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# Effect of treasury management on the financial performance of Commercial Banks in Kenya

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**EFFECT OF TREASURY MANAGEMENT ON THE FINANCIAL  
PERFORMANCE OF COMMERCIAL BANKS IN KENYA**

**GATIMU TERESIA WANGUI**

**066770**

**A RESEARCH THESIS SUBMITTED IN PARTIAL FULFILMENT OF  
THE REQUIREMENTS FOR THE DEGREE OF MASTER OF  
COMMERCE AT STRATHMORE UNIVERSITY**



**STRATHMORE BUSINESS SCHOOL**

**STRATHMORE UNIVERSITY,**

**NAIROBI, KENYA**

**JUNE, 2019**

## DECLARATION

I declare that this work has not been previously submitted and approved for the award of a degree by this or any other University. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made in the thesis itself.

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Teresia Wangui Gatimu

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3<sup>RD</sup> June 2019

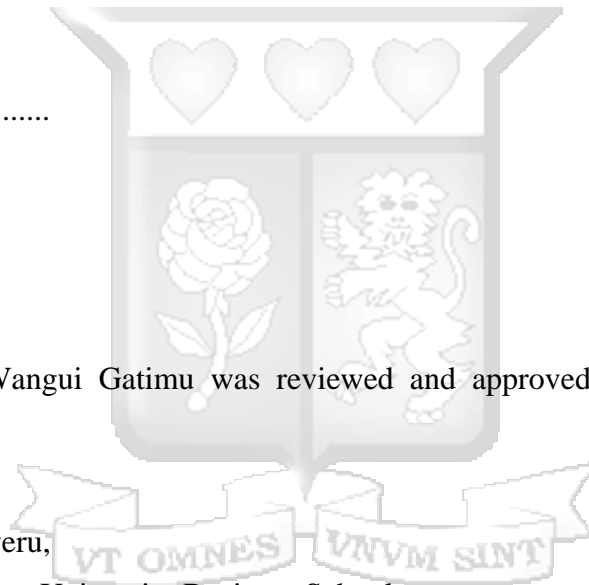
## APPROVAL

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## LIST OF ABBREVIATIONS

CBK	:	Central Bank of Kenya
DTMFIs	:	Deposit Taking Micro Finance Institutions
NIM	:	Net Interest Margin
ROA	:	Return on Assets
ROE	:	Return on Equity
SACCOs	:	Savings and Credit Co-Operative Society



## ABSTRACT

Treasury management importance cannot be underestimated particularly for sustained financial performance of commercial banks. The study was guided by risk management theory and liquidity preference theory. 43 licensed commercial banks in Kenya were studied to achieve the study objectives. Data was obtained from secondary data sources and primary data sources using a questionnaire. The findings were that four main treasury management practices were adopted by the commercial banks and included funding strategies, investment strategies, liquidity management and risk management. The treasury management practices studied were perceived to explain 67.6% of the financial performance of the studied commercial banks in Kenya. The number of significant treasury management practices reduced with increase in bank size. The study concluded that funding strategies, investment strategies, liquidity management and risk management strategies were the main determinants of financial performance among commercial bank. However, evaluation of the size of the commercial banks was concluded to be paramount during the formulation and integration of the treasury management decisions. The study recommended that treasury management practices should be a target mainly for small and medium commercial banks that seek to increase their financial performance. Additionally, the researcher recommended that the management of the banks should institute appropriate internal mechanisms to put mechanisms of having periodic and regular review of the treasury practices in line with their bank size. The study ensured originality in defining the research and adopted content where all sources were fully recognized. The study limitations included data collection confidentiality concerns and extracting of data from the financial statements due to varying reporting by commercial banks.

## CHAPTER ONE: INTRODUCTION

### 1.1 Background of the Study

Incidents of financial management crisis globally and uncertainty in business environments has proven that proper treasury management practices are essential for sustained financial performance (Olamide, Uwalomwa, & Ranti, 2015; Ravenhill, 2017). Particularly in the banking sector, poor treasury management brings about undesirable outcomes and ultimately institution bankruptcy causing financial crisis (Mwangi & Muturi, 2016). This has resulted in the importance of treasury management practices being heightened which aid in anticipation, control, and prevention of potentially costly risks. However, despite the existence of various treasury management practices, banks both in the developed and emerging economies have continued to underperform and struggle to remain profitable (Basel, 2017).

The collapse of Royal British bank and City of Glasgow bank in the 18th century and Barings bank in the 19th century as a result of poor treasury management attests to this apprehension (Grossman, 2010; Onwonga, 2016). In Kenya, the recent collapse of some of the commercial banks also confirms that successful utilization of treasury management practices in promoting financial performance is yet to be realized (Kinyua, 2014). Banks such as Chase Bank, Imperial Bank and Dubai Bank were put under receivership between 2010 and 2016 indicating lack of effective treasury management measures in the banks (Central Bank of Kenya, 2016; Mutuku, 2016). This leads to increased concern on the exact state of treasury management practices and effects brought on financial performance of commercial banks.

The volatile nature of market environments in which organizations operate in poses increased uncertainties that threaten the performance of firms (Picciotto & Mayne, 2016). Specifically, after the global financial crisis in 2008, most organizations continue to experience challenges in

remaining profitable (Nyasimi & Gitau, 2016). Monitoring and responding to changes in the environment is of great importance now more than ever. This has seen increased recognition in the importance of treasury management in organizations so as to mitigate these uncertainties, prevent insolvency and illiquidity as well as improve the organizations performance (Okere, Isaka, & Ogunlowore, 2018).

Historically treasury management centered on working capital management which was critical to the financial well-being of every organization. As a result of corporate re-engineering and the dynamic way in which organizations use information and technology, treasury management has become broader in its scope of responsibilities (Phillips, 1997). Treasury management is about cash management, short term financial investments and management of risk relating to short term investments and liquidity (Schmid, 2010). Commercial banks main revenue comes from treasury management and cash concentration disbursement services (White & Tyler, 2016).

In the banking sector, treasury management has become significantly more complex due to uncertainty and risks (Said & Tumin, 2011). The ability of commercial banks to achieve financial performance depends on how treasury management is conducted to maximize returns on cash and investments versus the cost of financing (White & Tyler, 2016). Treasury management at commercial banks vary with non-financial institutions since commercial banks will need to source for cheapest funds from the market, investing them in higher returns but low risk investments and be able to meet cash requirements of customers which happen are unpredictable (Ogunpola, 2014). Hamid (2011) viewed treasury management as the complex approach of maximizing financial performance through optimal use of resources held by commercial bank. Financial performance of commercial banks is vital since they contribute in a big way to economic development and growth by facilitating flow of resources from areas of surplus to deficit segments (Ongore, 2013).

According to White and Tyler (2016), the main investment instruments used by banks include commercial papers, repurchase agreements (repos), tri-party repos, bonds, short term money market deposits, customer advances and floating rate notes. These instruments have different implications on a commercial bank's cash position and financial performance (Uche, 2014).

To attain effective treasury management in organizations, financial risk management has proven to be beneficial in identification, assessment and monitoring of potential risks to the organization (Schmid, 2010). The efficiency of risk management in an organization is accessed by the ability of the organization to prevent risks from occurring, proper control of risks if they occur and ensuring return to normalcy of an organization's operations after the risks (Olamide, Uwalomwa, & Ranti, 2015). The importance of financial risk management is ensuring the continuous maximization of shareholders' capital and resumption to normalcy of operations even in the event that unforeseeable risks occur (Graham & Bordeleau, 2010).

Successful financial risk management has been found by various scholars to be effective in avoiding and minimizing costly risks and improving organizational performance. Specifically, Collier, (2004) and Wanjohi, (2013) found that proper financial risk management had the ability of improving financial performance of organizations and improved returns in the banking sector respectively. Felix and Claudine, (2008) and Al-Khoury, (2011) also established in their respective studies that proper management of risk including liquidity, capital and credit positively influenced bank's profitability and overall performance. This proposes that for an organization to be financially secure and stable, financial risk management needs to be efficient and effective.

Moreover, Gaitho, (2010) reviewing risk management involving saving, credit and cooperative organizations in Nairobi and revealed that financial risk management had impacted undoubtedly on their agencies and aided in achieving financial objectives, regulatory and customer

requirements. This relates with Omar, (2016) who established that poor financial performance and low margins emanated from poor risk management coupled with competition increase in the market. A study by Mbuguah, (2013) also indicated that fraud related challenges among profit making financial institutions in Kenya could be mitigated through proper management of treasury related risks hence showing the role of financial risk management as a treasury management tool in commercial banks.

Liquidity management has been established to positively impact the financial performance of commercial banks. The findings by Dang (2011) support this by indicating that optimal liquidity levels impacted on financial performance positively. Nyabwanga, (2011) also found that working capital management directly affected the financial performance, cash level, competitiveness, growth, working capital and quality of the assets held by commercial bank. The importance of liquidity notwithstanding, some studies have not found empirical support on the role of liquidity. An example is Said and Tumin (2011) whose study was based in Malaysia and China found no significant relationship between financial performance and liquidity position of commercial banks; regions and market segments notwithstanding.

Regionally, Ugraise, (2013) assessed cash status of commercial banks and financial performance among Rwanda's commercial banks and established that cash level management was important in enhancing commercial banks performance. This re-counts a study conducted by Attom, (2013) who found that liquidity management and short term investments played a huge and significant role in the sustainable growth as well as the rate of survival of Ghana's commercial banks. Mukti, (2013) used a panel regression approach on all the profit making private banks Kenya and found significant positive effect on liquidity management and financial performance. The findings are

also consistent with Sang, (2014) who focused on banks in Nakuru and also found similar positive effect.

Bank financial performance is mainly attained using financial ratios which include Net Interest Margin (NIM), return on assets (ROA) and return on equity (ROE). ROE measure shows the financial performance level compared to amount invested by shareholders. ROA indicates the financial performance of a bank and is the percent of income the assets held by the bank at any time (Khrawish, 2011). NIM on the other hand assesses the interest income against interest expense incurred to fund the funds being invested or advanced as loans by the commercial banks (Gul *et al.*, 2011).

Treasury management practices vary with size of the commercial bank and so is the financial performance of commercial banks (Khrawish, 2011). For treasury management to be effective the practices in place need to be aligned with the commercial bank's size, financial strategy, flexibility and limits for each financial risk (Uche, 2014). In this regard, well managed treasury management practices should have well set out procedures which should be updated regularly and be aligned to the size of the organization. Treasury management policies act as the channel through which board of the commercial banks and management delegate financial decisions (White & Tyler, 2016). Therefore, standard treasury management practices help to ensure adequate controls are in place by the banks and that there are adequate checks and balances and thus enable the bank to maximize financial performance (Graham & Bordeleau, 2010).

General objective of treasury department of any commercial bank is to maximize financial performance of the firm but optimal use of the resources and management of the inherent risk facing treasury decisions (Rop, 2016). Though, the treasury function is core to financial performance of commercial banks, empirical evidence and studies on the treasury management

have not been fully conclusive on the exact effect on financial performance. There have been contradicting findings from the studies done on components of treasury management. This study focused on how treasury management impacts on a bank's financial performance.

## **1.2 Research Problem**

Central Banks across the world regulate the treasury management practices to be adopted. However, despite the strict regulations, commercial banks continue to collapse due to inappropriate treasury management practices adopted. Empirically, studies conducted have not been fully conclusive on the exact effect of treasury practices and the main objective of commercial banks: financial performance. In Nigeria, Ironkwe and Muenee (2016) found a positive correlation relationship between treasury management and bank performance. Okere, Isaka, and Ogunlowore, (2018) found that financial performance was positively impacted by optimal liquidity management. This coincides with Libor and Ngahu, (2015) who also found a strong and positive effect between treasury management and financial performance profit making commercial banks in Kenya. Also, Kathomi, Kimani, and Kariuki, (2017) established that properly implemented treasury management measures positively impacted the sustainability of financial institutions.

However, Ilhomovich, (2009) established that the effect of treasury management is not always clear since treasury decisions involved risk and financial tradeoff as a result of treasury decisions undertaken. On the contrary, Shuremo, (2016) established that implementation of treasury management practices was negatively related to the commercial banks financial performance. While Txomin, (2011) found out that treasury management did not necessarily target to improve financial performance but to maintain commercial banks financial soundness, liquidity, prevention of bank panic and consequently bank collapse. Therefore, due to the contradicting findings, there

is increased need for identification of the common treasury practices in different areas of treasury management for ease of benchmarking (Phillips, 1997).

Thus, the effect of treasury management on financial performance of commercial banks in Kenya remains unclear. Understanding the influence of treasury management is essential for providing a guide in improving the performance of the banking sector in Kenya which has been under threat from vast regulations including interest rate regulations and the probable increase of the core capital from one billion to five billion, posing threat to their profitability. The study aimed at addressing this by answering the research question; what is the effect of treasury management on the financial performance of commercial banks in Kenya?

### **1.3 Research Objectives**

#### **1.3.1 General Objective**

To determine the effect of treasury management on the financial performance of commercial banks in Kenya.

#### **1.3.2 Specific Objectives**

The study was guided by the following specific objectives;

1. To determine the treasury management practices adopted by commercial banks in Kenya.
2. To determine the moderating effect of size on the relationship between treasury management practices and financial performance of commercial banks in Kenya.
3. To examine the perceived effect of treasury management on financial performance of commercial banks in Kenya.

## **1.4 Research Questions**

The study aimed at addressing the following research questions;

1. Which treasury management practices are adopted by commercial banks in Kenya?
2. What is the moderating effect bank size on the relationship between treasury management practices and the financial performance of commercial banks in Kenya?
3. How does commercial banks management perceive the effect of treasury management on financial performance of commercial banks in Kenya?

## **1.5 Scope of the Study**

The study sought to analyze the effect of treasury management on the financial performance of commercial banks in Kenya. The independent variables were treasury management practices and the dependent variable was the financial performance of commercial banks. Target population was commercial banks in Kenya totaling to 43. Secondary data for the study was collected for a five-year period 2013 to 2017 on an annual basis. Primary data was collected using questionnaires in year 2019 from all the 43 commercial banks.

## **1.6 Significance of the Study**

The study is considered important to various players who include the bank management and commercial banks practitioners, regulatory bodies and policy formulators and researchers.

### **1.6.1 Bank Management and Industry Practitioners**

The findings of the study will be vital to financial institutions managers and industrial practitioners. Based on the recommendations made at the end of the study, they may be able to improve the effectiveness in the use or implementation of treasury management practices and may use it to gain a competitive edge against their rivals. This will ensure that organizational goals are achieved

while assuring financial security and sustainability of the commercial banks. Other managers in other sectors may also benefit regarding the same therefore promoting economic wellbeing of the people, economic development and growth in the country. The study has recommended that bank managers to formulate treasury management practices that are in line with the bank size and this will drive the financial performance of the commercial banks.

### **1.6.2 Regulators and Policy Formulators**

The findings of the study will also be of importance to the regulatory bodies and policy formulators in the country. It will shed light on whether the performance of the banks may be enhanced through proper treasury management practices. It may act as a guide in formulation of a benchmark of conducive practices to favour standard treasury management capable of improving commercial banks financial performance. This is important since this sector contributes significantly to the country's economy. Further, the study recommended that regulators will need to do more and ensure that treasury management practices are in line with the bank size. Further, cases of noncompliance was noted which should be addressed by the policy formulators.

### **1.6.3 Researchers and Academicians**

Researchers, students, and other academicians will find value in this study for information. Thus, future studies can be based on the present study especially by taking advantage of the highlighted challenges and shortcomings of the present study and the recommended future research directions. The study has added to body of scholarly knowledge and further helps academicians' society who want to study in detail the treasury management and commercial financial institutions financial performance. The study recommended for further study on other financial institutions like deposit taking micro finance institutions. Further study was also recommended where other treasury management practices will be studied.

## **CHAPTER TWO: LITERATURE REVIEW**

### **2.1 Introduction**

The chapter reviews the theoretical foundations on treasury management and financial performance of commercial banks. Specifically, the chapter contains theoretical review focusing on their proposition and implication to the study and empirical review with emphasis to the methodology and findings. It also describes the conceptual framework and summary of literature review with an over view of the research gaps to be addressed by the study. It formed a basis on which the entire study was conducted.

### **2.2 Theoretical Review**

Theories were considered as important anchor guide for the study. They enabled the study to define the study problem from a theoretical ground. Thus, the study was founded on Risk Management Theory and Liquidity Preference Theory. These theories provided the theoretical underpinnings of the study on transmission mechanism of treasury management on financial performance. These enabled prediction of the relationship between the study independent and dependent variables and thus definition of the hypothesis. The theories presented herein are discussed in terms of the assumptions, proposition, and criticisms that have been brought about by the theories over the years.

#### **2.2.1 Risk Management Theory**

Risk Management Theory was introduced and advanced by David, (1997). Risk Management Theory provides a framework through which risk may be identified, assessed, prioritized followed by coordination measures for minimizing, monitoring and control of the effects of the risks (David, 1997). The theory holds that each organization is prone to be faced with various risk arising from

both the internal and external factors. These risks include credit risk, legal liabilities, project failures, uncertainties in the financial markets, deliberate attack from an adversary, disasters as well as or events of uncertain or unpredictable root-cause (Weng, 2005). According to the Risk Management Theory, these unforeseeable risks despite not being accounted for may result in adverse effects on the performance and overall success of the firm when not well managed (Eichhorn, 2004).

Risk Management Theory describes the process of coming up with strategies for identifying and managing potential and imminent risks that may affect the organization (Tseng, 2007). Risk management attempts to assess uncertainties, prioritise them and prescribe the best course of action to deal with any uncertainty, especially where information on the risk taking behaviour of the decision maker is present (Grable, 2000). This ensures management is constantly aware and informed about risks that could occur through constant monitoring of its exposure and being strategically positioned and flexible to respond to change.

These risks either directly or indirectly influence firms based on the specific organization or risk (Eichhorn, 2004). The relevance of Risk Management Theory in explaining risk management strategies in organizations is supported empirically by studies conducted such as Wu and Olson, (2010) and Ngugi, (2001) in enabling organizations to anticipate and manage risks thus minimizing losses. On the contrary, Linbo, (2004) argues that the main limitation of the theory is that it creates ambiguity as it does not distinguish the exact risk management practices to be employed by organizations.

The relevance of the theory to the study is in describing that all organizations are prone to experience risks irrespective of the industry or nature of operations, with the commercial banks in Kenya being of no exception. These risks if not well managed through appropriate risk

management strategies are theorized to cause reduction in returns and shareholder capital in the commercial banks. Therefore, according to this theory, management of different risks through well formulated and implemented treasury management practices are expected for commercial banks to remain profitable. Commercial banks are theorized to make decisions on which risks to reduce and which ones to increase and how, based on the rate of attainment of comparative advantage.

### **2.2.2 Liquidity Preference Theory**

Thus theory was first introduced by Keynes in 1936 and later developed to respond to various disciplines in different fields. The theory holds that three main motives have been put across as to why people may demand and prefer liquidity. These include; the speculative motive which is the company's ability to utilize special opportunities which may bring benefits to the firm, the transaction motive in which people hold cash to be utilized for daily transactions and precautionary motive whereby cash is held for unexpected events (Bibow, 2013; Carvalho, 2015).

According to this theory, liquidity management in organizations are motivated by any or all of the three reasons why people prefer cash money. In application liquidity preference theory describes two types of premiums at spot rate and forward rate. In essence, these rates are used by commercial banks to compensate for the scarce liquid resources (Beck & Hesse, 2006). Demand for money is the main driving force for liquidity in the banking industry (Vossen, & Ness, 2010). However, the theory is not comprehensive enough in describing the impact that liquidity management may have on how the banks perform.

The proposition of the theory thus is that commercial banks in Kenya have varying liquidity levels depending on the current demand for money by their customers. The importance of the theory is that it describes the motives behind which organizations and individuals may opt to hold cash. Therefore, through proper liquidity management, the commercial banks would be able to attain a

balance in their liquidity levels and hence remain profitable. According to this theory, proper liquidity management practices are essential in enhancing the growth and productivity of the financial aspects of commercial banks.

## **2.3 Empirical Literature**

Empirical review has been done in respect to study objectives and covers treasury management.

### **2.3.1 Funding Strategies and Financial Performance of Commercial Banks**

Treasury management involves determination of optimal funding sources. Normally, the board in a commercial bank offers the greater blueprint to be followed relating to debt, liquidity, risk and treasury at large. On daily basis, the treasury decisions deals with the specific decisions relating to customers, cash, funding and risks. The objective is to ensure cheapest funding of treasury activities and thus maximizing returns (Rooyen, 2002). Funding strategies involve trade-off between risk of funding, like customers calling their deposits at any moment and ensuring funds are invested at optimal return levels. Equity funding is considered the cheapest source of funding although it's not a very flexible or regular funding. Debt is considered risky since it increases leverage level and increase interest expense (Ahlin, & Townsend, 2007) and may affect a firm's financial performance.

Commercial banks mainly rely on debt funding from deposits which are mainly short term. Demirgüç-Kunt and Huizinga (2009) found that bank funding techniques impacted on risk and returns. The study also found that commercial banks attracted only short term funding sources like short term borrowing accounted a small source of funds for commercial banks with major short term funding being funded by deposits. Further findings were that deposit and non-deposit funding had higher risk including being a source of potential liquidity crisis. This was supported by Huang

and Ratnovski, (2008) criticised funding bank through deposits since customers could withdraw the funding based on rumours, unfounded panic and speculation causing the bank to be insolvent, fail to meet the financial obligations of ensuring customers have their money and thus bank fail.

Another study done by Mahjabeen, (2010) empirically examined influence of funding on financial stability in Europe. The study organizations performances in Japan and United States. The study found that financial institutions with better funding methods were likely and continued to be more sustainable. However, the study was not conclusive in describing the nature of such funding strategies which would render a firm financially sustainable, operationally and financially.

Similarly; Kiiru, (2013) investigated Deposit Taking Micro Finance institutions in Kenya funding structure and how this affected financial performance in period 2011 to 2012. The results revealed positive significant relationship between funding structure and financial performance. Increase in customer deposits and assets in DTMFIs would significantly improve financial performance of DTMFI while borrowing significantly decreased DTMFIs financial performance. The study was however limited only one segment of financial institutions which may not be comparable to commercial banks.

While Ondieki *et al*, (2013) examined external financing strategies and how the strategies influenced financial performance of SACCOs in Kisii Central District using a sample size of 100 respondents. The study found that SACCOs were receiving external funding which influenced the financial of the institutions. The effect was dependent on portfolio quality, investment policies and policies on financing mix. The current study will aim at ascertaining whether the same influence exists among the commercial banks.

### **2.3.2 Investment Strategies and Financial Performance of Commercial Banks**

Treasury management objective mainly is to invest bank financial assets in short term investments capable of maximizing financial returns (Dang, 2011). The theoretical rationale for investing in alternative assets develop a mix of investment portfolio which diversifies the risks, ensure stable returns and thus translating in improved financial performance (Bhattacharyya, 2011).

A study done by Gachoki, (2013) on the investment strategies used by private equity fund investors in Kenya found that 45% of the companies adopted venture capital as a strategy, 33% adopted leveraged buyouts and 22% adopted mezzanine financing as an investment strategy. The study concluded investment styles had effect on the performance of private equity fund investing in Kenya. However, the conclusions may not be fully applied to the commercial banks as the study focused only on the private equity funds.

Likewise; Osano, (2013) also obtained the same positive effect brought about by adopted investment approaches and financial performance of firms in investment in Kenya. The population of study was all investment funds in Kenya and nineteen investment funds as given by Capital Market Authority Cap. 485A as of 2013. From inferential statistics, a positive relationship was established between ROA and the Predictor variables which are investment strategy, Leverage, Liquidity, age and size. This implied that to improve financial performance, investment literacy and capability programs needed to be incorporated in the investment sector's innovation strategies.

Azzi and Suchard, (2013) on the other hand examined the investing behavior of investors in China. The results of the study showed that investment decisions was mainly affected by the attitudes portrayed by investors both domestic and foreign investors in China. The study however was not able to be specific on the exact effects brought about by these investors' behaviors on the financial performance of organizations.

On the contrary; Kogie, (2003) in a study on investment decisions of the future of collective investment schemes in Kenya found that investment among the firms had experienced slow growth having insignificant effect on financial performance. The study also the reduced financial performance as result of investment strategies was contributed to by low public awareness and education of investors, lack of public trust and low returns indicating that most organizations still lacked well set out investment strategies.

### **2.3.3 Liquidity Management and Financial Performance of Commercial Banks**

Liquidity management involves retaining cash position that is adequate to meet short term cash needs and that maximizes investment of excess cash to maximize financial returns. Bank liquidity refers to a bank's ability to cater for both short term and long term financial obligations (Alamayehu, & Ndung'u, 2012). Liquidity management involves ensuring that bank has ability to be able to service short term obligations to avoid insolvency and same time earn optimal revenues from investment (Basel, 2013).

Proper liquidity management plays an essential role in maintaining the general success of a firm (Neupane, & Subedi, 2013). Liquidity is of primary importance for the survival of a firm in the short term and long term due to its influence on profitability of organizations. Profitability measures the economic success of a firm irrespective of cash flow in the firm (Maness & Zietlow, 2005). According to Macharia, (2013) there profitability and liquidity of Commercial Banks in Kenya are positively related.

Al-Tamimi and Obeidat, (2013) on the other hand investigated liquidity management in Commercial Banks of Jordan for eight years period. The findings was that commercial banks level of profitability was positively related to level of liquidity and capital liquidity levels. This was attributed to the commercial banks' ability to invest and customer confidence by knowing that the

bank was stable. Liquidity risk that comes with maintaining low liquidity levels had effect of constraining banks' profitability. This however tends to contradict Ibrahim, (2017) who conducted a study on the impact of liquidity on the profitability of Iraqi commercial banks measured by current ratio. The study found that an increase in liquidity ratios would not necessarily result in increased returns on assets. The study findings however cannot be fully generalized as the study was done internationally, the current study will aim at providing local empirical evidence.

Bassey, (2017) found there was a correlation between the performance of deposit money banks in Nigeria and liquidity management. However, Konadu, (2009) in a study in Ghana concluded that liquidity reduced financial performance levels on the firms operating in Ghana banking industry. In Canada, Graham and Bordeleau, (2010) found that there liquidity and financial performance was about determining the optimal levels of beyond which liquidity reduced bank financial performance.

Majakusi, (2016) studied the impact liquidity management has on returns of commercial banks for a period of four years (2010 to 2014). The study measured liquidity using current ratio. The findings were that there were frequent fluctuations in the financial performance of the banks while liquidity and capital adequacy remained fairly constant. Similar findings were obtained by Ogol, (2011) used current ratio as a measurement and established that liquidity practices meant to reduce risk at MFIs negatively impacted on the financial performance of the financial institutions. The study suggested that the microfinance institutions to maintain optimal cash levels that do not hurt profitability.

#### **2.3.4 Financial Risk Management and Financial Performance of Commercial Banks**

Financial risk management practices are usually designed to reduce adverse consequences of financial decisions being made by the commercial institutions (Wanjohi, 2013). This entails the

process of identifying, minimizing and controlling effects of uncertain events in a firm. Risk management framework is a must for any commercial bank; it's a requirement in most countries in addition to the banks having it to reduce negative impact of operational and financial decisions. Without proper management of risks an organization is likely to be faced with operational and credit problems that negatively affect the financial performance (Mutuku, 2016). This is supported by Kargi, (2011) who investigated effect of treasury control and budgeting control on the Nigeria firms in manufacturing profitability and revealed that money control and cash budgeting had fine and non-large courting with profitability.

Tafri *et al*, (2009) on the other hand examined the relationship between profitability and financial risk of Islamic banks and conventional in Malaysia between 1996 and 2005. The findings were that there was significant impact on profitability due to risk management mechanisms put in place by Islamic banks and conventional banking institutions. Liquidity risk was measured by current ratio while exchange risk was measured by the level and amount of exchange gains and losses. In all banks category, interest rate did not significantly affect financial performance based on equity measures. Interest rate risk however had significant impact on financial performance measured by return on assets on conventional banks. Profitability was not affected in a significant way by liquidity of conventional and Islamic banks. While these findings are important and guiding to this study, Tafri *et al* (2009) did not determine the exact financial risk management practices employed by the various sizes and categories of banks.

This coincides with Gakure *et.al*, (2012) who assessed how credit techniques affected performance of commercial banks. The findings by this study indicated that risk management on credit improved commercial banks financial performance. Although the study did not examine the various credit management techniques and their effect on loans, the study confirmed the

importance of credit management among commercial banks in meeting banks objectives. Similarly, Kuria, (2016) on a study on the effectiveness of operational risk control and management at Co-operative bank established that there was a need for an effective monitoring process in risk management, though was not able to fully distinguish the association existing in-between the operational risk management and profitability of selected commercial banks.

On the contrary, Li and Zou, (2014) who sought to expound on the relationship between risk on loans and financially assessed performance of profit making banks in Europe between the period of 2007 and 2012. The empirical study recognized that management of risk in advancing credit did not have a positive outcome on profits of banking institutions. This concurs with Rundassa and Batra, (2016) who examined and concluded that asset quality and capital adequacy ratios were insignificant to affect ROA, while management soundness, earnings and liquidity ratio were significant. Nyabicha, (2017) studied the effect of financial risk management on the banks trading at Nairobi Securities Exchange financial performance. To quantify credit risk, nonperforming loans to total loans was used while interest rate risk was measured by percentage of interest expense to total interest income. The study found a statistically non-significant association amongst financial exposure management and bank financially assessed performance in Kenya. The study however focused only on the commercial banks trading at the Nairobi Securities Exchange and not all commercial banks in Kenya.

### **2.3.5 Banks Size, Treasury Management Practices and Financial Performance**

Empirical evidence indicates that treasury management practices and financial performance depend on size of the bank. Central Bank of Kenya recognizes this and reports financial performance of commercial banks by category of the bank. Central Bank of Kenya classifies banks into three tiers: Tier One are the large banks, Tier two are the medium sized banks, Tier three are

the small commercial banks (CBK, 2017). It is based on this that this study used bank size as a moderating variable. To achieve this, analysis was done by bank size where results from the various categories was carried out.

According to Lee (2009) bank size has significant effect on profitability although the relationship was nonlinear meaning that gains in profitability reduced for larger firms. This coincides with Lipunga, (2014) who conducted a study on the determinants of profitability of listed commercial banks in developing countries specifically focusing on Malawi during the period 2009-2012 using internal-based and external (market)-based profitability measurements and found out that bank size has a statistically significant impact on ROA however capital adequacy has insignificant effect. Despite the study confirming that bank size does have an influence on the profitability of commercial banks, it was done from an international perspective hence cannot be equally compared locally.

Similarly, Smhan and Al-khatib (2015) who examined the determinants of financial performance of Jordan Islamic banks revealed a significant positive relationship between equity ratio, inflation, and bank size and ROA. This compares with Awojobi et al. (2011) who empirically investigated the key determinants of bank risk management efficiency in Nigeria and showed that bank capital adequacy is positively associated with liquidity, bank size and market risk. Bank size from results was proven to be statistically insignificant.

While Waiyera (2017) investigated the factors that influence bank profitability in Kenya and found that bank size, a bank specific factor, had a significant positive correlation with bank profitability. This is in line with Pervan and Josipa (2012) who examined the influence of firm size on its business success. The analysis was conducted for the 2002-2010 period and the results revealed that firm size had a significant positive influence on firm profitability. Additionally, results showed

that assets turnover and debt ratio also statistically significantly influence firms' performance while current ratio didn't prove to be an important explanatory variable of firms' profitability. The study findings did not focus specifically on the commercial banks and the current study will aim at addressing this.

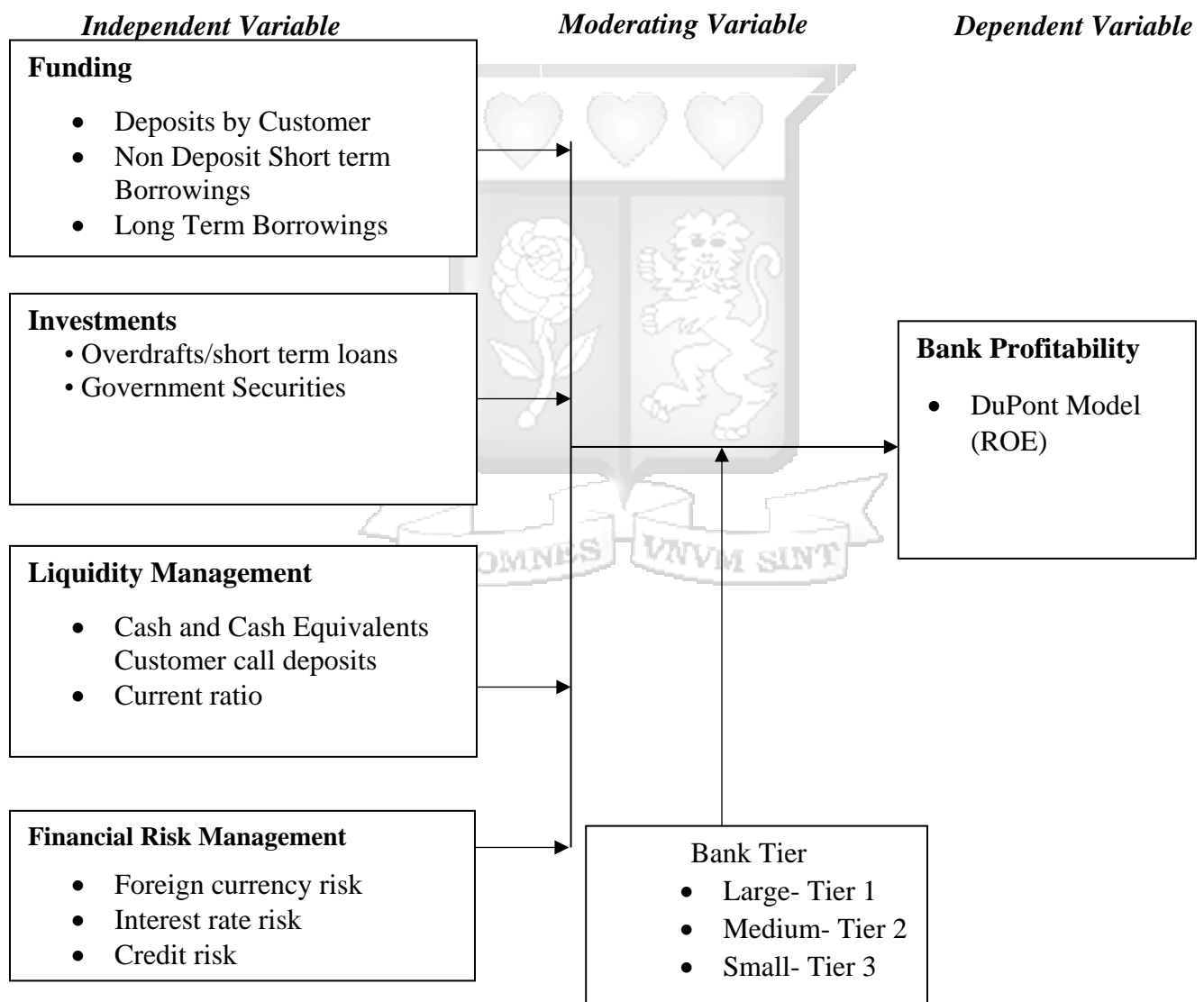
## **2.4 Summary of Literature Review and Research Gaps**

The reviewed literature has shown that proper treasury management is integral in enhancing the returns of commercial banks. The reviewed theories namely; Risk Management Theory and Liquidity Preference Theory indicated the need for incorporating treasury management in commercial banks and the theorized outcomes to be anticipated. However, the empirical studies conducted have revealed inconsistent and contradictory findings on the nature and direction of the effects that adoption of treasury management practices have on financial performance profit oriented banks specifically in Kenya.

The difference in the findings obtained by the studies could be due to differences in methodologies, variables investigated and time frame. The studies conducted have also focused generally on individual treasury management practices and their effect on the performance of the commercial banks without investigating the general impact of the combined use of treasury management practices on their financial performance. Additionally, most of the literature conducted both in the developed and developing countries, have inconsistent findings. It is based on these identified gaps that this study aimed to fill these knowledge gaps by conducting the study in Kenya on financial performance and treasury management practices.

## 2.5 Conceptual Framework

The framework presents the study concept on the relationship between the studied dependent and examined independent variables by this study. The conceptual framework for the study as shown by Figure 2.1 It indicates that the predictor variables include the various management techniques used to run treasury function of commercial banks, the moderating variable which was the bank tier while the dependent variable was the financial performance of the commercial banks.



## ***Figure 2. 1 Conceptual Framework***

***Source: Researcher, 2019***

As shown by Figure 2.1, Funding strategies was measured by the weight of customer deposits to total assets, short term non deposit borrowings to total assets and long term borrowing to total assets. The data was obtained from bank financial reports on annual basis per bank. The data to be obtained per year was the amount of customer deposits, other short term non deposit borrowings, long term borrowings and total assets. Investment strategies were measured by weight of amount invested in short term loans given to customers to total assets and amount of government securities investment to total assets. This was obtained from commercial banks financial statements on annual basis. Liquidity management was measured by cumulative weight of cash and cash equivalents to total customer call deposits and total current assets to current liabilities. Data will be obtained from commercial banks financial statements annually. Data obtained was amount of cash equivalent, total call deposits and current assets and current liability amounts (Kiiru, 2013; Mallick, & Yang, 2011).

Financial risk management, was determined using foreign currency, interest rate and credit risk as used by Mwangi, (2014) and Mutuku, (2016) on their respective studies on management of risk management and effect on financial performance among commercial banks. Foreign currency risk be measured by amount of exchange loss/gain to total income. Interest rate risk was measured by interest expense to total income while credit risk was quantified by the ratio non-performing loans to total loans advanced. Data was obtained from the banks financial statements per year and will relate to exchange loss or gain per year, total income, total interest, total income, non-performing loans and loan advances.

The dependent variable which was the commercial banks financial performance was measured by the DuPont model obtained by multiplying profit margin by total asset turnover and financial leverage. Information will be obtained from financial statements of commercial and CBK supervisory reports. This will be computed by weight of net income to total sales, sales over total assets, total assets to average shareholder equity. Statistics obtained on annual basis will be net income, total sales, total assets and shareholders' equity. DuPont model will be used since it is a comprehensive measure of commercial banks' financial performance (Mallick, & Yang, 2011).



## **CHAPTER THREE: RESEARCH METHODOLOGY**

### **3.1 Introduction**

This chapter details the methodology which was implemented in addressing the research objectives. The chapter discusses chronologically the research design, population of the study, sampling methods, data collection instruments and the data analysis techniques which was used. The chapter also describes the research quality measures and the ethical considerations which were met.

### **3.2 Research Philosophy**

The two main paradigms that guide research in social sciences are the positivist and phenomenological paradigms. Positivist paradigm posits that to empirically establish the correlation between two variables in a study and to formulate and test hypotheses. This philosophy is based on the assumption that universal scientific propositions are true only if the observed effects have been verified by empirical tests (Saunders, Lewis & Thornhill, 2003).

This study adopted positivist research philosophy. Decision on this design was premised on theory and a conceptual model from hypotheses drawn. This philosophy requires quantitative data and corresponding analytical techniques. This paradigm further involves operationalizing concepts so that they can be measured, and taking large samples (Kothari, 2004).

### **3.3 Research Design**

According to Kothari, (2004) research design refers to the plan, outline or arrangement of activities of a particular research that facilitate comprehensive data collection and analysis. It is an organization of the conditions for proper gathering and analysis of collected data to attain relevance of the research purpose. The study used a descriptive research design.

As described by Kothari (2004), the design entails a methodical and empirical review where the researcher has no control over the study variables as they already exist or cannot be manipulated. The research design facilitates making inferences pertaining to the variables of the study both dependent and independent and enabling making of valid conclusions where possible hence the most appropriate for the study. A descriptive research was used to assess the relationship that exists between the study variables; namely, treasury management and financial performance of commercial banks in Kenya.

### **3.4 Target Population**

The population targeted by a study entails the specific individuals or elements about which information is desired (Kothari, 2004). For this empirical study, the population targeted comprised of all the commercial banks in Kenya licensed by the CBK as per the banking supervision annual report 2018 which were 43 (Appendix I).

### **3.5 Sampling**

Sampling was not applied by this study based on knowledge that the population was small size. Thus, the study used a census sampling approach so as to cover all 43 commercial banks in Kenya. This refers to a sampling approach whereby there is complete enumeration of all items in a population. The use of census sampling approach is recommended by Creswell, and Creswell, (2017) who indicate that where the study population is manageable due to the small size, the entire population should be used so as to facilitate equal representation of the study elements. This is same argument that was advanced by Cooper and Schindler (2014) who argued that census approach should be used to ensure that the results are reliable and accurate.

### 3.6 Data Collection Procedures

Data collected by the study was both primary and secondary data. Primary data was used to collect cross sectional data, to capture non quantitative aspects of the study that may not be established from data collected and hence validate the results of quantitative analysis. The respondents were the respective banks' treasury managers. These respondents were chosen due to their direct involvement with the treasury management of the commercial banks hence the most conversant for the study. The information collected pertained to the treasury management practices employed. The primary data was obtained using semi-structured questionnaires containing open ended and close ended questions. The preference of questionnaires is due to their being economical and able to collect a wide range of data within the shortest time possible. The questionnaire was structured to cover the non-quantitative aspects whereby each section addressed the study's specific objectives. Section A was on the general information on commercial banks, Section B on treasury management practices adopted by the commercial banks and Section C on the perceived treasury management practices applied by commercial banks.

Questionnaires enabled capturing the respondents view pertaining to objective one, the treasury management practices employed in the commercial banks as well as data on other variables affecting treasury management. From the sections, the respondents' views were ranked using a Likert Scale and this mainly involved awarding a score on the range of 1-5 and on various aspects some brief explanations will be required. The questionnaires were administered through a drop and pick method which will gave the respondents ample time to fill and return the questionnaires. Follow ups were done through calls and emails by the researcher and questionnaires were collected after a period of two weeks.

Secondary data on the other hand was used to collect longitudinal data to enable quantitative assessment and hence provide more reliable and accurate results. This related to the information pertaining to the treasury management influence on financial performance measures. Secondary data was obtained and summarized using data collection sheet and included measures of the financial performance for the period, 2013 to 2017. The data was collected from the annually published commercial banks' financial statements. Some of the information collected included Return on Assets, Total Assets owned, Annual Number of Non-Performing Loans, Total Capital Investments and Current Liabilities. This enabled determination of how treasury management impacted on financial performance of commercial banks.

### **3.7 Data Analysis and Presentation**

The obtained data was fed to Statistical Package for Social Sciences (SPSS) version 21 and STATA version 15 was used to analyze the data. The two analysis software was used due to the nature of the data and also ensure that the findings were reliable and accurate. This was important in overcoming the inherent limitations of the two systems. The questionnaire data was cross sectional and thus SPSS was best suited to analyses the data. Secondary data was panel data and thus STATA was the best to provide the underlying relationship by considering the time series effect in the data. To determine the treasury management used by commercial banks in Kenya, data collected from the questionnaire were used. Descriptive statistics like the mean and standard deviation will be used to describe the data.

To evaluate the effect of treasury management and performance of commercial banks in Kenya, secondary data analysis was used. Inferential analysis including panel data and regression were used to determine the relationship between the dependent and independent variables. The results were then presented in tables from which the interpretations were drawn. To examine the perceived

influence of treasury management on commercial banks in Kenya financial performance, questionnaire was used. Descriptive statistics like the mean and standard deviation were used to describe the data.

### 3.7.1 Analytical Model

To assess the relationship between treasury management and commercial banks financial performance, the study adopted the following panel data model;

$$Y_i = \beta_0 + \beta_1 X_{1t} + \beta_2 X_{2t} + \beta_3 X_{3t} + \beta_4 X_{4t} + \varepsilon \quad (\text{Equation 3.1})$$

Where:

$Y_i$  = Dependent Variable (Financial Performance of Commercial banks assessed measured by DuPont analysis)

$\beta_0$  = Intercept

$\beta_1$  and  $\beta_4$  = Coefficient of the independent variables

$X_{1t}$  = Funding Strategies at time t

$X_{2t}$  = Investment Strategies at time t

$X_{3t}$  = Liquidity Management at time t

$X_{4t}$  = Risk Management at time t

$\varepsilon$  = error term

To test the moderating effect of bank size on the relationship between treasury management and financial performance of commercial banks in Kenya, panel data was done on each bank size. Initial panel data analysis was done on all commercial banks followed by panel analysis per tier. The model had the following format:

$$Y_{iz} = \beta_0 + (\beta_1 X_{1t})Z + (\beta_2 X_{2t})Z + (\beta_3 X_{3t})Z + (\beta_4 X_{4t})Z + \varepsilon \quad (\text{Equation 3.2})$$

Where:

$Y_{iz}$  = Dependent Variable (Financial Performance of Commercial banks assessed measured by DuPont analysis across the various bank sizes)

$\beta_0$  = Intercept

$\beta_1$  and  $\beta_4$  = Coefficient of the independent variables

$X_{1t}$  = Funding Strategies at time t

$X_{2t}$  = Investment Strategies at time t

$X_{3t}$  = Liquidity Management at time t

$X_{4t}$  = Risk Management at time t

Z = Bank Size

$\varepsilon$  = error term

Analysis was done across each tier of commercial banks to assess how treasury management affects financial performance across the bank tiers. The study variables applied by the study are operationalized in table 3.1 below:

**Table 3. 1 Operationalization of the Study Variables**

Variable	Indicators	Type of analysis
Independent	<ul style="list-style-type: none"> <li data-bbox="370 422 1243 905">• Funding strategy were measured by the weight of customer deposits to total assets, short term non-deposit borrowings to total assets and long term borrowing to total assets. The data was obtained from bank financial reports on annual basis per bank. The data to be obtained per year were amount of customer deposits, other short-term borrowings, long-term borrowings and total assets.</li> <li data-bbox="370 926 1243 1283">• Investment strategy was measured by weight of amount invested in short term loans given to customers to total assets and amount of government securities investment to total assets. This was obtained from commercial banks financial statements on annual basis.</li> <li data-bbox="370 1304 1243 1743">• Liquidity strategy was measured by cumulative weight of cash and cash equivalents to total customer call deposits and total current assets to current liabilities. Data was obtained from commercial banks financial statements per annum. Data obtained were amount of cash equivalent, total call deposits and current assets and current liabilities.</li> </ul>	Descriptive statistics Panel Data

Variable	Indicators	Type of analysis
Dependent	<ul style="list-style-type: none"> <li data-bbox="370 380 1240 989">• Financial risk management was measured by cumulative weight of foreign currency exchange risk, interest risk and credit risk. Foreign currency risk was measured by amount of exchange loss/gain to total income. Interest rate risk was measured by interest expense to total income while credit risk was measured by non-performing loans to total loans advanced. Data was obtained from commercial bank financial statements per year. Data collected related to exchange loss or gain per year, total income, total interest, non-performing loans and loan advances.</li> <li data-bbox="370 1041 1240 1209">• Bank tier was obtained from CBK supervisory reports showing whether the bank is large, medium or small. Large banks were coded 3, 2 medium, 1 small.</li> <li data-bbox="370 1293 1240 1829">• Bank profitability was computed using DuPont analysis using information obtained from bank financial statements and CBK supervisory reports. This was computed by weight of net income to total bank revenue, total bank revenue over total assets, total assets to average shareholder equity. The information was obtained from supervisory reports. Statistics obtained on annual basis were net income, total bank revenue, total assets and shareholders' equity.</li> </ul>	Descriptive statistics Panel Data

### **3.7.2 Diagnostic Tests**

Diagnostic tests were done to ensure research quality and included normality and multi-collinearity. These were the main assumptions of linear regressions which must be met before the analysis was done. Multi-collinearity test was conducted on the regression model so that wrong conclusions about the relationship between dependent variable and independent variables were avoided. Hausman test was used to determine the nature of time series effect on the data and thus assess the best technique to use.

### **3.8 Research Quality**

Quality research is about the scientific process encompassing all aspects of study design. It is the systematic process of ensuring that the results of the study are accurate, reliable and inferences drawn are genuine and applicable in an accurate manner (Kothari, 2004). The study quality was ensured by secondary data and using both primary and objective interpretation of the study results.

#### **3.8.2: Reliability of Data Collection Instruments**

Reliability is the ability of research measurement constructs to yield consistent results among the respondents (Kothari, 2004). Reliability was evaluated by use of Cronbach's alpha and instruments updated where reliability was not met. Cronbach's alpha coefficient range between 0 and 1. The values obtained for all the variables were ensured they are higher than 0.7. This was achieved through rephrasing the questions with low alpha or dropping them. For the secondary data, the researcher ensured that the data was obtained from its original source and not from a source where data might have been manipulated and altered. The Cronbach alpha results obtained are presented in table 3.2 with detailed findings in Appendix II.

**Table 3.2: Operationalization of the Study Variables**

<b>Variable</b>	<b>No of Items</b>	<b>Cronbach Alpha</b>
Funding Strategies	4	0.861
Investment Strategies	4	0.798
Liquidity Strategies	5	0.798
Risk Management Strategies	11	0.830
Financial Performance	4	0.738

The findings indicate that funding strategies had a Cronbach alpha of 0.861, investment strategies, 0.798, liquidity strategies 0.798, risk management strategies 0.830 and financial performance 0.738. The values were above 0.7 and thus the constructs were reliable.

### **3.8.2 Validity of Data Collection Instruments**

Validity is termed as the level of the accuracy of a claim (Polit, & Beck, 2012). The instrument was evaluated for content validity; the questionnaire contents included the use of appropriate vocabulary, sentence structure and whether the questions are suitable for the intended respondents. To achieve this, a draft questionnaire was developed. The final questionnaire was also pre-tested and necessary adjustments made before the actual study was conducted. Coherence and accuracy of the study data collection tools (questionnaire) and daily cleaning of data was ensured. To ensure the validity of the secondary data results, the researcher triple checked the data collection and calculation processes.

### **3.9 Ethical Issues in Research**

Ethical standards in the study was safeguarded through fully acknowledging information sources and permission to collect data sought from the university and commercial banks. All information obtained will be used for academic purposes only and treated with confidentiality. In addition, no

organization or any individual was harmed by this study. Participation was also voluntary without coercion or enticement and privacy ensured throughout the study period.



## CHAPTER FOUR: PRESENTATION OF RESEARCH FINDINGS

### 4.1 Introduction

The study intended to assess the effect of treasury management on the commercial banks financial performance in Kenya. The current chapter presents the research findings obtained, data analysis and interpretation on the specific objectives of the study. Descriptive and inferential statistics were used to achieve study objectives.

### 4.2 Secondary Data Analysis

Data obtained from all the 43 commercial banks for the period 2013 to 2017 was used. Secondary data analysis was done using panel data.

#### 4.2.1 Step Wise Regression

Step wise regression was done to confirm whether the measures used to compute the dependent variables were important in determining the independent variables used in the regression and panel data. The findings are presented in Table 4.1 with the individual panel analysis being presented in Appendix IV.

**Table 4.1: Step Wise Regression Results**

Variable	Construct	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics		
		B	Std. Error	Beta			Tolerance	VIF	R
Funding Strategy	Customer Deposits	0.047	0.005	0.497	9.19	0.000	0.733	1.364	0.757
	Short Term non deposit borrowings*	-0.051	-1.08	0.281	-0.077	0.978	1.023	0.721	
	Long term borrowings	0.037	0.005	0.369	6.817	0.000	0.733	1.364	
Investment Strategies	Short Term Deposits advanced	0.007	0.003	0.124	2.591	0.010	0.573	1.746	0.859

Variable	Construct	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics		
		B	Std. Error	Beta			Tolerance	VIF	R
Liquidity Strategies	Government Securities*	-0.177	-1.171	0.243	-0.083	0.057	17.391	0.055	
	Cash and Cash Equivalent	0.013	0.003	0.121	3.614	0.000	0.887	1.128	0.895
	Customer call deposits*	-0.113	-1.805	0.073	-0.127	0.254	3.941	0.225	
Risk Management Strategies	Current Ratio	-1.269	0.05	-0.847	25.237	0.000	0.887	1.128	
	Forex gain loss	0.059	0.016	0.248	3.784	0.000	0.992	1.008	.397
	Interest expense	-0.002	0.001	-0.173	-2.637	0.009	0.992	1.008	
	Non-performing loans	0.106	0.028	0.248	3.798	0.000	0.995	1.005	

Forward (Criterion: Probability-of-F-to-enter  $\leq .050$ )

\*Indicates dropped variables

Under funding strategy ( $R = 0.757$ ,  $p < 0.05$ ), the retained measures were customer deposits ( $B = 0.047$ ,  $p < 0.05$ ) and long term borrowings ( $B = 0.037$ ,  $p < 0.05$ ) and dropped variable was short term non deposit borrowings ( $B = -0.051$ ,  $p > 0.05$ ). On the investment strategies ( $R = 0.859$ ,  $p < 0.05$ ), the retained measure was short term loans advanced ( $B = 0.007$ ,  $p < 0.05$ ). Government securities ( $B = -0.177$ ,  $p > 0.05$ ) was dropped. Under liquidity strategies ( $R = 0.895$ ,  $p < 0.05$ ), the constructs retained were cash and cash equivalent ( $B = 0.013$ ,  $p < 0.05$ ) and current ratio ( $B = -1.269$ ,  $p < 0.05$ ). Customer call deposits ( $B = -0.113$ ,  $p > 0.05$ ) was dropped. Under risk management strategies ( $R = 0.397$ ,  $p < 0.05$ ), all measures were retained that included forex gain loss ( $B = 0.059$ ,  $p < 0.05$ ), interest expense ( $B = -0.002$ ,  $p < 0.05$ ) and nonperforming loans ( $B = 0.106$ ,  $p < 0.05$ ). The retained variables were used in computing the value of the independent variables for panel data analysis.

## 4.2.2 Descriptive Statistics

Descriptive statistics were obtained to determine the distribution of the study independent and dependent variables. The findings are presented in Table 4.2.

**Table 4.2: Descriptive Statistics**

Variable	N	Min	Max	Mean	SD	Skewness	Kurtosis
Financial performance	202	0.47	0.84	0.6069	0.0764	0.744	0.286
Funding Strategies	202	1.26	4.25	2.313	0.68955	0.875	-0.171
Investment Strategies	202	0.9	3.97	1.2929	0.95101	0.948	0.189
Liquidity Strategies	202	1.15	2.85	2.0092	0.36118	0.589	-0.024
Risk Management Strategies	202	0.09	13.56	1.245	2.15244	1.872	1.901
Customer Deposits	202	1.61	4.68	2.7607	0.81423	0.766	-0.76
Long term borrowings	202	0	3.96	1.8654	0.76918	0.47	-0.274
Short Term Deposits advanced Cash and Cash Equivalent	202	0	4.68	1.2493	1.35305	0.156	0.117
Current Ratio	202	1.2	4.6	2.899	0.73792	0.577	-0.156
Forex gain loss	202	0.88	1.22	1.1195	0.05099	-0.553	0.868
Interest expense	202	0.01	2.41	0.0774	0.32212	1.205	1.52
Non-performing loans	202	0.06	40.45	3.4374	6.47904	1.58	1.328
	202	0.01	1.82	0.2203	0.17836	1.68	1.525

Financial performance had a lowest of 0.47, highest of 0.84, mean of 0.6069, standard deviation of 0.0764, kurtosis of 0.744 and skewness of 0.286. Funding strategies had a lowest of 1.26, highest of 4.25, mean of 2.313, standard deviation of 0.68955, skewness of 0.875 and kurtosis of -0.171. Investment strategies had a lowest of 0.9, mean of 3.97, highest of 1.2929, standard deviation of 0.95101, skewness of 0.948 and kurtosis of 0.189. Liquidity strategies had a lowest of 1.15, highest of 2.85, mean of 2.0092, standard deviation of 0.36118, skewness of 0.589 and kurtosis of -0.024. Risk management strategies had a lowest of 0.09, highest of 13.56, mean of 1.245, standard deviation of 2.15244, skewness of 1.872 and kurtosis of 1.901 after standardization.

The study constructs that included customer deposits, long term borrowings, short term deposits advanced, cash and cash equivalent, current ratio, forex gain loss, interest expense and non-performing loans also had kurtosis and skewness of +/-2 which implied that they were normally distributed. Thus, the study variables were distributed around the mean implying lack of outliers and normally distributed and thus appropriate for data analysis.

#### 4.2.3 Hausman Test

Hausman test was used to choose between fixed effects model and a random effects model. The null that the preferred model was random effects. The data was strongly balanced where all the studied banks had data for the all the five years being studied.

The findings are presented in Table 4.3.

**Table 4.3: Hausman Test**

panel variable: Month (strongly balanced) time variable: Year, 2013 to 2018 delta: 1 unit				
	Coefficients		(b-B)	sqrt(diag(v_b-v_B))
	(b) fe	(B) re	Difference	S.E.
Funding_St~s	.0179668	.0337689	-.0158021	.0033857
Investment~s	.0462033	.0414503	.004753	.0041548
Liquidity~s	.043634	.0212901	.022344	.0073137
Risk_Manag~s	-.0061865	-.0059767	-.0002098	.0006582

b = consistent under Ho and Ha; obtained from xtreg  
B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

$$\text{chi2}(4) = (b-B)' [(v_b-v_B)^{-1}] (b-B)$$

$$= 34.19$$

$$\text{Prob}>\text{chi2} = 0.0000$$

The  $\text{prob}>\text{chi2}$  was 0.000 implying that that the individual-level effects being adequately modeled by a random-effects model was rejected. The data therefore was best fitted for fixed effect model. This is what was applied by panel data to achieve the research objectives.

#### 4.2.4 Effect of Treasury Management and Financial Performance of All Commercial Banks

The study objective was to establish the influence treasury management has on financial performance of commercial banks. To achieve this, banks were classified into three categories and inferential statistics for each category of bank determined to indicate the relationship between treasury management and financial performance for three categories of banks. Secondary data was used to achieve this objective.

The results of the panel data analysis for all commercial banks obtained as shown by Table 4.4.

**Table 4. 4: All Commercial Banks Panel Data Analysis Results**

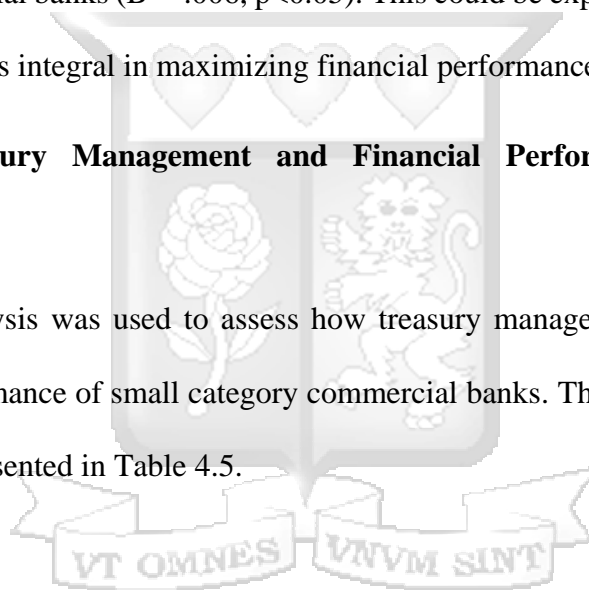
Fixed-effects (within) regression		Number of obs	=	202	
Group variable: Bank		Number of groups	=	47	
R-sq: within	= 0.5618	Obs per group: min	=	1	
between	= 0.6859	avg	=	4.3	
overall	= 0.6757	max	=	5	
corr(u <sub>i</sub> , Xb)	= 0.0133	F(4,151)	=	48.40	
		Prob > F	=	0.0000	
Financial_~e	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
Funding_St~s	.0179668	.0083198	2.16	0.032	.0015285 .034405
Investment~s	.0462033	.0063809	7.24	0.000	.033596 .0588107
Liquidity_~s	.043634	.0150255	2.90	0.004	.0139467 .0733213
Risk_Manag~s	-.0061865	.0016794	-3.68	0.000	-.0095047 -.0028683
_cons	.4256602	.0212055	20.07	0.000	.3837625 .4675579
sigma_u	.0371796				
sigma_e	.02586207				
rho	.67391943	(fraction of variance due to u <sub>i</sub> )			
F test that all u <sub>i</sub> =0:		F(46, 151) =	6.99	Prob > F = 0.0000	

The study obtained an overall  $R^2$  of 0.6557,  $p < 0.05$ . This implied that treasury management practices accounted for up to 67.57% of the total variation of the financial performance of commercial banks ( $R^2 = 0.6757$ ). This means only 32.43% of the changes in the financial performance of the commercial banks is accounted for by other factors not presented in the model. Therefore, treasury management practices have a strong positive effect on the financial performance of commercial banks.

The test of model fitness results also shows that the model,  $F_{(4,151)} = 48.4$ ,  $P < .05$  qualified for further analysis. The results implied that the predictor variable were appropriate predictors of performance of commercial banks hence able to significantly explain changes in the financial performance at any particular time. Further, model coefficients obtained funding strategies ( $B = 0.018$ ,  $p < 0.05$ ), investment strategies ( $B = 0.046$ ,  $p < 0.05$ ) and liquidity strategies ( $B = 0.043$ ,  $p < 0.05$ ) indicated that the variables had positive effect on financial performance of commercial banks which was significant. Risk management had a minimal negative effect on financial performance of commercial banks ( $B = -.006$ ,  $p < 0.05$ ). This could be explained by risk return trade off and the fact that risk is integral in maximizing financial performance.

#### **4.2.5 Effect of Treasury Management and Financial Performance of Small-Sized Commercial Banks**

Further, panel data analysis was used to assess how treasury management practices combined affected financial performance of small category commercial banks. The results of the regression analysis obtained are presented in Table 4.5.



**Table 4. 5: Small Banks Panel Analysis**

Fixed-effects (within) regression	Number of obs	=	114
Group variable: Bank	Number of groups	=	33
R-sq: within = 0.3821	Obs per group: min =		1
between = 0.5180	avg =		3.5
overall = 0.5931	max =		5
corr(u_i, Xb) = -0.1171	F(4,77)	=	11.91
	Prob > F	=	0.0000

Financial_~e	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
Funding_St~s	.0197899	.0129721	1.53	0.131	-.0060407	.0456206
Investment~s	.0352534	.0173224	2.04	0.045	.0007602	.0697467
Liquidity_~s	.1277459	.0280863	4.55	0.000	.071819	.1836729
Risk_Manag~s	-.0105225	.0023451	-4.49	0.000	-.0151922	-.0058529
_cons	.272456	.0446132	6.11	0.000	.1836197	.3612923
sigma_u	.042004					
sigma_e	.02042268					
rho	.80880096	(fraction of variance due to u_i)				

F test that all u\_i=0: F(32, 77) = 7.45 Prob > F = 0.0000

The study obtained an overall  $R^2$  of 0.5931,  $p < 0.05$ . This implied that treasury management practices accounted for up to 59.31% of total variation of the financial performance of small sized commercial banks ( $R^2=0.5931$ ). Consequently, 40.69% of the changes in the financial performance of the commercial banks is accounted for by other factors not presented in the model. Therefore, treasury management practices have a strong positive effect on the financial performance of the small commercial banks.

The test of model fitness results also shows that the model,  $F(4, 77) = 11.91$ ,  $P < .05$  was valid for further analysis. This meant that the independent variables are a good predictor of variations in performance of the commercial banks hence able to significantly explain changes in the financial performance at any particular time. Further, model coefficients obtained funding strategies ( $B = 0.019$ ,  $p < 0.05$ ), investment strategies ( $B = 0.035$ ,  $p < 0.05$ ) and liquidity strategies ( $B = 0.128$ ,  $p < 0.05$ ) indicated that the variables had positive and significant effect on financial performance of commercial banks. Risk management had a minimal negative effect on financial performance of

commercial banks ( $B = -.011$ ,  $p < 0.05$ ). This meant that for small sized commercial banks to maximize their financial returns, they required to assume certain level of risk.

#### 4.2.6 Effect of Treasury Management and Financial Performance of Medium Commercial Banks

To determine the effect of treasury management on financial performance of medium commercial banks, panel data analysis was undertaken. Results are presented in Table 4.6.

**Table 4.6: Medium Banks Panel Data Analysis**

Financial_~e	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
Funding_St~s	.0062306	.0094715	0.66	0.515	-.0129976 .0254588
Investment~s	.0447461	.0095703	4.68	0.000	.0253174 .0641748
Liquidity~s	-.0138202	.0404044	-0.34	0.734	-.0958454 .068205
Risk_Manag~s	-.0030593	.0024594	-1.24	0.222	-.0080522 .0019335
_cons	.5924487	.0929277	6.38	0.000	.4037955 .7811019
sigma_u	.04405945				
sigma_e	.01979618				
rho	.83203269	(fraction of variance due to u_i)			

Fixed-effects (within) regression  
 Group variable: Bank  
 R-sq: within = 0.5107  
       between = 0.7677  
       overall = 0.7539  
 corr(u\_i, Xb) = 0.4629  
 Number of obs = 57  
 Number of groups = 18  
 Obs per group: min = 1  
                   avg = 3.2  
                   max = 5  
 F(4, 35) = 9.13  
 Prob > F = 0.0000  
 F test that all u\_i=0: F(17, 35) = 9.02 Prob > F = 0.0000

The study obtained an overall  $R^2$  of 0.7539,  $p < 0.05$ . This implied that treasury management practices accounted for up to 75.39% of the total variation of the financial performance of medium sized commercial banks ( $R^2 = 0.7539$ ). This means only 75.39% of the changes in the financial performance of the commercial banks is accounted for by other factors not presented in the model. Therefore, treasury management practices have a strong positive effect on the financial performance of the medium commercial banks.

The test of model fitness results also shows that the model,  $F_{(4, 35)} = 9.13$ ,  $P < .05$  was valid for further analysis. This meant that the independent variables are a good predictor of variations in performance of the commercial banks hence able to significantly explain changes in the financial performance at any particular time. Further, model coefficients obtained for funding strategies ( $B =$

0.006,  $p < 0.05$ ) and investment strategies ( $B = 0.044$ ,  $p < 0.05$ ) indicated that the variables had positive and significant effect on financial performance of commercial banks. Liquidity strategies ( $B = -0.01$ ,  $p < 0.05$ ), risk management ( $B = -0.003$ ,  $p < 0.05$ ) had negative effect on financial performance of commercial banks. This meant that for medium commercial banks to maximize their financial returns, they needed to concentrate more on funding and investment strategies. Liquidity and risk management strategies were important but to a certain level.



#### 4.2.7 Effect of Treasury Management and Financial Performance of Large Commercial Banks

To determine the effect of treasury management and financial performance of large commercial banks, panel data analysis was undertaken. The findings obtained are presented in Table 4.7.

**Table 4.7: Large Banks Panel Data Analysis**

Fixed-effects (within) regression		Number of obs	=	31
Group variable: Bank		Number of groups	=	12
R-sq:	within = 0.7777	Obs per group:	min =	1
	between = 0.1457		avg =	2.6
	overall = 0.0042		max =	5
corr(u_i, Xb) = -0.9707		F(4,15)	=	13.12
		Prob > F	=	0.0001

Financial_~e	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
Funding_St~s	-.0601136	.0219921	-2.73	0.015	-.1069886	-.0132387
Investment~s	.0179602	.0112259	1.60	0.130	-.0059672	.0418876
Liquidity~s	.0867723	.0602161	1.44	0.170	-.0415753	.21512
Risk_Manag~s	-.1176778	.0200083	-5.88	0.000	-.1603245	-.0750311
_cons	.7101281	.1186836	5.98	0.000	.4571601	.9630962
sigma_u	.11926322					
sigma_e	.01959019					
rho	.97372749	(fraction of variance due to u_i)				

F test that all u_i=0:	F(11, 15) =	5.14	Prob > F =	0.0021
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The study obtained an overall  $R^2$  of 0.0042,  $p < 0.05$ . This implied that treasury management practices accounted for up to 0.4% of the total variation of the financial performance of large



commercial banks ( $R^2=0.0042$ ). This means 99% of the changes in the financial performance of the commercial banks is accounted for by other factors not presented in the model. Therefore, treasury management practices have a weak negative effect on the financial performance of the large commercial banks.

The test of model fitness results also shows that the model,  $F(4, 15) = 13.12$ ,  $P < 0.05$  was valid for further analysis. This meant that the independent variables are a good predictor of variations in performance of the commercial banks hence able to significantly explain changes in the financial performance at any particular time. Further, model coefficients obtained indicated that funding strategies ( $B = -0.06011$ ,  $p < 0.05$ ), and risk management ( $B = -0.117$ ,  $p < 0.05$ ) had negative effect on financial performance of commercial banks. Investment and liquidity strategies had an insignificant effect on financial performance of large commercial banks.



indicated a chi square of 0.646 which was close of 0.5 implying that the sampling was adequate for analysis and results were valid. Bartlett's Test of Sphericity results indicated a  $p < 0.05$  which implied that there was a relationship on the study variables and the data met structural detection and analysis. Detailed findings of the study are presented in Appendix VI. The response rate is considered justified and very good in determination of the phenomenon under study as it conforms to Kothari (2004) assertion that of, above 75% to be very appropriate so as to enable generalization of the findings.

The results obtained indicated that 64% of the respondents were middle level managers, 23% were top managers and 13% were employees. This implies that majority of the respondents (87%) were from managerial positions hence well informed on the treasury management practices and its role in financial performance of the commercial banks. As shown, 33% of the respondents had worked in the banks for the duration of 15-20 years, 31% a duration of 10-15 years, 21% a duration of 5-10 years and 15% a duration of over 20 years. This indicates that majority (79%) of the respondents had worked at the banks for a considerable length of time of over 10 years they were therefore conversant with the banks' operations hence gave reliable information.

#### **4.3.2 Treasury Management Practices Adopted by Commercial Banks**

The study first objective was to determine the treasury management practices used by commercial banks in Kenya. The study investigated the extent to which various treasury management practices have been adopted by commercial banks in Kenya. Particularly, the treasury management practices studied included funding strategies, investment strategies, liquidity management and risk management strategies. This was investigated by use of questionnaires.

### 4.3.2.1 Funding Strategies adopted by Commercial Banks

The study sought to determine funding strategies put in place by the banks. The respondents were required to rate the statements using a Likert scale of 1-5, where higher value represents high extent. The findings obtained are presented by Table 4.9.

**Table 4.9: Funding Strategies adopted by Commercial Banks**

Funding Strategies	N	Std.	
		Mean	Deviation
The bank has short term funding policy that guides treasury	34	3.74	1.499
There is a list of approved sources of short term funds	34	3.41	1.163
The bank mainly uses deposits as a source of short term funding	34	2.46	1.354
Short term funding is done mainly to protect banks liquidity as opposed to financial performance	34	2.79	1.128

As shown by table 4.9, on the Funding Strategies adopted by Commercial Banks, the respondents stated a large extent on the bank has short term funding policy that guides treasury having a mean of 3.74 and standard deviation of 1.499. On there is a list of approved sources of short term funds, the respondents indicated a moderate extent with a mean of 3.41 and standard deviation of 1.163. However, on short term funding is done mainly to protect banks liquidity as opposed to financial performance and the bank mainly uses deposits as a source of short term funding, the respondents stated a small extent having means of 2.79 and 2.46 respectively. This implies that the most utilized funding strategy was short term funding policy while deposits as a source of short term funding was the least. Funding from investment partners, increased focus on customer deposits as savings and use of term deposits were considered as other forms of funding strategies. Therefore, there is

need for the commercial banks to diversify and innovate newer funding strategies so as to remain profitable and improve their financial performance.

#### 4.3.2.2 Investment Strategies adopted by Commercial Banks

The study investigated the investment strategies put in place by the banks. The respondents were required to rate the statements using a Likert scale of 1-5, where higher value represents high extent. The findings obtained are presented by Table 4.10.

**Table 4.10: Investment Strategies adopted by Commercial Banks**

<b>Investment Strategies</b>	<b>N</b>	<b>Mean</b>	<b>Std. Deviation</b>
The bank has a short term investment policy that guides treasury	34	2.54	1.232
There is a list of approved investment instruments that can be used	34	3.05	1.213
The bank mainly invests in treasury bills/bonds	34	3.03	1.46
Short term investments are done mainly in consideration of banks liquidity as opposed to financial performance	34	3.23	1.385

As shown by Table 4.10, on investment Strategies adopted by Commercial Banks, the respondents stated a moderate extent of implementation on the list of approved investment instruments that can be used, the bank mainly invests in treasury bills/bonds and short term investments are done mainly in consideration of banks liquidity as opposed to financial performance having means of 3.05, 3.03 and 3.23 respectively. However, on the bank has a short term investment policy that guides treasury, the respondents stated a small extent of adoption with a mean of 2.54 and standard deviation of 1.232. This implies that none of the investment strategies put in place by the commercial banks had an above average level of adoption indicating that the banks still had imminent gaps on how they undertook their investments.

### 4.3.2.3 Liquidity Strategies adopted by Commercial Banks

The study studied the liquidity strategies put in place by the banks. The respondents were required to rate the statements using a Likert scale of 1-5, where higher value represents high extent. The findings obtained are presented by Table 4.12.

**Table 4.12: Liquidity Strategies adopted by Commercial Banks**

<b>Liquidity Strategies</b>	<b>N</b>	<b>Mean</b>	<b>Std. Deviation</b>
There is a clear policy guideline used by the commercial bank on liquidity management	34	3.49	1.073
The bank had adopted liquidity projection systems to protect against insolvency	34	3.1	1.294
Liquidity management is the main function of treasury	34	3.62	1.091

The results obtained show that on Liquidity management is the main function of treasury, the respondents indicated a large extent having a mean of 3.62 and standard deviation of 1.091. The respondents however indicated a moderate extent of adoption on there is a clear policy guideline used by the commercial bank and the bank had adopted liquidity projection systems to protect against insolvency having means of 3.49 and 3.1 respectively. Therefore, implying that in spite of liquidity management being the core function of treasury, other aspects of liquidity management were still lagging behind in the commercial banks with only moderate extents of adoption. Other suggested liquidity management strategies included maintaining a loan deposit ratio and internal trigger levels to manage liquidity levels.

#### 4.3.2.4 Risk Management Strategies adopted by Commercial Banks

The study sought to determine risk strategies put in place by the banks. The respondents were required to rate the statements using a Likert scale of 1-5, where higher value represents high extent. The findings obtained are presented by Table 4.13.

**Table 4.13: Risk Management Strategies adopted by Commercial Banks**

<b>Risk Management Strategies</b>	<b>N</b>	<b>Mean</b>	<b>Std. Dev</b>
There are practices and procedures through which risk management strategies are implemented	34	3.26	1.585
The bank has mechanisms of managing foreign exchange risk	34	3.1	1.165
There is frequent risk management review by the bank	34	4.21	0.833
There is control risk self-assessment measures implemented by the bank	34	4.28	0.887
There are sound credit management practices	34	3.67	1.264
The bank constantly undertakes financial operating risk management	34	3.18	1.412
The bank has an effective process of developing and implementing risk response strategies	34	2.9	1.392
There is continuous reporting of risks to all relevant structures	34	3.36	1.53
The bank monitors the risk performance on an ongoing basis	34	2.9	1.501
The bank has an effective process of resourcing risk management response strategies and processes	34	3.36	1.495

The findings as shown by Table 4.13, imply that the respondents agreed that control risk self-assessment measures implemented by the bank to a very large extent with a mean of 4.28 and standard deviation of 0.887. The respondents indicated a large extent of adoption of frequent risk management review by the bank having a mean of 4.21 and standard deviation of 0.833. Also on

there are sound credit management practices, the respondents stated a large extent having a mean of 3.67 and 1.264.

The respondents however stated a moderate extent of adoption of the bank has an effective process of resourcing risk management response strategies and processes, there is continuous reporting of risks to all relevant structures, there are practices and procedures through which risk management strategies are implemented, the bank has mechanisms of managing foreign exchange risk, and the bank constantly undertakes financial operating risk management having means of 3.36, 3.36, 3.26, 3.1 and 3.18 respectively.

However, on the bank has an effective process of developing and implementing risk response strategies and bank monitors the risk performance on an ongoing basis the respondents indicated a small extent with each a mean of 2.9. This shows control risk self-assessment measures, frequent risk management review and sound credit management practices were the only risk management strategies indicated to be implemented to a large extent with majority of the remaining risk management practices implemented to moderate extent and some a low extent. Therefore, implying that despite the benefits gained from well-structured and executed risk management measures, the commercial banks were yet to be successful in proper implementation of all their risk management strategies. Process improvement was considered a way to improve risk management and reduce revenue leakages.

#### **4.3.2.5 Treasury Management Practices and Financial Performance**

The study aimed at determining the effect of the treasury management practices employed on the financial performance constructs of the commercial banks. The respondents were required to rate the statements using a Likert scale of 1-5, where higher value represents high extent. The findings obtained are presented by Table 4.14.

**Table 4.14: Treasury Management Practices and Financial Performance**

Treasury Management Practices and Financial Performance	N	Mean	Std. Dev
Treasury management improves return on capital employed	34	4.1	0.821
Treasury management leads to increased return on assets	34	3.85	1.089
Treasury management increases Return on Investment	34	3.54	1.072
Treasury management improves operating profit margin	34	3.62	0.99
Level of current financial performance attributed to treasury management practices employed	34	3.54	1.072

As shown by Table 4.14, to a very large extent, the respondents indicated that the Treasury management improves return on capital employed with a mean of 4.1 and standard deviation of 0.821. To a large extent, the respondents stated that treasury management leads to increased return on assets and improves operating profit margin having means of 3.85 and 3.62 respectively. However, on treasury management increases Return on Investment and Level of current financial performance is attributed to treasury management practices employed, the respondents were neutral implying moderate extent with each a mean of 3.52 and standard deviation of 1.072. This shows that the treasury management practices adopted had the greatest impact on the Return on Capital Employed and the least impact on Return on Investment. Therefore, treasury management practices are yet to achieve the desired effects on the financial performance especially in improvement of investments and profit margin accrued by the commercial banks.

### 4.3.3 Diagnostic Tests

The study quality was ensured by using both primary and secondary data and objective interpretation of the study results. Diagnostic tests on regression analysis was done to ensure that assumptions of regression and quality of quantitative assessment are valid.

#### 4.3.3.1 Test for Multicollinearity

Multicollinearity tests was done on the regression model to avoid incorrect conclusions about the relationship between dependent and predictor variables. Variance Inflation Factor (VIF) and tolerance degree was used to indicate presence of multicollinearity test. The findings obtained are presented by Table 4.15.

**Table 4.15: Test for Multicollinearity**

Variable	Tolerance	VIF
Funding Strategies	0.753	1.327
Investment Strategies	0.354	2.828
Liquidity Management	0.431	2.319
Risk Management Strategies	0.961	1.04

The findings obtained show that Funding Strategies had a tolerance value of 0.753 and VIF value of 1.327, Investment Strategies had a tolerance of 0.354 and VIF value of 2.828, Liquidity Management had a tolerance of 0.431 and VIF value of 2.319 and Risk Management Strategies had a tolerance of 0.961 and VIF value of 1.04. Therefore, all variables had tolerance of greater than 0.1 and VIF less than 10 and there was no multicollinearity problem.

#### 4.3.3.2 Descriptive Statistics and Test for Normality

Normality test was undertaken to ensure that the study variables are normally distributed. Skewness which is the extent to which a distribution of values deviates from symmetry around the mean was used to test normality of the data. While Kurtosis which is a measure of the "peakedness" or "flatness" of a distribution was used in testing the normality of the study variables. The normality test results are presented by Table 4.16. Detailed findings are presented in Appendix IV.

**Table 4.16: Descriptive Statistics and Normality Test**

	<b>Minimum</b>	<b>Maximum</b>	<b>Mean</b>	<b>Std. Deviation</b>	<b>Skewness</b>	<b>Kurtosis</b>
Funding Strategies	1	4.75	3.1026	1.08779	-0.205	-1.274
Investment Strategies	1.25	5	2.9615	0.89321	-0.13	0.292
Liquidity Management Strategies	1.75	5	3.3397	0.806	-0.158	-0.569
Risk Management Strategies	1.73	5	3.3893	0.80854	-0.324	0.003
Financial Performance	2	5	3.7756	0.74735	-0.889	0.637

The minimum statistic for Funding Strategies over the period was 1, highest of 4.75 and mean of 3.1. The lowest of the Investment Strategies over the period was 1.25, highest of 5 and mean of 0.89. The lowest of Liquidity Management over the period was 1.75, highest of 5 and mean of 3.33. The lowest of the Risk Management Strategies was 1.7, highest of 5 and mean of 3.389. While the lowest of the Financial Performance over the period was 2, highest of 5 and mean of 3.78.

The results obtained show that Funding Strategies had a Skewness value of -0.205 and Kurtosis value of -1.274, Investment Strategies had a Skewness value of -.13 and Kurtosis value of 0.292, Liquidity Management had a Skewness value of -0.158 and Kurtosis value of -0.569. Risk Management Strategies had a Skewness value of -0.324 and Kurtosis value of 0.003 and Financial Performance had a Skewness value of -0.889 and Kurtosis value of 0.637. Hence, for all the variables, skewness and kurtosis statistics were within +/-2 and hence the data was normally distributed. Therefore, an indication that the normality assumption of linear regression analysis was in place and thus linear regression could be applied on the data.

#### 4.3.4 Perceived Correlation of Treasury Management on Financial Performance of Commercial Banks

To examine the perceived effect of treasury management on financial performance of commercial banks in Kenya from the primary data, regression analysis was computed. The independent variables were the treasury management practices namely Risk Management Strategies, Funding Strategies, Liquidity Strategies, and Investment Strategies while the dependent variable was the financial performance of the commercial banks. The findings are presented in Table 4.17.

**Table 4.17: Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.838a	0.703	0.668	0.43075

*a. Predictors: (Constant), Risk Management Strategies, Funding Strategies, Liquidity Strategies, Investment Strategies*

The results of the regression analysis as shown by Table 4.17 shows that treasury management practices studied were perceived to explain 70.3% of the variations in financial performance ( $R^2=0.703$ ). This implies that only 29.7% of the variation in the financial performance of commercial banks were perceived by the respondents to be explained by factors other than those investigated by the study.

The study further undertook ANOVA analysis to establish the validity and effectiveness of the model in explaining the relationship between the perceived effects of treasury management on financial performance of commercial banks. The results are presented in Table 4.18.

**Table 4.18: Model ANOVA**

	Sum of Squares	Df	Mean Square	F	Sig.
Regression	14.916	4	3.729	20.097	.000a
Residual	6.309	29	0.186		
Total	21.224	33			

a. Predictors: (Constant), Risk Management Strategies, Funding Strategies, Liquidity Strategies, Investment Strategies

b. Dependent Variable: Financial Performance

The model in Table 4.19 was found to be valid ( $F_{(4, 33)} = 20.097, P < .001$ ). This means that the treasury management practices were perceived to be good predictors of variations in financial performance and were able to predict changes in the performance at any particular time.

**Table 4.19: Model Coefficients**

	Unstandardized Coefficients	Std. Error	Standardized Coefficients Beta	t	Sig.
(Constant)	1.373	0.349		3.93	0.000
Funding Strategies	0.684	0.117	0.996	5.85	0.000
Investment Strategies	-0.547	0.181	-0.654	-3.024	0.005
Liquidity Strategies	0.257	0.148	0.277	1.734	0.092
Risk Management Strategies	0.307	0.112	0.332	2.731	0.01

The value of the constant in Table 4.19 shows that the performance of the commercial banks will always exist at a certain minimum ( $\beta_0 = 1.373, P < 0.05$ ). All the independent variables except investment strategies were perceived to influence the performance of the commercial banks positively namely; Funding Strategies ( $\beta_1 = 0.684, P = 0.05$ ), Liquidity Strategies ( $\beta_3 = 0.257, P = 0.092$ ) and Risk Management Strategies ( $\beta_4 = 0.307, P = 0.01$ ). This implies that an increase in these strategies were perceived to result in increased financial performance. However, Investment Strategies ( $\beta_2 = -0.547, P = 0.005$ ) was perceived to influence negatively the financial performance of the commercial banks. All the variables except Liquidity Strategies, have a p-value less than 5% ( $P < 0.05$ ) meaning that, when all variables in this study are combined they are significant in explaining the variations in financial performance of the commercial banks.

## **CHAPTER FIVE: SUMMARY, DISCUSSION, CONCLUSION AND RECOMMENDATIONS**

### **5.1 Introduction**

The study intended to investigate the effect of treasury management on financial performance of commercial banks in Kenya. This chapter presents; the summary and discussion of the findings, conclusions and recommendations of the study.

### **5.2 Summary and Discussion of the Findings**

The study sought to analyze the effect of treasury management on the financial performance of commercial banks in Kenya. The independent variables were the various treasury management practices while the dependent variable was the financial performance of the commercial banks. The target population was all the 43 commercial banks in Kenya and the study data was collected for a five-year period 2013 to 2017 on an annual basis. Data collected was analyzed using both descriptive and inferential statistics. Summary of key findings is presented below as per the specific research objectives.

#### **5.2.1 Treasury Management Practices Adopted by Commercial Banks in Kenya**

The study investigated the extent to which treasury management practices have been adopted by commercial banks in Kenya. The main treasury management strategies adopted by the commercial banks were established to include funding strategies, investment strategies, liquidity management and risk management strategies. The study found out that the most utilized funding strategy was short term funding policy while deposits as a source of short term funding was the least. The study also found that none of the investment strategies put in place by the commercial banks had an above average level of adoption indicating that the banks still had imminent gaps on how they

undertook their investments. The study also found that most aspects of liquidity management were still lagging behind in the commercial banks with only moderate extents of adoption and that the commercial banks were yet to be successful in proper implementation of all their risk management strategies. This tends to coincide to a study conducted in China and Malaysia that established the same findings (Said & Tumin, 2011).

The findings were in line with Kathomi, Kimani, and Kariuki, (2017) who established that though properly implemented financial risk management measures positively impacted the sustainability of financial institutions, most commercial banks fail to properly execute them hence end up underperforming. Similarly, Osano, (2013) found that most of these investment strategies were only adopted to a relatively small extent. While on the contrary, Li and Zou, (2014) found a large extent of implementation of the treasury management strategies on their study undertaken on commercial banks in Europe between the period of 2007 and 2012. Another study done by Mahjabeen, (2010) found out that financial institutions with better treasury management would be sustainable.

### **5.2.2 Effect of Treasury Management Practices on the Financial Performance of Commercial Banks in Kenya**

The study further sought to establish the effect various forms of treasury management practices on financial performance of commercial banks based on the secondary data collected. Panel data was used where analysis was first conducted on all commercial banks combined followed by small banks, medium banks and large commercial banks.

The findings indicated that combined, treasury management practices had a strong positive effect on financial performance of commercial banks ( $R^2 = 0.6757$ ,  $F_{(4,151)} = 48.4$ ,  $p < 0.05$ ). Funding strategies, investment strategies and liquidity strategies were found to have a positive and

significant effect on financial performance of commercial banks in Kenya. Risk management was found to have a negative effect on financial performance of commercial banks in Kenya. Results of panel data using bank size revealed that significance of treasury management practices on financial performance was dependent on size of commercial banks. The effect of treasury management was found to be the greatest among medium sized banks ( $R^2=0.7539$ ), followed by small banks ( $R^2= 59\%$ ), and least among large commercial banks ( $R^2= 0.0042$ ). This would mean that effect of treasury management on financial performance of commercial banks have an optimal level after which the effect would start dwindling. Large commercial banks are also usually diversified and have attained their size through an aggressive growth strategy often obtained at the expense of margins and profitability, management of large deposits also attracts huge costs in terms of expertise therefore impacting the overall financial performance.

These findings concur with those of Graham and Bordeleau, (2010) who studied the importance of liquidity management is ensuring the continuous maximization of shareholders' capital. The results on the test of significance on the other hand revealed that the models were significant only for the medium and large commercial banks showing that the treasury management practices were only good predictors of variations in performance of the two bank tiers.

Further, among small banks investment, liquidity and risk management strategies had a significant effect on commercial banks financial performance. Among medium banks, only funding strategies had significant effect on financial performance. Among large commercial banks, funding and risk management had significant effect on financial performance of commercial banks. This meant that treasury management strategies that have effect of financial performance vary with size of the bank.

These findings were related to those by Bassey, (2017) found that there was a significant relationship between liquidity management and the performance of large deposit money banks in Nigeria. Kathomi, Kimani, and Kariuki, (2017) established that properly implemented financial risk management measures positively impacted the sustainability of large financial institutions. Also, this is supported by Kargi, (2011) who investigated effect of treasury control and budgeting control on the profitability of Nigerian manufacturing companies and revealed that money control and cash budgeting had fine and non-large courting with profitability. This however tends to contradict Ibrahim, (2017) who conducted a study on the impact of liquidity on the profitability of Iraqi commercial banks measured by current ratio regardless the size of the commercial banks.

### **5.2.3 Perceived Effect of Treasury Management on Financial Performance of Commercial Banks in Kenya**

The study also sought to examine the perceived effect of treasury management on financial performance of commercial banks in Kenya from the primary data. To achieve this, regression analysis was computed whereby treasury management practices studied were perceived to explain 70.3% of the variations in performance ( $R^2=0.703$ ). This implies that only 29.7% of the variation in the performance at the commercial banks were perceived by the respondents to be explained by factors other than those investigated by the study. The same perceived positive relationship was established by several studies conducted (Graham & Bordeleau, 2010; Dang 2011; Macharia, 2013).

The model was found to be valid meaning that the treasury management practices were perceived to be good predictors of variations in financial performance and were able to predict changes in the performance at any particular time. All the variables except Liquidity Strategies, have a p-

value less than 5% ( $P < 0.05$ ) meaning that, when all variables in this study when combined are significant in explaining the variations in financial performance of the commercial banks.

The reviewed theories namely; risk management theory and liquidity preference Theory also indicated the need for incorporating treasury management in commercial banks. The positive perceived relationship tends to concur with studies conducted such as Demirgüç-Kunt and Huizinga, (2009) found that bank activity and funding strategies impacted on risk and returns. The findings are also consistent with Sang, (2014) who focused on commercial banks in Nakuru and also established a similar positive effect. Gakure et.al, (2012) who investigated how credit management techniques affected the banks performance and indicated that credit risk management techniques had a positive effect on the banks performance

Collier, (2004) and Wanjohi, (2013) also found that proper financial risk management positively and significantly influenced the financial performance of organizations and improved returns in the banking sector respectively. Ironkwe and Muene, (2016) exploring treasury management revealed a positive correlation exists between treasury management and bank performance of large and medium banks. Felix and Claudine, (2008) and Al-Khour, (2011) also established in their respective studies that proper management of liquidity risk, capital risk and credit risks positively influenced large bank's profitability and overall performance. While Txomin, (2011) found out that treasury management does not necessarily targeting to improve financial performance but to maintain commercial banks financial soundness, liquidity, prevention of bank panic and consequently bank collapse.

However, Konadu, (2009) in a study in Ghana concluded that there was a negative perceived relationship between the treasury management practices and financial performance in the Ghana

banking sector. While Nyabicha, (2017) found a statistically non-significant perceived relationship between financial risk management and bank performance in Kenya.

### **5.3 Conclusion**

The study found that four main treasury management practices adopted by commercial banks include funding, investment, liquidity management and risk management strategies. However, the study found that most of these treasury management practices were still underutilized having moderate to low levels of adoption by the commercial banks. The study thus concludes that the efficiency of treasury management will be based on the efficiency in formulation and implementation of these strategies by the commercial banks, which are yet to fully integrate them among their core functions hence the low implementation levels which need to be improved.

The study found that treasury management practices have strong positive effect on financial performance of commercial banks. The effect of treasury management is greatest among medium sized banks, followed by small banks and least among large commercial banks. Among small banks investment, liquidity and risk management strategies has significant effect on commercial banks financial performance. Among medium banks, only funding strategies has significant effect on financial performance. Among large commercial banks, funding and risk management has significant effect on financial performance of commercial banks. The study therefore concluded that the level of significance of the strategies is dependent on the size of the commercial bank.

The study further found that the treasury management practices studied were perceived to explain a huge portion of the financial performance of the commercial banks and also found that all variables except Liquidity Strategies were significant in explaining the variations in financial performance of the commercial banks. The study thus makes the conclusion that the current

financial performance of the commercial banks is largely determined by the treasury management practices adopted and improvement in the level of implementation of the treasury management practices will translate in enhanced financial performance of the commercial banks. Consequently, the study concludes that Funding, Investment, Liquidity Management and Risk Management Strategies are main determinants of financial performance, however the level and extent of the effect will vary based on the strategy.

## **5.4 Recommendations**

### **5.4.1 Recommendation for Policy**

Adoption of treasury management practices that are in line with the bank size was found to be crucial in enhancing commercial banks financial performance. The study recommends for adoption of appropriate policy environment by commercial banks, government and other regulatory bodies such as the CBK pertaining to the adoption of treasury management practices by the commercial banks. The study also recommends that the government should put in place appropriate policies that favor the implementation of these practices among the commercial banks but also other financial institution. The central bank is also recommended to look into the treasury management practices of commercial banks and evaluate whether there is need to improve or increase these practices as there has been cases of banks collapsing despite the regular treasury management hence adversely affected by financial risks.

### **5.4.2 Recommendation for Practice**

Treasury management was found to improve financial performance of commercial banks. As the bank size increases from small to medium to large, the important treasury management practices continued to vary. The study therefore recommends that management of commercial banks to

assess and ensure the treasury management practices in place and are in line with the size of their institutions with a target to increasing the financial performance.

The study recommends that the management of the banks should institute appropriate internal mechanisms to ensure that there is constant review of the current treasury management practices with the expected earnings and wealth maximization objectives of the organizations. The study also recommends that the bank managers should prioritize these strategies in arriving at key bank decisions, ensure there is proper budget allocation to the practices, internal controls, timeliness of releasing funds securing adequate funding, effective plan on allocation of funds and effective approval of funds which will act to improve the efficiency of the practices.

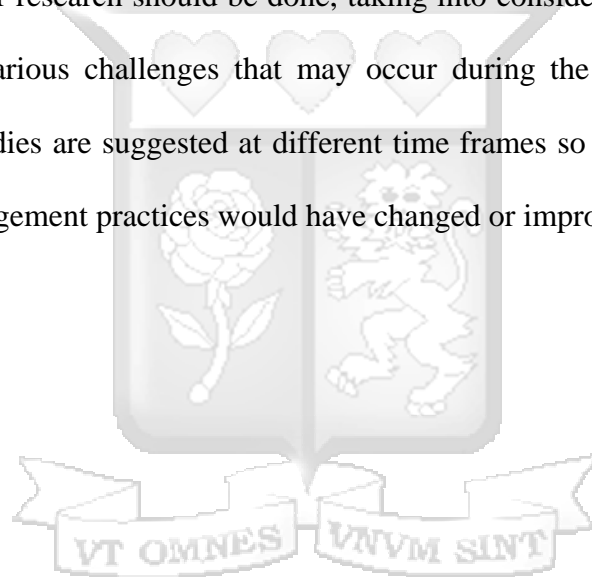
### **5.5 Limitations to the Study**

There were several limitations which the researcher was faced with during the study which had to be managed to deliver credible findings. On the questionnaire data collection, some of the respondents were reluctant or unwilling to participate in the study. This was in line with the policies of some commercial banks who restricted their members of staff from providing information before seeking approvals. Other respondents sighted tight schedules. This delayed data collection process and the researcher had to obtain permissions from all relevant bodies.

Secondary data collection was also limited to the differing reporting formats by the commercial banks. The format of disclosure of various banks was different on the items being sought by the study. Numerous banks were acquired, changed their names, temporarily closed their operations and merged over the study period. This affected the ease in compiling secondary data required for analysis.

## 5.6 Areas for Further Research

Despite the research questions being well answered, several areas remain unclear and require further research. The study was limited only to treasury management of commercial banks which may not be an actual representation of financial institutions and organizations in other sectors which have adopted treasury management. The study thus suggests that further research should be conducted in other financial institutions such as SACCOs, Deposit Taking Banks and other organizations and the results. The study only focused on four treasury management practices, therefore suggests further research should be done, taking into consideration other practices and also investigating the various challenges that may occur during the implementation process. Additionally, further studies are suggested at different time frames so as determine whether the prevailing treasury management practices would have changed or improved.



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## APPENDICES

### Appendix I: Letter of Introduction



20 March, 2019

#### TO WHOM IT MAY CONCERN

#### Academic Reference for Gatimu Teresia Wangui Student No. 66770

Ms Gatimu Teresia Wangui is a postgraduate student in our Master of Commerce (MCom) programme. In partial fulfilment of the MCom degree, students are required to carry out a research project and write a thesis on a contemporary subject within their field of specialisation. Among other activities, the project involves data collection and analysis.

Teresia is requesting to gather information to be used in her research. The information she will obtain from your organization will be used for this academic purpose only and will be kept confidential. The results of the survey will be in summary form and will not disclose any individual, company name or company information in any way.

The research study is entitled “**Effects of Treasury Management on The Financial Performance of Commercial Banks in Kenya.**”

We hope that your organization can assist by providing information to the above named student.

Yours faithfully,



Quindos Karanja  
Coordinator – Master Programmes  
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## Appendix II: Questionnaire

Thank you for accepting to participate in this survey. The questionnaire will take approximately 10-15 minutes to complete. This questionnaire is designed to collect information on the EFFECT OF TREASURY MANAGEMENT ON THE FINANCIAL PERFORMANCE OF COMMERCIAL BANKS IN KENYA. The information obtained will only be used for academic purposes and shall remain confidential. No names or any identifying information will be used in the data analysis. Please provide honest and candid answers. Please tick or write in the spaces provided.

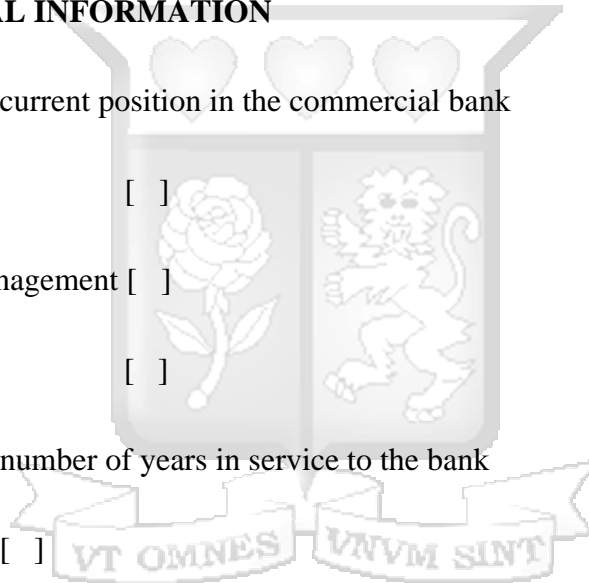
### SECTION A: GENERAL INFORMATION

1. Please indicate your current position in the commercial bank

- a) Top Management [ ]
- b) Middle Level Management [ ]
- c) Employee [ ]

2. Please indicate your number of years in service to the bank

- a) Less than 5 years [ ]
- b) 5 – 10 years [ ]
- c) 10 – 15 years [ ]
- d) 15 – 20 years [ ]
- e) Over 20 years [ ]



**SECTION B: TREASURY MANAGEMENT PRACTICES ADOPTED BY THE COMMERCIAL BANKS**

**Treasury Management Practices**

This section seeks to determine the treasury management practices used by commercial banks. Please rate the following using a Likert Scale of 1–5 where 1 is very small extent, 2 is small extent, 3 is moderate extent, 4 is large extent and 5 is to a very large extent.

**3. Funding Strategies**

Statement	1	2	3	4	5
The bank has short term funding policy that guides treasury					
There is a list of approved sources of short term funds					
The bank mainly uses deposits as a source of short term funding					
Short term funding is done mainly to protect banks liquidity as opposed to financial performance					

4. Which other short term funding strategies have been adopted by your bank?

.....

.....

**5. Investment Strategies**

Statement	1	2	3	4	5
The bank has a short term investment policy that guides treasury					
There is a list of approved investment instruments that can be used					
The bank mainly invests in treasury bills/bonds					

Statement	1	2	3	4	5
Short term investments are done mainly in consideration of banks liquidity as opposed to financial performance					

6. Which other short term investment strategies have been adopted by your bank?

.....

.....

### 7. Liquidity Strategies

Statement	1	2	3	4	5
There is a clear policy guideline used by the commercial bank					
The bank had adopted liquidity projection systems to protect against insolvency					
Liquidity management is the main function of treasury					

8. Which other liquidity strategies have been adopted by your bank?

.....

.....

### 9. Risk Management

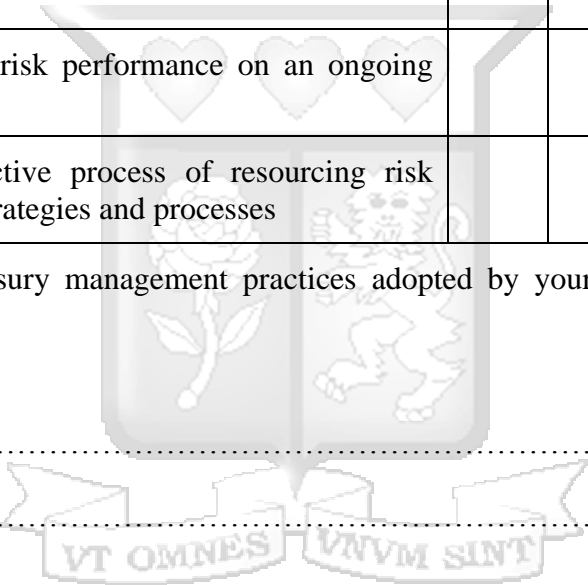
Statement	1	2	3	4	5
There are practices and procedures through which risk management strategies are implemented					
The bank has mechanisms of managing foreign exchange risk					
There is frequent risk management review by the bank					

Statement	1	2	3	4	5
There is control risk self-assessment measures implemented by the bank					
There are sound credit management practices					
The bank constantly undertakes financial operating risk management					
The bank has an effective process of developing and implementing risk response strategies					
There is continuous reporting of risks to all relevant structures					
The bank monitors the risk performance on an ongoing basis					
The bank has an effective process of resourcing risk management response strategies and processes					

Are there any other treasury management practices adopted by your bank that influence its financial performance?

.....

.....



**SECTION C: FINANCIAL PERFORMANCE OF THE COMMERCIAL BANKS**

10. Please rate the extent to which treasury management has helped to improve the following measures of financial performance at your organization using a scale of 1 to 5 where 1 is very small extent, 2 is small extent, 3 is moderate extent, 4 is large extent and 5 is to a very large extent.

Statement	1	2	3	4	5
Treasury management improves return on capital employed					
Treasury management leads to increased return on assets					
Treasury management increases Return on Investment					
Treasury management improves operating profit margin					

11. To what gradation do you attribute the current financial performance of your bank to the treasury management practices employed

- a) Very large extent [ ]
- b) Large extent [ ]
- c) Moderate extent [ ]
- d) Small extent [ ]
- e) Very Small extent [ ]

12. Which measures can you suggest to improve the financial performance of commercial banks?

.....

.....

.....

**End**

**Thank you for your time**

### Appendix III: List of commercial banks in Kenya

No.	Bank Name	Tier
1	KCB Bank Kenya Ltd	Large
2	Standard Chartered Bank (K) Ltd	Large
3	Equity Bank Kenya Ltd	Large
4	Barclays Bank of Kenya Ltd	Large
5	Co – operative Bank of Kenya Ltd	Large
6	Commercial Bank of Africa Ltd	Large
7	Diamond Trust Bank (K) Ltd	Medium
8	NIC Bank PLC	Medium
9	Stanbic Bank Kenya Ltd	Medium
10	I & M Bank Ltd	Medium
11	National Bank of Kenya Ltd	Medium
12	Chase Bank Ltd**	Medium
13	Citibank N.A. Kenya	Medium
14	Bank of Baroda Ltd	Medium
15	Family Bank Ltd	Medium
16	Bank of Africa Kenya Ltd	Medium
17	Prime Bank Ltd	Medium
18	Ecobank Kenya Ltd	Medium
19	HFC Ltd	Medium
20	Imperial Bank Ltd**	Medium
21	Bank of India	Medium

22	Gulf African Bank Ltd	Small
23	African Banking Corporation Ltd	Small
24	Guaranty Trust Bank (Kenya) Ltd	Small
25	Mayfair Bank Ltd	Small
26	Sidian Bank Ltd	Small
27	Victoria Commercial Bank Ltd	Small
28	SBM Bank (Kenya) Ltd	Small
29	Jamii Bora Bank Ltd	Small
30	Development Bank of Kenya Ltd	Small
31	Spire Bank Ltd	Small
32	DIB Bank Kenya Ltd	Small
33	Guardian Bank Ltd	Small
34	First Community Bank	Small
35	Consolidated Bank of Kenya Ltd	Small
36	Transnational Bank Ltd	Small
37	Paramount Bank Ltd	Small
38	Habib Bank A.G. Zurich	Small
39	M-oriental Commercial Bank Ltd	Small
40	Middle East Bank (K) Ltd	Small
41	Credit Bank Ltd	Small
42	Charterhouse Bank Ltd	Small
43	UBA Kenya Bank Ltd	Small

#### Appendix IV: Reliability Analysis

No	Measure	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
1	The bank has short term funding policy that guides treasury	89.79	332.378	0.802	0.909
2	There is a list of approved sources of short term funds	90.13	346.273	0.712	0.912
3	The bank mainly uses deposits as a source of short term funding	91.08	349.968	0.526	0.915
4	Short term funding is done mainly to protect banks liquidity as opposed to financial performance	90.74	360.617	0.387	0.917
5	The bank has a short term investment policy that guides treasury	91	358.737	0.39	0.917
6	There is a list of approved investment instruments that can be used	90.49	349.52	0.606	0.913
7	The bank mainly invests in treasury bills/bonds	90.51	343.204	0.613	0.913
8	Short term investments are done mainly in consideration of banks liquidity as opposed to financial performance	90.31	348.745	0.537	0.914
9	There is a clear policy guideline used by the commercial bank	90.05	346.997	0.758	0.911
10	The bank had adopted liquidity projection systems to protect against insolvency	90.44	341.937	0.729	0.911
11	There is a minimum liquidity ratio a commercial bank must have	90.38	349.822	0.643	0.913
12	Liquidity management is the main function of treasury	89.92	376.283	0.023	0.921
13	There are practices and procedures through which risk management strategies are implemented	90.28	342.682	0.567	0.914
14	The bank has mechanisms of managing foreign exchange risk	90.44	356.252	0.474	0.915
15	The bank has a policy for insuring cash	90.46	354.202	0.459	0.916
16	There is frequent risk management review by the bank	89.33	364.649	0.413	0.916
17	There is control risk self-assessment measures implemented by the bank	89.26	363.511	0.419	0.916

No	Measure	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
18	There are sound credit management practices	89.87	340.167	0.787	0.91
19	The bank constantly undertakes financial operating risk management	90.36	354.131	0.42	0.916
20	The bank has an effective process of developing and implementing risk response strategies	90.64	357.762	0.356	0.918
21	There is continuous reporting of risks to all relevant structures	90.18	353.993	0.384	0.917
22	The bank monitors the risk performance on an ongoing basis	90.64	354.447	0.385	0.917
23	The bank has an effective process of resourcing risk management response strategies and processes	90.18	355.783	0.362	0.918
24	Treasury management improves return on capital employed	89.44	363.41	0.46	0.916
25	Treasury management leads to increased return on assets	89.69	349.903	0.672	0.913
26	Treasury management increases Return on Investment	90	358.053	0.475	0.915
27	Treasury management improves operating profit margin	89.92	357.704	0.528	0.915
28	To what gradation do you attribute the current financial performance of your bank to the treasury management practices employed	90	352.579	0.614	0.913

## Appendix V: Tests and Descriptive Statistics

Construct	Min	Max	Mean	Std. Dev	Skewness		Kurtosis	
Please indicate your current position in the commercial bank	1	3	1.9	0.598	0.029	0.378	-0.064	0.741
Please indicate your number of years in service to the bank	2	5	3.44	0.995	0.017	0.378	-0.995	0.741
The bank has short term funding policy that guides treasury	1	5	3.74	1.499	-0.721	0.378	-1.129	0.741
There is a list of approved sources of short term funds	1	5	3.41	1.163	-0.669	0.378	-0.505	0.741
The bank mainly uses deposits as a source of short term funding	1	5	2.46	1.354	0.555	0.378	-1.131	0.741
Short term funding is done mainly to protect banks liquidity as opposed to financial performance	1	5	2.79	1.128	0.195	0.378	-1.007	0.741
The bank has a short term investment policy that guides treasury	1	5	2.54	1.232	0.796	0.378	-0.128	0.741
There is a list of approved investment instruments that can be used	1	5	3.05	1.213	0.177	0.378	-1.304	0.741
The bank mainly invests in treasury bills/bonds	1	5	3.03	1.46	-0.154	0.378	-1.389	0.741
Short term investments are done mainly in consideration of banks liquidity as opposed to financial performance	1	5	3.23	1.385	-0.438	0.378	-1.291	0.741
There is a clear policy guideline used by the commercial bank	2	5	3.49	1.073	-0.302	0.378	-1.236	0.741
The bank had adopted liquidity projection systems to protect against insolvency	1	5	3.1	1.294	-0.123	0.378	-1.096	0.741
There is a minimum liquidity ratio a commercial bank must have	1	5	3.15	1.136	-0.544	0.378	-0.8	0.741
Liquidity management is the main function of treasury	1	5	3.62	1.091	-0.952	0.378	0.172	0.741
There are practices and procedures through which risk management strategies are implemented	1	5	3.26	1.585	-0.488	0.378	-1.376	0.741
The bank has mechanisms of managing foreign exchange risk	1	5	3.1	1.165	-0.63	0.378	-0.586	0.741

The bank has a policy for insuring cash	1	5	3.08	1.306	0	0.378	-1.314	0.741
There is frequent risk management review by the bank	1	5	4.21	0.833	-1.563	0.378	4.434	0.741
There is control risk self-assessment measures implemented by the bank	1	5	4.28	0.887	-1.557	0.378	3.453	0.741
There are sound credit management practices	1	5	3.67	1.264	-0.975	0.378	-0.041	0.741
The bank constantly undertakes financial operating risk management	1	5	3.18	1.412	-0.513	0.378	-1.083	0.741
The bank has an effective process of developing and implementing risk response strategies	1	5	2.9	1.392	0.131	0.378	-1.16	0.741
There is continuous reporting of risks to all relevant structures	1	5	3.36	1.53	-0.555	0.378	-1.187	0.741
The bank monitors the risk performance on an ongoing basis	1	5	2.9	1.501	0.036	0.378	-1.367	0.741
The bank has an effective process of resourcing risk management response strategies and processes	1	5	3.36	1.495	-0.409	0.378	-1.265	0.741
Treasury management improves return on capital employed	2	5	4.1	0.821	-1.1	0.378	1.462	0.741
Treasury management leads to increased return on assets	2	5	3.85	1.089	-0.71	0.378	-0.728	0.741
Treasury management increases Return on Investment	1	5	3.54	1.072	-0.847	0.378	0.031	0.741
Treasury management improves operating profit margin	2	5	3.62	0.99	-0.681	0.378	-0.669	0.741
To what gradation do you attribute the current financial performance of your bank to the treasury management practices employed	2	5	3.54	1.072	-0.443	0.378	-1.152	0.741







## Non-performing Loans

```
. xtreg Financial_Performance Non_performing_loans i.Year, fe
```

```
Fixed-effects (within) regression      Number of obs   =    202
Group variable: Bank                  Number of groups =     47

R-sq:  within = 0.0135                Obs per group:  min =     1
        between = 0.1581                avg =           4.3
        overall = 0.0345                max =           5

corr(u_i, xb) = -0.2737                F(5,150)       =     0.41
                                         Prob > F       =     0.8415
```

Financial_~e	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
Non_perfor~s	-.0232797	.0222081	-1.05	0.296	-.0671609	.0206014
Year						
2014	.0044263	.0085006	0.52	0.603	-.0123702	.0212227
2015	-.0032033	.0087508	-0.37	0.715	-.0204942	.0140875
2016	.0041922	.0090296	0.46	0.643	-.0136495	.0220339
2017	.0036064	.0090587	0.40	0.691	-.0142927	.0215055
_cons	.6102268	.0073748	82.74	0.000	.5956548	.6247988
sigma_u	.06745381					
sigma_e	.038935					
rho	.75009125	(fraction of variance due to u_i)				

```
F test that all u_i=0:      F(46, 150) =    12.53      Prob > F = 0.0000
```

## Risk Management

```
Fixed-effects (within) regression      Number of obs   =    202
Group variable: Bank                  Number of groups =     47

R-sq:  within = 0.0232                Obs per group:  min =     1
        between = 0.0305                avg =           4.3
        overall = 0.0339                max =           5

corr(u_i, xb) = 0.0766                F(1,154)       =     3.66
                                         Prob > F       =     0.0574
```

Financial_~e	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
Risk_Manag~s	-.0041327	.0021589	-1.91	0.057	-.0083976	.0001323
_cons	.6120691	.003803	160.95	0.000	.6045564	.6195818
sigma_u	.06541035					
sigma_e	.0382353					
rho	.74532698	(fraction of variance due to u_i)				

```
F test that all u_i=0:      F(46, 154) =    13.51      Prob > F = 0.0000
```

### Liquidity Strategies

Fixed-effects (within) regression  
 Group variable: Bank

Number of obs = 202  
 Number of groups = 47

R-sq: within = 0.2155  
 between = 0.1214  
 overall = 0.1242

Obs per group: min = 1  
 avg = 4.3  
 max = 5

corr(u\_i, Xb) = -0.0556

F(1,154) = 42.31  
 Prob > F = 0.0000

Financial_~e	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
Liquidity_~s	.0845555	.0129997	6.50	0.000	.0588747	.1102362
_cons	.4370318	.0262305	16.66	0.000	.3852136	.4888499
sigma_u	.06228765					
sigma_e	.03426595					
rho	.76767371	(fraction of variance due to u_i)				

F test that all u\_i=0: F(46, 154) = 15.68 Prob > F = 0.0000

### Investment Strategies

Fixed-effects (within) regression  
 Group variable: Bank

Number of obs = 202  
 Number of groups = 47

R-sq: within = 0.4662  
 between = 0.5913  
 overall = 0.5936

Obs per group: min = 1  
 avg = 4.3  
 max = 5

corr(u\_i, Xb) = -0.1038

F(1,154) = 134.52  
 Prob > F = 0.0000

Financial_~e	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
Investment_~s	.0664953	.0057333	11.60	0.000	.0551693	.0778213
_cons	.5209509	.0076748	67.88	0.000	.5057895	.5361123
sigma_u	.04298448					
sigma_e	.02826475					
rho	.69813808	(fraction of variance due to u_i)				

F test that all u\_i=0: F(46, 154) = 9.63 Prob > F = 0.0000

## Funding Strategies

Fixed-effects (within) regression  
 Group variable: Bank

Number of obs = 202  
 Number of groups = 47

R-sq: within = 0.2955  
 between = 0.6353  
 overall = 0.5703

Obs per group: min = 1  
 avg = 4.3  
 max = 5

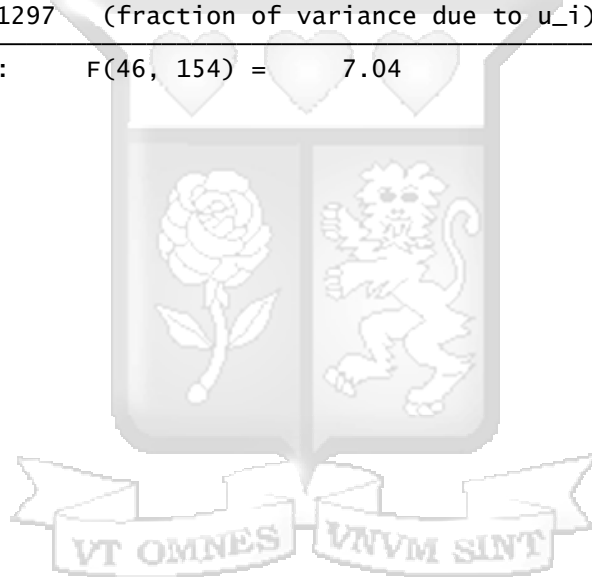
corr(u\_i, Xb) = 0.3973

F(1,154) = 64.59  
 Prob > F = 0.0000

Financial_~e	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
Funding_St~s	.0577895	.0071905	8.04	0.000	.0435847	.0719943
_cons	.4732546	.0167881	28.19	0.000	.4400898	.5064193
sigma_u	.04343904					
sigma_e	.03247238					
rho	.64151297					

(fraction of variance due to u\_i)

F test that all u\_i=0: F(46, 154) = 7.04 Prob > F = 0.0000



## Appendix VI: Factor Analysis

### Communalities

	Initial	Extraction
Customer_Deposits	1	0.94
Long_term_borrowings	1	0.6
Short_Term_Deposits_advanced	1	0.666
Cash and Cash Equivalent	1	0.857
Current Ratio	1	0.839
Forex_gain_loss	1	0.678
Interest_expense	1	0.834
Non_performing_loans	1	0.574

Extraction Method: Principal Component Analysis.

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.031	44.787	44.787	4.031	44.787	44.787	3.814	42.382	42.382
2	1.678	18.646	63.433	1.678	18.646	63.433	1.886	20.957	63.339
3	1.128	12.537	75.971	1.128	12.537	75.971	1.137	12.632	75.971
4	0.827	9.191	85.162						
5	0.632	7.02	92.181						
6	0.303	3.366	95.547						
7	0.253	2.812	98.359						
8	0.1	1.116	99.475						
9	0.047	0.525	100						

Extraction Method: Principal Component Analysis.

### Component Matrix(a)

	Component		
	1	2	3
Customer_Deposits	0.862	0.443	0.004
Long_term_borrowings	0.754	-0.145	-0.104
Short_Term_Deposits_advanced	0.727	-0.216	0.301
Cash and Cash Equivalent	0.636	0.672	-0.022
Current Ratio	-0.871	0.25	0.135
Forex_gain_loss	0.325	-0.04	-0.755
Interest_expense	-0.055	0.894	0.177
Non_performing_loans	0.334	-0.24	0.636

Extraction Method: Principal Component Analysis.

a. 3 components extracted.

### Rotated Component Matrix(a)

	Component		
	1	2	3
Customer_Deposits	0.687	0.681	-0.068
Long_term_borrowings	0.762	0.078	-0.113
Short_Term_Deposits_advanced	0.758	0.047	0.299

Cash and Cash Equivalent	0.402	0.826	-0.11
Current Ratio	-0.906	-0.011	0.136
Forex_gain_loss	0.323	-0.02	-0.757
Interest_expense	-0.324	0.849	0.087
Non_performing_loans	0.391	-0.059	0.647

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 5 iterations.

Component Transformation Matrix

Component	1	2	3
1	0.953	0.302	-0.031
2	-0.303	0.947	-0.101
3	0	0.106	0.994

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

	Customer_Deposits	Long_term_borrowings	Short_Term_Deposits_advanced	Cash_and_Cash_Equivalent	Current_Ratio	Forex_gain_loss	Interest_expense	Non_performing_loans
Customer_Deposits	1	0.517	0.545	0.838	-0.633	0.293	0.32	0.215
Long_term_borrowings	0.517	1	0.382	0.426	-0.589	0.286	-0.193	0.295
Short_Term_Deposits_advanced	0.545	0.382	1	0.234	-0.662	0.052	-0.123	0.33
Cash and Cash Equivalent	0.838	0.426	0.234	1	-0.337	0.095	0.422	-0.009
Current Ratio	-0.633	-0.589	-0.662	-0.337	1	-0.329	0.243	-0.177
Forex_gain_loss	0.293	0.286	0.052	0.095	-0.329	1	-0.072	-0.047
Interest_expense	0.32	-0.193	-0.123	0.422	0.243	-0.072	1	-0.048

Non_performing_loans	0.215	0.295	0.33	-0.009	-0.177	-0.047	-0.048	1
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