

**A STUDY OF THE EFFECT OF THE TREASURY SINGLE ACCOUNT ON
COMMERCIAL BANKS DEPOSITS AND LENDING IN ZAMBIA**

BY

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**A Dissertation submitted to the University of Zambia in partial fulfillment of the
requirements for the award of the degree of Master of Business Administration in
Management Strategy**

THE UNIVERSITY OF ZAMBIA

LUSAKA

2024

DECLARATION

I, **Felix Mulenga**, do hereby declare that this work is my original work achieved through personal reading and research. This work has never been submitted to the University of Zambia or any other Universities. All sources of data used and literature on related works previously done by others, used in the production of this Dissertation have been duly acknowledged. If any omission has been made, it is not by choice but by error.

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APPROVAL

This Dissertation by **Felix Mulenga** is approved as a partial fulfillment of the requirements for the award of the degree of Master of Business Administration in Management Strategy.

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ABSTRACT

The implementation of the Treasury Single Account (TSA) in Zambia brought about drastic changes in the management of public funds. The Bank of Zambia assumed custodianship of public funds while Commercial Banks remain revenue collection agents throughout the country. This study investigated the effect of the TSA on Commercial Banks Deposit Mobilization and Lending in Zambia. Secondary and Time series data were collected from the Bank of Zambia (BOZ) annual reports covering the pre- and post-TSA implementation eras, over a ten-year period (2010-2019). The independent variable was represented by Government Deposits (representing the TSA), while aggregate Commercial Banks Deposits and Loans and Advances were the dependent variables. The data were analysed using descriptive, regression and correlation analysis, with the aid of IBM SPSS Statistics version 28. The findings of the study revealed that Government Deposits have a significant positive effect on Commercial Banks Deposit Mobilization. The P-value was found to be <0.001 which is less than 0.05 meaning that the P-value is statistically significant at 5% level. The study also revealed that Government Deposits have significant positive effect on Commercial Banks Loans and Advances. The P-value was found to be <0.001 which is less than 0.05 meaning the P-value is statistically significant at 5% level. The trend analysis of Government Deposits further revealed a slow growth in Government Deposits after TSA implementation. Between 2010 and 2014 which is the pre-TSA era, Government Deposits in Commercial Banks grew by 163%, whilst between 2015 and 2019, which is the post-TSA era; Government Deposits grew by 74%. The trend analysis of Loans and Advances revealed a slower growth in Loans and Advances during the post-TSA era (35%), compared to 136% growth during the pre-TSA era. The study therefore concluded that the TSA which aims to withdraw Government Deposits from Commercial Banks has a negative effect on Commercial Bank Deposits and their lending ability. The study recommended that banks should develop strategies to attract private sector deposits, to fill the void created by the implementation of the TSA. Banks should come up with innovative solutions to tap into the unbanked population. It is important that banks develop attractive savings products to encourage the culture of saving among citizens. The study further recommended that the Ministry of Finance should consider allowing Commercial Banks involved in revenue collection, a few days float before revenue is remitted to the main TSA account at Bank of Zambia (BOZ).

Keywords: Treasury Single Account, Government Deposits, Loans and Advances

ACKNOWLEDGEMENTS

I would like to acknowledge my supervisor, Dr. T. Chowa for his guidance throughout my research work. He always took time to critic my work and made invaluable contribution to the study.

I would also like to acknowledge the UNZA GSB faculty for creating an environment that promotes learning. I am indebted to my employer Investrust Bank Plc for the financial support and time away from work during my studies. Further appreciations go to my elder brother Kayula Mulenga and family, and Enock Mukena (posthumously) and family for their material and moral support during my studies.

Finally, I would like to express my sincere gratitude to all those who supported and encouraged me in different ways to enable me complete this work.

DEDICATION

I dedicate this work to the Almighty God, who gives me the strength, wisdom and understanding to do all things. He has been by my side, and I have seen His grace and favour over my life. This far the Lord has brought me. If I can boast about anything, it is the grace of our Lord.

I also dedicate this work to my wife, Namasiku Misika and our three children, Mwansa Mulenga, Steve Mulenga and Lilato Mulenga, who have been a source of encouragement and motivation to continue with this study and had to endure many days of my absence from home during the course of my studies.

This will not be complete without mentioning my father, Mr. Humphrey K. Mulenga and my late mum, Stellar Chilufya and all my brothers and sisters, who had to make many sacrifices for me to acquire an education.

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ABBREVIATIONS AND ACRONYMS

TSA:	Treasury Single Account
CDM:	Commercial Bank Deposit Mobilization
GD:	Government Deposits
L&A:	Loans and Advances
BOZ:	Bank of Zambia
MOF:	Ministry of Finance
IFMIS:	Integrated Financial Management Information System
LDR:	Loan-to-deposit ratio
NPL:	Nonperforming Loan

CHAPTER 1

INTRODUCTION

1.1 Introduction

Public Financial Management (PFM) is a crucial aspect for effective governance. It involves managing government finances, including revenue collection, expenditure, and cash management. (Vion, 2017) reports that for many years, development partners have promoted the implementation of the Treasury Single Account (TSA) in developing countries as the main instrument to optimize cash management. (Pattanayak & Fainboim, 2010) assert that in countries with fragmented government banking arrangements, the establishment of a TSA should receive priority in the public financial management agenda. The government of the republic of Zambia in 2015 commenced the implementation of the Treasury Single Account (TSA), as a tool for effective public financial management (MOF, 2015). The TSA is a public accounting system under which all government revenues is collected into one single account, usually maintained at the Central Bank (Pessoa & William, 2012). The purpose of the TSA is to ensure accountability of government cash resources, enhance transparency and prevent abuse of public funds. One of the ways the TSA ensures efficient management of cash resources is by removing idle balances in government accounts with Commercial Banks (Pattanayak & Fainboim, 2011). The other benefit of the TSA system include reduction in unnecessary government borrowing through short term bridge financing and elimination of the unethical practice of government borrowing its own money through Treasury Bills and Government Bonds, bought by Commercial Banks from the Bank of Zambia, using idle government balances (MOF, 2019).

The TSA relieved the banking sector from management of government cash resources generated through Ministries, Departments and Agencies (MDAs) and thus created a hole in their liquidity base. (Pessoa & William, 2012) note that the TSA has implications for Commercial Banks in that the ability to hold on to government revenue for a time without paying interest has been a source of income for Commercial Banks in many countries. As the government repatriates balances (deposits) held by MDAs, a further source of profits for Commercial Banks disappears. (Banke & Yitayaw, 2022) contend that deposits are the most

important financial resource for Commercial Banks to meet their day to day business operations and it therefore requires that banks mobilize and accumulate enough deposits. The going concern of every Commercial Bank is highly dependent on deposits collected from customers (Namazi & Salehi, 2010). A bank's lending capacity is highly dependent on its ability to attract deposits, making it the ultimate source of bank profit and growth.

This study will therefore assess the how the implementation of the TSA policy in Zambia affects the performance of Commercial Banks; vis-à-vis effect on deposit mobilization and their lending ability.

1.2 Background to the Study

Commercial banks play a very important role in the financial system and the economy of any country. A stable financial sector is very critical to the wellbeing of an economy. Banks act as intermediaries between those who have surplus cash and those who need cash for investments and other purposes. Banks can only play this intermediary role if they maintain sufficient liquidity. Liquidity is key to driving performance in the banking sector.

The global financial crisis of 2007-2008 heightened the significance of liquidity in the financial sector. It is estimated that between 2008 and 2014, the United States Federal Reserve pumped more than \$4.0 trillion into the U.S economy to prevent collapse of financial system (Duigan, 2019). It is also believed that measures taken by the Federal Reserve to protect the U.S financial systems and spur economic growth helped prevent a global economic catastrophe (Duigan, 2019). Apart from deteriorating performance of the banking sector, liquidity problems can have damaging impact on the reputation of a financial institution (Jenkinson, 2008). Banks support the economy by providing loans to businesses, other financial institutions, individuals, and governments using customer deposits or other borrowed funds. It is therefore of utmost importance that banks should maintain adequate liquidity levels to function efficiently and effectively.

The Government of the republic of Zambia commenced implementation of the Treasury Single Account (TSA) in January, 2015. Until the introduction of the TSA, Ministries, departments, and other government Agencies (MDAs) which generate revenue maintained multiple banks accounts with Commercial Banks. This resulted in inefficiencies such as delays in remitting

funds to the ministry of finance and inability of government to know exact amounts in its accounts. This also created room for leakages of funds and embezzlement of public funds. During the launch of the TSA, Secretary to the cabinet asserted that the people of Zambia were fatigued with incessant negative reports in handling of public resources (TIMES OF ZAMBIA, 2015).

The Treasury Single Account is a banking arrangement put in place to eliminate multiple bank accounts created by Ministries, Departments and Agencies (Policy Monitoring and Research Centre (PMRC), 2018). The primary objective of the TSA is to ensure effective aggregate control of cash resources (MOF, 2019). The TSA concept is where all government revenues and expenditure are managed through one account maintained at the Central Bank. Commercial Banks which act as revenue collection agents are periodically required to transfer revenue collected on behalf of the government to the Treasury Single Account maintained at the Bank of Zambia (BOZ). (Sabo, et al., 2019) assert that as a result of implementation of the TSA, which moves public funds to the Central Bank, Deposit Money Banks start to lose funds immensely and thus impacting on their liquidity base. According to the 2016 Zambia Banking Industry Survey, one of the biggest issues faced by Commercial Banks and impacting their business was liquidity risk (PwC, 2017). The challenging liquidity environment meant that banks resorted to accessing funds through interbank lending and relatively priced fixed term deposits. As a result of the increased demand for interbank lending, interest rates pushed from about 15% in October 2015 to a high of 27% in March 2016. This general rise in interest rates led to an increase in interest expenses for Commercial Banks thus reducing their net interest margin from 65% in 2015 to 60% in 2016 (PwC, 2017). The 2019 Bank of Zambia annual report records that liquidity conditions in the Market were tight, partly due to Kwacha withdraw through net government revenue (BOZ, 2020). As a result, the overnight interbank rate also rose to 12.64% at the end of December 2019 from 9.8% at the end of December 2018, thus pointing to tightness in the market liquidity conditions.

In last few years, we have also seen some of the major Commercial Banks in Zambia reducing their branch network across the country, in order to curtail operating costs. In May 2019, Zambia National Commercial Bank (ZANACO) announced it was going to cut on the number of branches and Automated Tellers Machines (ATMs) and instead increase its agency banking network (Mitchell, 2019). Cavmont Bank also announced plans to close four branches countrywide in June 2019. In 2020 Standard Chartered Bank announced the closure of 5

branches countrywide. According to the Central Bank, the total number of bank branches in 2018 fell to 372 from 410 in 2017 (BOZ, 2019). Banks are looking for ways to minimize the fixed cost of maintaining branches and finding other means to offer products and services in a commercially viable way.

1.3 Statement of the problem

Before the implementation of the TSA various government agencies tasked with revenue collection maintained and held funds in Commercial Bank Accounts. These Government Deposits provided a cheap source of funds for commercial banks as they are normally interest free. With cheap funds, commercial banks can invest in interest earning assets such as securities and Loans and Advances. Following the implementation of the TSA, Commercial Banks are required to regularly transfer funds collected on behalf of the government to the Treasury Single Account maintained at the Bank of Zambia. This therefore meant that Commercial Banks lost a cheap source of funds. According to a study by (Odu & Joseph, 2019), Commercial Banks tend to lose immensely from the implementation of the Treasury Single Account, as this has caused insufficiency of available cash in the banking system, resulting in a surge in market rates, as banks source for funds to cover their liquidity position. (Anyanzwa, 2023) reports that Kenya's National Treasury was to begin mopping up government funds from Commercial Banks in September 2023, as the initial phase of TSA implementation project took off, a move that was likely to cause a shakeup in the liquidity position of the banking sector, in which government cash constituted about 8 to 10 percent of total bank deposits. (Sabo, et al., 2019) attest that the TSA system which moves public funds to the Central Bank results in immense loss of funds by banking sector and affect their liquidity base.

Given that the TSA is a recent financial management system being implemented in Zambia, not much has been empirically documented with regards to how the TSA relates to the performance of the Commercial Banks in Zambia. This study will therefore assess how the implementation of the TSA policy affects the performance of Commercial Banks in Zambia, with regards to deposit mobilization and lending.

1.4 The Aim of the Study

The aim of this study was to determine the effects of the Treasury Single Account (TSA) on Commercial Bank deposits and lending in Zambia.

1.5 The Objectives of the Study

The objectives of this research study were:

1. To investigate the effect of the TSA implementation on Commercial Banks Deposit Mobilization in Zambia.
2. To investigate the effect of the TSA implementation on the lending ability of Commercial Banks in Zambia.
3. To recommend possible measures to support Commercial Banks Deposit Mobilization and lending in Zambia.

1.6 Research Questions

1. What is the effect of the TSA on Commercial Banks Deposit Mobilization in Zambia?
2. What is the effect of the TSA on the lending ability of Commercial Banks in Zambia?
3. What are the possible measures to support Commercial Banks Deposit Mobilization and lending in Zambia?

1.7 Significance of the Study

The results from this study will go a long way in providing information to policy makers and government, on the effects of the TSA on banking sector and could also serve as an input to formulation of monetary and fiscal policies, in responding to banking sector challenges. The study will enable Managers and Boards of Commercial Banks to assess the effects of the Treasury Single Account (TSA) on their ability to mobilize deposits, provide credit and ultimately on their overall performance. It will also help potential and existing shareholders, Creditors, and Investors in Commercial Banks to make informed decisions. It will also contribute knowledge to literature for scholars and researchers interested in carrying out further studies in this area.

1.8 Scope of the Study

The study assessed the performance of the 18 Commercial Banks in Zambia by analysing the effect of Government Deposits on Commercial Bank Deposits and Loans and Advances between the periods 2010 to 2019. Secondary data on Government Deposits, Aggregate Commercial Banks Deposits and Loans and Advances were collected from Bank of Zambia annual reports over the period under study.

1.9 Limitation of the study.

The study only focused on one explanatory variable, Government Deposits, notwithstanding other factors that may affect Commercial Banks Deposit Mobilization and lending. It is therefore hoped that this study will elicit further research in this area.

1.10 Operational Definitions

This section presents the definition of key terms used in the study.

Treasury Single Account: A unified structure of government accounts enabling consolidation and optimum utilization of government cash resources.

Government Deposits: Government deposits refer to deposits held by the national treasuries and local government entities.

Loans and Advances: This is money borrowed from financial institutions repayable with interest.

Liquidity: Liquidity refers to how easy it is to turn an asset into cash without causing a big loss in value.

1.11 Ethical Considerations

There were little ethical considerations relating to participants as the study employed secondary data from Bank of Zambia annual reports, which are in public domain. However, the study was subjected to a review and clearance by University of Zambia Ethics Committee.

1.12 Chapter Summary

This chapter provided the introduction of the study and the background information on the implementation of the TSA in Zambia. It outlined how the TSA relates to Government Deposits in Commercial Banks, the statement of the problem, the research objectives and the research questions, significance of the study to various stakeholders and provided direction for the entire research.

1.13 Organization of the Dissertation

The rest of the study is organized as follows:

Chapter Two: Contains the theoretical foundation, the relevant literature review giving different insights from various authors on key elements of the study and the empirical review of related studies. It then builds on the construction of the conceptual framework and hypothesis testing.

Chapter Three: Gives details of the research design that was used to arrive at the results of the study. The chapter outlines the data collection procedure and method of data analysis.

Chapter Four: Presents the data analysis, results, and discussion of findings.

Chapter Five: Gives the summary in form of the conclusions drawn from the research findings and the recommendations of the study.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter presents the literature review. It discusses the theories around deposits (liabilities) creation by the banking sector and how they relate to lending. It covers the concept of the Treasury Single Account and importance of Liquidity in banking sector, Commercial Bank Deposit Mobilization and lending (Loans and Advances). It is also covers the review of related empirical studies done by other researchers, construction of the Conceptual Framework and Hypothesis testing.

2.2 Theoretical Foundation

There are many theories that relate bank deposits (liabilities) to liquidity. Bank deposits are considered liabilities for banks because they represent funds that the bank owes to its customers. When a customer deposits money into their account, the bank is essentially borrowing those funds. The bank promises to repay the funds on demand or according to the agreed upon terms. As such, deposits represent the obligation that the bank must fulfill and are classified as liabilities on its balance sheet. Banks use a portion of their deposits for lending in form of Loans and Advances.

2.2.1 The Financial Intermediation Theory of banking

The financial intermediation theory holds that banks are merely financial intermediaries, not different from other non-bank financial institutions. Financial intermediation is a process which involves surplus units depositing funds with financial institutions, which in turn lend to deficit units (Werner, 2015). Financial intermediation presupposes the absence of complete financial self-sufficiency, the existence of some economic units whose receipts exceed their expenditure, and of the other units whose expenditure is in excess of their receipts. According to this theory, banks act as intermediaries between savers (depositors) and borrowers (those seeking loans). Banks collect deposits from individuals and institutions and then lend them to borrowers who need capital for various purposes. (Dewatripont, et al., 2010) assert that banks create liquidity

by borrowing short and lending long, meaning that banks borrow from depositors with short term maturities and lend to borrowers at longer maturities.

Generally, in a capitalist economy, most investments are owned and managed by private entrepreneurs and firms. These investors lack enough equity to fully finance their projects and often seek loans to complete financing. Banks on the other hand aggregate deposits to make these loans. More recently (Krugman , 2015) believes that banks are pure financial intermediaries, presenting a model of banking in which a bank purchases assets with funds it had acquired in the form of deposits or issuance of equity or bonds. (Casu, et al., 2006) contend that banks as financial intermediaries play a pivotal role in the economy, channeling funds from units in surplus, to units in deficit. They reconcile the need of the borrowers and lenders by transforming small-size, low risk and highly liquid deposits into loans which are of large size, high risk and illiquid. (Matthews & Thomson, 2005) on the other hand, state that banks first need to obtain deposits in order to be able to lend. (Akims, 2022) holds that the role performed by Commercial Banks in financial intermediation remains at the forefront of economic development of countries. Channeling of funds from surplus units to deficit units is one among the major roles performed by banks in improving efficiency in the financial system. The financial intermediation theory rests on the notion that intermediaries strive to minimize the inherent transaction costs as well as the information asymmetries between savers and investors (Akims, 2022). Banks as repositories and custodians of very important financial information have the potential to eliminate the information asymmetry related to problems in the financial sector.

2.2.2 The Fractional Reserve theory of banking

The Fractional reserve banking system is common throughout the entire world. In this approach, banks only keep a small required reserve ratio of cash on hand and lend out the rest in the interest of expanding the money supply (Rossouw, et al., 2015). The principle of fractional reserve banking implies that Commercial Banks take on (deposit) surplus funds from the public (individuals and businesses) that wish to save. A certain percentage of such deposits are placed as prescribed reserves with the Central Bank. The bank can use the balance of the deposits above the reserve ratio to make loans to the public. (Rossouw, et al., 2015) contend that the important point to note is that loans are not created out of nothing but funded by deposits received by banks. It is for this reason that banks run into financial difficulty,

particularly when deposits are withdrawn. Banks normally attract deposits for a shorter term than the terms of their loans and advances to the public. In other words, businesses borrowing for investment purposes require longer-term advances funded by short-term deposits. As such when deposits are withdrawn from a particular bank and such a bank cannot replace withdrawn deposits with new deposits, the bank will suffer a liquidity crisis as its advances are committed for longer terms (Rossouw, et al., 2015). The greatest benefit of the fractional reserve banking system is its ability to act as a money multiplier.

Fractional reserve theory of banking also supports that each bank is a financial intermediary. However, this theory disagrees with the former theory concerning collective, macroeconomic role of banks (Werner, 2015). It argues that together, the banking system creates money, through the process of multiple deposit expansion. Under the fractional reserve system, it has been demonstrated that, only the totality of banks can expand deposits to the full reciprocal of the reserve ratio (Werner, 2015). The theory argues that what is true for the banking system as an aggregate is not true for an individual bank that constitutes only one of the many units in the aggregate.

The fractional reserve banking system and its money multiplier effect can be demonstrated as follows: When banks receive deposits, they increase their reserve holding with the Central Bank, while the balance of deposits above the reserve ratio can be used to increase Loans and Advances to the public. The simple multiplier used to calculate the total increase in Loans and Advances resulting from a deposit with a bank, assuming a reserve ratio of 10 percent is given by the following formula (Van der Merwe, et al., 2010):

$$\Delta m = 1/r$$

Where Δm = change in total deposit expansion in the banking sector

r = prescribed reserve ratio.

An initial increase of US\$100 million in bank deposits for example will result in an increase of US\$10 million in prescribed reserves and Loans and Advances of US\$90 million. The US\$90 million in Loans and Advances are assumed to be deposited in full with a bank, resulting in an increase of US\$9 million in prescribed reserves and US\$81 million in Loans and Advances. This continues to a total increase of US\$1000 million in deposit as a liability of banks, with corresponding assets comprising prescribed reserved of US\$100 million and Loans

and Advances amounting to US\$900 million (Rossouw, et al., 2015). While proponents of this system believe it has led to previously unthinkable levels of economic growth, critics insist it is too innately precarious to function in perpetuity.

2.2.3 The Commercial Loan Theory

The commercial loan theory, also known as real bills, was developed by classical economists of the 18th and 19th centuries, such as Adam Smith, David Ricardo and John Stuart Mill, and acquired widespread acceptance (Green, 2018). According to this doctrine, a Commercial Bank should only provide short term self-liquidating loans to businesses to meet their working capital requirements and that the central bank should lend to Commercial Banks based on the security of such loans. The theory is based on the assumption that such loans would automatically adjust the money supply to the needs of the trade and ensure the appropriate degree of liquidity for each bank and the whole economy. The logical basis for the doctrine was that Commercial Bank deposits are demand or near demand liabilities and should therefore be committed to obligations that are self-liquidating within a short period, in the normal course of business operation.

2.2.4 Liability Management Theory

The Liability Management Theory is a financial strategy that aims to manage risks arising from the difference between assets and liabilities of a company. The origin of the Liability Management Theory can be traced back to the 1960s when some bankers and economists advocated for more flexible and market-oriented approach to managing bank assets and liabilities (Bhattacharya, 2011). According to this theory, an individual bank can acquire reserves from different sources by creating additional liabilities against itself. These sources include the following:

1. Issuance of Time Certificates of Deposits

A traditional certificate of deposit is a type of investment offered by most financial institutions (Bhattacharya, 2011).

This is one major source of reserve money for Commercial Banks. These certificates of deposit bear different maturity days from ninety days to one year and are offered with interest rates competitive with Treasury Bills and similar instruments.

2. Borrowing from other Commercial Banks

This is another way of acquiring reserves by borrowing from other Commercial Banks with excess reserves. Commercial Banks sometimes experience temporary funding crises or short term liquidity shortages. In such situations, they need quick access to cash. Banks can borrow from other banks to address these immediate liquidity needs. Central Banks also require banks to maintain a minimum amount of reserves to ensure liquidity in the banking sector. These reserves fluctuate based on customer withdraws and deposits. Therefore, when a bank faces a shortage and cannot meet its reserve requirement, it may borrow from other banks with a surplus to bridge the gap. This act of banks borrowing from each other is referred to as interbank borrowing. (Dietrich & Hauck, 2020) posit that interbank trades have effects on aggregate credit supply and the stability of the banking sector.

3. Borrowing from Central Bank

Borrowing from Central Banks is another way of creating liabilities. Central Bank credit facilities are generally available through discounting or advance to meet the day to day and seasonal liquidity needs of Commercial Banks. (Choudhry, 2012) describes the availability of lender of the last resort assistance to distressed Commercial Banks, as a cornerstone of the banking structure in a country, and in the relationship between the Central Bank and Commercial Banks. (Rossouw, et al., 2015) argue that in practice, this function has evolved into Central Banks rendering assistance to Commercial Banks suffering liquidity problems. A typical example is when a Commercial Bank is faced by a large deposit withdraw (loss of liabilities) or a sharp increase in non-performing loans and delinquent borrowers (an erosion of bank's asset base).

4. Raising of Capital Funds

Commercial Banks can also acquire reserves through issue of shares. Raising funds through the Initial Public Offering (IPO) is one of the most attractive sources of financing for Commercial Banks in the face of increasing stringent capital adequate requirements and the need for additional funds to increase the loan portfolio (Kurbanov & Asirarov, 2022). An Initial Public Offering is the first sale of a company's shares to the public, which leads to market listings. Commercial banks can increase their capitalization through Initial Public Offering of their shares, thereby raising additional financial resources.

This study is underpinned by the Financial Intermediation, Fractional Reserve, and the Liabilities Management theories, in that all the three theories reinforce the notion that banks must first acquire deposits before they can undertake the lending activity.

2.3 Treasury Single Account (TSA)

A Treasury Single Account (TSA) is defined as a unified structure of government bank accounts enabling consolidation and optimum utilization of government cash resources (Pattanayak & Fainboim, 2011). In other words, a TSA is a bank account or set of linked bank accounts through which the government transacts its receipts and payments and gets a consolidated view of its cash position at the end of each day. (Pattanayak & Fainboim, 2011) argue that, a fragmented system for handling government receipts and payments, through the banking system poses a critical public financial management weakness that must be addressed. (Lienert, 2009) in supporting the TSA system contends that in most advanced countries, nearly all revenues are consolidated daily in a TSA, which is firmly under the control of the Treasury of the Ministry of Finance (MOF). (Hashim, 2014) further argues that in the absence of the TSA, fragmentation of government financial resources in multiple bank accounts, outside the control of the Treasury leads to build up of idle cash balances. A TSA system helps consolidate cash balances, giving the ministry of finance Treasury oversight of all government cash flows and brings improvement in budget control and monitoring.

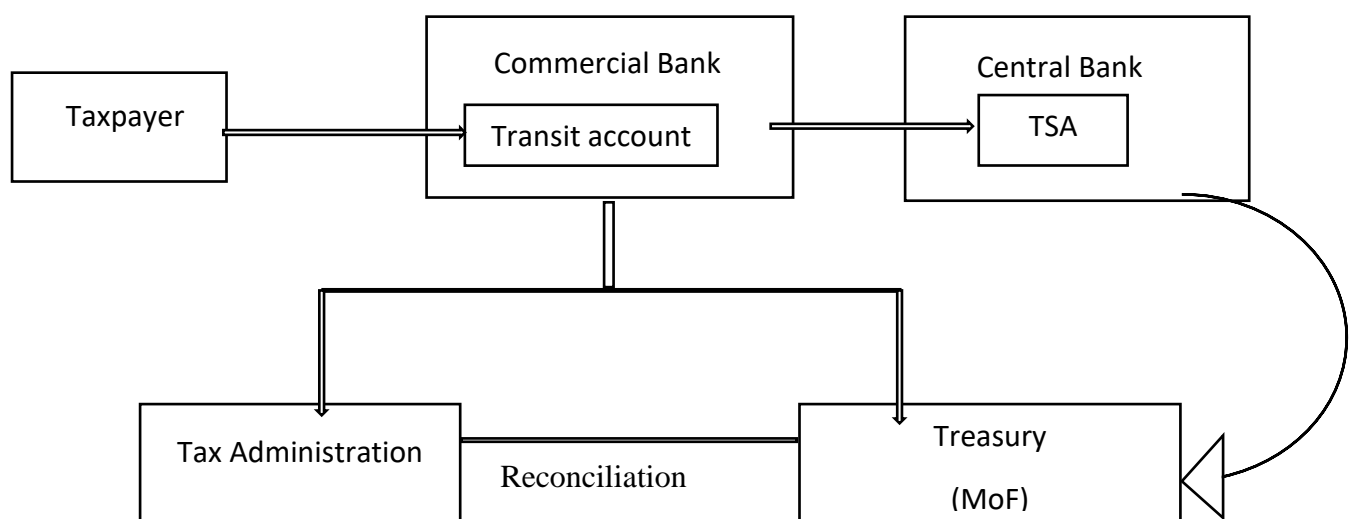
As the Central Bank act as the fiscal agent of the government, the custody of the Treasury Single Account in most countries is with the Central Bank. This entails that government balances in Commercial Banks which collect revenue on behalf of government should be

cleared every day or at an agreed interval and all government cash balances should be consolidated in the TSA main account at the Central Bank. However, there are other instances where the TSA is maintained with a large publicly owned Commercial Bank, such as in Latin American countries (Pattanayak & Fainboim, 2010).

Implementation of the TSA system in Zambia commenced in 2015. Commenting on its implementation in January 2015, the Secretary to the Treasury, Mr. Fredson Yamba, stressed that the TSA system aims to improve the government’s ability to efficiently and effectively manage public financial resources (MOF, 2015). The TSA is designed to streamline government bank accounts and entails that payments to all civil servants and suppliers of good and services to the government, are electronically processed directly into their bank accounts (MOF, 2019).

2.3.1 A Simple Revenue Transit Circuit

A simple Revenue Transit circuit is given in the figure below. This is explained as follows: A taxpayer or user of government services makes the payment to a revenue transit account in a Commercial Bank. The Commercial Banks then remitted the funds to the TSA at the Central Bank at regular intervals (for instance, at the end of business day). At the end of each day, the bank submits an account statement (ideally electronically) to the tax authority and to the Treasury, which is used for reconciliations against taxpayer records (tax authority) and the TSA (MOF/Treasury).



Source: (Pattanayak & Fainboim, 2010).

Figure 1: Simple Revenue Transit Circuit

(Pattanayak & Fainboim, 2010) outline the benefits that government can derive from the implementation of the TSA as follows:

The TSA,

- Allows complete and timely information on government cash resources.
- Improves appropriation control. TSA ensures that the ministry of finance has full control over budget allocations and strengthens the authority of the budget appropriation.
- Enables efficient cash management. TSA facilitates regular monitoring of government cash balances.
- Reduces bank fees and transaction costs. Reducing the number of bank accounts results in lower administrative costs incurred by government on bank reconciliations and bank fees.
- Facilitates efficient payment mechanism. TSA ensures that there is no ambiguity regarding the volume or location of government funds and makes it possible to monitor payment mechanism precisely.
- Lowers liquidity reserve needs: A TSA reduces the volatility of cash flows through the treasury, thus allowing it to maintain a lower cash reserve / buffer to meet unexpected fiscal volatility.

2.3.2 The TSA Structure

There are broadly two categories of the TSA structure, namely centralized and distributed TSA architecture (Pattanayak & Fainboim, 2011).

1. Centralised TSA Architecture

A purely centralised arrangement is one in which all revenue and expenditure transactions of the government pass through a Single Account generally maintained at the Central Bank.

2. Distributed TSA Architecture

The TSA is virtually operational even though line agencies down to the lowest level in the organizational hierarchy are allowed to retain separate transaction accounts in the banking

system. However, under this structure, balances in all transactional accounts should be swept into the TSA main account at the end of each day or the agreed time interval.

2.3.3 Characteristics of an Efficient TSA

(Pattanayak & Fainboim, 2011) state that an efficient TSA has six main characteristics as follows:

- **Location:** The TSA should be operated at the Central bank because resources held there are exposed to less counterparty risk compared to private or public commercial bank deposits, therefore must not face moral hazard.
- **Coverage:** The higher the resources managed by the TSA, the greater the benefits it will generate. It is therefore argued that the TSA should have the widest possible coverage of public resources that are used to fulfill government functions. At a minimum, coverage should include cash balances of all government entities. The cash balances of all government entities, both budgetary and extra budgetary, to ensure full consolidation of the government cash resources.
- **Concentration:** Government agencies should not maintain resources in bank accounts that are beyond the oversight of the Treasury and the Treasury should be given power to authorize the opening or closing of bank accounts within the government Treasury.
- **Fungibility:** For Treasury to manage its cash flow according to financial principles, fungibility of resources should be allowed to achieve maximum efficiency. Book-entry accounts are designed to guarantee the fungibility of TSA resources for Treasury use, irrespective of their budget earmarking or appropriation. Best practice is to hold entries in government Integrated Financial Management System (IFMIS), although it is possible to adopt a system whereby the TSA sub-accounts within the same bank function as book entries.
- **Timely revenue and payment transaction:** Government resources should be placed into the TSA immediately after being collected and disbursements made only when expenditure is justified.
- **Timely Information:** Information about government aggregate cash position should be available and accessible on a daily basis, preferably in real time.

2.3.4 Integrated Financial Management Information System (IFMIS) and TSA Implementation

The government's capacity to manage its public finance is central to its ability to deliver services. Financial management information systems facilitate this as they support management of public sector budgetary, accounting, treasury and public debt management processes as well as generating corresponding reporting documents (Una & Pimenta, 2015). A Financial Management Information System (FMIS) or Integrated Financial Management Information System (IFMIS) is an information system that tracks financial events and summarises financial information (Brown, 2008). FMIS systems are a set of automation solutions that allow government finance and accounting staff to carry out their day-to-day operational tasks. This enables them to plan, prepare, and approve budgets, approve, and verify commitments, issue payment orders and payments, monitor and report on financial resources collected and develop resource allocation and borrowing strategies (Hashim, et al., 2018). In the government context, IFMIS refers to more specifically to the computerisation of Public Financial Management (PFM) processes from budget preparation and execution, to accounting and reporting, with the help of an integrated system for financial management of line ministries, spending agencies and all other public sector operations (Brown, 2008). IFMIS is seen as a salient system to re-establish fiscal discipline and sound financial governance precisely because it is meant to address the issues of financial misconduct (PMRC, 2018). IFMIS according to the (Institute of Certified Public Accountants (ICPAK), 2017) improves public financial management through the following capabilities:

- Enhanced management of government expenditure, debt, and liabilities.
- Ability to use historical information to provide better budget modeling process
- Reduced cost of financial transactions.
- Increased decision-making efficiency.

The operationalization of the IFMIS enabled the Zambian government to implement the Treasury Single Account. Before implementation of the TSA, the national treasury management was riddled with several banking and cash management arrangements separately run by different ministries, departments, and spending agencies (PMRC, 2018). IFMIS makes it possible to integrate financial systems between Commercial Banks which act as revenue collection agents, the Treasury as well as the Central Banks. The role of IFMIS in effective implementation of TSA cannot be over emphasized.

2.3.5 Global Perspective of the TSA.

(Pattanayak & Fainboim, 2010) contend that in some countries the TSA is composed of a Single bank account at the Central Bank (sometimes with subsidiary ledger accounts), which is operated by either a centralized authority (such as treasury and its regional units) or by a number of budget institutions. In the latter case, each budget institution's transactions are tracked, accounted for, and managed through a well-developed general ledger. In other cases, countries such as Sweden have several linked accounts outside the TSA main account with balances automatically swept off at the end of the day. Individual line agencies are allowed to have separate transaction accounts. In such cases, the TSA is organized along the following lines:

1. Accounts for individual spending agencies are opened either at the Central Bank or with Commercial Banks.
2. These are zero balance accounts with money being transferred to the accounts as specific payments are approved.
3. The balances in the accounts are automatically swept at the end of each day to the TSA main account.
4. The Central Bank consolidates the balances in all the government accounts at the end of each day.

2.4 Commercial Banks and their Deposit Mobilization and Lending functions

Commercial Banks are financial entities ordained with multifaceted responsibilities, spanning the mobilization of savings, the extension of credit, and the facilitation of payment systems. Commercial Banks play a pivotal role as financial intermediaries in mobilizing funds from sectors such as households, business firms, and government (Mdisa, et al., 2019). The main purpose of Commercial Banks is to provide financial services to the general public and also provide loan facilities to businesses, which help in ensuring economic stability and growth of the economy (Abdugaffarovna, 2022). On the other hand, (Manish, 2020) describes Commercial Banks as financial institutions which perform the function of accepting deposits from the general public and giving loans for investment, with the aim of earning a profit. The primary function of Commercial Banks is collection of deposits and provision of Loans and

Advances. (Abdugaffarovna, 2022) gives a summary of the functions of Commercial Banks as follows:

1. **Depository Function:** Commercial Banks accept deposits from individuals and entities, providing secure repository for savings while ensuring liquidity.
2. **Credit Intermediation:** Commercial Banks function as intermediaries by channeling deposits into loans to borrowers seeking capital for diverse purposes.
3. **Payment Facilitation:** Commercial Banks orchestrate payment systems, offering transactional services such as checking accounts, electronic transfers, debit, and credit card services to expedite financial transactions.
4. **Risk Management:** Commercial Banks evaluate and manage risk by meticulously assessing borrowers' creditworthiness, thereby mitigating potential losses arising from default.

In banking sector, deposit mobilization is a scheme intended to encourage customers to deposit more cash with the bank and this money in turn will be used by the bank to disburse more loans to generate additional revenue for the bank (Kazi, 2012). According to (Shettar, 2014) deposit mobilization is one of the most important parts of banking activity in developing all spare parts of the economy. Deposit mobilization is the chief source of funds to undertake lending operation. It is the size of the deposits that largely decide the lending potential of a bank. (Manish, 2020) further states that the prime function of Commercial Banks is to collect deposits from the public. Such deposits fall into three main categories as follows:

1. **Current Account Deposits:** These Deposits are payable on demand and are therefore called demand deposits. These can be withdrawn by the depositor any number of times depending on the balance in the account. Banks normally do not pay interest on these deposits.
2. **Fixed Deposits:** Fixed deposits have a fixed period of maturity and are referred to as time deposits. These are deposits for a fixed period of time ranging from a few days to one year. They can be normally withdrawn only after the maturity of the specified fixed period. They carry a higher rate of interest.
3. **Savings Account Deposits:** These are deposits whose main objective is to save. They combine the features of both current and fixed deposits. They are payable on demand and pay interest which is much lesser than that of fixed deposits.

Commercial Banks collect the surplus balances of individuals, firms and finance the deficit units. Since Commercial Banks depend on depositors' money as a source of funds, there is therefore some relationship between the ability of banks to mobilize deposits and the amount of credit granted to the customers. According to (Sharma, 2009) the bank credit and bank deposits are very closely related with each other that they present two sides of the same coin, the balance sheet of banks. Banks world over thrive on their ability to generate income through lending. This lending activity is made possible only if banks can mobilize enough funds from their customers.

(Adem, 2015) contends that in developing countries , Commercial Banks are major players in the financial systems, performing financial intermediation and play an important role in accelerating economic growth. (Bello, 2005) further argues that the banking system plays it financial intermediary role by mobilizing and channeling financial resources to need areas. Banks play an intermediary function by mobilizing funds from savers (surplus units) and lending them to investors, both individuals and businesses (Casu, et al., 2006). This ability to grant loans and advances which is their primary source of income is dependent on their ability to mobilize deposits from the market (Selvaraj & Balaji , 2015). (Banke & Yitayaw, 2022) assert that deposit mobilization is as important to banks, as is oxygen is to humans. Banks and other financial institutions may fail to meet their business objectives if they do not have enough deposits (Viswanadham, et al., 2015). Banks must raise enough deposits to keep the economy running smoothly (Gunasekara & Kumari, 2018).

2.4.1 Loans and Advances

(Mishkin & Eakins, 2012) contend that a bank's loan portfolio is both the most valued asset and the source of most profitable income. The term Loans and Advances refers to the amount lent by the creditor (Bank) to the borrower (customer) (Wagle, 2010). (Ashabur, 2019) notes that Loans and Advances is the most important asset as well as the primary sources of earnings for a bank which help to improve the financial health of a bank. (Mdisa, et al., 2019) also assert that the lending activity is the core business of Commercial Banks that contribute the largest income proportion for the banks. Commercial Banks keep a portion of their deposits as legal reserves, and the balance is used to make Loans and Advances (Manish, 2020). Individuals and firms can borrow this money and banks make profits by charging interest on these loans. Loans

and Advances dominate the asset side of the balance sheet of any bank and also constitute the prime source of income for the banks (Wagle, 2010). The two essential functions of Commercial Banks may be best summarized as the borrowing and lending of money. By discharging these functions efficiently, Commercial Banks render a valuable service to the community by increasing the productive capacity of the country and thereby accelerating the pace of economic development (Shekhar & Shekhar, 2013).

2.5 Effect of Deposit withdrawal on the Liquidity of a Bank

Banks normally have two types of assets, namely liquid assets, and illiquid assets. Liquid assets are those that can be easily converted into cash, such as cash itself, short-term-government bonds, and highly traded stocks. Illiquid assets, on the other hand are harder to sell quickly without a substantial loss in value i.e. fixed assets, shares that cannot be easily traded, certain debt instruments such as loans. When customers withdraw funds from the banks, the bank must provide cash. If the bank does not have enough liquid assets such as cash or cash equivalents, it can face liquidity problems. Liquidity problems arise due to interaction between funding and asset side of the balance sheet when a bank does not hold sufficient cash (or assets that can easily be converted into cash) to repay depositors and other creditors (Fragas, et al., 2023).

From the foregoing, we note that there is a relationship between bank deposits (liabilities) and liquidity. One key measure of liquidity is the loan-to-deposit ratio. A decline in bank deposits puts pressure on the loan-to-deposit ratio. Therefore, attracting deposits from customers and other sources is one of the ways banks can increase their liquidity. Liquidity is fundamental to the well-being of financial institutions particularly banking as it determines the growth and development of financial markets (Abiola, 2015). (Banks, 2014) defines liquidity as the availability of cash and equivalent resources. The Basel Committee on Banking Supervision describes liquidity as a reservoir of funds that management can readily have access to in order to meet funding requirements and business opportunities (BCBS, 2006).

Liquidity is the lifeblood of the financial sector and allows expected and unexpected obligations to be met so that daily business affairs can proceed uninterrupted. In the absence of sufficient cash resources, activities may be jeopardized and more importantly increases the probability of encountering a severe financial distress (Banks, 2014). (Douglas, 2014) contends

that while capital is important to cover losses of any kind, the recent financial crisis underlined the importance of a second type of buffer, the “liquidity” that banks must have to cover unexpected cash outflows. Banks act as liquidity providers and financial intermediaries in financial systems. This is accomplished by mobilizing funds (short-term deposits) from the surplus units (lenders) and making use of the funds for financing the deficit units (borrowers) in form of loans and investments (long-term assets). Therefore, efficient coordination of cash inflows and cash outflows requires effective risk management structure for managing liquidity (Negret, 2009). The viability and efficiency of a bank is greatly influenced by the availability of liquidity in sufficient amounts at all times. Banks are expected to maintain adequate liquidity in order to efficiently perform their daily obligations such as meeting depositors’ demands or withdrawals, and provision of funds when borrowers draw on committed credit facilities. The importance of liquidity goes beyond individual banking institution as failure of one bank as a result of liquidity challenges may have a contagious effect and destabilize the entire financial system. (Chiaromonte, 2018) observes that banks are vulnerable to sudden and unexpected demand for funds by their customers and inability to honour those demands due to liquidity problems may have serious implications on the whole financial system.

In banking, the term liquidity is used among other applications to express specific conditions for a product, an institution, a market segment or even an economy (Brunnermeier & Pedersen, 2008). Thus, liquidity is neither an amount nor a ratio, but rather an expression of the capability of a financial institution or bank to fulfill its mandatory obligations (Tian, 2009).

The importance of liquidity to the financial sector cannot be over emphasized. Liquidity challenges in the financial sector can have far reaching damaging effects on an economy. It is therefore crucial that banks maintain sufficient liquidity at all times, in order to function efficiently and effectively. The growth, development and survival of banks depend on liquidity (Abiola, 2015).

2.6 Empirical Literature Review

Several studies have been done on the effects of the TSA on the financial performance of banks in other countries. However, there was no evidence of similar studies done on the effects of the TSA on the banking sector in Zambia.

(Mwambuli & Igoti, 2021) investigated the impact of the Treasury Single Account on the financial performance of selected banks in Tanzania. Data were collected from annual reports of fourteen (14) Commercial Banks and Bank of Tanzania for a period of 10 years. The study used Net interest Margin as dependent variable and government deposits as an independent variable. The data were analysed by both EVIEWS 12 and STATA 16 using Ordinary Least Squares (OLS) regression model. The results of the study concluded that the TSA had an impact on the Banks' financial performance. The results showed that government deposits have significant positive effect on Net Interest Margin.

(Kanu, 2016) assessed the impact of the TSA on the Liquidity of Banks in Nigeria using primary data from 10 Deposit Money Banks by way of questionnaires administered to management staff. The study used Chi-Square as a statistical tool to analyse the data. The findings of the study showed that there is negative impact of the TSA on the liquidity base and performance of the banking sector in Nigeria. The research however did not clearly state what parameters were used to measure bank performance. It could have been better if the research considered secondary data to assess liquidity before and after the implementation of the TSA to come up with conclusions.

(Agbo, et al., 2016) evaluated the effects of the TSA on the Performance and Survival of Deposit Money Banks in Nigeria using secondary data from six banks. The study used Return on Assets (ROA) and Net Interest Margin (NIM) to assess performance. The study employed the sample t-test analysis technique. The study found that the TSA had no effect on the performance and survival of banks in terms of Return on Assets and Net Interest Margin. The sample size of 6 banks looks too small to make generalizations. We are not sure what could have been the findings if the study had considered data on all deposit money banks instead of six.

(Ndubuaku, et al., 2017) examined the impact of the TSA on the performance of banking sector in Nigeria using secondary and time series data from the Central Bank of Nigeria. The study assessed the impact of the TSA on Credit to the Private Sector, Deposit Mobilization and Loans and Advances. Regression and Correlation analysis were used to determine the relationship between the TSA (represented by Federal Government Deposits) and performance of banks (represented by Deposit Mobilization, Credit to the Private Sector and Loans and Advances). The findings showed that the TSA has significant impact on Credit to Private Sector, Deposit

Mobilization and Loans and Advances. However, the study only covered the pre and implementing year of the TSA, which may not be enough period to draw conclusions.

(Ajetunmobi, et al., 2017) investigated the impact of the TSA on Liquidity of Banks in Nigeria using secondary data from fifteen listed banks. The parameters used were the Current ratio, Quick Ratio and Profit after Tax (PAT). The data were analysed using descriptive statistics and Paired Sample t-test. The findings showed that the implementation of the TSA impacted negatively on the liquidity base of banks in Nigeria. The study also found that there is significant difference in the Profit after Tax (PAT) of banks before and after the adoption of TSA.

(Muraina, 2018) carried further studies on the effects of the TSA on Deposit Money Banks's Liquidity Performance in Nigeria. Secondary data on liquidity ratios and Total Federal Government of Nigeria Deposits from twenty-two (22) Deposit Money Banks were collected through the Central Bank of Nigeria. The study employed Correlation and Feasible Generalized Least Square (FGLS) technique to analyse the data. The study found that there was a significant positive impact of Federal Government Deposits on the Banks' liquidity performance in the pre-TSA era and that the TSA had a significant negative impact on the bank's liquidity performance in the post -TSA period. The sample size of 22 Deposit Money Banks looks more than representative enough to draw conclusions. According to the Central Bank of Nigeria, there were 24 Commercial Banks in Nigeria as of January 2021 (Central Bank of Nigeria, 2021).

(Odu & Joseph, 2019) assessed the effects of the TSA on the liquidity of Deposit Money banks and effective control of government cash resources in Nigeria. A survey research design was employed, and data was collected from 10 Deposit Money banks through structured questionnaires. The study used description and inferential statistics using Pearson's moment coefficient (r) to analyse the data. The study revealed that the TSA has significant negative impact on the liquidity of Deposit Money Banks.

(Mkaro & Keong, 2023) examined the impact of the Treasury Single Account (TSA) policy on performance of the banking sector in Tanzania in relation to Ownership concentration, Bank Size, and Macroeconomic variables such as Gross Domestic Product (GDP), exchange rate, interest rate and inflation rate. The study used balanced panel data set comprising 30 banks

from quarter one 2010 to quarter four 2020. The study revealed that the effects of interest rate, GDP and exchange rates turned negative while the inflationary effects on bank performance were enhanced after TSA adoption. The regression results further revealed that, while foreign and state-owned banks were more resilient, private, and domestic banks' performance deteriorated after TSA adoption. The study argues that this is so because a major portion of domestically owned private bank's deposits were derived from the government and thus their performance was impaired after withdrawal of government deposits, while the government fortified its state-owned banks to prevent them from failing. Private Banks on the other hand had to find their own means to turn around their positions. Findings of this study are similar to the finding by (Ajetunmobi, et al., 017), (Muraina, 2018), (Mwambuli & Igoti, 2021), (Ndubuaku, et al., 2017) and (Odu & Joseph, 2019) whose finding revealed that the TSA had a negative impact on performance of banks.

(Okpala, et al., 2019) carried out further studies on the Impact of the Treasury Single Account on the Failure of Financial Institutions in Nigeria. The study adopted a survey research design approach. The population consisted of 99 financial institutions and the sample was made up of 30 companies. Primary data was collected through questionnaires administered to 450 management staff. Regression technique with aid of E-views version 9.5 was employed to measure the strength of the relationship between variables. The study revealed that the TSA has a significant impact on the failure of financial institutions. This finding is consisted with most studies reviewed from Nigeria except the findings by (Agbo, Jugu, & Okwoli, 2016).

(Mawalla, 2023) examined the Implications of the Treasury Single Account (TSA) on Tanzanian Banks focusing on profitability, efficiency, and stability, using Return on Assets (ROA), Return on Equity (ROE) and Non-Performing Loans (NPL) as performance parameters. Data were collected from 35 banks and analysed with the aid of Difference -In-Difference (DID) regression model. The results of the study revealed notable adverse effects on ROA and ROE. The study further revealed significant adverse effects of the TSA on the Non-Performing Loans (NPL).

According to a report by the (World Bank Group, 2017), the banking sector in Tanzania started recording negative signals following the implementation of the TSA. In 2016, the year of implementation of TSA, the non-performing loans (NPL) to total loan ratio increased to 9.5%, from 6.4% recorded in 2015, thus pointing to a negative implication to the banks' future lending

and profitability. The report highlights that Banks have been navigating the new environment created by government's decision to centralize public institutions bank account at the Bank of Tanzania, rather than at Commercial Banks, leading to a decline in deposits estimated to be around (US \$280 million).

(Silim & Pastory, 2022) analysed the effects of the Treasury Single Account on the financial performance of Commercial Banks in Tanzania over the period 2015 to 2020. The sample size consisted of five Commercial Banks. The study employed a descriptive research design and the CAMEL analysis approach that is using Capital adequacy, Asset quality, Management, Earnings and Liquidity as performance parameters. The findings of the study revealed that all the selected Commercial Banks maintained a strong position on their composite rating system before and after the TSA implementation. They were sound in the aspect of Capital adequacy, Earning capacity, Management quality and liquidity conditions. The sample of five banks may not be representative enough to generalize the findings. It is also worth noting that a similar study by (Mkaro, Lau, & Keong, 2023) found that foreign and state owned banks in Tanzania were more resilient while the performance of private domestic banks deteriorated after TSA implementation. It might be therefore that the five banks selected in this study falls in the category of foreign and state owned banks.

(Oyadonghan & Atagboro, 2020) investigated the effects of the introduction of the Treasury Single Account the on sustainability of Deposit Money Banks in Nigeria. The study population comprised of all the 18 listed Commercial Banks in Nigeria. Primary data were collected using a structured questionnaire. Convenience sampling technique was used to select a sample of 6 employees from each of the listed Commercial Banks. Descriptive statistics were employed to analyse the data; that is by means of (percentage, frequency counts, mean, and standard deviation). The results from the study revealed that the introduction of the Treasury Single Account in Nigeria has posed significant sustainability challenges in the banking sector. The findings were that the TSA has an adverse effect on liquidity and bank performance, leading to pressure on interest rates, poor availability of credit to the economy, high monetary policy rate and cash reserve ratio and increase in marketing costs and more governance issues in the banks. The study however only involved listed Commercial Bank in Nigeria. The use of convenience sampling techniques may be subject to researcher bias and the sample collected may not be representative.

2.7 Knowledge Gap

A number of studies have been done on the effects of the Treasury Single Account on the banking sector. For example, studies by (Agbo, et al., 2016), (Ajetunmobi, et al., 2017), (Kanu, 2016), (Ndubuaku, et al., 2017), (Odu & Joseph, 2019) and (Okpala, et al., 2019), (Muraina, 2018) and (Sabo, et al., 2019) investigated the impact of the TSA on the performance of the banking sector in Nigeria. On the other hand, (Mawalla, 2023), (Silim & Pastory, 2022) and (Mkaro, et al., 2023) carried out studies on the effects of the TSA on the banking Sector in Tanzania.

In the case of studies from Nigeria, most of them had limitation in terms of time scope. The TSA implementation in Nigeria commenced in 2015 and most of these studied were done by 2018 which is just three years after implementation of TSA. This time period may be too short to investigate the effect of TSA on banking sector and make generalizations. Studies were also only focused on a few selected banks, which could make generalizations difficult, because there could have been a bias in the selection of the study sample. Most of the studies used purposive sampling which is a non-probability method for obtaining a sample where researchers use their expertise to choose specific participants that will help the study meet its objects. This sampling method has some drawbacks in that it can be arbitrary and subjective, reflecting the researcher's stance more than the population. It is also subject to researcher bias and data manipulation, and it can be hard to defend the representativeness of the data. This sampling technique provides a significant number of inferential statistics procedures that are invalid, because they allow you to generalize from specific samples to a large population. This study is also different in that it covers an equal period before and after implementation of the TSA implementation. This makes a comparative review of the trends analysis before and after TSA implementation easier.

Moreover, while studies have been done on the effects of the TSA on banking sector in other countries, we could not find empirical evidence that similar studies have been done in Zambia. It is worth noting that the effects on the TSA on banking sector would be country specific depending on the extent to which the banking sector relies on government deposits. We cannot therefore generalize findings from other countries to the Zambian context, without carrying out a study. This study also uses a more direct way of assessing the effects of TSA on performance of the banking Sector, by analysing effect on Deposit Mobilization and Lending, unlike the

approaches used by most of the studies reviewed. This study will therefore close this knowledge gap by studying the effect of the TSA on the Commercial Banking Sector in Zambia and provides a foundation for researchers interested in carrying out further studies in this area.

2.8 Conceptual Framework

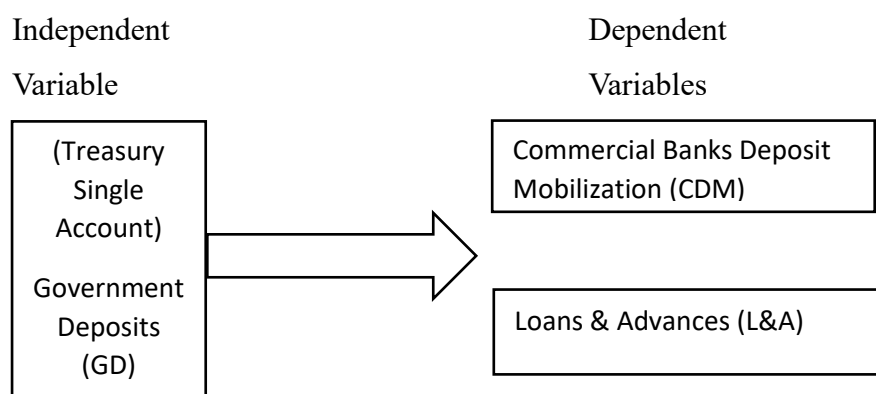
This section presents the conceptual framework that explains the relationship between the variables under study and leads to formulation of the study hypothesis.

A conceptual framework is a description of the way a researcher understands the factors and / or variables that are involved in the study and their relationship to one another (Luft, et al., 2022). The purpose of the conceptual framework is to articulate the concepts under study using relevant literature and to clarify the presumed relationships among those concepts (Rocco & Plakhotnik, 2009).

A review of relevant theories and literature above has demonstrated that there is a relationship between customer deposits and the overall deposits of a bank and its ability to provide Loans and Advances. Data analytics can be used to study the effects of deposits from a particular customer segment on the overall deposit base of the bank and other performance measures such as Loans and Advances. In this study, we consider the Government Deposits as a customer segment representing the Treasury Single Account and study its effect on the overall Commercial Banks Deposit Mobilization and Loans and Advances. In this model, the independent variable is represented by Government Deposits, while Commercial Banks Deposit Mobilization and Loans and Advances are the dependent variables. Knowledge of how deposits from a specific customer segment impacts their business can help banks make informed decision to develop specific strategies to retain their most important segments.

2.8.1: The Conceptual Framework that will be used to measure the hypothesis.

This framework depicts the relationship between TSA represented by Government Deposits, Commercial Banks Deposit Mobilization and Loans and Advances.



Source: Author's construction (2023) based on literature review

Figure 2: Conceptual Framework

Conceptual Model

1. $CDM = f(GD)$
2. $L\&A = f(GD)$

Where:

CDM = Commercial Banks Deposit Mobilization,

L&A = Loans and Advances

GD = Government Deposits

Commercial Banks mobilize deposits from various customer segments such as individuals, businesses, governments, and non-governmental entities. These deposits (liabilities) contribute to liquidity in the banking sector. Banks will normally use a portion of these deposits to lend to customers in form of Loans and Advances.

2.8.2 Hypothesis Testing.

In line with hypothesis testing, we would construct the null and alternative hypotheses. Our null hypothesis would be that there is no linear relationship between the two variables in the regression model. We would use the beta coefficient (β) to test if there is a linear relationship between two variables. Our null hypothesis (H_0) would be $\beta = 0$ and the alternative hypothesis (H_1) would be $\beta \neq 0$.

Given the model above, the study tested the following hypothesis.

Hypothesis 1

H₀: Government Deposits (GD) have no significant effect on Commercial Banks Deposit Mobilization (CDM).

H₁: Government Deposits (GD) have significant effect on Commercial Banks Deposit Mobilization (CDM).

Hypothesis 2

H₀: Government Deposits (GD) have no significant effect on Commercial Banks Loans and Advances (L&A).

H₁: Government Deposits have significant effect on Commercial Banks Loans and Advances.

This model can be used for forecasting and scenario analysis to see the effect of changes in customer segment deposits on the performance of the bank, such as deposit mobilization and lending ability.

2.9 Chapter Summary

This chapter has discussed the literature review of the study on the effects of the Treasury Single Account on Commercial Banks Deposits and Lending in Zambia. It has provided an explanation of the theoretical rationale of the problem under study. It gives an overview of the Treasury Single Account, the concepts of Commercial Bank Deposit Mobilization and lending and how these relate to liquidity of a bank. The purpose of the literature review is to provide background to and justification for the research under study (Arshed & Danson, 2015). It allows the researcher to understand the current state in the subject area, to relate this to the ongoing research, and to identify gaps in this knowledge. The chapter covers a review of empirical literature related to the study and established the research gaps in the study area.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

This chapter gives details on how the research was carried out. It covers the design adopted to conduct the study, and how data collection and analysis were done to arrive at the findings. The areas covered include, the research design, population, data collection procedure and method of data analysis.

3.2 Research Design

The study followed the positivism (objectivism) approach. Positivism believes that there is a single reality which can be measured and known. It is a philosophy that is closely associated with the idea of fact-based investigation. The study was empirical analytical, descriptive, and quantitative in nature. The study employed secondary and time series data on Government Deposits, Aggregate Commercial Bank Deposits and Loans and Advances before and after implementation of the TSA, for a period of 10 years (2010-2019). The selected study period enabled us to assess the trend analysis on Commercial Banks Deposits and Lending, for a period of five years, before and after TSA implementation. This period also enabled us to collect sufficient data to improve the reliability, accuracy, and robustness of regression analysis.

3.2.1 Justification for the Design

This approach was used as the study was focused on identifying relationship between variables that could be measured and quantified. The study relied on concrete and verifiable evidence that facilitate statistical analysis of data, to draw conclusions. This design is also makes it possible to test the hypothesis, identify patterns and consequences of a new phenomenon (TSA in this case), and make predictions. This method is useful for evaluating the direct effects of the Treasury Single Account on Commercial Banks Deposits and Lending. Utilizing descriptive method of analysis on performance before and after implementation of TSA provides a multi-dimensional analysis of Commercial Banks Deposits and Loans and Advances over the period

under study. The study follows a similar approach used by other researchers such as (Ndubuaku, et al., 2017) and (Ajetunmobi, et al., 2017).

3.3 Study Population

The population was made up of all the 18 Commercial Banks in Zambia during the period under review. According to Bank of Zambia annual report, there were 18 Commercial Banks operating Zambia, as at 31 December, 2019 (BOZ, 2020). The study assessed the effect of the TSA on Deposit Mobilization and Lending for the entire Commercial Banking sector, because the Bank of Zambia reports monthly / annual aggregate data on deposits and Loans and Advances for the sector.

3.4 Data Collection Procedure

The study systematically reviewed Bank of Zambia (BOZ) annual reports from 2010 to 2019 to collect the data. 2010 to 2014 is the pre-TSA period, while 2015 to 2019 is the post-TSA period. Secondary data on Government Deposits, Aggregate Commercial Banks Deposits and Loans and Advances were collected from the Bank of Zambia Annual Reports, for each year reviewed. In order to have a more representative data, annual average figures were used. The average is the sum of all values divided by the number of values. This was achieved by taking the average figures over a 12-month period in each year. That is dividing the sum of the monthly values (Commercial Bank Deposits and Loans and Advances) by 12, to arrive at the annual average figure.

3.5 Reliability and Validity of Data

Reliability of data relates to the consistency and stability of data over time or across different situations. In the case of secondary data, it involves evaluating whether the data can be trusted to yield consistent results if collected and analysed repeatedly (Oluwaseum, et al., 2019). The Bank of Zambia compiles data on aggregate performance of the entire Commercial Banking sector in Zambia annually, based on the monthly data submitted by Commercial Banks. This data is reliable as BOZ is a trusted source of data. Validity of secondary data means assessing whether the data accurately represents the phenomenon or concepts being studied. Data analytics can be used to measure how deposits from a particular customer segments impacts on

overall deposit base of a bank as well as Loans and Advances, among other performance measures. The collected data aligns with the research objectives.

3.6 Method of Data Analysis

The collected data were summarized in table and analysed using Descriptive, Regression and Correlation Analysis. Ordinary Least Squares (OLS) was used to determine the relationship between the TSA - represented by Government Deposits and Commercial Banks Deposit Mobilization and Loans and Advances. Government Deposits were the independent variable while Commercial Banks Deposit Mobilization and Loans and Advances were the dependent variables. The data were analysed with the aid of IBM SPSS Statistics version 28. The coefficients from the regression and correlation analysis were summarised presented in tables.

The regression model is given by:

$$Y = \alpha + \beta X + \epsilon$$

Where:

Y = the Dependent Variable

X = the independent variable

α = some constant (the intercept)

β = the coefficient of the predictor variable (the slope)

ϵ = represents the error term in the Model.

3.7 Chapter Summary

This chapter identified the research methodology and design used for this study. It gave a detailed analysis of research design, population, and the data collection procedure and data analysis. The collected data were analysed with aid of the Statistical Package for Social Sciences (SPSS).

CHAPTER 4

PRESENTATION OF RESEARCH FINDINGS

4.1 Introduction

This chapter presents the data analysis, interpretation, and discussion of research findings. The data collected were analysed in line with the aim of the study, which was to determine the effect of the TSA on Commercial Banks Deposits and lending in Zambia. The regression and trends analysis results are presented in detail, together with discussion of the implications of the results. The relationship between variables was tested at [$P = 0.05$, (95%: CI)]. If the P-value is ≤ 0.05 , the relationship between the variables is significant and the decision is to reject the null hypothesis, otherwise accept if P-value is > 0.05 .

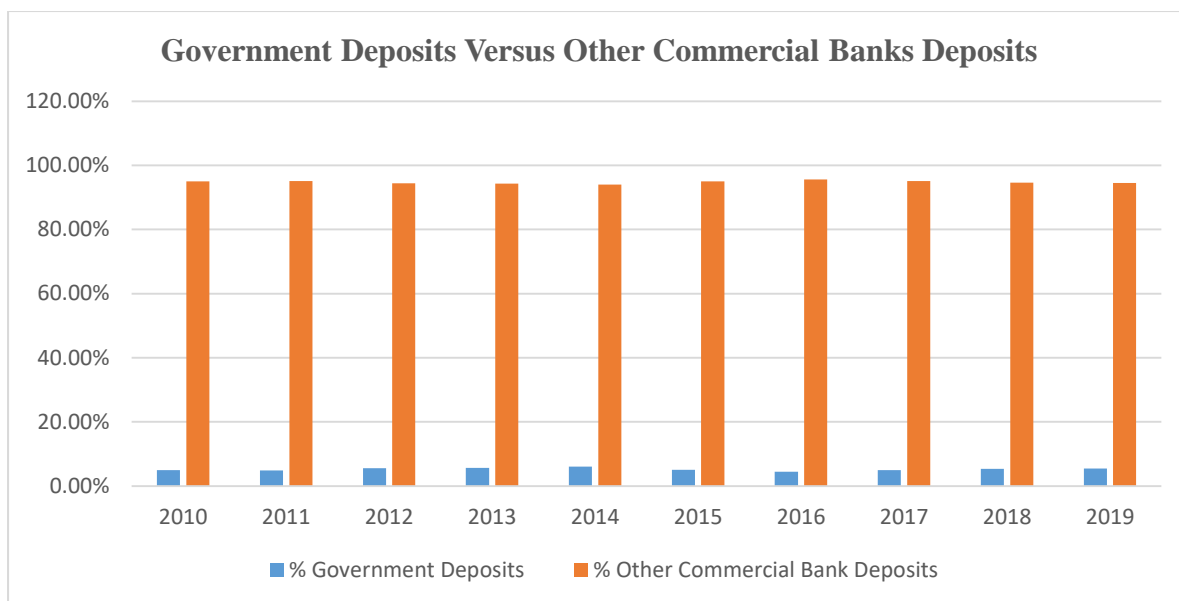
4.2 Descriptive analysis of Data.

This section shows the trend analysis of Government Deposits versus Other Commercial Banks Deposits and movement in Aggregate Commercial Banks loan-to-deposit (LDR), before and after implementation of the TSA.

Table 1: Movement in Government Deposits and Other Commercial Banks Deposits between 2010 and 2019.

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
%Government Deposits	4.96	4.87	5.57	5.69	6.01	5.00	4.43	4.94	5.35	5.47
% Other Commercial Banks Deposits	95.04	95.13	94.43	94.31	93.99	95.00	95.57	95.06	94.64	94.53

Source: Author's research findings (2023)



Source: Author’s research findings (2023)

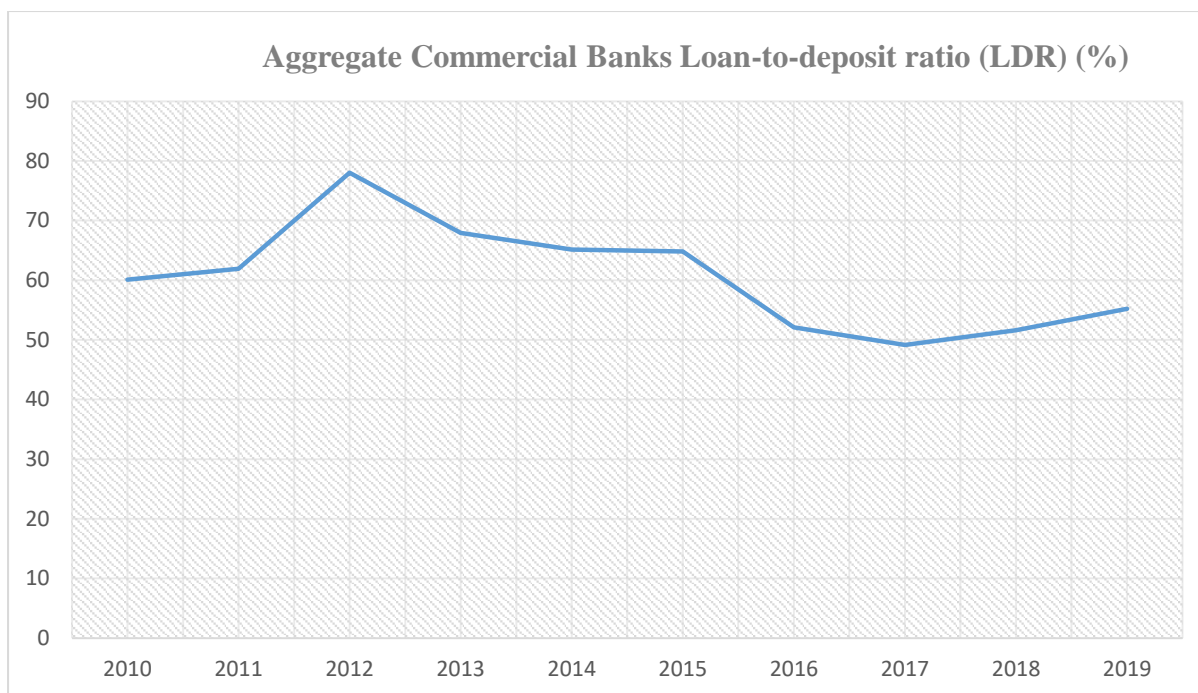
Figure 3: Movement in Government Deposits and Other Commercial Banks Deposits between 2010 and 2019.

Figure 3 reveals that the proportion of Government Deposits versus Aggregate Commercial Banks Deposits remained relatively the same between 2010 and 2019. The trend however shows slow growth in Government Deposits between 2015 and 2019. Between 2010 and 2014 which is the pre-TSA era, Government Deposits grew by 163%. However, between 2015 and 2019 which is the post – TSA era, government Deposits grew by 74%. This shows that there is a decline in the growth of Commercial Banks Government Deposits after the implementation of TSA.

Table 2: Movement in the Aggregate Commercial Banks Loan-to-Deposit Ratio (LDR) between 2010 and 2019.

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Aggregate LDR (%)	60.10	61.92	78.01	67.92	65.13	64.82	52.08	49.12	51.6	55.22

Source: Author’s research findings (2023)



Source: Author's research findings (2023)

Figure 4: Movement in the Aggregate Commercial Banks Loan-Deposit-Ratio (LDR) between 2010 and 2019.

The loan-to-deposit ratio (LDR) is a metric used to assess a bank's liquidity by comparing total loans to its total deposits for the same period. The LDR is expressed as a percentage. If it is too high, it means that the bank may not have enough liquidity to cover any unforeseen funding requirements. Generally, the loan-to-deposit ratio of 80% to 90% is considered ideal. The Aggregate Commercial Banks Loan-to-deposit ratio was 60.10% in 2010 and rose to 78.01% in 2012. The ratio fell to 64.82% in 2015, the year the TSA implementation commenced in Zambia. The lowest LDR was recorded in 2017 at 49.12% and rose to 55.22% in 2019. The trend shows an improvement in the loan-to-deposit ratio during the Post TSA era. However, this improvement cannot be attributed to an increase in deposits, but rather to the slow growth in Loans and Advances during the post-TSA era. It appears there is a slowdown in lending during the post – TSA era. Between 2010 and 2014 which is the pre-TSA, Loans and Advances grew by 136%. However, between 2015 and 2019, which is the post TSA period, Loans and Advances grew by 36%.

The slowdown in lending can be attributed to relative increase in gross Non-performing loans during the Post-TSA era, as revealed by the Bank of Zambia annual reports (2010-2019). A Non-performing loan (NPL) is a loan that is either in default or close to default because the

borrower has not made the scheduled payments for a specific period. By 2014, Non-performing loans had declined to 6.1% from 10.4% in 2011. In 2015, Non-performing loans rose to 7.3%. In 2017 and 2018, Non-performing loans were 12.0% and 11.0% respective, which were above the 10.0% prudential limit. However, in 2019, a notable drop in Non-performing loans to 8.9% is observed. Usually, banks reduce lending during periods of high Non-performing loans to minimize exposure to risky assets, protect capital, maintain liquidity, and ensure long-term stability (Jing, 2020).

4.3 Hypothesis 1 Testing

This section presents the testing of the study hypothesis. Regression and Correlation analysis was done, using SPSS Statistics version 28 to test the hypothesis.

H₀: Government Deposits (GD) have no significant effect on Commercial Bank Deposit Mobilization (CDM). H₀: $\beta = 0$, meaning there is no relationship between Government Deposits and Commercial Banks Deposit Mobilization.

H₁: Government Deposits (GD) have significant effect on Deposit Mobilization (CDM). H₁: $\beta \neq 0$, meaning there is a relationship between Government Deposits (GD) and Commercial Banks Deposit Mobilization (CDM).

Table 3: Model Summary of the Regression and Correlation analysis results between Government Deposits and Commercial Banks Deposit Mobilization

Constant	β	Correlation Coefficient (r)	T-test	P-Value (Sig.)	Decision
1.40 x 10 ⁹	18.427	0.980	13.767	<0.001	H ₁ : Accepted

Dependent Variable: Commercial Banks Deposit Mobilization (CDM)

Source: Author's research finding 2023

For linear relationship,

$$Y = \alpha + \beta X + \epsilon$$

Where:

Y = the dependent variable

X = the independent variable

α = some constant (the intercept)

β = the coefficient of the explanatory variable (Slope)

ϵ = represents the error term in the model.

Our independent variable is Government Deposits (GD), while Commercial Banks Deposit Mobilization (CDM) is our dependent variable. Substituting the independent and dependent variable, we can present the equation as follows:

$$\text{CDM} = \alpha + \beta\text{GD} + \epsilon$$

Using our Constant and β values, we can present the estimated regression equation as follows:

$$\text{CDM} = 1.4 \times 10^9 + 18.42(\text{GD})$$

The regression model explains that Government Deposits (GD) have a positive relationship with Commercial Banks Deposit Mobilization (CDM). An increase of 1 Kwacha in GD will lead to an increase of 18.43 Kwacha in CDM. The correlation coefficient (r) of 0.980 indicates a strong positive relationship between Government Deposits and Commercial Banks Deposit Mobilization. When we look at the Sig column, we note that the regression model predicts the dependent variable significantly well. The P-value of < 0.001 which is less than 0.05 means the P-value is statistically significant at 5% level. And since the t_{cal} (13.767) is outside our acceptance region of (± 1.96) , we reject the null hypothesis and uphold the alternative one hypothesis that there is a significant effect of Government Deposits on Commercial Banks Deposit Mobilization.

4.4 Hypothesis 2 Testing

H_0 : Government Deposits (GD) have no significant effect on Commercial Banks Loans and Advances (L&A).

H_0 : $\beta = 0$, meaning there is no relationship between Government Deposits (GD) and Commercial Banks Loans and Advances (L&A).

H_1 : Government Deposits (GD) have significant effect on Commercial Banks Loans and Advances (L&A).

H_1 : $\beta \neq 0$, meaning there is a relationship between Government Deposits (GD) and Commercial Banks Loans and Advances (L&A).

Table 4: Model Summary of the Regression and Correlation analysis results between Government Deposits and Commercial Banks Loans and Advances

Constant	β	Correlation Coefficient (r)	T-test	P-Value (Sig.)	Decision
4.8×10^9	8.675	0.971	11.441	<0.001	H ₁ : Accepted

Dependent Variable: Loans and Advances (L&A)

Source: Author's research findings (2023)

Our independent variable is Government Deposits (GD) while Commercial Loans and Advances (L&A) is our dependent variable.

Therefore, our estimated regression is given by:

$$L\&A = \alpha + \beta (GD) + \epsilon$$

Using our Constant and β values, we can present the estimated regression equation as follows:

$$L\&A = 4.8 \times 10^9 + 8.67 (GD).$$

The regression model explains that Government Deposits (GD) have a positive relationship with Commercial Bank Loans and Advances. An increase of 1 Kwacha in GD would lead to increase of 8.68 Kwacha in L&A. The correlation coefficient of 0.97 indicates a strong positive relationship between Government Deposits and Commercial Banks Loan and Advances. Looking at the Sig column, we note that the regression model significantly predicts the dependent variable. The P-value of <0.001 which is less than 0.05, means that the P-value is statistically significant at 5% level. And since the tcal (11.441) is outside our acceptance region of (+/-1.96), we reject the null hypothesis and uphold the alternative hypothesis that Government Deposits have significant effect on Commercial Banks Loans and Advances.

CHAPTER 5

DISCUSSION OF FINDINGS

5.1 Introduction

The study has examined the effects of the Treasury Single Account on Commercial Banks Deposit Mobilization and Lending in Zambia from 2010 - 2019.

This section discusses the findings, their implications and how they relate to the findings by other researchers.

5.2 Commercial Banks Deposit Mobilization

The findings of study have revealed that Government Deposits have significant positive effect on Commercial Banks Deposit Mobilization [(P-value <0.001); (CI: 95%)]. An increase of 1 Kwacha in Government Deposits would result in an increase of 18.43 Kwacha in Commercial Banks Deposit Mobilization. It can be seen that Government Deposits contribute significantly to the overall deposit mobilization of Commercial Banks in Zambia. This therefore means that, the TSA which essentially withdraws Government Deposits from Commercial Banks has a negative effect on their ability to mobilize deposits. The findings of this study are consistent with the findings by (Mkaro, et al., 2023) whose study revealed the performance of some banks was impaired after TSA adoption, as a major portion of their deposits was derived from Government deposits.

The trend analysis on Government Deposits with Commercial Banks between 2010-2019 further revealed a slower growth (74%) in Government Deposits during the post-TSA era (2015-2019), compared to a growth of 163% during the pre-TSA era (2010-2014). The findings of this study are also consistent with studies by (Ndubuaku, Ohaegbu, & Nina, 2017) and (Odu & Joseph, 2019), whose findings were that Treasury Single Account impacts negatively on the banking sector's ability to mobilize deposits. The (World Bank Group, 2017) report on Tanzania also revealed a challenging environment for Commercial Banks created by the government's decision to centralize public institutions bank accounts, leading to a decline in Commercial Bank deposits.

5.3 Commercial Bank lending (Loans and Advances)

The findings of the study have revealed that Government Deposits have a positive significant effect on Commercial Banks' ability to extend Loan and Advances [(P-value <0.001; (CI: 95%)]. An increase of 1 Kwacha in Government Deposits would result in an increase of 8.68 Kwacha in Loans and Advances. The Trend analysis on Loans and Advances from 2010-2019 revealed a slower growth in Loans and Advances (36%) during the post-TSA era (2015-2019), compared to a growth of 136% during the pre-TSA era (2010-2014). These findings may point to the dependence of Commercial Banks on Government Deposits to extend Loans and Advances. The implication therefore is that the TSA, which essentially withdraws Government Deposits from Commercial Banks, has a negative effect on Loans and Advances. The findings of this study are consistent with the findings by (Ndubuaku, et al., 2017) whose findings revealed that the TSA has significant negative impact on the banking sector's ability to provide Loans and Advances. The findings are also in line with (Oyadonghan & Atagboro, 2020) whose study revealed that the introduction of the TSA has adverse effect on the availability of credit to the economy. (Selvaraj & Balaji , 2015) also contend that the ability to grant Loans and Advances, which is the primary source of income for Commercial Banks is dependent on their ability to mobilize deposits from the market.

5.4 Chapter Summary

This chapter has presented the research findings, addressing the research objectives. The chapter highlighted how the data were analysed as well as results of the data analysis. It has also reviewed the findings of other studies and how they relate to the findings of this study.

CHAPTER 6

CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

This chapter makes conclusions from the findings of the research study and makes recommendations and draws comparisons with similar previous studies on the topic.

6.2 Conclusions

This study assessed the effects of the Treasury Single Account on Commercial Banks Deposit Mobilization and Lending in Zambia. The trend analysis revealed a slow growth in both Government Deposits and Loans and Advances during the post-TSA era. The regression results further suggest that the Treasury Single Account has a negative effect on Commercial Banks Deposit mobilization and their lending ability.

From the above analysis, we make inferences as follows:

Implementation of the TSA, which seeks to withdraw Government Deposits from Commercial Banks, has a negative effect on Commercial Banks Deposits. Ultimately, this withdrawal of Government Deposits impacts negatively on their lending ability since banks need deposits (liabilities) to provide Loans and Advances. The findings are in agreement with the findings of the studies done by (Kanu, 2016), (Muraina, 2018), (Mwambuli & Igoti, 2021), (Ajetunmobi, et al., 2017), (Ndubuaku, et al., 2017), (Mkaro, et al., 2023) and (Odu & Joseph, 2019), whose findings revealed that the TSA impacts negatively on the performance of the banking sector.

These findings point to Commercial Banks' reliance on Government Deposits, to Mobilize Deposits and thus provide lending.

6.3 Recommendations

With this realization that the Treasury Single Account has a negative effect on Deposit mobilization and their lending ability, we make the following recommendations:

- Banks should move away from over reliance on Government Deposits and develop strategies to attract deposits from the private sector.
- Commercial Banks should simplify account opening procedures by reducing paperwork and leveraging digital technology to create a smooth onboarding experience that encourages customers to initiate and maintain long lasting banking relationships. Technology can allow customers to submit required documentation digitally, leading to reduced time and effort needed to onboard customers on the bank's side. The more customers open accounts, the more opportunities for Commercial Banks to mobilize deposits and provide credit.
- Commercial Banks should leverage data analytics to drive deposit growth by targeting available customer segments ripe for deposit acquisition. By targeting the right long-lasting relationships and directing efforts toward targeted client needs, banks can optimize their efforts and success rates in increasing customer wallet share.
- Banks should develop synergies with fintech companies to facilitate customer payments to bank accounts, thereby creating a seamless banking experience. Fintech is short form for financial technology, where technology intersects with finance, leveraging digital tools to enhance and automate financial services for business and individual customers.
- Banks should come up with innovative solutions to tap into the unbanked population. According to the 2020 FinScope survey undertaken by the Bank of Zambia in collaboration with Financial Sector Deepening Zambia (FSD Zambia), about 30% of Zambia's adult population are financially excluded (BOZ, 2020). Banks should therefore develop attractive savings products to encourage the culture of saving among citizens.
- The Bank of Zambia should limit the amount of cash that can be withdrawn over the counter, to encourage people to use electronic means of payments. This will ensure that money remains within the financial systems.
- The Bank of Zambia should use its monetary policy measures such as the Monetary Policy Rate (MPR) and Reserve Ratio to protect the integrity of financial systems, while trying to maintain macroeconomic stability.
- The ministry of Finance should consider allowing Commercial Banks acting as revenue collection agents a few days float before revenue is remitted to the main TSA account at the Bank of Zambia. This is supported by (Pattanayak & Fainboim, 2010) who contend that in some countries, banks providing revenue remittance services are

remunerated by allowing them a float for a few days. For example, in Columbia, banks involved in revenue collection are allowed to retain revenue for 15 days before remitting to the main TSA account.

6.4 Suggestion for Future Research

This study only focused on one explanatory variable, Government Deposits, to investigate their effects Commercial Banks Deposit Mobilization and lending. There could be other variables such as macroeconomic factors i.e. inflation, interest rates, Gross Domestic Product (GDP) growth, exchange rates that could have an effect on Commercial Banks Deposit Mobilization and their Lending capacity. It is therefore recommended that future researchers who might be interested in carrying out studies in this area should expand the scope to include other variables not included in this study.

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APPENDICES

Appendix 1:

Table 5: TSA Structure in various countries

OECD Countries					
Country	Description	Coverage	Degree of Centralization	Role of Commercial Banks	Availability of IFMIS
France	France has a well-developed TSA at the Central Bank. the TSA includes the balances of local authorities, the quasi-government bodies as well as central government revenue spending departments.	National and regional/ local governments and quasi government bodies	Fully centralized architecture with regional sub-accounts of the TSA	No involvement	IFMIS, including an interface with Central Bank for TSA operation
United Kingdoms	All central government cash balances are aggregated into a TSA maintained at the Central Bank. Local authorities and state owned enterprises (SOE) are outside the central system and hold their cash balances in Commercial Banking system.	National government	Fully centralised architecture	Yes, significant involvement	Yes
Australia	The department of Finance and Administration (DFA) is responsible for banking and payment arrangements within government. The DFA holds the main government accounts at the Central Bank, the Reserve Bank of Australia.	National government	A mixed architecture with elements of both centralized and decentralized models of TSA	The central government is the manager of the TSA, but departmental payments are executed through the	Yes

United States	<p>The US Treasury maintains a consolidated pool, in a single account, for all funds of the Federal government. The Federal Reserve Banks (FRBs) act as the main government banks. The FRB, and specifically the Federal Reserve Bank of New York (FRBNY) maintain the Treasury general account (TGA), accepts deposits of federal taxes and other federal agency receipts and process checks, and electronic payments drawn on the (TGA).</p>	Federal Government	<p>Decentralized architecture with the FRB acting as the main government bank for agencies, who are given the responsibility for accounting control and use of funds.</p>	<p>Commercial Banking system</p> <p>Some involvement with Central Bank being the manager of TSA</p>	Yes
Sweden	<p>There are around 270 central government authorities. They make or receive a large number of payments. Authority payments (including Swedish Social Insurance Administration) are collected in a Central Account (SCR) that the Debt Office (DO) has at the Central Bank. Every institution has one or more transaction accounts at one or</p>	Central / national government	<p>Decentralized architecture. Central government agencies sign agreements with banks and pay for the banking services used by them.</p>	<p>Commercial Banks provide transaction banking services. Central government agencies have transaction accounts at one or more</p>	Yes

	more banks. The balances in the authorities' transaction accounts are transferred to and collected in a to account at the respective banks and then onward to the SCR.			Commercial Banks.	
--	--	--	--	-------------------	--

Source: (Pattanayak & Fainboim, 2010)

Appendix 2:

Table 6: Banks of Zambia data on Government Deposits, Aggregate Commercial Banks Deposits and Loans and Advances

YEAR	GD (K)	CDM (K)	L&A (K)
2010	760607649	15340074190	9219431772
2011	943652781	19391780969	12007555473
2012	1217512866	21840111138	17037115983
2013	1588271167	27934467167	18972554000
2014	2003676667	33353083333	21722000000
2015	2024250000	40504083333	26253000000
2016	2001916667	45153833333	23517000000
2017	2457216667	49743575000	24434000000
2018	3020808333	56449000000	29135000000
2019	3529383333	64503125000	35616700000

Source: Bank of Zambia Annual Reports

Key:

K = Zambian Kwacha

GD = Government Deposits

CDM = Aggregate Commercial Banks Deposits

L&A = Commercial Banks Loans & Advances

Appendix 3:

Table 7: Coefficients of Regression and Correlation analysis between Government Deposits and Commercial Banks Deposit Mobilization

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1(Constant)	1.40×10^9	2.8×10^9		.493	.636
Govt Deposits	18.427	1.338	.980	13.767	<.001

a. Dependent Variable: Commercial Banks Deposit Mobilization (CDM)

Source: Author's research findings (2023)

Appendix 4:

Table 8: Coefficients of Regression and Correlation analysis results between government Deposits and Loans and Advances.

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1(Constant)	4.8×10^9	1.6×10^9		2.999	.017
Govt Deposits	8.675	.758	.971	11.441	<.001

a. Dependent Variable: Loans and Advances (L&A)

Source; Author's research findings (2023)

Appendix 5: Regression Analysis

```
[16]: import pandas as pd
import statsmodels.api as sm
import numpy as np

[17]: df = pd.read_excel('BOZ.xlsx') # reads the data from the excel file
[18]: del df['YEAR'] # deleting the column 'YEAR' we do not need it for the analysis
[19]: df # We can view the cleaned data, which is ready for analysis
[19]: Government_Deposits Commercial_Banks_Loans Total_Commercial_Bank
0          760607649          9219431772          15340074190
1          943652781          12007555473          19391780969
2          1217512866          17037115983          21840111138
3          1588271167          18972554000          27934467167
4          2003676667          21722000000          33353083333
5          2024250000          26253000000          40504083333
6          2001916667          23517000000          45153833333
7          2457216667          24434000000          49743575000
8          3020808333          29135000000          56449000000
9          3529383333          35616700000          64503125000

[20]: # Fitting the linear regression model
model = sm.OLS(y, X).fit()
# Getting the correlation matrix of the independent variables
correlation_matrix = df[['Government_Deposits', 'Commercial_Banks_Loans']].corr()
# Extracting the coefficients, p-values, and other relevant statistics
coefs = model.params
p_values = model.pvalues
confidence_intervals = model.conf_int(alpha=0.05)
t_values = model.tvalues
degrees_of_freedom = model.df_resid
# Creating a table to store the results
results = pd.DataFrame({
'Variable': X.columns,
1
```

```

'Coefficient': coefs,
'P-value': p_values,
'95% Confidence Interval Lower Bound': confidence_intervals.iloc[:, 0],
'95% Confidence Interval Upper Bound': confidence_intervals.iloc[:, 1],
'T-value': t_values
})

```

```

print("Correlation Matrix:")
print(correlation_matrix)
print("\nRegression Results:")
print(results)

```

Correlation Matrix:

	Government_Deposits	Commercial_Banks_Loans
Government_Deposits	1.000000	0.970775
Commercial_Banks_Loans	0.970775	1.000000

Regression Results:

	Variable	Coefficient	P-value \
const	const	1.401795e+09	6.355725e-01
Government_Deposits	Government_Deposits	1.842685e+01	7.478984e-07
95% Confidence Interval Lower Bound \			
const		-5.161271e+09	
Government_Deposits		1.534031e+01	
95% Confidence Interval Upper Bound			
const		7.964862e+09	0.492536
Government_Deposits		2.151339e+01	13.767001

1 Simple Linear Regression

```

[21]: # Performing the simple linear regression model
y = df['Commercial_Banks_Loans']
# Define the independent variables (including the intercept)
X = sm.add_constant(df['Government_Deposits'])
# Fit the linear regression model
model = sm.OLS(y, X).fit()
# Getting the correlation matrix of the 'Government_Deposits' and _

```

```

☐ 'Commercial_Banks_Loans'
correlation_matrix = df[['Government_Deposits', 'Commercial_Banks_Loans']].corr()
# Get the summary of the model
summary = model.summary()
2
# Extract the coefficients, p-values, and other relevant statistics
coefs = model.params
p_values = model.pvalues
confidence_intervals = model.conf_int(alpha=0.05)
t_values = model.tvalues
degrees_of_freedom = model.df_resid
# Create a table to store the results
results = pd.DataFrame({
'Variable': X.columns,
'Coefficient': coefs,
'P-value': p_values,
'95% Lower': confidence_intervals.iloc[:, 0],
'95% Upper': confidence_intervals.iloc[:, 1],
'T-value': t_values
})
print("Correlation Matrix:")
print(correlation_matrix)
print(summary)
print(results)
Correlation Matrix:
Government_Deposits Commercial_Banks_Loans
Government_Deposits 1.000000 0.970775
Commercial_Banks_Loans 0.970775 1.000000
OLS Regression Results
=====
=====
==
Dep. Variable: Commercial_Banks_Loans R-squared:

```

0.942

Model: OLS Adj. R-squared:

0.935

Method: Least Squares F-statistic:

130.9

Date: Sat, 29 Jul 2023 Prob (F-statistic):

3.08e-06

Time: 11:22:08 Log-Likelihood:

-227.27

No. Observations: 10 AIC:

458.5

Df Residuals: 8 BIC:

459.1

Df Model: 1

Covariance Type: nonrobust

=====

	coef	std err	t	P> t	[0.025
		3			0.975]

const	4.835e+09	1.61e+09	2.999	0.017	1.12e+09
-------	-----------	----------	-------	-------	----------

8.55e+09

Government_Deposits	8.6747	0.758	11.441	0.000	6.926
---------------------	--------	-------	--------	-------	-------

10.423

=====

Omnibus: 1.755 Durbin-Watson: 1.545

Prob(Omnibus): 0.416 Jarque-Bera (JB): 0.848

Skew: 0.696 Prob(JB): 0.655

Kurtosis: 2.688 Cond. No. 5.40e+09

=====

Notes:

[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.

[2] The condition number is large, 5.4e+09. This might indicate that there are strong multicollinearity or other numerical problems.

Variable Coefficient P-value \

const const 4.834721e+09 0.017103

Government_Deposits Government_Deposits 8.674711e+00 0.000003

95% Lower 95% Upper T-value

const 1.116945e+09 8.552496e+09 2.998805

Government_Deposits 6.926281e+00 1.042314e+01 11.441074

C:\Users\10287\Anaconda3\lib\site-packages\scipy\stats_stats_py.py:1769:

UserWarning: kurtosistest only valid for n>=20 ... continuing anyway, n=10

warnings.warn("kurtosistest only valid for n>=20 ... continuing "

[22]: y = df['Total_Commercial_Bank']

Define the independent variables (including the intercept)

X = sm.add_constant(df['Government_Deposits'])

Fit the linear regression model

model = sm.OLS(y, X).fit()

Getting the correlation matrix of the 'Government_Deposits' and _

☐ 'Total_Commercial_Bank'

correlation_matrix = df[['Government_Deposits','Total_Commercial_Bank']].corr()

Get the summary of the model

summary = model.summary()

Extract the coefficients, p-values, and other relevant statistics

coefs = model.params

4

p_values = model.pvalues

confidence_intervals = model.conf_int(alpha=0.05)

t_values = model.tvalues

degrees_of_freedom = model.df_resid

Create a table to store the results

results = pd.DataFrame({

```
'Variable': X.columns,
'Coefficient': coefs,
'P-value': p_values,
'95% Confidence Interval Lower Bound': confidence_intervals.iloc[:, 0],
'95% Confidence Interval Upper Bound': confidence_intervals.iloc[:, 1],
'T-value': t_values
})
```

```
print("Correlation Matrix:")
print(correlation_matrix)
print(summary)
print(results)
```

Correlation Matrix:

	Government_Deposits	Total_Commercial_Bank
Government_Deposits	1.000000	0.979541
Total_Commercial_Bank	0.979541	1.000000

OLS Regression Results

```
=====
=====
```

=

Dep. Variable: Total_Commercial_Bank R-squared:

0.959

Model: OLS Adj. R-squared:

0.954

Method: Least Squares F-statistic:

189.5

Date: Sat, 29 Jul 2023 Prob (F-statistic):

7.48e-07

Time: 11:22:08 Log-Likelihood:

-232.95

No. Observations: 10 AIC:

469.9

Df Residuals: 8 BIC:

470.5

Df Model: 1

Covariance Type: nonrobust

```

=====
=====
              coef              std err          t      P>|t|      [0.025
0.975]
-----
                    5
-----
const              1.402e+09      2.85e+09   0.493    0.636    -5.16e+09
7.96e+09
Government_Deposits  18.4269      1.338    13.767   0.000    15.340
21.513
=====
=====

```

Omnibus: 1.961 Durbin-Watson: 1.135
 Prob(Omnibus): 0.375 Jarque-Bera (JB): 0.655
 Skew: 0.627 Prob(JB): 0.721
 Kurtosis: 2.990 Cond. No. 5.40e+09

Notes:

[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.

[2] The condition number is large, 5.4e+09. This might indicate that there are strong multicollinearity or other numerical problems.

Variable	Coefficient	P-value \
const	1.401795e+09	6.355725e-01
Government_Deposits	1.842685e+01	7.478984e-07
	95% Confidence Interval	Lower Bound \
const		-5.161271e+09
Government_Deposits		1.534031e+01
	95% Confidence Interval	Upper Bound T-value
Const		7.964862e+09 0.492536
Government_Deposits		2.151339e+01 13.767001

C:\Users\10287\Anaconda3\lib\site-packages\scipy\stats_stats_.py:1769:

UserWarning: kurtosistest only valid for n>=20 ... continuing anyway, n=10

warnings.warn("kurtosistest only valid for n>=20 ... continuing "

```
[23]: model = sm.OLS(y, X).fit()
```

```
# Get the correlation matrix of the independent variables
```

```
correlation_matrix = df[['Government_Deposits','Total_Commercial_Bank']].corr()
```

```
# Extract the coefficients, p-values, and other relevant statistics
```

```
coefs = model.params
```

```
p_values = model.pvalues
```

```
confidence_intervals = model.conf_int(alpha=0.05)
```

```
t_values = model.tvalues
```

```
degrees_of_freedom = model.df_resid
```

```
# Create a table to store the results
```

```
results = pd.DataFrame({
```

```
'Variable': X.columns,
```

```
6
```

```
'Coefficient': coefs,
```

```
'P-value': p_values,
```

```
'95% Confidence Interval Lower Bound': confidence_intervals.iloc[:, 0],
```

```
'95% Confidence Interval Upper Bound': confidence_intervals.iloc[:, 1],
```

```
'T-value': t_values
```

```
})
```

```
print("Correlation Matrix:")
```

```
print(correlation_matrix)
```

```
print("\nRegression Results:")
```

```
print(results)
```

```
Correlation Matrix:
```

	Government_Deposits	Total_Commercial_Bank
Government_Deposits	1.000000	0.979541
Total_Commercial_Bank	0.979541	1.000000

```
Regression Results:
```

	Variable	Coefficient	P-value \
const	const	1.401795e+09	6.355725e-

```
01
```

Government_Deposits	Government_Deposits	1.842685e+01	7.478984e-07
	95% Confidence Interval Lower Bound \		
Const		-5.161271e+09	
Government_Deposits		1.534031e+01	
	95% Confidence Interval	Upper Bound	T-value
const		7.964862e+09	0.492536
Government_Deposits		2.151339e+01	13.767001

End of Statistical analysis