.590 1	0.064 5	4.484 4	4.556
3	7	- 0.005 9	0.233	24.5	- 5.4763	19.228 3	4.592 6	0.077 8	4.577 8	4.5543
3	8	- 0.007 1	0.252 3	21.75	- 10.488 1	19.260 8	4.595 1	0.069 8	4.668 9	4.5584
3	9	0.001 5	0.269 9	19	- 5.7189	19.308 8	4.597 6	0.067 6	4.618 1	4.5733
3	10	0.003 4	0.297 4	18.75	- 5.8109	19.335 5	4.600 2	0.061 4	4.568 6	4.5822
3	11	0.003 1	0.269 5	18.5	- 5.9281	19.511 9	4.602 7	0.074 2	4.653	4.5907
3	12	0.008 8	0.285 7	18.25	- 5.9076	19.456	4.605 2	0.066 6	4.614 9	4.6022
3	13	0.003 1	0.291 3	18	- 5.8559	19.453 6	4.607 7	0.055 8	4.535 1	4.5857
3	14	0.002 9	0.306 4	17.75	- 4.5374	19.467 5	4.610 2	0.054 7	4.531 4	4.5932
3	15	0.002 8	0.280 7	17.5	-4.321	19.612 6	4.612 6	0.059 6	4.541 9	4.5974
3	16	0.004	0.427	17.25	- 4.5653	19.597 2	4.615 1	0.052 7	4.540 7	4.6039
3	17	0.002 7	0.422 5	17	- 4.5684	19.557	4.617 6	0.058 9	4.484 1	4.6128
3	18	0.003 9	2.012	17.775	- 1.4726	19.614 1	4.620 1	0.055	4.497 4	4.6148

3	19	0.004 9	2.123 2	18.55	- 1.8892	19.719 4	4.622 5	0.061 3	4.520 3	4.6086
3	20	0.015 4	1.898 1	19.325	- 1.5972	19.700 6	4.625	0.058 1	4.543 2	4.6087
3	21	0.003 4	0.491 6	20.1	- 0.3677	19.665 6	4.627 4	0.054 3	4.416 8	4.6095
3	22	0.007	0.491 6	19.675	- 0.2745	19.676 7	4.629 9	0.068 9	4.450 9	4.613
4	1	- 0.001 8	0.828 6	23.8	- 3.8372	16.487 9	2.847 8	0.014 4	4.527 5	4.5503
4	2	0.064 4	0.334 2	23.895	0	16.991 8	2.862 2	0.017	4.414 1	4.5036
4	3	0.061 6	0.389 8	21.76	- 4.9626	17.249 8	2.876 4	0.019 6	4.515 1	4.5152
4	4	0.053 3	0.472 4	19.625	- 3.9486	17.528 1	2.890 4	0.020 8	4.547 6	4.5225
4	5	0.011 8	0.306 2	17.49	- 3.7868	17.676 4	2.904 2	0.021 5	4.481 6	4.5429
4	6	0.015 4	0.067 9	16.71	- 3.9152	18.081 6	2.917 8	0.028 8	4.484 4	4.556
4	7	- 0.012 1	0.205 7	15.93	- 2.9642	18.024 6	2.931 2	0.021 7	4.577 8	4.5543
4	8	0.007	0.020 8	15.15	- 1.9564	18.472 9	2.944 4	0.028 4	4.668 9	4.5584
4	9	0.012 5	0.066 4	14.37	- 2.5667	18.68	2.957 5	0.033 9	4.618 1	4.5733
4	10	0.022 9	0.083 6	14.652 5	- 2.2683	18.682 6	2.970 4	0.031 3	4.568 6	4.5822
4	11	0.026 9	0.065 5	14.935	- 3.2233	18.859 2	2.983 2	0.037 3	4.653	4.5907
4	12	0.032 9	0.098 7	15.217 5	- 2.4328	18.940 7	2.995 7	0.037 7	4.614 9	4.6022

4	13	0.005 4	1.195 5	15.5	0	18.930 1	3.008 2	0.033 5	4.535 1	4.5857
4	14	0.017	0.091 3	15.945	-2.136	19.021 6	3.020 4	0.036 1	4.531 4	4.5932
4	15	0.037 3	0.013	16.39	- 2.1715	19.145 4	3.032 5	0.039 5	4.541 9	4.5974
4	16	0.042	0.006 6	16.835	- 2.1618	19.274 1	3.044 5	0.039 5	4.540 7	4.6039
4	17	0.005 8	0.110 6	17.28	-2.006	19.299 5	3.056 4	0.043 7	4.484 1	4.6128
4	18	0.012 2	0.032 5	17.79	- 1.4301	19.427 5	3.068 1	0.042 9	4.497 4	4.6148
4	19	0.017 6	0.405 5	18.3	- 1.4982	19.437 3	3.079 6	0.038 8	4.520 3	4.6086
4	20	- 0.011 5	0.215 6	18.81	-1.625	19.408 3	3.091	0.042 5	4.543 2	4.6087
4	21	0.004 3	0.168 5	19.32	- 1.5587	19.381 4	3.102 3	0.037 7	4.416 8	4.6095
4	22	0.006 7	0.168 5	19.305	-1.609	19.439	3.113 5	0.050 8	4.450 9	4.613
5	1	0.010 1	2.511 6	25.43	0	17.465	4.064 7	0.052 3	4.527 5	4.5503
5	2	- 0.053 4	1.758 8	25.572 5	- 4.6005	17.437 1	4.069	0.031 3	4.414 1	4.5036
5	3	- 0.040 9	0.984 6	24.63	- 4.7448	18.059	4.073 3	0.038 9	4.515 1	4.5152
5	4	- 0.060 4	0.936 8	23.687 5	- 3.2968	18.178 7	4.077 5	0.035 9	4.547 6	4.5225
5	5	0.019 5	0.407 9	22.745	- 3.6903	18.374 8	4.081 8	0.035 3	4.481 6	4.5429

5	6	0.016 5	0.576 9	22.105	- 2.8096	18.667	4.086	0.047 9	4.484 4	4.556
5	7	0.007 1	0.264 9	21.465	- 2.9761	18.688 6	4.090 2	0.042 9	4.577 8	4.5543
5	8	0.022 8	0.266 4	20.825	- 3.2556	18.859 1	4.094 3	0.044 2	4.668 9	4.5584
5	9	0.021 3	0.075 6	20.185	- 3.2142	18.954 2	4.098 5	0.044 3	4.618 1	4.5733
5	10	0.033 3	0.127 1	20.826 3	- 2.7244	19.049	4.102 6	0.043 2	4.568 6	4.5822
5	11	0.037 4	0.110 8	21.467 5	- 3.0888	19.203 1	4.106 8	0.047 3	4.653	4.5907
5	12	0.036 5	0.271 2	22.108 8	- 2.4167	19.273 8	4.110 9	0.049 4	4.614 9	4.6022
5	13	0.001 3	0.140 2	22.75	- 2.0022	19.347 4	4.115	0.051 3	4.535 1	4.5857
5	14	0.009 5	1.004 8	22.972 5	- 0.9222	19.369 3	4.119	0.051 2	4.531 4	4.5932
5	15	0.006 7	0.235 7	23.195	- 1.5627	19.447 9	4.123 1	0.052	4.541 9	4.5974
5	16	0.020 9	0.149 8	23.417 5	- 1.5803	19.455	4.127 1	0.048 3	4.540 7	4.6039
5	17	0.001 9	0.165 1	23.64	- 1.6043	19.466 4	4.131 2	0.052 5	4.484 1	4.6128
5	18	0.004 2	0.263 2	24.145	- 1.5731	19.521 8	4.135 2	0.053 8	4.497 4	4.6148
5	19	0.006 5	0.047 1	24.65	- 1.8362	19.456 7	4.139 2	0.049 5	4.520 3	4.6086
5	20	0.004 7	0.126 3	25.155	0	19.454	4.143 1	0.049 7	4.543 2	4.6087
5	21	0	0.384 1	25.66	0	19.505 4	4.147 1	0.051 3	4.416 8	4.6095
5	22	-0.004	0.384 1	25.402 5	0	19.558 6	4.151	0.070 5	4.450 9	4.613

Turnitin Report

The screenshot shows a web browser window displaying the Turnitin Class Portfolio page. The browser's address bar shows the URL: https://www.turnitin.com/s_class_portfolio.asp?aid=79547&cid=28892067&lang=en.... The page header includes the Turnitin logo and navigation tabs for 'Class Portfolio', 'My Grades', 'Discussion', and 'Calendar'. A navigation menu at the top right lists 'Boniface Stima', 'User Info', 'Messages', 'Student', 'English', 'Help', and 'Logout'. A blue sidebar on the left contains icons for home, search, and other functions.

The main content area features a 'NOW VIEWING: HOME > DISSERTATIONS' breadcrumb. A light blue notification box reads: 'Welcome to your new class homepage! From the class homepage you can see all your assignments for your class, view additional assignment information, submit your work, and access feedback for your papers. Hover on any item in the class homepage for more information.' Below this is a dark grey button labeled 'Class Homepage'.

A paragraph explains: 'This is your class homepage. To submit to an assignment click on the "Submit" button to the right of the assignment name. If the Submit button is grayed out, no submissions can be made to the assignment. If resubmissions are allowed the submit button will read "Resubmit" after you make your first submission to the assignment. To view the paper you have submitted, click the "View" button. Once the assignment's post date has passed, you will also be able to view the feedback left on your paper by clicking the "View" button.'

The 'Assignment Inbox: Dissertations' table is shown below:

Assignment Title	Info	Dates	Similarity	Actions
Dissertations		Start 01-Apr-2021 2:59PM Due 08-Apr-2021 11:59PM Post 08-Apr-2021 11:59PM	16%	Resubmit View

On the right side of the browser window, a Gmail interface is partially visible, showing 'Reply all', 'Forward', and 'Up' buttons, along with an email address 'reply@turnitin.com'.